State of Florida

Public Service Commission

CAPITAL CIRCLE OFFICE CENTER • 2540 SHUMARD OAK BOULEVARD
TALLAHASSEE, FLORIDA 32399-0850

-M-E-M-O-R-A-N-D-U-M-

DATE: April 30, 2010

TO: Ann Cole, Commission Clerk, Office of Commission Clerk

FROM: Mike Lawson, Senior Attorney, Office of General Counsel

RE: Docket No. 130209 -Petition for limited proceeding to approve revised and restated stipulation and settlement agreement by Duke Energy Florida, Inc. d/b/a Duke Energy.

Please place the attached document in the correspondence section of the above-referenced docket file. Please return the CD-R disks to Mike Lawson once the upload is complete.

Thank you.

MTL/tfw

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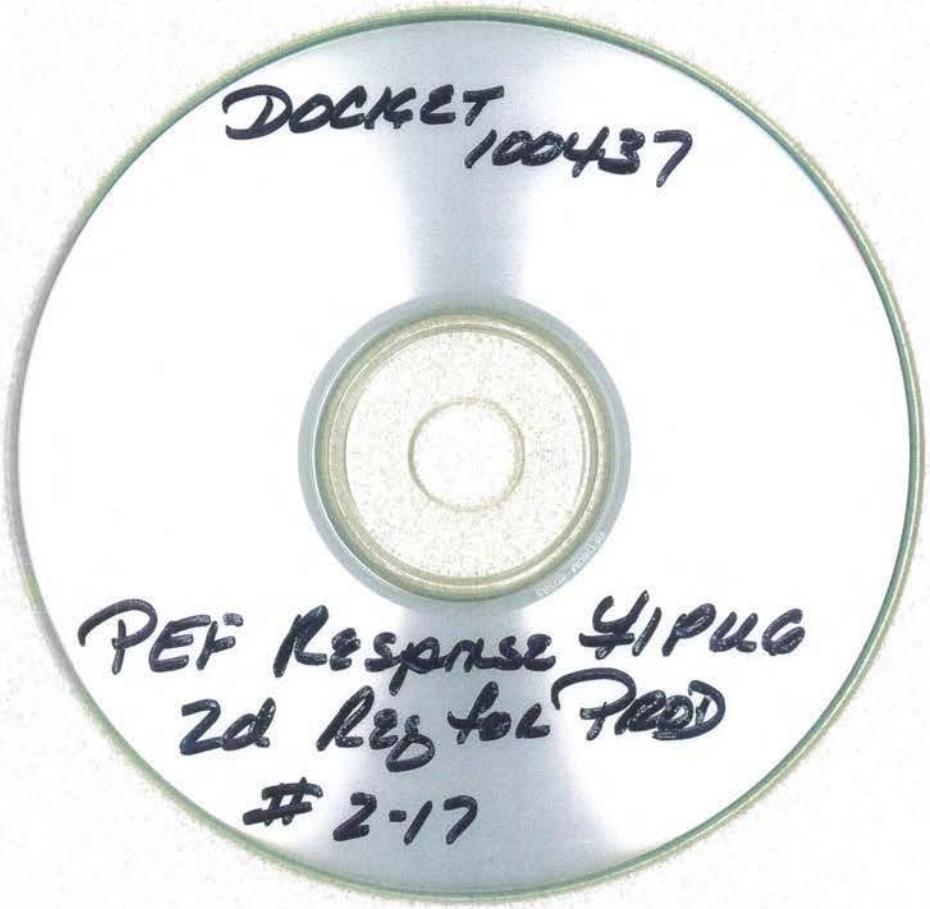
Ruth, please transfer these on
one to DN 05500-13.
Thank you
Ann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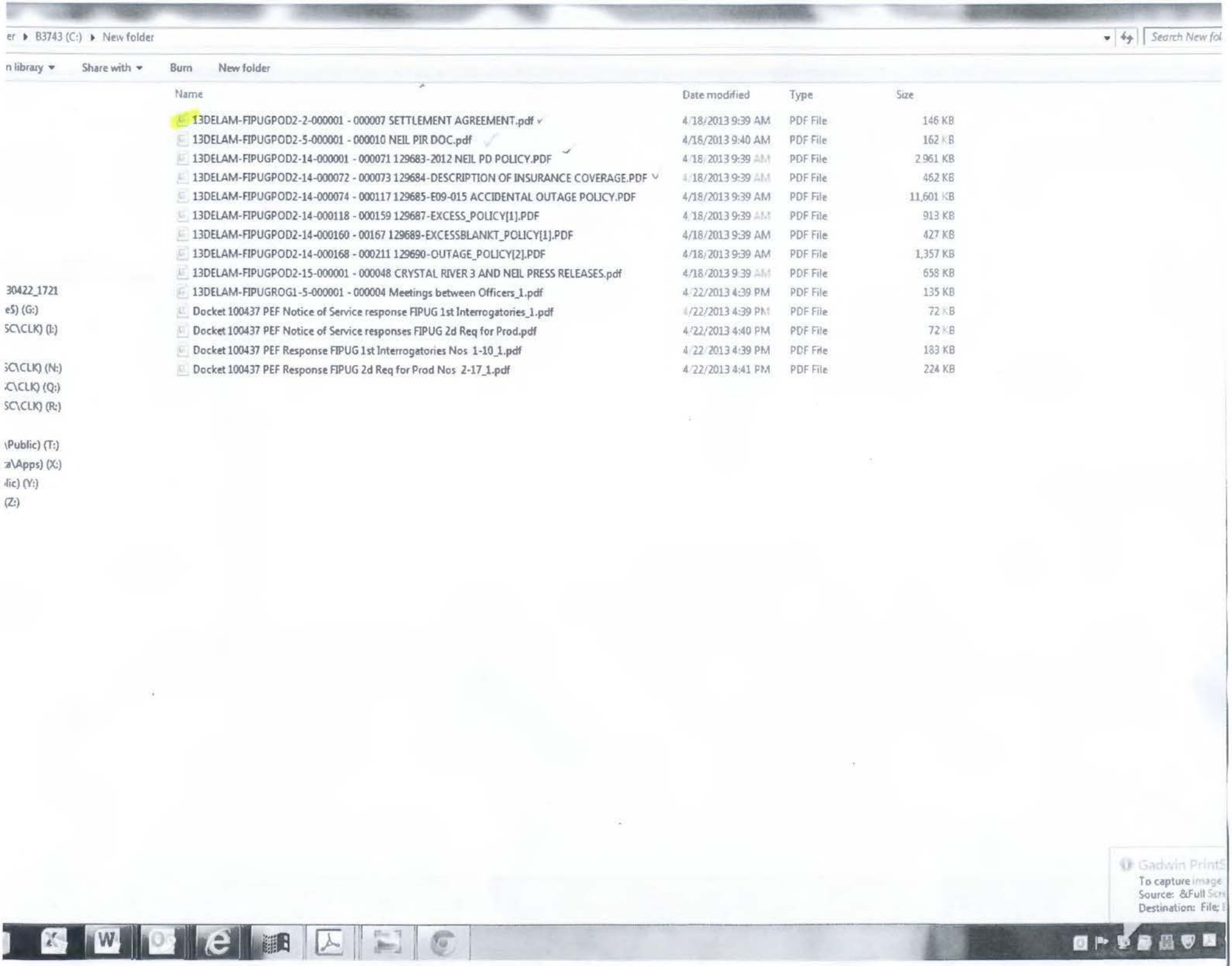
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SETTLEMENT AGREEMENT AND MUTUAL RELEASE

This Settlement Agreement and Mutual Release (the "Agreement"), binding and effective as of March 28, 2013, is made and entered into by and between Florida Power Corporation doing business as Progress Energy Florida, Inc. ("Progress"), and Nuclear Electric Insurance, Ltd. ("NEIL"). Progress and NEIL are referred to together as the "Parties" or individually as a "Party."

WHEREAS, NEIL issued various insurance policies to Progress for property damage and business interruption at Progress's Crystal River 3 nuclear plant located in Crystal River, Florida ("CR3"), including Primary Property and Decontamination Liability Insurance Policies Nos. P09-081, P10-081, and P11-081; Decontamination Liability, Decommissioning Liability, and Excess Property Insurance Policies Nos. X09-015, X10-015, and X11-015; Blanket Excess, Decontamination Liability, Decommissioning Liability, and Excess Property Insurance Policies Nos. BX09-004, BX10-004, and BX11-004; and Accidental Outage Insurance Policies Nos. E09-015, E10-015, and E11-015 (these twelve policies shall be referred to collectively as the "Policies" and Policies Nos. E09-015, E10-015, and E11-015 shall be referred to collectively as the "AO Policies");

WHEREAS, Progress submitted claims to NEIL under the Policies seeking recovery for property damage to the containment structure at CR3 (as defined below) which occurred on or about October 2, 2009, March 14, 2011, and July 26, 2011, and accidental outage at CR3 beginning on or about January 15, 2010, which claims are more fully described in the proofs of loss submitted by Progress to NEIL under the Policies (the "Claims");

WHEREAS, NEIL has previously paid Progress $305,000,000 in connection with the Claims;

WHEREAS, NEIL has reserved its rights and has set forth various factual and legal contentions which, according to NEIL, may limit or preclude additional coverage under the Policies for the Claims;

WHEREAS, Progress disputes NEIL's factual and legal contentions and contends that it is entitled to full coverage for the Claims under the Policies;

WHEREAS, without admitting any liability, the Parties wish to conclude, resolve and settle all disputes between them relating to the Claims without the need for further investigation of the Claims or for arbitration between the Parties;

NOW, THEREFORE, in consideration of the mutual promises, covenants and agreements set forth in this Agreement, the sufficiency of which the parties acknowledge, it is agreed as follows:

1. Payment to Progress. On or before April 27, 2013, NEIL shall pay Progress the sum of Five Hundred Thirty Million Dollars ($530,000,000) (the "NEIL Payment"). For the avoidance of doubt, such payment shall be in addition to those amounts already paid by NEIL

with respect to the Claims. NEIL shall make the NEIL Payment by wire transfer in accordance with the instructions to be provided by Progress reasonably in advance of the payment date.

2. Allocation of Payments. Four Hundred Ninety Million Dollars ($490,000,000) of the $835,000,000 in total payments made by NEIL with respect to the Claims constitutes payment by NEIL of the equivalent of one full policy limits under NEIL's Accidental Outage coverage. The balance of the $835,000,000 in total payments made by NEIL constitutes payment by NEIL under NEIL's Property and Decontamination Liability coverage.

3. Definition of CR3 Containment Structure. CR3 Containment Structure shall be defined as the buttresses, ring girder, dome, steel liner, panels, bays, and tendons of the containment building. For reference, and attached as an Exhibit, the containment building is labeled as the reactor building in the plot plan Progress Energy Dwg. #CR3-G86-D, Rev. 14.

4. Mutual Releases.

Progress, on its own behalf and on behalf of its officers, directors, owners, affiliates, insurers, employees, assigns, partners, shareholders, successors, predecessors, employees, assigns, partners, representatives, and all others claiming by or through it (collectively, the Progress Releasors") hereby covenant not to sue and unconditionally and fully and forever release and discharge NEIL and its officers, directors, owners, affiliates, insurers, reinsurers, employees, assigns, partners, shareholders, successors, predecessors, employees, assigns, partners, representatives, and all others claiming by or through it (collectively, the "NEIL Releasees") from any and all claims, actions, suits, debts, liens, contracts, agreements, obligations, promises, accounts, rights, controversies, disputes, losses, costs and expenses (including attorneys' fees and costs actually incurred), liabilities, damages, demands, and causes of action of any nature or kind, whether now known or unknown, suspected or unsuspected, fixed or contingent, constituting, arising out of or in any way connected to: (i) the Claims; (ii) the AO Policies; or (iii) any and all claims under the Policies arising out of or related in any way, directly or indirectly, to the CR3 Containment Structure. Nothing in this Agreement shall affect the Progress Releasors' right to take action to enforce the terms of this Agreement.

The NEIL Releasees covenant not to sue and unconditionally and fully and forever release and discharge the Progress Releasors from any and all claims, actions, suits, debts, liens, contracts, agreements, obligations, promises accounts, rights, controversies, disputes, losses, costs and expenses (including attorneys' fees and costs actually incurred), liabilities, damages, demands, and causes of action of any nature or kind, whether now known or unknown, suspected or unsuspected, fixed or contingent, constituting, arising out of or in any way connected to: (i) the Claims; (ii) the AO Policies; or (iii) any and all claims under the Policies arising out of or related in any way, directly or indirectly, to the CR3 Containment Structure. Nothing in this Agreement shall affect the NEIL Releasees' right to take action to enforce the terms of this Agreement.

It is the intent of the parties that they are hereby releasing any claim, known or unknown, for property damage or business interruption arising from or related to the creation of an opening in the wall of the CR3 Containment Structure in or about September 2009, the detensioning and

retensioning of portions of the Containment Structure related thereto, and the property damage that was the subject of the Claims.

5. Costs and Fees. Each Party shall bear its own costs and expenses (including attorneys' fees) relating to the Claims.

6. Representations and Warranties. Each Party represents and warrants that (1) it is represented by counsel of its own choosing in entering into this Agreement and has been given sufficient time to consult with advisers of the Party's choice with regard to this Agreement; (2) the signatory to this Agreement has full legal right, power and authority to execute the Agreement and bind the Party for whom the signatory signs; (3) the execution, delivery and performance of the Agreement and the stipulations and terms herein are duly authorized; (4) no other person, entity, partnership, or party must approve or otherwise authorize this Agreement for it to be binding on behalf of the Party; (5) it has read, understands, and voluntarily accepts the Agreement; (6) it is not relying on any representations not contained herein; and (7) it has not assigned or transferred, or purported to assign or transfer, to any person, firm, company or corporation whatsoever, any matter released hereunder.

Progress further represents and warrants that any claim that it might bring after the date hereof for damage to the CR3 Containment Structure, under policies issued by NEIL, shall be brought only under a policy issued for the period April 1, 2012 or later.

NEIL further represents and warrants that, for any claim brought by Progress after the date hereof for damage to the CR3 Containment Structure, NEIL will not take the position that such claim should have been brought under any of the Policies.

7. Compromise; Admissibility. The Parties acknowledge that this Agreement represents the compromise of disputed claims and shall not constitute an admission of liability by either Party, nor should any inference be drawn with respect to any legal arguments or issues of policy interpretation. Neither this Agreement nor any of the terms of this Agreement shall be admissible for any purpose in any arbitration or other legal proceeding other than in a proceeding between the Parties which concerns an alleged breach of the terms of this Agreement or in connection with proceedings before the Florida Public Service Commission.

8. Confidentiality of Information. The Confidentiality Agreement between the Parties effective as of December 21, 2009 shall remain in full force and effect.

9. Choice of Law; Dispute Resolution. This Agreement in all respects shall be interpreted under the law of the state of New York. Any disputes arising under this Agreement shall be resolved in accordance with Section V.G.4 of NEIL Primary Property and Decontamination Liability Insurance Policy P12-081.

10. Severance. In the event any provision of this Agreement is deemed to be invalid or unenforceable by any arbitrator, court or administrative agency of competent jurisdiction, and in the event that any provision cannot be modified so as to be valid and enforceable, then that provision shall be deemed severed from the Agreement, and the remainder of the Agreement shall remain in full force and effect.

11. Headings and Pronouns. The headings in this Agreement are inserted for convenience and identification only, and are in no way intended to describe, interpret or limit the scope, extent or intent of this Agreement or any provision hereof. All pronouns and any variations thereof shall be deemed to refer to the masculine, feminine, neuter, singular or plural wherever the context of this Agreement so requires.

12. Entire Agreement; Modification. This Agreement contains the entire agreement between Progress and NEIL and fully supersedes any and all prior agreements or understandings between them regarding its subject matter. This Agreement may only be modified by written agreement signed by both Parties.

13. Execution; Counterparts. This Agreement may be executed in two (2) or more counterparts, and execution in such manner shall in no way affect or alter the validity of this Agreement or the rights and responsibilities of the Parties hereto. Upon execution, the Parties shall exchange executed counterparts, and said exchange may be made by facsimile or email transmission.

[REMAINDER OF PAGE LEFT INTENTIONALLY BLANK]

Dated: March 28, 2013

FLORIDA POWER CORPORATION, D/B/A
PROGRESS ENERGY FLORIDA, INC.

By: _____

Name: F. ALEXANDER GLENN

Title: State President

NUCLEAR ELECTRIC INSURANCE, LIMITED

By: _____

Name: _____

Title: _____

Dated: March 28, 2013

FLORIDA POWER CORPORATION, D/B/A
PROGRESS ENERGY FLORIDA, INC.

By: _____

Name: _____

Title: _____

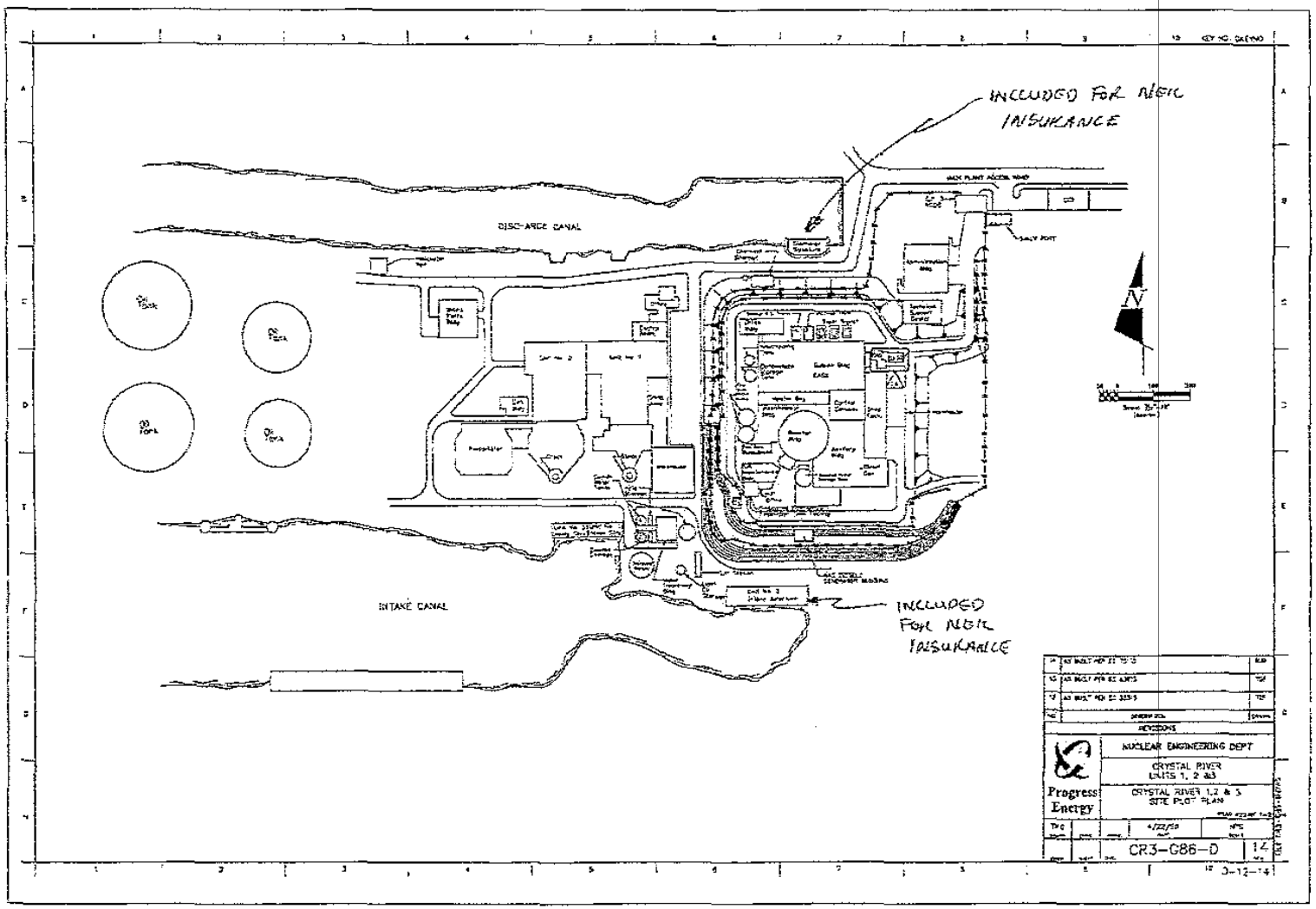
NUCLEAR ELECTRIC INSURANCE, LIMITED

By: David B. Ri

Name: David B. Ripsom

Title: President & CEO

Exhibit to Settlement Agreement and Mutual Release
Effective as of March 28, 2013



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Policyholders' Insurance Record (PIR)

nuclear electric insurance limited

Policyholder Insurance Record (PIR)

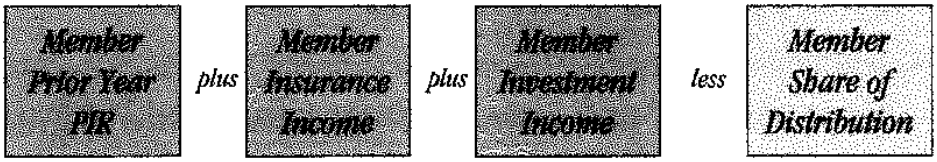
- The PIR is used as a method to track an individual Members contribution to NEIL's capital over the duration of their Membership.

- The PIR provides a method of allocating resources, when there is a need to do so, in an equitable fashion.

- A return of excess premium, in the form of an annual policyholder distribution, is one example of when the PIR is used.

Components

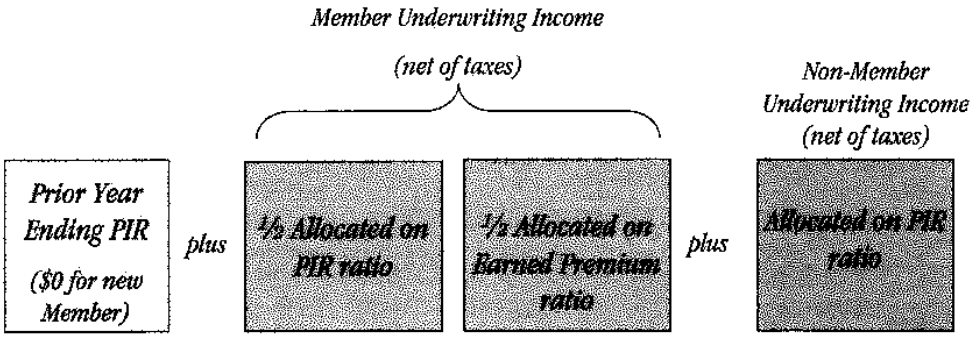
A Member's PIR is made up of the following components:



Components

- A Member's PIR is made up of the following components:
  - Prior year ending PIR balance.
  - Member share of current year underwriting income from Member and Non-Member Insurance Programs, net of applicable income tax.
  - Member share of current year investment income including unrealized gain/loss, net of applicable income tax.
  - Less Member share of annual distribution.

Component Calculations – Underwriting Income

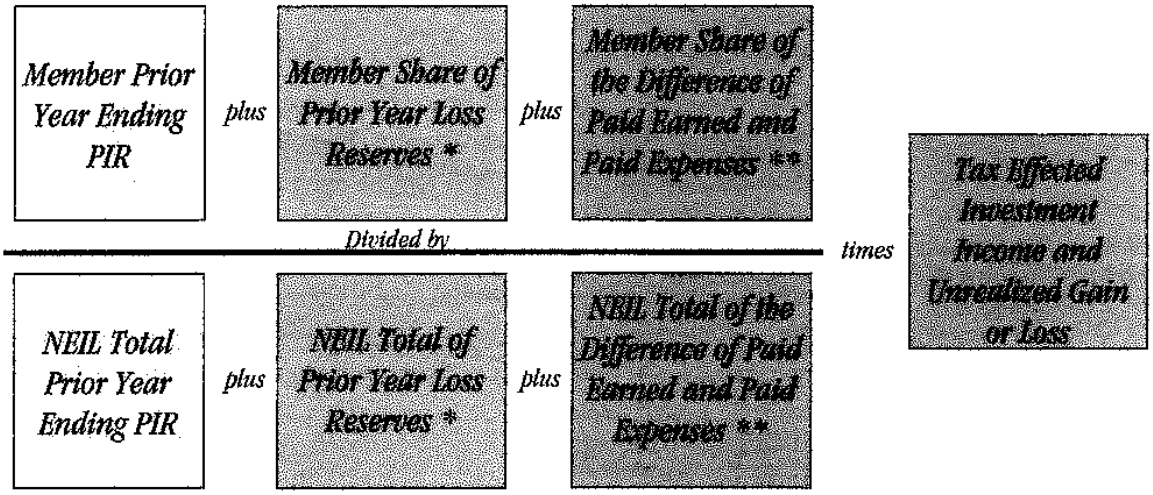


Component Calculations – Underwriting Income

- New Members begin with a zero PIR.
- Underwriting income from Member Insurance Programs, net of applicable taxes, and excluding losses is allocated as follows:
  - 50% is allocated based upon the individual Member's earned premiums as a percentage of total NEIL Member earned premiums. (Earned Premium Ratio)
  - 50% is allocated based on the individual Member's PIR as a percentage of total NEIL Member PIR. (PIR Ratio)
  - Losses incurred in the current year are allocated 50% by the Earned Premium Ratio and 50% by the PIR Ratio for the year to which the loss is attributed.
- Underwriting income from Non-Member Insurance Programs is allocated as follows:
  - 100% is allocated based on the individual Member's PIR as a percentage of total NEIL Member PIR.

Component Calculations – Investment Income

This summation of these figures is compared to the Member total for the same figures to create a ratio for allocation of both realized and unrealized investment income.



** Member program allocated 50% on PIR ratio and 50% on Earned Prem. Ratio - Non-Member program allocated on PIR ratio*

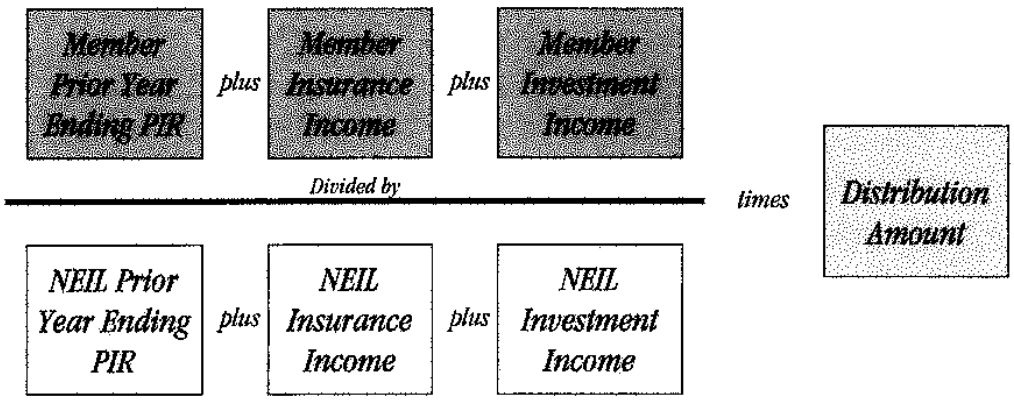
*** Expenses allocated 50% on PIR and 50% on current year Earned Prem. Ratio*

Component Calculations – Investment Income

- Investment income net of applicable income taxes, and the change in unrealized gains or losses, net of deferred tax, is allocated by the "Other Income Ratio". This ratio is calculated as follows:
  - Begin with individual Member's prior year ending PIR.
  - Add the individual Member's share of Prior Year Loss Reserves.
    - Member program loss reserves are allocated based on 50% of the Member's earned premium ratio and 50% of Member's beginning PIR ratio for the respective year.
    - Non-Member program loss reserves are allocated based on the Member's beginning PIR ratio for the respective year.
  - Add the individual Member's share of the difference between current year paid/earned premiums and underwriting expenses for Member Insurance Programs.
    - Underwriting expenses are allocated 50% on the current year Earned Premium Ratio, and 50% on the prior year ending PIR Ratio.
- The individual Member's sum of these components as a percentage of the NEIL total is used to allocate Investment Income and Unrealized Gains or Losses.

Component Calculations – Distribution

This summation of these figures is compared to the Member total for the same figures to create a ratio for allocation of the annual policyholder distribution.



Component Calculations – Distribution

- Distribution calculation
  - A Member's prior year ending PIR is added to its current share of underwriting income, investment income and unrealized gain or loss.
  - The same calculation is done at the NEIL Member total level.
  - The sum of the individual Member components is divided by sum of the NEIL total Member components.
  - The resulting percentage is multiplied by the distribution amount.

$$\frac{\text{Member Beg. PIR + Member Underwriting Inc. + Member Inv. Inc. + Member UGL}}{\text{NEIL total Beg. PIR + NEIL total Underwriting Inc. + NEIL total Inv. Inc. + NEIL total UGL}} \times \text{Distribution Amount}$$

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NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

Terms & Conditions Endorsement

Member Insured: Florida Power Corporation

Site: Crystal River
Endorsement No. 10
Policy Number: P12-081
Effective Date: April 1, 2012

Effective Time of this Endorsement is 12:01 a.m. Standard Time in Hamilton, Bermuda.

It is hereby agreed and understood that this Endorsement cancels and replaces:
Endorsement No. 9
As used herein, EPC Contract shall refer to the Engineering, Procurement and Construction contract that Progress Energy Florida, Inc. shall enter into for the repairs to the Containment Structure at the Insured Unit.

As used herein, Repairs shall refer to all work performed under the EPC Contract.

For the purposes of this Endorsement the Containment Structure shall be defined as the buttresses, ring girder, dome, liner, panels, bays, and tendons of the containment building. For reference, the containment building is labeled as the reactor building in the plot plan Progress Energy Dwg. #CR3-G86-D, Rev. 11, 10-21-03.

This Policy does not cover Accidental Property Damage to the Containment Structure. This Policy also does not cover Accidental Property Damage to tools, materials, supplies, equipment and machinery, including those belonging to contractors' and subcontractors', used to effect Repairs.

Notwithstanding the above,

1.) Subject to all other terms and conditions of this Policy, Property Damage caused by an Accident discovered prior to either the earlier of either November 15, 2012, or the date on which Repairs begin, that arises out of or relates to the construction pre-work activities specified in Exhibit A below, is not excluded by this endorsement, but the limits of liability for such damage is $50,000,000.

2.) Subject to all other terms and conditions of this Policy, Property Damage to the Containment Structure caused by windstorm, flood, earthquake, or volcanic eruption is not excluded by this endorsement, but the limits of liability for such damage is $300,000,000 in excess of $200,000,000, in excess of the Policy deductible. For the period from April 1, 2012 to the earlier of either November 15, 2012, or the date on which Repairs begin, and subject to all other terms and conditions of this Policy, Property Damage to the Containment Structure caused by windstorm, flood, earthquake, or volcanic eruption is not excluded by this endorsement, but is limited to $300,000,000 and subject to all other terms and conditions of this Policy.

3.) Subject to all other terms and conditions of this Policy, Accidental Property Damage to the

Containment Structure that is discovered prior to the earlier of either November 15, 2012, or the date on which Repairs begin, which is not caused by (i) Repairs , or (ii) an activity included in Exhibit A below, is not excluded by this endorsement, but is limited to $100,000,000.

Exhibit A

1. Temporary Office Facility Set-Up &/or Reconfiguration
2. Fab Shop & Early Material Lay-Down Area Set-Up
3. Core Bores to Assess Tritium Levels in Concrete Bay 56
4. Excavating Berm Areas and Soil Surveys to Support a Second Crane
5. Contract Award
6. Base Scope Contractor Demobilization
7. Construction Equipment Mobilization
8. Mobilize Field Office Facilities
9. Mobilize Craft Support Facilities
10. Mobilize Tendon Contractor Equipment to Site
11. Install Facilities and Temp Power
12. Contractor Setup for Rebar Scanning
13. Material Receiving and Lay-Down Setup
14. Receive Work Platform(s)
15. Receive Shoring
16. Receive Concrete Hydo-demolition Equipment
17. Receive Concrete Wall Demolition Mockup Material
18. Receive Shoring Material
19. Receive Water Management
20. Limited Tendon Access Interference Removal
21. Setup Batch Plant
22. Begin Interference Removal for 1st Bay and Beyond Platform Erection and Concrete Removal
23. Receive Concrete Constituents, Water, and Nitrogen
24. Receive Spent Fuel Pool Protective Barrier Material
25. Erect Platform and Scaffold for Concrete Removal

This endorsement shall not serve to limit the recovery for, or otherwise exclude, any loss incurred under Section I.A.2, including expenses covered under I.E.1 following Accidental Property Damage covered under Section I.A.2.

This endorsement shall not serve to limit the recovery for, or otherwise exclude, any loss incurred stemming from an act of terrorism that causes Accidental Property Damage covered by this Policy.

This Endorsement shall not serve to limit the recovery for, or otherwise exclude Accidental Property Damage to (i) the contents of the containment building, (ii) adjacent buildings, or (iii) equipment, provided that such equipment is not used to effect Repairs .

All other terms and conditions of the Policy remain the same.

This Endorsement does not increase the amount of insurance provided under this Policy.

IN WITNESS WHEREOF, the parties hereto have caused this Endorsement to be executed and attested on their behalf.

Wilmington, Delaware

Date: _____

Attest: _____

INSURER:
Nuclear Electric Insurance Limited

By: _____
David B. Ripsom, President

Wilmington, Delaware

Date: _____

Witness: _____

MEMBER INSURED:
Florida Power Corporation

By: _____
Attorney-in-Fact

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

Terms & Conditions Endorsement

Member Insured: Florida Power Corporation

Site: Crystal River
Endorsement No. 9
Policy Number: P12-081
Effective Date: April 1, 2012

Effective Time of this Endorsement is 12:01 a.m. Standard Time in Hamilton, Bermuda.

It is hereby agreed and understood that this Endorsement cancels and replaces:
Endorsement No. 8
As used herein, EPC Contract shall refer to the Engineering, Procurement and Construction contract that Progress Energy Florida, Inc. shall enter into for the repairs to the Containment Structure at the Insured Unit.

As used herein, Repairs shall refer to all work performed under the EPC Contract.

For the purposes of this Endorsement the Containment Structure shall be defined as the buttresses, ring girder, dome, liner, panels, bays, and tendons of the containment building. For reference, the containment building is labeled as the reactor building in the plot plan Progress Energy Dwg. #CR3-G86-D, Rev. 11, 10-21-03.

This Policy does not cover Accidental Property Damage to the Containment Structure. This Policy also does not cover Accidental Property Damage to tools, materials, supplies, equipment and machinery, including those belonging to contractors' and subcontractors', used to effect Repairs.

Notwithstanding the above,

1.) Subject to all other terms and conditions of this Policy, Property Damage caused by an Accident discovered prior to August 1, 2012 that arises out of or relates to the construction pre-work activities specified in Exhibit A below, is not excluded by this endorsement, but the limits of liability for such damage is $50,000,000.

2.) Subject to all other terms and conditions of this Policy, Property Damage to the Containment Structure caused by windstorm, flood, earthquake, or volcanic eruption is not excluded by this endorsement, but the limits of liability for such damage is $300,000,000 in excess of $200,000,000, in excess of the Policy deductible. For the period from April 1, 2012 to the earlier of either August 1, 2012, or the date on which Repairs begin, and subject to all other terms and conditions of this Policy, Property Damage to the Containment Structure caused by windstorm, flood, earthquake, or volcanic eruption is not excluded by this endorsement, but is limited to $300,000,000 and subject to all other terms and conditions of this Policy.

3.) Subject to all other terms and conditions of this Policy, Accidental Property Damage to the Containment Structure that is discovered prior to August 1, 2012, which is not caused by (i)

Repairs , or (ii) an activity included in Exhibit A below, is not excluded by this endorsement, but is limited to $100,000,000.

Exhibit A

1. Temporary Office Facility Set-Up &/or Reconfiguration
2. Fab Shop & Early Material Lay-Down Area Set-Up
3. Core Bores to Assess Tritium Levels in Concrete Bay 56
4. Excavating Berm Areas and Soil Surveys to Support a Second Crane
5. Contract Award
6. Base Scope Contractor Demobilization
7. Construction Equipment Mobilization
8. Mobilize Field Office Facilities
9. Mobilize Craft Support Facilities
10. Mobilize Tendon Contractor Equipment to Site
11. Install Facilities and Temp Power
12. Contractor Setup for Rebar Scanning
13. Material Receiving and Lay-Down Setup
14. Receive Work Platform(s)
15. Receive Shoring
16. Receive Concrete Hydo-demolition Equipment
17. Receive Concrete Wall Demolition Mockup Material
18. Receive Shoring Material
19. Receive Water Management
20. Limited Tendon Access Interference Removal
21. Setup Batch Plant
22. Begin Interference Removal for 1st Bay and Beyond Platform Erection and Concrete Removal
23. Receive Concrete Constituents, Water, and Nitrogen
24. Receive Spent Fuel Pool Protective Barrier Material
25. Erect Platform and Scaffold for Concrete Removal

This endorsement shall not serve to limit the recovery for, or otherwise exclude, any loss incurred under Section I.A.2, including expenses covered under I.E.1 following Accidental Property Damage covered under Section I.A.2.

This endorsement shall not serve to limit the recovery for, or otherwise exclude, any loss incurred stemming from an act of terrorism that causes Accidental Property Damage covered by this Policy.

This Endorsement shall not serve to limit the recovery for, or otherwise exclude Accidental Property Damage to (i) the contents of the containment building, (ii) adjacent buildings, or (iii) equipment, provided that such equipment is not used to effect Repairs .

All other terms and conditions of the Policy remain the same.

This Endorsement does not increase the amount of insurance provided under this Policy.

IN WITNESS WHEREOF, the parties hereto have caused this Endorsement to be executed and attested on their behalf.

Wilmington, Delaware

Date: _____

Attest: _____

INSURER:
Nuclear Electric Insurance Limited

By: _____
David B. Ripsom, President

Wilmington, Delaware

Date: _____

Witness: _____

MEMBER INSURED:
Florida Power Corporation

By: _____
Attorney-in-Fact

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

Terms & Conditions Endorsement

Member Insured: Florida Power Corporation

Site: Crystal River
Endorsement No. 8
Policy Number: P12-081
Effective Date: April 1, 2012

Effective Time of this Endorsement is 12:01 a.m. Standard Time in Hamilton, Bermuda.

It is hereby agreed and understood that this Endorsement cancels and replaces:
Endorsement No. 4
As used herein, EPC Contract shall refer to the Engineering, Procurement and Construction contract that Progress Energy Florida, Inc. shall enter into for the repairs to the Containment Structure at the Insured Unit.

As used herein, Repairs shall refer to all work performed under the EPC Contract.

For the purposes of this Endorsement the Containment Structure shall be defined as the buttresses, ring girder, dome, liner, panels, bays, and tendons of the containment building. For reference, the containment building is labeled as the reactor building in the plot plan Progress Energy Dwg. #CR3-G86-D, Rev. 11, 10-21-03.

This Policy does not cover Accidental Property Damage to the Containment Structure. This Policy also does not cover Accidental Property Damage to tools, materials, supplies, equipment and machinery, including those belonging to contractors' and subcontractors', used to effect Repairs.

Notwithstanding the above,

1.) Subject to all other terms and conditions of this Policy, Property Damage caused by an Accident discovered prior to July 1, 2012 that arises out of or relates to the construction pre-work activities specified in Exhibit A below, is not excluded by this endorsement, but the limits of liability for such damage is $50,000,000.

2.) Subject to all other terms and conditions of this Policy, Property Damage to the Containment Structure caused by windstorm, flood, earthquake, or volcanic eruption is not excluded by this endorsement, but the limits of liability for such damage is $300,000,000 in excess of $200,000,000, in excess of the Policy deductible. For the period from April 1, 2012 to the earlier of either July 1, 2012, or the date on which Repairs begin, and subject to all other terms and conditions of this Policy, Property Damage to the Containment Structure caused by windstorm, flood, earthquake, or volcanic eruption is not excluded by this endorsement, but is limited to $300,000,000 and subject to all other terms and conditions of this Policy.

3.) Subject to all other terms and conditions of this Policy, Accidental Property Damage to the Containment Structure that is discovered prior to July 1, 2012, which is not caused by (i) Repairs

, or (ii) an activity included in Exhibit A below, is not excluded by this endorsement, but is limited to $100,000,000.

Exhibit A

1. Temporary Office Facility Set-Up &/or Reconfiguration
2. Fab Shop & Early Material Lay-Down Area Set-Up
3. Core Bores to Assess Tritium Levels in Concrete Bay 56
4. Excavating Berm Areas and Soil Surveys to Support a Second Crane
5. Contract Award
6. Base Scope Contractor Demobilization
7. Construction Equipment Mobilization
8. Mobilize Field Office Facilities
9. Mobilize Craft Support Facilities
10. Mobilize Tendon Contractor Equipment to Site
11. Install Facilities and Temp Power
12. Contractor Setup for Rebar Scanning
13. Material Receiving and Lay-Down Setup
14. Receive Work Platform(s)
15. Receive Shoring
16. Receive Concrete Hydo-demolition Equipment
17. Receive Concrete Wall Demolition Mockup Material
18. Receive Shoring Material
19. Receive Water Management
20. Limited Tendon Access Interference Removal
21. Setup Batch Plant
22. Begin Interference Removal for 1st Bay and Beyond Platform Erection and Concrete Removal
23. Receive Concrete Constituents, Water, and Nitrogen
24. Receive Spent Fuel Pool Protective Barrier Material
25. Erect Platform and Scaffold for Concrete Removal

This endorsement shall not serve to limit the recovery for, or otherwise exclude, any loss incurred under Section I.A.2, including expenses covered under I.E.1 following Accidental Property Damage covered under Section I.A.2.

This Endorsement shall not serve to limit the recovery for, or otherwise exclude Accidental Property Damage to (i) the contents of the containment building, (ii) adjacent buildings, or (iii) equipment, provided that such equipment is not used to effect Repairs .

All other terms and conditions of the Policy remain the same.

This Endorsement does not increase the amount of insurance provided under this Policy.

IN WITNESS WHEREOF, the parties hereto have caused this Endorsement to be executed and attested on their behalf.

INSURER:
Nuclear Electric Insurance Limited

Wilmington, Delaware

Date: _____ By: _____
David B. Ripsom, President

Attest: _____

MEMBER INSURED:
Florida Power Corporation

Wilmington, Delaware

Date: _____ By: _____
Attorney-in-Fact

Witness: _____

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

PRIMARY PROPERTY AND DECONTAMINATION LIABILITY INSURANCE POLICY

Declarations attached to and made a part of Policy No. P12-081
(Crystal River)

Item 1. Member Insured: Florida Power Corporation
Member Address: d/b/a Progress Energy Florida, Inc.
410 S. Wilmington Street
Raleigh, North Carolina 27601
Respective Interest: 100%

Item 2. Insurer: Nuclear Electric Insurance Limited

Mailing Address: 1201 N. Market Street, Suite 1100, Wilmington, Delaware 19801

Item 3.

A. Policy Period:

From 12:01 a.m. (Time) on April 1, 2012 (Date) to 12:01 a.m. (Time)

on April 1, 2013 (Date), Standard Time in Hamilton, Bermuda.

B. Policy Year:

From 12:01 a.m. (Time) on April 1, 2012 (Date) to 12:01 a.m. (Time)

on April 1, 2013 (Date), Standard Time in Hamilton, Bermuda.

Item 4. Premium: $1,138,000

Item 5. A. Multiple: 10

B. Retrospective Premium Adjustment: $11,380,000

Item 6. Amount of Insurance: $500,000,000

Course of Construction: $50,000,000 per project

Item 7. Description and location of property covered:
All real and personal property known as Crystal River Unit 3 Nuclear Generating Plant located in Citrus County, Florida as specifically oulined in the attached plot plan Florida Power Corporation, Dwg. #CR3-G61-D-0, Rev., 7-11-75; Progress Energy Dwg. #CR3-G86-D, Rev. 11, 10-21-03; Progress Energy Dwg. #CR3-G85-D, Rev. 9, 6/10/04 showing the insurance site boundary and excluded buildings and areas as filed with Nuclear Electric Insurance Limited in accordance with the Site Description Procedure.

The Paint Shop and its contents are excluded from all coverage except for radioactive decontamination.
See Attachment 1

Item 8. Deductibles:

Deductible Amount:

$10,000,000

Deductible for any Loss under Section V.M (Windstorm Loss, Flood Loss and Earthquake or Volcanic Eruption Loss):

$10,000,000 plus 10% of the amount of the Loss in excess of $10,000,000

Transit Deductible Amount:

$100,000

Item 9. Insureds:
Florida Power Corporation d/b/a Progress Energy Florida, Inc. and City of Alachua, Florida; City of Bushnell; City of Gainesville, Florida; City of Kissimmee, Florida; a Municipal Corporation, City of Leesburg, Florida; City of New Smyrna Beach, Florida; Florida and Utilities Commission; City of Ocala; Orlando Utilites Commission and City of Orlando; Seminole Electric Cooperative, Inc., and all contractors and subcontractors as their interest may appear.

Item 10. Loss Payee Clause:

A. Expenses covered under Section I.A.2 shall be adjusted with the Member Insured and payable to:

Florida Power Corporation d/b/a Progress Energy Florida, Inc.

The Member Insured may, by written notice to the Insurer, designate other payees.

B. All other covered Losses shall be adjusted with the Member Insured and payable to:

Loss, if any, shall be payable to Florida Power Corp d/b/a Progress Energy Florida and, except any loss to materials and supplies and except any particular loss less than $50,000 shall be payable:

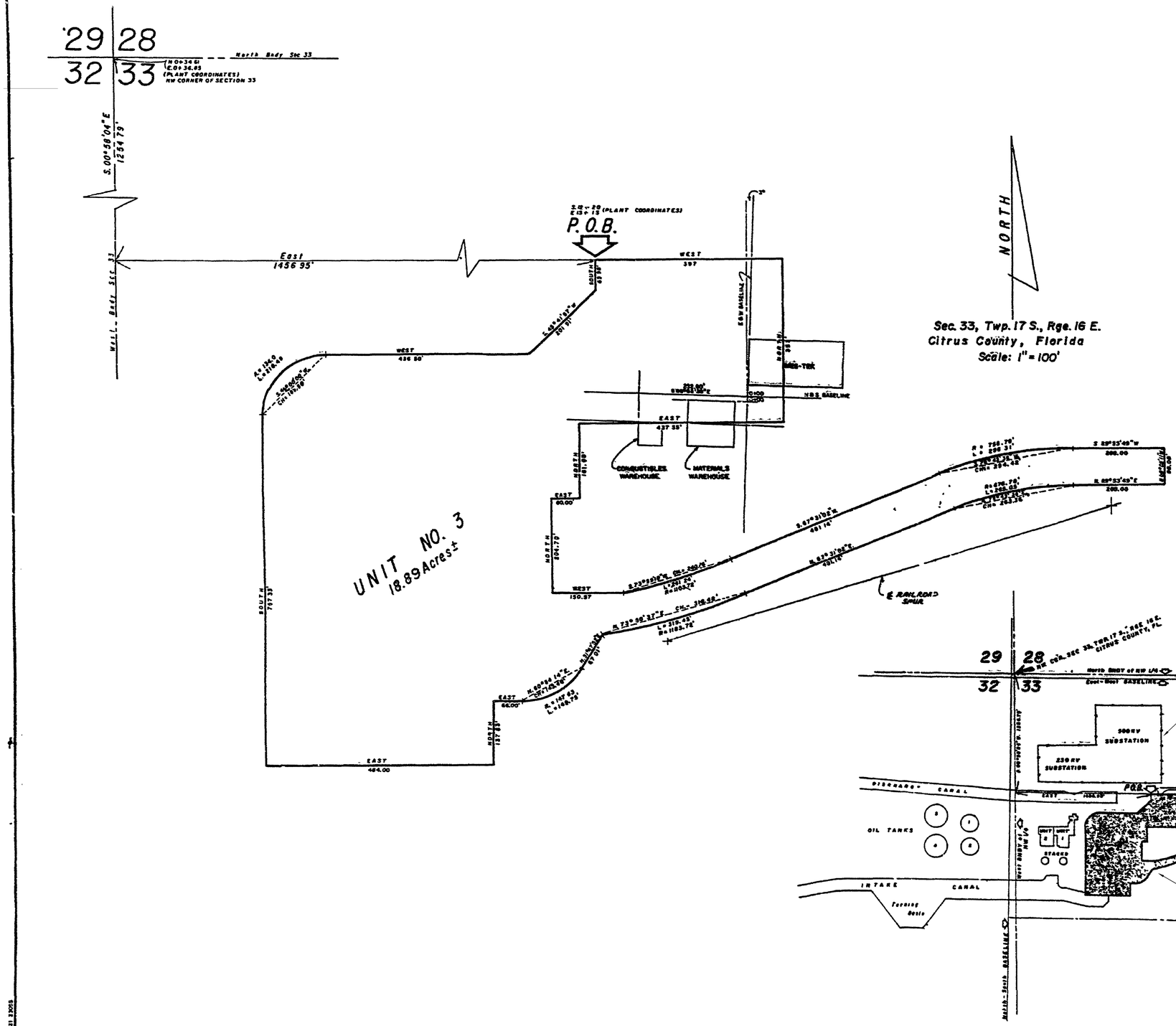
(1) 100% of settlement for property of others, contractors' equipment, debris removal or decontamination shall be made payable to Florida Power Corporation d/b/a Progress Energy Florida, Inc.

(2) 91.8% of settlement for loss to, or repair or replacement of described property shall be made payable to The Bank of New York, Mellon, (Mortgage Trustee) and 8.2% of such settlement shall be made payable to Florida Power Corporation d/b/a Progress Energy Florida, Inc.

The Member Insured may, by written notice to the Insurer, designate other payees.

Item 11. Service of Process to Insured (see Section V.G.5):

General Counsel
Florida Power Corporation d/b/a Progress Energy Florida, Inc.
c/o Duane Morris LLP
222 Delaware Avenue, Suite 1600
Wilmington, DE 19801-1659



DESCRIPTION:

COMMENCE AT THE NW CORNER OF SECTION 33, TOWNSHIP 17 S., RANGE 16 EAST, CITRUS COUNTY, FLORIDA, SAID CORNER HAVING PLANT COORDINATE OF N 0+34 61 & E 0+36 89, AND RUN S.00°58'04"E., ALONG THE WEST BOUNDARY OF SAID SECTION 33, 1254.79 FEET; THENCE EAST, 1456.95 FEET TO THE POINT OF BEGINNING, SAID POINT HAVING THE PLANT COORDINATES, S. 12+20 & E. 15+19, THENCE SOUTH, A DISTANCE OF 63.98 FEET; THENCE S.45°41'57"W., A DISTANCE OF 201.91 FEET; THENCE WEST, A DISTANCE OF 436.50 FEET TO THE POINT OF CURVATURE OF A CURVE CONCAVE SOUTHEASTERLY AND HAVING A RADIUS OF 134.0 FEET THENCE RUN 210.49 FEET ALONG THE ARC OF SAID CURVE, A CHORD BEARING AND DISTANCE OF S.45°00'00"W. 189.50 FEET TO THE POINT OF TANGENCY; THENCE SOUTH, 757.33 FEET, THENCE EAST, 484.00 FEET; THENCE NORTH 1378.3 FEET; THENCE EAST, 66.00 FEET TO THE POINT OF CURVATURE OF A CURVE CONCAVE NORTHWESTERLY AND HAVING A RADIUS OF 147.43 FEET; THENCE RUN 149.78 FEET ALONG THE ARC OF SAID CURVE, A CHORD BEARING AND DISTANCE OF N.60°54'14"E., 143.40 FEET TO THE POINT OF TANGENCY; THENCE N.31°47'32"E., 67.01 FEET TO A CURVE CONCAVE NORTHERLY AND HAVING A RADIUS OF 1183.72 FEET, THENCE RUN 319.43 FEET ALONG THE ARC OF SAID CURVE, A CHORD BEARING & DISTANCE OF N.73°50'37"E., 318.43 FEET TO THE POINT OF TANGENCY; THENCE N.67°31'02"E., 481.14 FEET TO THE POINT OF CURVATURE OF A CURVE CONCAVE SOUTHERLY AND HAVING A RADIUS OF 676.79 FEET; THENCE 265.05 FEET ALONG THE ARC OF SAID CURVE, A CHORD BEARING AND DISTANCE OF N.78°43'36"E., 263.36 FEET TO THE POINT OF TANGENCY; THENCE N.89°53'49"E., 200 FEET; THENCE N.00°06'11"W., 80.00 FEET, THENCE S.89°53'49"W., 200 FEET TO THE POINT OF CURVATURE OF A CURVE CONCAVE SOUTHERLY AND HAVING A RADIUS OF 756.79 FEET; THENCE RUN 296.31 FEET ALONG THE ARC OF SAID CURVE, A CHORD BEARING AND DISTANCE OF S.78°43'36"W., 294.42 FEET TO THE POINT OF TANGENCY; THENCE S.67°31'02"W., 481.14 FEET TO THE POINT OF CURVATURE OF A CURVE CONCAVE NORTHERLY AND HAVING A RADIUS OF 1183.72 FEET, THENCE RUN 241.24 FEET ALONG THE ARC OF SAID CURVE, A CHORD BEARING AND DISTANCE OF S.73°39'18"W., 240.78 FEET, THENCE WEST, 150.97 FEET; THENCE NORTH, 204.79 FEET; THENCE EAST, 60.00 FEET; THENCE NORTH, 161.00 FEET; THENCE EAST, 437.55 FEET; THENCE NORTH, 353 FEET; THENCE WEST, 397 FEET TO THE POINT OF BEGINNING

CONTAINING 18.89 ACRES, MORE OR LESS.

NOTE BEARINGS USED IN THIS DESCRIPTION WERE ESTABLISHED FROM PLANT BASE LINE BEARINGS OF TRUE NORTH AND EAST

NOTES: 1. SITE DATA FROM DWG SUR-0064-D
2. ADDED ARES-TEK, COMBUSTIBLES WAREHOUSE AND MATERIALS WAREHOUSE.
3. ADDED RAILROAD SPUR.

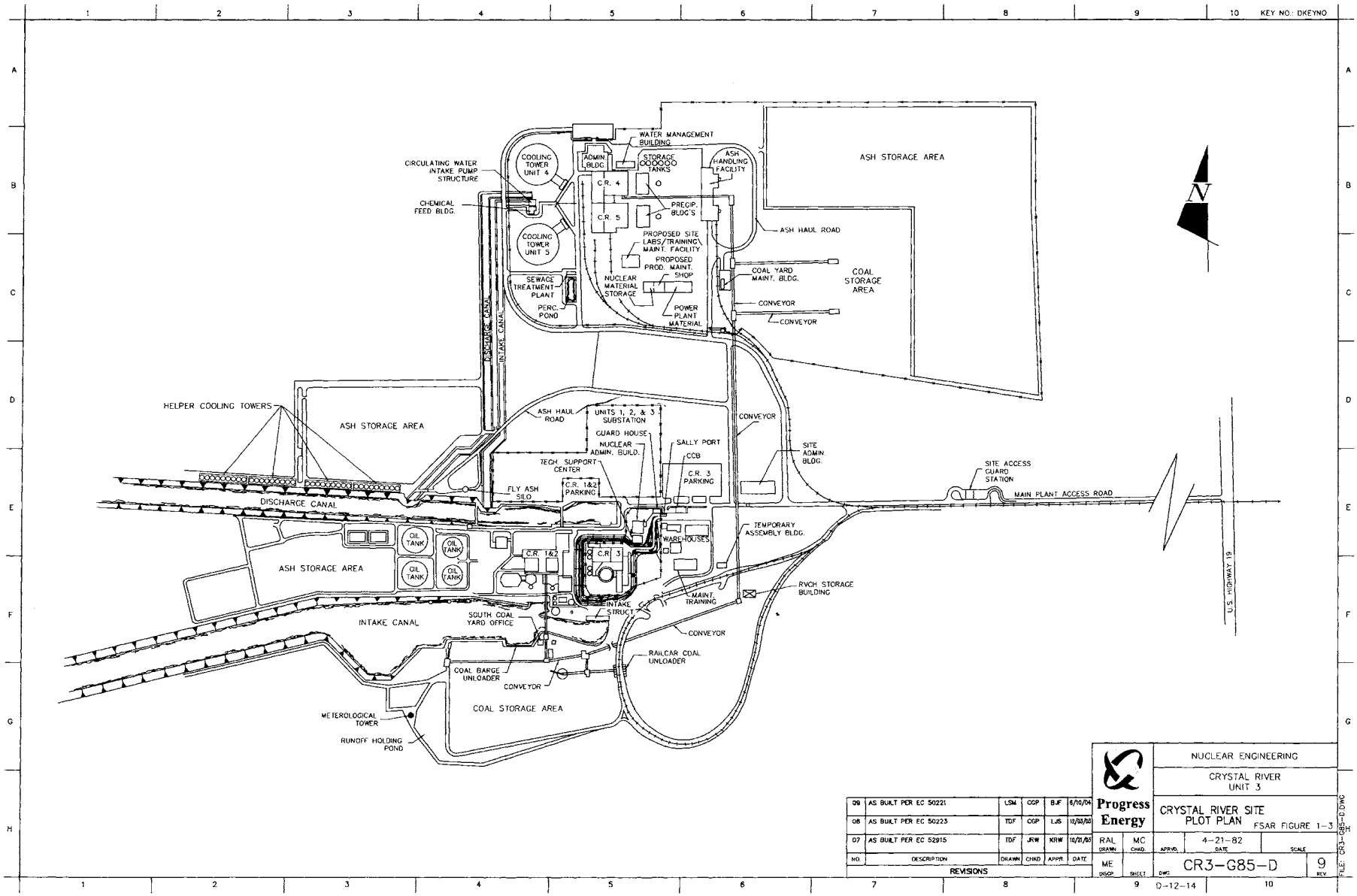
ALSO SEE DRAWING CR3-G86-D WHICH SHOWS BOUNDARY AROUND INTAKE & DISCHARGE STRUCTURES. ALSO SEE DRAWING CR3-G85-D WHICH SHOWS BOUNDARY AROUND HELPER COOLING TOWERS.

NO.	DESCRIPTION	BY	DATE	APPD
REVISIONS				
2	RE ISSUED PER DCN 94-162	MPS	7/11/94	CSM
1	VOID PER DCN # 91-276	SSG	7/14/94	LDL

FLORIDA POWER CORPORATION
SYSTEM ENGINEERING DEPARTMENT
PRODUCTION ENGINEERING SECTION

LOCATION OF WAREHOUSE FACILITIES AT CRYSTAL RIVER 3 SITE (PARTICIPATION AGREEMENT)

SCALE AS SHOWN DATE JULY 14, 1978 DRAWN FLE
CHECKED C.R.C.
APPROVED
SHEET 1 DWG. NO. CR 3-G61-D REV 2



NO.	DESCRIPTION	DRAWN	CHKD	APPR	DATE
09	AS BUILT PER EC 50221	LSM	CGP	BJF	6/10/04
08	AS BUILT PER EC 50223	TDF	CGP	LJS	12/03/03
07	AS BUILT PER EC 52915	TDF	JRW	KRW	10/21/03

REVISIONS

Progress Energy

NUCLEAR ENGINEERING

CRYSTAL RIVER UNIT 3

CRYSTAL RIVER SITE PLOT PLAN FSAR FIGURE 1-3

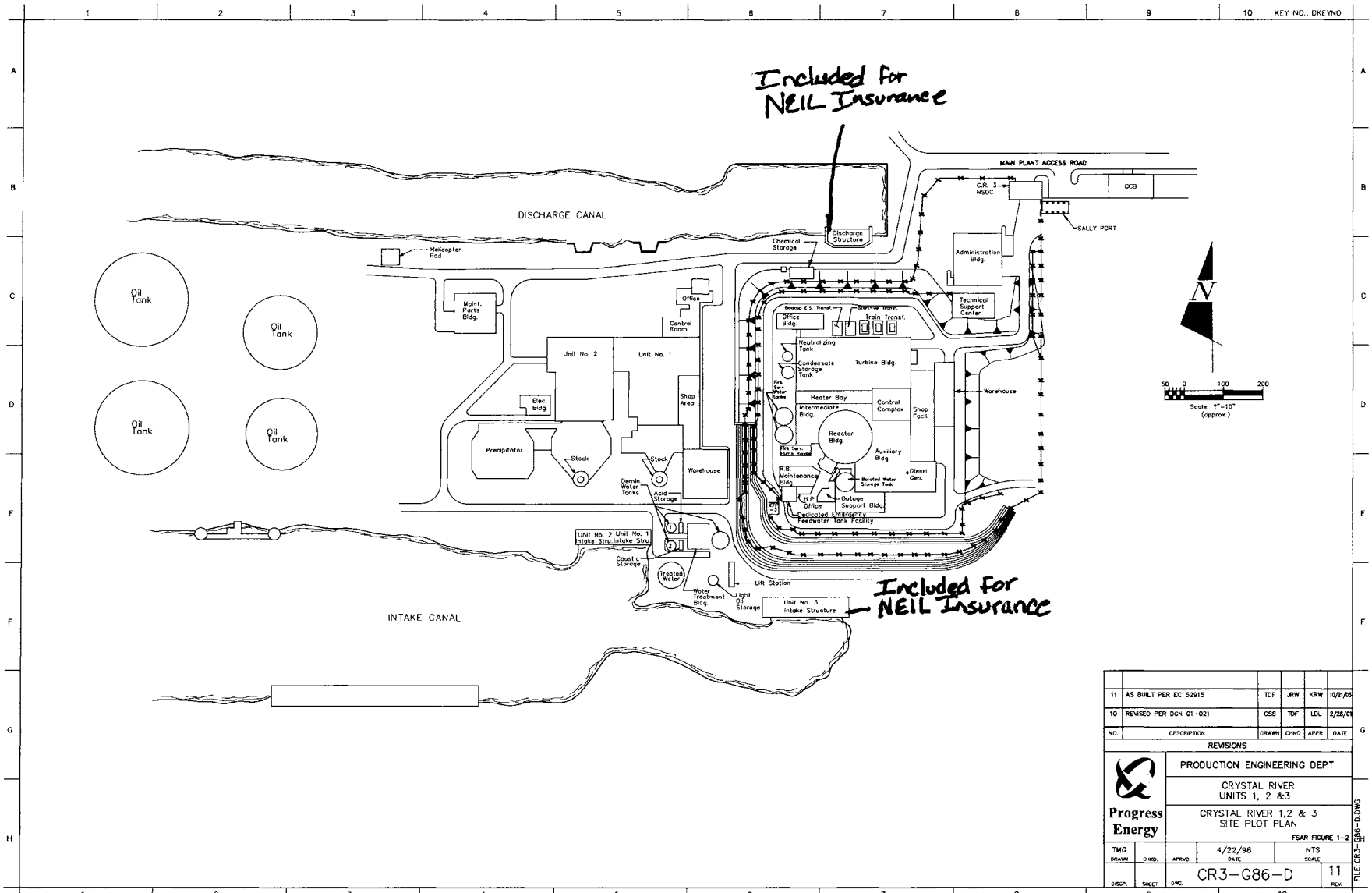
RAL DRAWN | MC CHKD | 4-21-82 DATE | SCALE

ME DSGN | SHEET | CR3-G85-D DWG | 9 REV

D-12-14

FILE: CR3-G85-D.DWG

Crystal River



Crystal River

NUCLEAR ELECTRIC INSURANCE LIMITED

PRIMARY PROPERTY AND DECONTAMINATION LIABILITY INSURANCE POLICY

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NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

PRIMARY PROPERTY AND DECONTAMINATION LIABILITY INSURANCE POLICY

This Policy is made by and among the Member Insured (specified in Item 1 of the Declarations) and Nuclear Electric Insurance Limited, a Bermuda mutual company with limited liability (the "Insurer").

The Insurer is only licensed in Bermuda and Delaware and the Insureds (those Insureds specified in Item 9 of the Declarations together with the Member Insured) will not be protected by the guaranty funds of any U.S. jurisdiction.

The Member Insured will be required to execute the Policy in Delaware. The Policy will become effective only upon the acceptance by the Member Insured of the delivery of the Policy at the Insurer's office in Delaware.

I. INSURING AGREEMENT

In consideration of the premium paid, and subject to the terms and conditions of this Policy, the Insurer agrees to pay the Member Insured, subject to the Deductible, for certain expenses and costs resulting from Accidental Property Damage.

In Witness Whereof, the Insurer and the Member Insured have caused this Policy to be executed and attested on their behalf in Wilmington, Delaware.

Wilmington, Delaware

INSURER:
Nuclear Electric Insurance Limited

Date: As of April 1, 2012

By: _____
David B. Ripsom, President

Attest: _____

Wilmington, Delaware

MEMBER INSURED:
Florida Power Corporation

Date: As of April 1, 2012

By: _____
Attorney-in-Fact

Witness: _____

A. **Coverage**

1. This Policy insures against Property Damage caused by an Accident, unless otherwise excluded, subject to the terms and conditions of this Policy.

2. This Policy also insures against expenses necessarily incurred by the Insureds in discharging their legal obligation to protect the public health and safety following Accidental Property Damage, unless otherwise excluded, subject to the terms and conditions of this Policy.

3. (a) In the event that Accidental Property Damage under this Policy and under one or more Other Insurance Policies with insurance coverage effective during the Policy Year is caused directly or indirectly by Flood, earthquake or volcanic eruption, the Member Insured agrees that:

   (i) The Insurer's liability for all Losses resulting from Accidental Property Damage shall not exceed the greater of (A) the Amount of Insurance stated in Item 6 of the Declarations, or (B) the highest of the Amount of Insurance stated in the declarations of the Other Insurance Policies providing coverage with respect to the same Accident; and

   (ii) The Insurer's liability under this Policy shall be the amount determined under subparagraph (a)(i) above times a fraction, the numerator of which is the Insurer's liability for the Losses resulting from Accidental Property Damage under this Policy, but for this paragraph (a), and the denominator of which is the sum of the Insurer's liability for Losses resulting from Accidental Property Damage under this Policy and all Other Insurance Policies, but for this paragraph (a).

4. The Insurer's liability under this Policy shall not exceed the course of construction limit per Project, as specified in Item 6 of the Declarations, in the event of Accidental Property Damage to property, tools, materials, supplies, equipment, and machinery involved or used in the activities described below (each of which shall be referred to separately as a "Project"):

   a) Steam generator replacement(s),

   b) Reactor head replacement(s),

   c) Nuclear Steam Supply System (NSSS) Pressurizer replacement(s),

   d) Main condenser replacement(s) and/or full retubing,

e) Major component replacement(s) along the turbine/generator shaft line, including the high, intermediate, and low pressure turbine rotors, and the generator rotor and stator,

f) Component replacement(s) associated with power up-rates that are anticipated to exceed a 1.0% increase in rated thermal power,

g) Emergency diesel generator replacement(s),

h) Moisture separator/feed water heater replacement(s),

i) Vessel Internal Component replacement(s), and

j) Large crane replacement(s), limited to the turbine overhead or gantry crane, BWR refueling floor crane, and PWR containment polar crane

and to contractor's or subcontractor's equipment, machinery, tools, and property. Such interests of contractors and subcontractors are limited to the Projects described in subsections a) through j) above, and for which they have been hired to perform work.

The course of construction sublimit in Item 6 of the Declarations shall also apply to any Property Damage to Temporary Works owned by the Insured, or leased or rented by the Insured under an arrangement that requires the Insured to secure and maintain the insurance, which Temporary Works are involved or used in the Projects described in subsections a) through j) above.

The course of construction sublimit in Item 6 of the Declarations shall also apply to any Property Damage that ensues from, arises out of or is caused by any Projects described in subsections a) through j) above and to any Property Damage that could have been avoided or reduced if the Project had not been undertaken.

However, the course of construction sublimit in Item 6 of the Declarations shall not apply if the Property Damage is caused by a natural hazard or the Insured can demonstrate that the cause of the Property Damage was unrelated to the Projects described in subsections a) through j) above and there is otherwise coverage under this Policy.

This subsection shall not be construed to limit the recovery for, or otherwise exclude, any Loss incurred under Section I.A.2 of this Policy

B. **Territorial Limits**

This Policy covers Insured Property worldwide except for loss or damage in the following countries:

Afghanistan, Angola, Armenia, Azerbaijan, Bosnia-Herzegovina, Botswana, Burundi, Chechnya, Croatia, Cuba, Democratic Republic of the Congo (former Zaire), Eritrea, Ethiopia, Federal Republic of Yugoslavia, Haiti, Iran, Iraq, Kashmir, Lebanon, Liberia, Libya, Montserrat, Myanmar (Burma), Nigeria, North Korea, Pakistan, Rwanda, Somalia, Sri Lanka, Sudan, Turkish provinces of Agri, Bingol, Bitlis, Diyarbakir, Elazig, Hakkari, Mardin, Mus, Siirt, Urfa and Van, and Yemen,

or any other country where trade relations are unlawful as determined by the Government of the United States of America, including its agencies, or the governing body of the European Union, including its agencies.

C. **Property Insured**

This Policy covers the property specified as such in Item 7 of the Declarations and situated at a location specified therein, and as provided in Section I.E.2 and in Section I.D.

D. **Property of Others**

Subject to its terms and conditions, this Policy also covers the personal property of employees and others at the location described in the Declarations unless otherwise excluded.

E. **Extensions of Coverage**

1. **Debris Removal and Decontamination**

This Policy also shall pay for expenses necessarily incurred by the Insureds in removing debris of and in decontaminating the Insured Property covered by this Policy, including those incurred to decontaminate land, following Accidental Property Damage, unless otherwise excluded.

2. **Transit Damage**

This Policy also shall pay for the Property Damage caused by an Accident, unless otherwise excluded, to Insured Property in transit and to property insured under Section I.D while such property is in transit, subject to a total sublimit of $10,000,000 and the following terms and conditions:

(a) For purposes of this coverage, Insured Property includes property that has been purchased for use at the site and is in transit to the site.

(b) This coverage applies to shipments of Insured Property worldwide and to the temporary storage of such Insured Property while at a repair facility, except that

(i) No coverage is provided while the Insured Property is within the borders of any country excepted from the Territorial Limits defined in Section I.B; and

(ii) No coverage is provided for any shipment beyond 100 nautical miles of the shores of the country of origin or destination for airborne or waterborne shipments, except when the point of exit and entry for the shipment is to be the same country in which case this coverage will remain in effect throughout the shipment.

(c) It is a condition of this insurance that the Insured Property be packed and shipped in accordance with all applicable laws or regulations having the force of law.

(d) This coverage is excess of any valid and collectible coverage from the seller or shipper.

Each and every Loss covered under this Section I.E.2 shall be adjusted separately, and from the amount of such Loss, or, if there is contributing insurance, from the Insurer's pro-rata share of such Loss, there shall be deducted the Transit Deductible Amount stipulated in Item 8 of the Declarations.

3. **Expediting Expense**

This Policy shall also pay for the reasonable extra costs to make temporary repairs or temporary replacement and to expedite the permanent repair or replacement of Insured Property damaged by an Accident, unless otherwise excluded, including overtime and the extra cost of express or other rapid means of transportation. This coverage is subject to a sublimit of the greater of $5,000,000 or an amount equal to ten percent (10%) of the loss (excluding the Expediting Expense), but not to exceed a maximum sublimit of $20,000,000. At the sole discretion of the Insurer, the maximum sublimit amount stated in this subsection may be increased if the Insurer determines that expenses incurred by the Insured that qualify as Expediting Expenses under this Policy, directly result in a reduction of the Insurer's potential Accidental Outage payments under an applicable NEIL I Accidental Outage Policy issued by the Insurer. The maximum amount to which the sublimit may be increased shall not exceed the amount, as determined by the Insurer, by which the Insurer's potential payments under the referenced NEIL I Accidental Outage Policy was reduced.

4. **Regulatory Code**

This Policy shall also cover the additional cost of repair or replacement of Insured Property arising out of Accidental Property Damage, necessitated by enforcement of any state or federal statute, regulation, ordinance or other rule having the force of law relating to minimum standards of construction or engineering or licensing, qualification or certification (hereinafter referred to as "Code") which is in effect at the time of the Accident and to which the Insured

Property is subject. All such costs are subject to a total sublimit of $2,500,000 and to the requirement that the costs involved are actually, directly and necessarily incurred in order to comply with any Code governing repair and/or replacement, or continued or renewed licensing, qualification or certification of the Insured Property which has sustained Accidental Property Damage.

5. **Removal from Premises**

If Insured Property is necessarily removed from any location specified in the Declarations for preservation from imminent physical damage, this Policy also covers such Insured Property for a period of forty-five (45) business days from the commencement of such removal, during removal, at any place to which such Insured Property has been removed, and during return; provided, however, this provision does not apply to Property Damage by radioactive contamination except as otherwise provided in Section I.E.2. The Member Insured shall notify the Insurer of any such removal within ten (10) business days after its commencement.

II. PRIORITY FOR DECONTAMINATION LIABILITY EXPENSES

1. Whenever the estimated expenses covered under Section I.A.2 exceed $100,000,000, except as provided in paragraph 2 below, it is agreed that payment under this Policy shall be first made with respect to Losses incurred under Section I.A.2, and then, to the extent proceeds of this Policy are not so utilized, with respect to Losses incurred under Section I.A.1.

2. Payment under this Policy may be made with respect to Losses covered under Section I.A.1 prior to the completion of payments under Section I.A.2 only on the following conditions:

   (a) The Member Insured must attest that:

      (i) no proceeds of this Policy in excess of an amount specified by the Insureds ("Specified Nuclear Liability Amount"), except as provided in a Proof of Loss filed with the Insurer, are needed to discharge the legal obligation or liability of the Insureds under the Atomic Energy Act of 1954, 42 U.S.C. Section 2011 et seq. as amended, and the regulations promulgated pursuant thereto (the "Act") to protect the public health and safety following Accidental Property Damage; and

      (ii) the payment or use of policy proceeds for Losses covered under Section I.A.1 does not violate any regulation or order of the Nuclear Regulatory Commission or any governmental body succeeding to the functions and authorities thereof ("NRC").

   (b) Except as provided in paragraph (c) below, the amount of insurance available for payment to the Insureds with respect to Losses covered under Section I.A.1 prior to the indemnification under Section I.A.2 shall be calculated by

subtracting the Specified Nuclear Liability Amount from the amount of insurance specified in Item 6 of the Declarations, as it may be reduced pursuant to the terms of this Policy.

(c) At the request of the Member Insured, the amount calculated in accordance with subparagraph 2(b) above, may be increased to include an amount equal to all or part of the Specified Nuclear Liability Amount, but only to the extent of amounts for which the Member Insured attests:

(i) that the Insureds are entitled under other valid and collectible insurance covering the same expenses covered by Section I.A.2;

(ii) that the Insureds will claim under such other insurance and use such claimed proceeds to discharge their legal obligation or liability under the Act to protect the public health and safety following Accidental Property Damage; and

(iii) that the payment or use of all or part of the Specified Nuclear Liability Amount for Losses covered under Section I.A.1 does not violate any regulation or order of the NRC.

III. EXCLUSIONS

A. General Exclusions

1. The coverage provided under this Policy does not apply to Property Damage caused by or resulting from:

(a) gradual accumulation of radioactive contamination;

(b) radioactive contamination at any location specified in the Declarations, resulting from matter released from any source outside the premises of that location and for which the Insured is covered or would be entitled to coverage or can make a claim against a third party who is insured under a nuclear energy liability policy issued by the Nuclear Energy Liability Insurance Association or Mutual Atomic Energy Liability Underwriters or any other third party liability insurer, but this exclusion shall not apply to radioactive contamination resulting from matter released from any source while such source is in transit from any location specified in the Declarations;

(c) failure of the Insureds to use all reasonable means to save and preserve the Insured Property at and after an Accident or when the Insured Property is in danger of Property Damage;

(d) unexplained or mysterious disappearance of Insured Property, or shortage disclosed upon taking inventory;

(e) delay, inherent vice, loss of use, or loss of market;

(f) any fraudulent, dishonest, or criminal act done by or at the instigation of any Insured, any Operator, a partner or joint venturer in or of any Insured or Operator, or an officer, director or trustee of any Insured or Operator;

(g) any order or directive of a federal, state, county, or municipal governmental entity or any department, agency or political subdivision thereof, including, without limitation, an order to replace undamaged Insured Property pursuant to a directive of the NRC, except acts of destruction at the time of and for the purpose of preventing the spread of Accidental Property Damage;

(h) seizure, destruction or confiscation by order or directive of any federal, state, county, or municipal governmental entity or any department, agency or political subdivision thereof, or risks of contraband or illegal transportation or trade;

(i) or attributable to manufacturing or processing operations which result in damage to stock or materials while such stock or materials are being actually worked upon;

(j) any form of deterioration or wear and tear, including but not limited to

(i) depletion, depreciation, and deterioration, including that of fuel element cladding;

(ii) embrittlement of any kind, including but not limited to hydrogen embrittlement and neutron embrittlement;

(iii) fatigue of any kind, including but not limited to thermal fatigue and high-cycle fatigue;

(iv) rust, erosion, or corrosion of any kind, including but not limited to stress corrosion cracking, unless caused directly by an independent and separate Accident not otherwise excluded, but then only for the Property Damage caused by such Accident;

(v) pitting, cracking, bulging, blistering, fretting, denting, deformation or distortion of the Insured Property which accompanies or is directly associated with the kinds of Property Damage specified in paragraphs (ii) through (iv) above; and

(vi) shrinking, bulging, expansion, cracking, shifting, rising, settling, sinking, and lateral or other movement of pavements, foundations, walls, floors, ceiling or roofs;

(k) dampness, dryness, or extremes or changes of temperature of the atmosphere, including but not limited to rust, corrosion or erosion or other resulting Property Damage, unless caused directly by an independent and separate Accident not otherwise excluded, but then only for the Property Damage caused by such Accident;

(l) Flood, unless otherwise provided by endorsement added hereto; or

(m) earthquake, volcanic eruption, landslide, subsidence or sinking of land or other earth movement, settlement or other movement of foundations, unless otherwise provided by endorsement added hereto.

With respect to the Exclusions in paragraphs (j) through (m), inclusive, the Insurer shall be liable if an independent and separate Accident not otherwise excluded ensues, but then only for the Property Damage caused by the ensuing Accident.

2. This Policy also does not cover:

(a) accounts, bills, currency, deeds, evidences of debt, money or securities;

(b) (i) records, manuscripts and drawings, for any amount in excess of their value blank plus the cost incurred for actually transcribing or copying them, except as provided in subparagraph III.A.2(b)(ii) below;

(ii) media, data storage devices, and program devices for electronic and electro-mechanical data processing or for electronically controlled equipment, for any amount in excess of the cost of reproducing such media, data storage devices, and program devices from duplicates or from originals of the previous generation of the media, and no liability is assumed hereunder for the cost of gathering or assembling information or data for such reproduction;

(c) vehicles licensed for highway use, aircraft or watercraft, except when such vehicles, aircraft or watercraft are being used for the servicing of or in connection with the operation of the Insured Property;

(d) any Accidental Property Damage, to the extent of the amount collectible from a contractor, manufacturer or supplier of machinery, equipment or other property under a guaranty or warranty, whether or not such contractor, manufacturer or supplier is included as an Insured under this Policy;

(e) the cost of making good any faulty workmanship, material, construction or design, whether or not due to negligence, inadvertence, misjudgment or any other cause, and regardless of any warranty which may affect such faulty components; provided, however, the Insurer shall be liable if an independent and

separate Accident not otherwise excluded ensues, but then only for the Property Damage caused by the ensuing Accident;

(f) more than one opening and closing of a turbine in connection with one Accident; provided, however, that additional openings and closings of a turbine in connection with a single Accident can be covered as expediting expenses subject to the provisions of Section I.E.3; and

(g) any sums which the Insured may be obligated to pay as damages

(i) because of bodily injury or personal injury, or

(ii) because of damage to property not described in the Declarations, or

(iii) for which the Insured is covered or would be entitled to coverage under a nuclear energy liability policy issued by the Nuclear Energy Liability Insurance Association or Mutual Atomic Energy Liability Underwriters or any other third party liability insurer.

(h) Land, except for intake and discharge canals that are within the description of the property covered under Item 7 of the Declaration, and as otherwise provided in Section I.E.1 (Extensions of Coverage).

B. **War Risk Exclusion**

1. Subject to paragraph 2 below, the coverage provided under this Policy does not apply to Property Damage caused directly or indirectly by:

(a) hostile or warlike action in time of peace or war, including action in hindering, combating or defending against an actual, impending or expected attack by any government or sovereign power (de jure or de facto), or by any authority maintaining or using military, naval or air forces; or by military, naval or air forces; or by an agent of any such government, power, authority or forces;

(b) any weapon of war employing nuclear fission or fusion whether in time of peace or war; or

(c) insurrection, rebellion, revolution, civil war, usurped power, or action taken by governmental authority in hindering, combating or defending against such an occurrence.

2. This War Risk Exclusion shall only apply to acts which are part of overt military activity.

IV. PREMIUM

1. The Member Insured agrees to pay to the Insurer the Premium under the terms and conditions hereinafter set forth. The Premium shall be paid to the Insurer by wire transfer or other method acceptable to the Insurer on or before the beginning of the policy period specified in Item 3A of the Declarations.

2. The Member Insured agrees to pay to the Insurer as an Additional Premium all Premium Adjustment(s) assessed under Section V.I of the Policy. For each Premium Adjustment, the Additional Premium in the year in which the Premium Adjustment is assessed shall be increased by a pro rata amount.

3. All Additional Premiums computed on the basis of pro rata Premium Adjustments shall be paid to the Insurer by wire transfer or other method acceptable to the Insurer within 40 calendar days after the Notification Date. However, to the extent that there is a request for a variance (as permitted under Section V.I.7), the Additional Premium referred to in this Paragraph need not be paid until 10 calendar days after a decision denying the request for a variance, such payment to be made by wire transfer or other method acceptable to the Insurer.

4. For each year that a Premium Adjustment is in place on the date of the renewal of the Policy, the full amount of each such Premium Adjustment shall be considered Additional Premium and shall be payable with the Premium.

5. Upon the termination of a particular Premium Adjustment in accordance with the terms of Section V.I, the Member Insured shall be entitled to a refund of a pro rata amount of the Additional Premium. The refund shall be paid by wire transfer or other method acceptable to the Member Insured within 40 calendar days after the date the Insurer notifies the Insured of the amount of the refund.

6. As a condition precedent to the Insurer's obligations under this Policy, the Member Insured agrees to notify the Insurer that the Insured Property has been classified Category Number Five by the Institute of Nuclear Power Operations (“INPO”), within seven (7) days of being advised by INPO of such classification being put in place, and to pay such additional Premium due hereunder to the Insurer as a result thereof by wire transfer or other method acceptable to the Insurer within twenty (20) business days after demand.

7. The Member Insured further agrees to pay the Insurer the Retrospective Premium Adjustment under the terms and conditions specified under Section VI.

V. CONDITIONS

A. Abandonment

There shall be no abandonment to the Insurer of any property.

B. **Appraisal**

In case the Member Insured and the Insurer shall fail to agree as to the amount of Property Damage, then, on the written demand of either, each shall select a competent and disinterested appraiser and notify the other of the appraiser selected within twenty (20) days of such demand. The two (2) appraisers so selected shall first select a competent and disinterested umpire; and failing for fifteen (15) days from the date of selection of the second appraiser to agree upon such umpire, then on request of the Member Insured or the Insurer, such umpire shall be selected by a judge of the United States District Court for the district in which the Insured Property is located. The appraisers shall then appraise the Property Damage, stating separately Replacement Cost and/or the Actual Cash Value of each item; and, failing to agree, shall submit their differences, only, to the umpire. An award in writing, so itemized, of any two when filed with the Insurer shall determine the amount of Property Damage. Each appraiser shall be paid by the party selecting him and the expenses of appraisal and of the umpire shall be paid equally by the Member Insured on the one hand and the Insurer on the other.

C. **Assignment**

Assignment or transfer of this Policy shall not be valid except with the prior written consent of the Insurer.

D. **Choice of Law**

1. In view of the diverse locations of the parties hereto and the desirability of unified regulation, the Insureds and Insurer agree that the terms of this Policy shall determine their respective rights and duties and that this Policy shall be construed and enforced in accordance with and governed by the internal law of the State of New York, United States of America.

2. The parties intend that the Insurer conduct its activities so as not to be subject to the insurance regulation of any jurisdiction other than Bermuda and Delaware. Accordingly, the parties expressly recognize and agree that paragraph 1 above does not evidence an intent by the parties to

   (a) give jurisdiction over the Insurer to the insurance regulatory authority of any jurisdiction other than Bermuda and Delaware; or

   (b) make applicable to this Policy any of the insurance laws or regulations (including those which specify the terms of the by-laws and contracts of mutual insurance companies) of any jurisdiction, including New York, other than to the extent such laws of Bermuda and Delaware are applicable; or

   (c) otherwise have the laws of Bermuda or Delaware apply to the construction or enforcement of this Policy.

E. **Concealment, Fraud**

The Insurer shall have no obligation to make any payment under this Policy if, whether before or after a Loss, any Insured has willfully concealed or misrepresented in writing any material fact or circumstance concerning this insurance or the subject thereof, or the interest of any Insured therein, or in case of any fraud or false swearing by any Insured relating thereto; but the application of this provision shall not affect the Member Insured's obligation to pay the Retrospective Premium Adjustment callable by the Insurer under this Policy, or provide other assurances to the Insurer Pursuant to Section VI.2.

F. **Deductibles**

1. There shall be deducted from the amount of each and every Loss the Deductible stated in Item 8 of the Declarations. In the event that more than one Deductible applies to any one Loss, then only the largest Deductible for that Loss shall be applied.

2. To the extent that the Deductible Adjustment applies in accordance with the provisions of Section V.I, and to the extent that the amount of the Deductible Adjustment is greater than the amount of the Deductible, then the Deductible Adjustment shall be substituted for the Deductible for purposes of Paragraph V.F.1. If there is more than one Deductible Adjustment in place under Section V.I, only the highest Deductible Adjustment will be considered for purposes of this Section V.F.

G. **Dispute Resolution**

1. The Insurer and the Insured mutually acknowledge that the form, terms and conditions of the Policy have been formulated by representatives of the companies participating in the mutual enterprise in order to provide insurance coverage which is vital to all participants. It is desired that the Insurer serve as a financially stable and reliable entity, responsive to the coverage needs of its participants, and providing coverage fairly and equitably as to each Insured, but taking equally into account fairness and equity as to all Insureds as a group. While every effort has been made to define with clarity and precision the scope of coverage and other policy provisions, the Insurer and the Insured mutually acknowledge that situations may arise where the terms of the Policy, or the interpretation of the terms, are disputed. For the foregoing reasons, the Insurer and the Insured agree that the following principles shall govern the interpretation of the Policy:

   (a) Even-handedness and fairness to both the Insurer and the Insured;

   (b) In the event of an ambiguity in a policy provision, the intentions of the Insurer and the Insured shall be considered by the Arbitrator(s). Evidence of such intentions is limited to the following extrinsic evidence: reports, notes, meeting minutes, and related materials produced by or given to the Insurer's Board of Directors, Advisory Committees, and Task Forces, and any testimony taken from a present or former employee of the Insurer, member of a Member Advisory Committee, or Director;

(c) The practice of the Insurer and the Insured in interpreting and applying the Policy;

(d) The cooperative rather than adversarial relationship between the Insurer and the Insured; and

(e) The contract construction rule of contra proferentem (construing a contract against the drafter) is not applicable to this insurance policy.

2. The Insurer and Insured will endeavor to resolve any dispute between them by means of a voluntary process to be agreed upon between them, including, without limitation, early neutral evaluation, mediation, mini-trial, neutral fact finding, or senior peer review. Neither the Insurer nor the Insured may be compelled to participate in any such voluntary process except that, at the request of an Insured, the Insurer agrees to submit the dispute to senior peer review. The Insurer agrees to pay the fees and expenses of any neutral party associated with the use of any process hereunder. Senior peer review is a process in which both sides present their arguments and view of the evidence to a panel of five (5) employees of other NEIL Members, unless the Insured and Insurer agree that a panel of three (3) would be more appropriate. The panel will provide a written non-binding opinion on the merits of the dispute. Though not an exclusive list, panel members may include individuals from NEIL's Member Representatives, Board of Directors, Member Advisory Committees, or Members' Legal Counsel. None of the panelists may be employed by a Member that is an affiliate of the Insured involved in the dispute. The panelists shall be selected by agreement of the Insured and Insurer, but if no agreement is reached within 30 days of the date the senior peer review is requested, the Insurer and Insured shall each submit a list of five names and a NEIL outside Director (as chosen by the Chairman of the Board) shall select the panelists. The panel, with input from the parties, shall establish a schedule for the proceeding, including, if appropriate, the submittal of written materials and oral arguments.

3. The Statement of Dispute Resolution Principles adopted by the Insurer's Board of Directors and Members, as it may be amended from time to time, shall not create any rights or obligations on the parties but shall be used as guidelines for conducting dispute resolution processes hereunder.

4. Any dispute, controversy or claim between the Insurer and the Insured as to any matter arising out of or relating to this Policy, or the breach, termination or invalidity thereof, which is not settled between themselves, pursuant to paragraph 2 above or otherwise, shall be settled by arbitration in accordance with the United Nations Commission on International Trade Law's (UNCITRAL) Arbitration Rules. Arbitration of a dispute is final and binding.

a. The number of arbitrators shall be one, unless the Insured or the Insurer requests a three-person panel, in which case the number of arbitrators shall be three.

b. In the event the arbitration is to be decided by a single arbitrator, and the parties cannot agree on the appointment of that arbitrator within sixty (60) days of the notice of arbitration being served, the sole arbitrator shall be selected by the appointing authority specified in paragraph 4.d.

c. In the event the arbitration is to be decided by three arbitrators, the Insured shall appoint one arbitrator and the Insurer another; the two so appointed arbitrators shall select the third, who will act as the Chairman for the panel. The party which files the notice of arbitration shall include in such notice the identity of its party-appointed arbitrator. Within forty-five (45) days of service of the notice of arbitration, the second party shall notify the party that filed the notice of arbitration of the identity of its party-appointed arbitrator. At the time of the notification of the appointment, each side shall provide the other with a detailed curriculum vitae for the selected arbitrator, which shall include information regarding any potential conflict of interest of the selected arbitrator, including any financial or personal interest in the result of the arbitration or any past or present relationship with the parties or their representatives. All arbitrators shall be obligated to update his/her potential conflict of interest information throughout the arbitration. If (i) the party filing the notice of arbitration fails to include the identity of its party-appointed arbitrator, or (ii) the second party does not notify the first party of its party-appointed arbitrator within forty-five (45) days of service of the notice of arbitration, or (iii) the two party-appointed arbitrators fail to agree on a third arbitrator within a period of sixty (60) days from the date of appointment of the second arbitrator, then, on request of either party, the missing party-appointed arbitrator or the third arbitrator (as the case may be) shall be selected by the appointing authority specified in paragraph 4.d. There shall be no *ex parte* communications between a party and any of the arbitrators, except that a party-appointed arbitrator shall be permitted to communicate with the party that appointed him/her concerning (1) the identity of the Chairman and (2) issues associated with arbitrator invoices.

d. The appointing authority shall be the American Arbitration Association ("AAA") in New York, New York. The AAA shall select arbitrators from the panel of international arbitrators for the International Centre for Dispute Resolution, the international division of the AAA (the "ICDR Roster"). The arbitrators selected from the ICDR Roster shall be U.S. nationals. If for any reason the AAA fails to appoint an arbitrator within thirty (30) days of the date of receipt of the request for such appointment, either party may proceed pursuant to Article 75 of the Civil Practice Law and Rules of the State of New York and make application to the Supreme Court of the State of New York, County of New York for the appointment of the arbitrator.

e. To the extent there is any inconsistency between the UNCITRAL Arbitration Rules and the provisions of this Policy, the latter shall govern.

f. The place of the arbitration shall be New York, New York, unless the parties agree upon another location.

g. Within forty-five (45) days after the appointment of the Chairman, the arbitrators shall conduct an initial conference to which the parties will be invited to attend. At the initial conference, the parties and arbitrators shall discuss, without limitation, (1) the procedures to be followed, (2) scheduling of submissions and hearings, and (3) a timetable for discovery. At a minimum, the discovery order shall require the parties to provide each other non-privileged documents that are requested by the other side and that reasonably relate to the claims and defenses asserted in the arbitration. Following the initial conference, the arbitrators shall issue a Procedural Order to the parties setting forth the procedures and schedule.

h. Within sixty (60) days of the close of the hearings (or the later of post-hearing oral argument or post-hearing written submissions should the arbitrators authorize them), the arbitrators shall issue their award, which shall be in writing and shall present a detailed statement of the factual and legal bases for the award. The award of the arbitrators shall require a majority of two votes. The arbitrators shall first determine the liability of the parties as to the dispute, claim or controversy, and then, only if necessary, determine the type and amount of relief to be granted. In no case may the arbitrators order the rescission or reformation of this Policy. Further, unless the arbitrators determine that it is inappropriate under the circumstances of the case, the award shall provide that post-award interest shall begin to accrue at the rate of the Prime Rate, as published in the Wall Street Journal as of the date of the award, plus two (2) percent per annum from the date sixty (60) days after the award is delivered to the parties until the date the award is paid.

i. The arbitrators shall award reasonable attorney's fees and costs to the prevailing party, not to exceed the amount of fees and costs incurred by the non-prevailing party. For this purpose, the fees incurred shall be calculated at reasonable hourly billing rates and shall include all reasonable out-of-pocket expenses, including, without limitation, the reasonable costs of expert witnesses and consultants. If the Insured has retained counsel on a contingency fee basis, and the Insurer is the prevailing party, the arbitrators shall award the Insurer all of its reasonable attorney's fees and costs (without consideration of the fees and costs incurred by the Insured).

j. In the event the award is challenged in court and the challenge is denied, the party that challenged the award shall pay the reasonable attorney's fees and costs incurred by the non-challenging party in defending against the challenge to the award.

k. The parties acknowledge that any dispute resolution proceeding is intended to be confidential and therefore agree to properly maintain and not disclose or reveal

any information obtained from the other party pursuant to the terms of a Confidentiality Agreement to be executed between the parties at the beginning of the proceeding (the terms of which shall be determined by the arbitrators in the event that the parties are unable to agree). In the case of arbitration, the written decision of the arbitrator(s) shall be available to other Insureds of NEIL and ONEIL, except that any information within the written decision that the Insured can show is proprietary in nature will be redacted.

5. To the extent that any dispute, claim or controversy between the Insured and the Insurer hereunder is not subject to arbitration for any reason, or to the extent that applicable law otherwise permits the parties to seek provisional relief from the courts prior to the time that the arbitral panel is appointed, the United States District Court for the Southern District of New York (or the Supreme Court of the State of New York, New York County, if federal jurisdiction cannot be attained) shall have exclusive jurisdiction thereof. For such purpose, the Insured agrees to accept, without objection to form or manner, service of process by registered mail or form of overnight mail to the person identified in Item 11 of the Declarations. For such purpose, the Insurer agrees to accept, without objection to form or manner, service of process by registered mail, or overnight mail, directed to the Insurer's General Counsel, at Nuclear Electric Insurance Limited, 1201 Market Street, Suite 1100, Wilmington, Delaware 19801. The foregoing consents to service of process are not intended, nor shall they be construed, to extend to any dispute, claim, controversy, cause of action, or other matter other than as stated in this paragraph.

H. **Headings**

The headings in this Policy are inserted for convenience only and shall not be deemed to constitute a part hereof.

I. **Evaluations and Compliance with Loss Control Standards**

1. The Insurer shall be permitted, but not obligated, to perform or to have performed on its behalf, evaluations of the Insured Property at any reasonable time. All evaluations and evaluation reports made by or on behalf of the Insurer are made solely for insurance purposes. Evaluation reports are based upon the conditions, practices and property observed and information made available at the time of the evaluation, and shall not be deemed to identify all hazards or to indicate that other hazards do not exist. The Insurer and those performing evaluations on its behalf shall not be responsible for the correction or control of any conditions, practices or property. Notwithstanding any other agreement, express or implied, to the contrary, neither the right to make an evaluation nor the making of an evaluation, nor any advice or report resulting therefrom, shall constitute or be construed as an undertaking on behalf of or for the benefit of the Insureds or others to determine or warrant that the facilities, operations or property are safe or healthful, or are in compliance with any law, rule, regulation, procedure or standard. It shall be the obligation of the Insureds to ensure that the Insurer is accorded the right to conduct an evaluation under this paragraph.

2. Notwithstanding the provisions in Paragraph V.I.5, upon discovery of a dangerous condition (the "Dangerous Condition) with respect to any property, or part thereof, insured under this Policy (the "Affected Property"), whether discovered as a result of an evaluation or otherwise, a representative of the Insurer may

   (a) request that the Affected Property be taken out of service without delay, and/or

   (b) request that actions be taken to remedy the Dangerous Condition.

3. If a request made under Paragraph V.I.2 is not complied with, the Insurer may immediately suspend coverage as to the Affected Property and/or as to Property Damage that could have been avoided or reduced had the Dangerous Condition been remedied, provided, however, that there will be coverage for Property Damage if the Insured can demonstrate that the Property Damage was unrelated to the failure to take the requested action (and there is otherwise coverage under this Policy). Notice of the suspension (which may be made together with either request referred to in Paragraph V.I.2) shall be written and, notwithstanding any other provisions under this Policy, may be sent to the Member Insured by hand delivery, e-mail, fax or courier.

4. It shall be an obligation under this Policy that the Insured comply with the Shall Requirements contained in the Insurer's Loss Control Standards.

5. When the Insurer learns of an Insured's failure to comply with, or to take agreed upon actions to correct a failure to comply with, a Shall Requirement contained in the Insurer's Loss Control Standards, the Insurer may notify the Insured of the non-compliance, and upon or after such notification shall have the right to

   (a) adjust the Insured's premiums ("Premium Adjustments") and/or the Insured's deductible ("Deductible Adjustments"), and/or

   (b) suspend coverage under this policy as to the property that is the subject of the applicable Shall Requirement and/or as to Property Damage that could have been avoided or reduced if not for the Insured's failure to comply with the applicable Shall Requirement, provided, however, that there will be coverage for Property Damage if the Insured can demonstrate that the Property Damage was not related to the noncompliance (and there is otherwise coverage under this Policy).

   The Actions referred to in this Paragraph may be collectively referred to as "Policy Adjustments".

6. Notification to the Insured about a non-compliance with the Shall Requirements contained in the Insurer's Loss Control Standards shall be in writing (the "Notification Letter") and, notwithstanding any other provisions under this Policy, may be sent to the

Member Insured by hand delivery, e-mail, fax or courier. The date of the Notification Letter shall be referred to as the "Notification Date". The Notification Letter shall set forth the specific Premium Adjustments and Deductible Adjustments to be made, which shall be assessed in accordance with the schedules contained in the Insurer's Rating Procedures and Schedules then in effect. Deductible Adjustments shall apply in accordance with the details set forth in the Notification Letter.

7. Unless indicated otherwise in the Notification Letter, all Premium and Deductible Adjustments will take effect on the 31st calendar day after the Notification Date unless the Insured requests a variance (in accordance with the procedures contained in the Loss Control Standards) or requests that the applicable coverage be removed because the Insured has elected not to comply with the relevant Loss Control Standard requirement. The precise scope of any coverage removal will be described in an endorsement to the Policy.

8. Unless indicated otherwise in the Notification Letter, all Premium and Deductible Adjustments will remain in effect until the Insurer endorses the Policy to remove such Policy Adjustments. For purposes of determining whether an Accident took place during a period that there was a Deductible Adjustment, the relevant date is the date on which the Accident actually occurred and not any deemed date that may otherwise be defined in the Policy.

9. Notwithstanding the provisions in Paragraph V.I.6 any suspension of coverage under Paragraphs V.I.3 and V.I.5 shall be in accordance with the scope of coverage suspension set forth in writing and delivered to the Insured.

10. If the Insured requests a variance, no Premium or Deductible Adjustments will be implemented while the variance request is being considered by the Insurer. If the Insurer does not grant the variance, the Premium and Deductible Adjustments shall be applied retroactively to the day the Adjustments would have gone into effect under Paragraph V.I.7, even if the Insured requests a review or otherwise appeals the Insurer's decision. The provisions of this paragraph will apply even in the event that an Accident actually occurs during the time that the variance request is being considered.

11. The Insurer may immediately suspend coverage under this Policy, in whole or in part, with respect to the Insured Property if (i) the NRC suspends or revokes for any reason the operating license issued with respect to any Unit on such Insured Property, or (ii) the NRC issues a shutdown order with respect to such Unit, or (iii) the NRC issues a confirmatory order keeping such Unit shut down. In the event that the Insurer chooses to suspend coverage under this provision, it shall notify the Member Insured in writing of that decision.

12. The coverage suspended in accordance with Paragraphs V.I.3 and V.I.5 above, as well as the coverage removed under Paragraph V.I.7 above, may be reinstated by the Insurer, but only by an endorsement issued to form a part of this Policy. The suspension of the insurance under this Policy will not affect the obligation of the Member Insured to pay

the Retrospective Premium Adjustment callable by the Insurer under this Policy, or provide other assurances to the Insurer Pursuant to Section VI.2.

J. **Insurer's Options**

It shall be the option of the Insurer to take all, or any part, of the destroyed or damaged Insured Property at the agreed or appraised value, and also to decontaminate or otherwise repair, or to rebuild or replace such Insured Property destroyed or damaged with other of like kind and quality within a reasonable time, on giving notice of its intention to do so within thirty (30) days after the receipt of the Proof of Loss as herein provided.

K. **Limits**

1. The Insurer shall not be liable for more than the amount shown as limit of liability in the Declarations for any one Accident.

2. The insurance provided by this Policy shall not be reduced by the sum paid for any one Accident.

3. Notwithstanding anything contained herein to the contrary, the Insurer's liability hereunder shall be the amount payable to the Member Insured but for this provision, less any amount owed to the Insurer by the Insureds, including amounts owed to the Insurer by the Insureds under this Policy or any other agreement or policy.

4. The Member Insured's recovery under Section I.A.1 and I.A.2 of this Policy shall not be decreased because the Replacement Cost or Actual Cash Value, whichever is applicable, of the Insured Property is less than the Insurer's limit of liability.

L. **Mortgagee Interests and Obligations**

1. If a Loss hereunder is assigned or made payable, in whole or in part, to a designated mortgagee not named herein as an Insured, such interest in this Policy may be canceled upon sixty (60) days' written notice of cancellation mailed or delivered to such mortgagee.

2. If the Insureds fail to meet the requirements stated herein in the case of Accidental Property Damage, such mortgagee, upon notice, shall render a written estimate of Loss within sixty (60) days and shall render Proof of Loss in the form approved by the Insurer within twelve (12) months thereafter and shall be subject to the provisions hereof relating to appraisal, arbitration and time of payment and of bringing suit. If the Insurer shall claim that no liability exists as to the mortgagor or owner, it shall, to the extent of payment of loss to the mortgagee, be subrogated to all the mortgagee's rights of recovery, but without impairing mortgagee's right to sue; or it may pay off the mortgage debt and require an assignment thereof and of the mortgage. Other provisions relating to the interests and obligations of such mortgagee may be added hereto by endorsement.

M. **Natural Hazards**

1. *Windstorm Loss*

Each Loss by windstorm, tornado or hurricane shall constitute a single Accident; provided, if more than one windstorm, tornado or hurricane should occur within any period of ninety-six (96) hours commencing during the term of this Policy, and such windstorms, tornados or hurricanes have a common origin or are caused by a single atmospheric disturbance, then such windstorms, tornados or hurricanes shall be deemed to be a single windstorm, tornado or hurricane.

2. *Flood Loss*

Each Flood shall be deemed a separate Accident; provided that if more than one Flood should occur within any period of ninety-six (96) hours commencing during the term of this Policy and such Floods have a common origin or are caused by a single Accident, then such Floods shall be deemed to be a single Flood.

3. *Earthquake or Volcanic Eruption Loss*

Each earthquake shock or volcanic eruption shall be deemed a separate Loss; provided that if more than one earthquake shock or volcanic eruption shall occur within any period of ninety-six (96) hours commencing during the term of this Policy and such earthquake shocks or volcanic eruptions have a common origin or are caused by a single incident, then such earthquake shocks or volcanic eruptions shall be deemed to be a single earthquake or volcanic eruption.

N. **Other Insurance**

The Insurer shall not be liable if at the time of the Accident there is any other insurance which would attach if this insurance had not been effected, except that this insurance shall apply only as excess and in no event as contributory insurance, and then only after all other insurance has been exhausted.

O. **Policy Decisions and Notice**

Except as provided in paragraph Q of Section V, all decisions or actions made or taken with respect to this Policy may only be taken or made by the first named Member Insured and all such decisions or actions shall be binding on all Insureds. Such decisions or actions shall include, without limitation, decisions to give or not give notices of losses, to file or not file proofs of loss and to bring or not bring an action under the dispute resolution provision. No decision or action with respect to this Policy may be made or taken by anyone other than the Insurer and the first named Member Insured. The first named Member Insured shall be that Member Insured whose name is listed first in Item 1 of the Declarations. The Insurer and the

Insureds agree that all communications between them as to any matter arising under or relating to this Policy shall be made as follows:

1. If to the Insurer: The communication must be sent by the first named Member Insured and must be sent, by facsimile, mail or courier to the Insurer at the address listed in Item 2 of the Declarations.

2. If to the Insureds: The communication must be sent by the Insurer to the first named Member Insured and must be sent, by facsimile, mail or courier to the address listed in Item 1 of the Declarations or to the address of such Member Insured's Delaware Representative. It shall be the obligation of the first named Member Insured to communicate the contents of any notification from the Insurer to the other Insureds.

The Insured's compliance with the provisions of this paragraph is a condition precedent to the Insurer's obligations under this Policy.

P. **Policy Modifications**

This Policy embodies all agreements between the Member Insured and the Insurer or any of their agents relating to this insurance. There shall be no change in the terms, provisions and stipulations of this Policy except in writing hereon or by endorsement added hereto by the Insurer and the Member Insured.

Q. **Requirements in Case of Loss**

1. It shall be an obligation of the Insureds to give or cause to be given to the Insurer immediate written notice of any Accidental Property Damage and to protect the Insured Property from further damage. The Insureds shall separate or cause to be separated, with reasonable promptness, the damaged and undamaged Insured Property, put it in the best possible order, furnish a complete inventory of the destroyed, damaged and undamaged Insured Property, showing in detail quantities, costs, the Replacement Cost and estimated amount of Property Damage claimed. The Insurer may deny coverage for such Accidental Property Damage if the Insured fails to comply with its obligations to provide immediate written notice thereof, but only if the Insurer demonstrates being prejudiced in its ability to adjust, assess or otherwise investigate the claim as a result of such failure.

2. Within twelve (12) months after the Accidental Property Damage, unless such time is extended in writing by the Insurer, not to be unreasonably withheld, the Insureds shall render to the Insurer a proof of loss ("Proof of Loss"), in the form approved by the Insurer, signed and sworn to by the Member Insured, stating the knowledge and belief of the Insureds as to the time and origin of the Accidental Property Damage, the interest of the Insureds and all others in the Insured Property, the value of the Insured Property involved in the Accident, the amount of Loss or damage thereto, all other contracts of insurance, whether valid or not, covering any of said Insured Property, and

(a) with respect to Losses covered under Section I.A.1, an attestation by the Member Insured that either no proceeds of this Policy, or no proceeds of this Policy in excess of the Specified Nuclear Liability Amount, except as provided in a Proof of Loss filed with the Insurer, are needed to discharge the legal obligation or liability of the Insureds under the Act to protect the public health and safety following Accidental Property Damage, and that the payment of policy proceeds for the Property Damage under Section I.A.1 does not violate any regulation or order of the NRC; and

(b) with respect to Losses covered under Section I.A.2, the time and origin of the Accidental Property Damage necessitating such expenses, the amount of expenses incurred in discharging the Insureds' legal obligation or liability under the Act to protect the public health and safety following Accidental Property Damage, and an attestation by the Member Insured as to the Insurer's legal obligation or liability to incur such expenses.

3. The Insureds shall exhibit or cause to be exhibited to any person designated by the Insurer, as often as may be reasonably required, all that remains of any Insured Property and shall submit to examinations under oath by any person named by the Insurer, and shall subscribe the same. The Insureds shall, as often as may be reasonably required, produce for examination all books of accounts, bills, invoices and other vouchers, or certified copies thereof if originals be lost, or other documents needed by the Insurer to determine its liability, at such reasonable time and place as may be designated by the Insurer or its representatives, and shall permit extracts and copies thereof to be made.

R. **State Premium Tax**

The Insureds represent that they have paid or will pay any applicable state premium tax.

S. **Subrogation**

1. Except as provided in paragraph S.3 below, the Insurer may require from the Insureds an assignment of all right of recovery against any party for Accidental Property Damage to the extent that payment therefor is made by the Insurer, and the Insureds shall execute and deliver all necessary instruments and do all things necessary or desirable on behalf of the Insurer to secure such rights. The Insureds shall take no action after the Accident which may prejudice the Insurer's rights under this paragraph; however, prior to an Accident, the Insureds may waive in writing any or all right of recovery against any party for Accidental Property Damage.

2. The Insurer hereby waives any right of subrogation acquired by reason of any payment under this Policy arising out of any Accidental Property Damage against the Insureds and any party furnishing services, materials, parts, or equipment in connection with the planning, construction, maintenance, operation or use of the Insured Property.

3. It is a condition of this Policy that the Insureds shall repay to the Insurer any recoveries made by the Insureds on account of any Accidental Property Damage to the extent that the Insurer would have been entitled to such recoveries had this waiver not been included in this Policy. The proceeds of any recovery shall be applied first to any uncompensated Property Damage incurred by the Insureds, including reimbursement of any deductible amount under this Policy, and then, to the extent any proceeds of such recovery remain, to reimburse the Insurer for any payments made by it to the Insureds.

T. **Suit**

No suit, action or proceeding on this Policy for the recovery of any claim shall be sustainable in any court of law or equity or any arbitral tribunal unless all the requirements of this Policy shall have been complied with, and unless commenced within eighteen (18) months after the Accident giving rise to such claim; provided, however, an extension of time granted by the Insurer for rendering a Proof of Loss with respect to any Accidental Property Damage shall extend the eighteen-month (18) period for bringing suit with respect to such claim by the period of the extension.

U. **Term and Cancellation**

1. This Policy shall commence on the date specified in Item 3A of the Declarations and shall terminate on the date specified in Item 3A of the Declarations. This Policy shall be automatically renewed for successive one-year terms, however either party may cancel this Policy by providing written notice to the other party by registered mail at least three months prior to any anniversary.

2. This Policy may be canceled at any time by the Insurer, upon approval of its Board of Directors, upon sixty (60) days' written notice of cancellation mailed or delivered to the Member Insured, with or without tender of the excess of paid premium above the pro rata premium for the expired time, which excess, if not tendered, shall be refunded on demand. Notice of cancellation shall state that said excess premium, if not tendered, will be refunded on demand.

3. This Policy shall be automatically canceled if (i) the INPO membership of either the Member Insured or the Operator is suspended or canceled by INPO for any reason and (ii) the Member Insured fails to notify the Insurer within five business days after receipt of notice of such suspension or cancellation of membership in INPO, unless the Insurer is otherwise notified during such five business days.

4. In the event that the Member Insured fails to pay to the Insurer any Retrospective Premium Adjustment due under this Policy, due under any Other Insurance Policy as such Member Insured may have with the Insurer, or referred to in Section VI, this Policy shall terminate provided that the Insurer notifies the Member Insured in writing of this delinquency and the Member Insured fails to make the required payment within 15 days after receiving such notice by registered mail.

5. Neither the cancellation of the Policy on the part of the Member Insured or the Insurer, nor its automatic termination, shall affect the obligation of the Member Insured to pay the Retrospective Premium Adjustment callable by the Insurer under this Policy, or provide other assurances to the Insurer Pursuant to Section VI.2.

V. Valuation

1. The value of the Insured Property at the time of an Accident shall be the Replacement Cost of such Insured Property, but only if such Insured Property as is damaged or destroyed is replaced within a reasonable time with identical or like kind property on the same premises and intended for the same occupancy and use. In all other cases, the value of the Insured Property at the time of loss shall be the Actual Cash Value of such Insured Property, notwithstanding that the Policy may refer to the Replacement Cost of such Insured Property. The Member Insured may elect first to make claim under this Policy on an Actual Cash Value basis and may make further claim on a Replacement Cost basis, provided the Insurer is notified in writing within one hundred and eighty (180) days after the Accident of the Member Insured's intent to make such further claim and such claim is filed within three hundred and sixty-five (365) days of such notice.

2. The value of Insured Property in transit at the time of an Accident shall be the Replacement Cost of such Insured Property, but not exceeding the amount which it would cost to repair or replace such Insured Property with material of like kind and quality within a reasonable time after such loss, including general average and salvage charges.

3. In the event of Property Damage to Insured Property constituting nuclear fuel, the Insurer's obligation to indemnify the Insureds and their legal representatives under Section I shall be limited as follows:

   (a) Beginning with the date initial criticality is achieved at a Unit, the value of the nuclear fuel in such Unit shall be deemed to be equal to the value of a full fuel core of the fuel then in such unit reduced to reflect the proportion of the usable burn up consumed; and

   (b) Spent nuclear fuel shall have no value and the Insurer shall have no obligation to indemnify the Insureds or their legal representatives for any Property Damage thereto.

W. Waiver Provisions

No provision, stipulation or forfeiture shall be held to be waived by any requirement or proceeding on the part of the Insurer relating to appraisal or to any examination provided for herein.

X. **When Loss Payable.**

The amount of Loss for which the Insurer may be liable shall be payable as soon as practicable and in any event within sixty (60) days after the Proof of Loss is received by the Insurer and ascertainment of the Loss is made either by agreement between the Member Insured and the Insurer expressed in writing or by the filing with the Insurer of an award as herein provided. Where only a partial Proof of Loss has been provided to the Insurer and the Insurer's liability for the Property Damage is uncontested, the Insurer may, in its sole discretion, make partial payment to the Insured. Nevertheless, the Insurer shall have no obligation to make such partial payment.

VI. RETROSPECTIVE PREMIUM ADJUSTMENT

The Member Insured agrees to pay to the Insurer the Retrospective Premium Adjustment under the terms and conditions hereinafter set forth.

1. The Insurer may make demand for the Retrospective Premium Adjustment in whole or in one or more parts from time to time, but only to the extent necessary, in the sole discretion of the Board of Directors of the Insurer, to cover Losses incurred by the Insurer under this Policy and all Other Insurance Policies with coverage effective during the Policy Year (specified in Item 3.B of the Declarations).

2. The Insurer, in the sole discretion of the Board of Directors, may require the Member Insured to provide assurance to the Insurer of the Member Insured's ability to satisfy its obligation to pay a Retrospective Premium Adjustment when called. Within twenty (20) business days of receiving notice from the Insurer that such assurance is required, the Member Insured shall notify the Insurer of the option selected to provide the required assurance, which will include, but is not limited to, providing a letter of credit, providing a financial guarantee, purchasing retrospective premium insurance, or paying a Deposit Premium, and implement such option by providing the Insurer with the required documentation or payment, depending on the option selected. The parameters for a letter of credit, a financial guarantee, and the retrospective premium insurance options will be provided to the Member Insured by the Insurer at the time the Insurer requires the Member Insured to take the action. The terms regarding the Deposit Premium are set forth in Paragraph 3 below.

3. If the Member Insured elects to pay a Deposit Premium, the Insurer may require the Deposit Premium to be paid in whole, in part, or in parts. Any Deposit Premium paid to the Insurer will be returned to the Member Insured when, in the sole discretion of the Insurer's Board of Directors, the retention of the Deposit Premium is no longer required. The amount of any Deposit Premium paid shall be a credit against the obligation of the Member Insured to pay a call made for a Retrospective Premium Adjustment and, to the extent thereof, shall be treated as a payment of the Retrospective Premium Adjustment as of the date a call for a Retrospective Premium Adjustment is made. Amounts paid as Deposit Premiums will be held in an interest bearing account and, until such a call is made, interest earned on the Deposit Premium amount will be

paid back to the Member Insured on an annual basis, within ninety (90) business days after the end of the applicable calendar year. However, if the Member Insured fails to elect one of the options available pursuant to Paragraph 2 within the time frame required, or at any other time when in the sole discretion of the Insurer's Board of Directors it is in the best interests of the Insurer, the Insurer may make demand upon the Member Insured for a Deposit Premium, whether or not a demand for a Deposit Premium is made upon any other Member Insured(s). If a demand is made by the Insurer, the Member Insured shall pay the Deposit Premium within twenty (20) business days of demand.

4. That portion of the Retrospective Premium Adjustment demanded by the Insurer shall be paid to the Insurer by wire transfer or other method acceptable to the Insurer within twenty (20) business days after demand. The Insurer may, without first pursuing any rights it may have against any Delinquent Member, make such number of further demands upon the Member Insured, including any Delinquent Member, for further portions of the Retrospective Premium Adjustment, to be payable twenty (20) business days after demand, as may be needed to obtain Retrospective Premium Adjustment from the Member Insureds of the Insurer under this Policy and all Other Insurance Policies with coverage effective during the Policy Year sufficient, in the sole discretion of the Board of Directors of the Insurer, to cover Losses under this Policy and all Other Insurance Policies with coverage effective during the Policy Year. The fact that the Insurer has received sufficient Retrospective Premium Adjustment from such Member Insureds shall not bar the Insurer from pursuing the Insurer's rights against any Delinquent Member.

5. When, for any purpose hereunder, it becomes necessary to calculate the obligation of the Member Insured for the Retrospective Premium Adjustment, it will be calculated as follows:

   (a) The amount of the Retrospective Premium Adjustment shall be equal to the product of (i) the Multiple selected by the Board of Directors of the Insurer as required to meet Losses under this Policy and all Other Insurance Policies with coverage effective during the Policy Year, times (ii) the Premium plus any Additional Premium, or if such is for a period shorter than a calendar year, such Premium and Additional Premium multiplied by a fraction the numerator of which is 365 and the denominator of which is the number of days in the policy period specified in Item 3A of the Declarations.

   (b) The policy year to which any Retrospective Premium Adjustment relates shall be determined by the Board of Directors of the Insurer at the time it makes the call for such Retrospective Premium Adjustment based on the date of the Accident under this Policy or any Other Insurance Policy giving rise to the obligation which such Retrospective Premium Adjustment is designed to satisfy. The aggregate of all Retrospective Premium Adjustments under this Policy shall not exceed the Retrospective Premium Adjustment set forth in Item 5.B of the Declarations.

(c) Subject to the provisions with respect to calls made in the event of failure to pay by Delinquent Members, the amount of any call for a Retrospective Premium Adjustment hereunder shall bear the same relation to the total Retrospective Premium Adjustment, payable by all Member Insureds of the Insurer under such call as the highest Premium plus Additional Premium determined under subparagraph (a)(ii) above bears to the aggregate Premiums plus Additional Premiums, used to calculate the total of all such calls, under this Policy and all Other Insurance Policies with coverage effective during the Policy Year.

(d) The obligation of the Member Insured for the Retrospective Premium Adjustment shall be and remain in full force and effect and all the above calculations shall be made without regard to whether or not the Insurer has any obligation to make payments under this Policy or this Policy is canceled or suspended.

6. When, for any purpose hereunder, it becomes necessary to calculate the obligation of the Member Insured for the Deposit Premium, it will be calculated as follows:

(a) The amount of the Deposit Premium, if required, shall be equal to Retrospective Premium Adjustment listed in Item 5.B of the Declarations, unless otherwise indicated.

(b) The aggregate of the Deposit Premium and any Retrospective Premium Adjustments callable under this Policy shall not exceed the Retrospective Premium Adjustment set forth in Item 5.B of the Declarations.

(c) The amount of the Deposit Premium may be adjusted at the anniversary of this Policy.

(d) The obligation of the Member Insured for the Deposit Premium shall be and remain in full force and effect and all the above calculations shall be made without regard to whether or not the Insurer has any obligation to make payments under this Policy or this Policy is canceled or suspended.

7. The Multiple is no higher than the Multiple in any Other Insurance Policy with insurance coverage effective during the Policy Year.

8. The Board of Directors of the Insurer in its sole discretion may adjust downward the Multiple stated in this Policy and any Other Insurance Policy with coverage effective during the Policy Year to a new lower Multiple, and the Retrospective Premium Adjustment callable under this Policy and any such Other Insurance Policy shall be reduced by a like proportionate amount. No downward adjustment in such Multiple and corresponding adjustment in any such Retrospective Premium Adjustment may be made with respect to any Retrospective Premium Adjustment which has been assigned by the Insurer, or in any Other Insurance Policy with coverage effective during the Policy

Year, if the Multiple in any such Other Insurance Policy, after adjustment, would be less than the Multiple, after adjustment, in this Policy, unless a similar downward adjustment is made in the Multiple in this Policy, together with a corresponding adjustment in the Retrospective Premium Adjustment.

9. The liability of the Member Insured shall be limited to the Premium, Additional Premium the Retrospective Premium Adjustment or any unpaid portion thereof due to the Insurer under the terms of this Policy, and any assurance that may be required pursuant to Section VI.2. No Member Insured shall be subject to any contingent liability or be required to pay any dues or assessments in addition to such Premium, Additional Premium, Retrospective Premium, and any assurance under Section VI.2. Adjustment due under this Policy and those due under any Other Insurance Policies as such Member Insured may have with the Insurer. The liability of the Member Insured for the Retrospective Premium Adjustment for the Policy Year shall cease six (6) years after the end of the Policy Year, unless prior demand is made therefor.

10. It is agreed that the obligation of the Member Insured to pay any Retrospective Premium Adjustment due under any Other Insurance Policy between the Insurer and the Member Insured which terminated on or before the inception date of this Policy is an obligation of the Member Insured under this Policy. It is also agreed that the terms and the amount of such obligation shall be determined by reference to the Other Insurance Policy under which such obligation arose, notwithstanding that such Other Insurance Policy may no longer be in effect.

11. The liability of each Member Insured, if there be more than one, for the Retrospective Premium Adjustment, and any assurance that may be required pursuant to Section VI.2, under this Policy shall be several and not joint and in proportion to their respective interests specified in the Declarations.

12. In the event the Insurer has available credit facilities from lenders, the Board of Directors of the Insurer may, in its sole discretion, utilize such facilities to finance Losses incurred by the Insurer under this Policy and all Other Insurance Policies. The Insurer may assign to the lenders the Insurer's interest in the Retrospective Premium Adjustment, in whole or in part, including, in the event the Insurer defaults on its obligations to such lenders, the right to call such interest assigned. Such assignment may be made and shall only be effective with respect to the financing of those Losses for which the Retrospective Premium Adjustment could be called. In the event any assignment is made, the Insurer shall give prompt notice thereof to the Member Insured. Each Member Insured shall, upon the request of the Insurer, give acknowledgment of its liability for the Retrospective Premium Adjustment to each of the lenders involved.

VII. MEMBERSHIP

Each Member Insured becomes a member of the Insurer as part of obtaining insurance from the Insurer, and as such, is entitled to the privileges and benefits, and by entering into this Policy agrees to be subject to and bound by the obligations and duties of membership. These are more fully set forth in

the Insurer's Memorandum of Association and in the Bye-Laws and any amendments thereto, each of which is hereby incorporated into and made a part of this Policy. In no event shall any amendment to the Memorandum of Association or the Bye-Laws increase the amount of Premium or Retrospective Premium Adjustment payable or callable hereunder.

VIII. DEFINITIONS

For purposes of this Policy, unless otherwise stated to the contrary, the following capitalized terms shall have the meanings set forth below. Other capitalized terms are included in the Declarations. Unless otherwise stated or required for the meaning of any provision, the singular shall include the plural and the plural, the singular. Whenever a Section or Paragraph number is included in the Policy, it refers to a Policy Section or Paragraph number.

A. "Accident" means a sudden and fortuitous event, an event of the moment, which happens by chance, is unexpected and unforeseeable. Accident does not include any condition which develops, progresses or changes over time, or which is inevitable. The date of the Accident shall be the later of when such Accident occurred or is discovered; provided, however, that no Accident is covered hereunder which occurred while the Insured was not insured by the Insurer under this Policy or a predecessor policy issued by the Insurer.

B. "Accidental" means caused by an Accident.

C. "Accidental Property Damage" means Property Damage which is caused by an Accident.

D. "Actual Cash Value" means the amount determined by taking the Replacement Cost of the Insured Property and reducing it by straight line depreciation at a rate of three percent (3%) per year, subject to a maximum depreciation of fifty percent (50%).

E. "Additional Premium" means the sum of all Premium Adjustment(s), if any, assessed in accordance with Section V.I of the Policy.

F. "Deductible Adjustments" refer to adjustments that may be made under Section V.I of the Policy, as a result of a non-compliance with a SHALL Requirement contained in the Company's Loss Control Standards, the amount of which shall be determined in accordance with the Company's Procedures and Schedules for the Rating of Nuclear Generating Stations and set forth in a Notification Letter to the Insured.

G. "Delinquent Member" means any member insured, including the Member Insured, who fails to pay a retrospective premium adjustment demanded by the Insurer under Policy or any Other Insurance Policy within twenty (20) business days after such demand.

H. "Deposit Premium" means the amount that the Member Insured may be required to pay to the Insurer under this Policy, as detailed in to Section VI of this Policy, as security for future Retrospective Premium Adjustments.

I. “Flood” means a general and temporary overflowing of water on normally dry land areas caused by or resulting from hurricane, tornado, or windstorm; surface water, waves, tidal water, or tidal wave, overflow of streams or other bodies of water, or spray from any of the foregoing, all whether driven by wind or not; water which backs up through sewers or drains; water below the surface of the ground including that which exerts pressure on or flows, seeps or leaks through sidewalks, driveways, foundations, walls, basements or other floors, or through doors, windows or other openings in such sidewalks, driveways, foundations, walls, basements or other floors, or release of water impounded by a dam.

J. "Insured Property" means the property specified as such in Item 7 of the Declarations and situated at a location specified therein.

K. “Loss” means the costs or expenses covered under Sections I.A, I.D. and I.E.

L. “Loss Control Standards” means the set of procedures and technical requirements adopted by the Insurer that are intended to minimize the risk of loss at Insured Sites.

M. “Member Insureds of the Insurer" means the Member Insureds under this Policy or the Other Insurance Policies.

N. “Operator” means those persons, entities, departments, agencies, or political subdivisions, if any, other than the Member Insured, responsible for operating a Unit covered by the Policy.

O. "Other Insurance Policy" means any Primary Property and Decontamination Liability Insurance Policy or Operating Facility Policy, other than this Policy, issued by the Insurer or any Primary Property and Decontamination Insurance Policy issued by Overseas NEIL Limited.

P. "Other Member Insurance Policy" means any insurance policy, other than this Policy, issued by the Insurer to one or more Member Insureds of the Insurer.

Q. “Premium Adjustment” refer to adjustments that may be made under Section V.I of the Policy, as a result of a non-compliance with a SHALL Requirement contained in the Company’s Loss Control Standards, the amount of which shall be determined in accordance with the Company’s Procedures and Schedules for the Rating of Nuclear Generating Stations and set forth in a Notification Letter to the Insured.

R. "Property Damage" means direct physical damage to or destruction of the Insured Property.

S. “Rating Procedures and Schedules” means the Procedures and Schedules for the Rating of Nuclear Generating Stations manual utilized by the Insurer to establish premiums during the underwriting process, as may be revised with the approval of the Board.

T. “Replacement Cost" means the cost incurred for the repair or replacement of the Insured Property that sustained Accidental Property Damage. For purposes of determining Actual Cash Value pursuant to Section I hereof, in the event the replacement property is not readily available, then Replacement Cost for such Insured Property shall be the original book value of the damaged component, less any applicable AFUDC, adjusted for inflation using the applicable Handy Whitman Index.

U. “Retrospective Premium Adjustment" means the amount of retrospective premium adjustment called or demanded of the Member Insured under this Policy as calculated pursuant to Section VI of this Policy, but not, in the aggregate, in excess of the Retrospective Premium Adjustment specified in Item 5.B of the Declarations.

V. “SHALL Requirement” means a standard within the Loss Control Standards that sets forth a minimum requirement to be met and maintained for the Insured Property to be insurable, and is identified as such within the Loss Control Standards.

W. “Temporary Works” means all structures and their materials which are not intended to form part of the permanent works but which are intended to provide working access to the site or to the permanent works, or which are intended to provide temporary support to the permanent works under construction, but shall not mean structures or their materials intended for re-use after completion of the permanent works unless their full value has been included in the contract value.

X. “Unit” means a nuclear operating unit.

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

Earth Movement Damage Endorsement

Member Insured: Florida Power Corporation

Site: Crystal River
Endorsement No. 1
Policy Number: P12-081
Effective Date: April 1, 2012

Effective Time of this Endorsement is 12:01 a.m. Standard Time in Hamilton, Bermuda.

1. Subject to the provisions set forth in this Endorsement and to the provisions and stipulations contained in the Policy, paragraph III.A.1.(m) of the Policy is hereby modified and the Policy is extended to insure against Property Damage caused by earthquake and volcanic eruption and subsidence or sinking of land at the Location specified herein. Except as stated above, paragraph III.A.1.(m) remains otherwise unchanged.

2. The Insurer shall not be liable for Property Damage caused by any earthquake shocks, volcanic eruptions or subsidence or sinking of land commencing before the effective date and time of this Endorsement, nor for any Property Damage resulting from earthquake, volcanic eruptions or subsidence or sinking of land after the expiration of the policy period stated in the Declarations. In no event shall this Endorsement render Insurer liable for Property Damage caused by (a) flood, surface water, waves, tidal water, or tidal wave, overflow of streams or other bodies of water, or spray from any of the foregoing; or (b) release of water impounded by a dam; all even though caused by or attributable to earthquake, volcanic eruption or subsidence or sinking of land.

IN WITNESS WHEREOF, the parties hereto have caused this Endorsement to be executed and attested on their behalf.

Wilmington, Delaware

Date: As of April 1, 2012

Attest: _____

INSURER:
Nuclear Electric Insurance Limited

By: _____
David B. Ripsom, President

Wilmington, Delaware

Date: As of April 1, 2012

Witness: _____

MEMBER INSURED:
Florida Power Corporation

By: _____
Attorney-in-Fact

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

Flood Endorsement

Member Insured: Florida Power Corporation

Site: Crystal River
Endorsement No. 2
Policy Number: P12-081
Effective Date: April 1, 2012

Effective Time of this Endorsement is 12:01 a.m. Standard Time in Hamilton, Bermuda.

Subject to the provisions of this Policy not in conflict, Section III, Exclusions, Part A.1.(l) and Section VIII, Definition, Part I are deleted.

This policy is extended to insure against Property Damage caused by Flood as defined below.

Flood is defined as a general and temporary overflowing of water onto normally dry land areas caused by or resulting from hurricane, tornado, or windstorm; surface water, waves, tidal water or tidal waves; overflow of streams or other bodies of water, or spray from any of the foregoing, all whether driven by wind or not, and release of water impounded by a dam at the Location specified herein.

The Insurer shall not be liable for Property Damage caused by Flood commencing before the effective date and time of this Endorsement, or after the expiration of the policy.

No coverage is provided by this Endorsement for Property Damage caused by or resulting from earthquake, volcanic eruption, landslide, subsidence or sinking of land or other earth movement.

No coverage is provided by this Policy for Property Damage caused by or resulting from:

a. Water below the surface of the ground including that which exerts pressure on or flows, seeps or leaks through sidewalks, driveways, foundations, walls, basement or other floors, or through doors, windows or other opening in such sidewalks, driveways, foundations, walls, basements or other floors;
b. Water which backs up through sewers or drains;

In every other respect, the provisions and stipulations of the Policy remain unchanged.

This Endorsement does not increase the amount of insurance provided under the Policy.

IN WITNESS WHEREOF, the parties hereto have caused this Endorsement to be executed and attested on their behalf.

INSURER:
Nuclear Electric Insurance Limited

Wilmington, Delaware

Date: As of April 1, 2012

By: _____
David B. Ripsom, President

Attest: _____

MEMBER INSURED:
Florida Power Corporation

Wilmington, Delaware

Date: As of April 1, 2012

By: _____
Attorney-in-Fact

Witness: _____

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

Fire Damage Exclusion Endorsement

Member Insured: Florida Power Corporation

Site: Crystal River
Endorsement No. 3
Policy Number: P12-081
Effective Date: April 1, 2012

Effective Time of this Endorsement is 12:01 a.m. Standard Time in Hamilton, Bermuda.

1. This Endorsement shall be applicable to the following property:

   a) Temporary Building Number 29
   b) Waterfront Maintenance Building near the Crystal River Unit 3 Intake Structure

2. It is hereby agreed and understood that this Policy does not insure against Property Damage to the property described in Paragraph 1, or the contents thereof, caused directly or indirectly by fire, or fire following lightning or explosion, or by any separate and independent Accident which ensues therefrom.

This Endorsement does not increase the amount of insurance provided under this Policy.

IN WITNESS WHEREOF, the parties hereto have caused this Endorsement to be executed and attested on their behalf.

Wilmington, Delaware

Date: As of April 1, 2012

Attest: _____

INSURER:
Nuclear Electric Insurance Limited

By: _____
David B. Ripsom, President

Wilmington, Delaware

Date: As of April 1, 2012

Witness: _____

MEMBER INSURED:
Florida Power Corporation

By: _____
Attorney-in-Fact

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

Terms & Conditions Endorsement

Member Insured: Florida Power Corporation

Site: Crystal River
Endorsement No. 4
Policy Number: P12-081
Effective Date: April 1, 2012

Effective Time of this Endorsement is 12:01 a.m. Standard Time in Hamilton, Bermuda.

As used herein, EPC Contract shall refer to the Engineering, Procurement and Construction contract that [Progress entity] shall enter into for the repairs to the Containment Structure at the Insured Unit.

As used herein, Repairs shall refer to all work performed under the EPC Contract.

For the purposes of this Endorsement the Containment Structure shall be defined as the buttresses, ring girder, dome, liner, panels, bays, and tendons of the containment building. For reference, the containment building is labeled as the reactor building in the plot plan Progress Energy Dwg. #CR3-G86-D, Rev. 11, 10-21-03.

This Policy does not cover Accidental Property Damage to the Containment Structure. This Policy also does not cover Accidental Property Damage to tools, materials, supplies, equipment and machinery, including those belonging to contractors' and subcontractors', used to effect Repairs.

Notwithstanding the above,

1.) Subject to all other terms and conditions of this Policy, Property Damage caused by an Accident discovered prior to July 1, 2012 that arises out of or relates to the construction pre-work activities specified in Exhibit A below, is not excluded by this endorsement, but the limits of liability for such damage is $50,000,000.

2.) Subject to all other terms and conditions of this Policy, Property Damage to the Containment Structure caused by windstorm, flood, earthquake, or volcanic eruption is not excluded by this endorsement, but the limits of liability for such damage is $300,000,000 in excess of $200,000,000, in excess of the Policy deductible. For the period from April 1, 2012 to the earlier of either July 1, 2012, or the date on which Repairs begin, and subject to all other terms and conditions of this Policy, Property Damage to the Containment Structure caused by windstorm, flood, earthquake, or volcanic eruption is not excluded by this endorsement, but is limited to $300,000,000 and subject to all other terms and conditions of this Policy.

3.) Subject to all other terms and conditions of this Policy, Accidental Property Damage to the Containment Structure that is discovered prior to July 1, 2012, which is not caused by (i) Repairs , or (ii) an activity included in Exhibit A below, is not excluded by this endorsement, but is limited to $100,000,000.

Exhibit A

1. Base Scope Contractor Demobilization
2. Temporary Office Facility Set-Up &/or Reconfiguration
3. Fab Shop & Early Material Lay-Down Area Set-Up
4. Limited Tendon Access Interference Removal
5. Contract Award
6. Construction Equipment Mobilization
7. Mobilize Field Office Facilities
8. Moblilize Craft Support Facilities
9. Mobilize Tendon Contractor Equipment to Site
10. Material Receiving and Lay-Down Setup
11. Install Facilities and Temp Power
12. Contractor Setup for Rebar Scanning
13. Setup Batch Plant
14. Receive Work Platform(s)
15. Receive Shoring
16. Receive Concrete Hydo-demolition Equipment
17. Receive Concrete Wall Demolition Mockup Material
18. Receive Shoring Material
19. Receive Water Management
20. Begin Interference Removal for 1st Bay and Beyond Platform Erection and Concrete Removal
21. Receive Concrete Constituents, Water, and Nitrogen
22. Receive Spent Fuel Pool Protective Barrier Material
23. Erect Platform and Scaffold for Concrete Removal

This endorsement shall not serve to limit the recovery for, or otherwise exclude, any loss incurred under Section I.A.2, including expenses covered under I.E.1 following Accidental Property Damage covered under Section I.A.2.

This Endorsement shall not serve to limit the recovery for, or otherwise exclude Accidental Property Damage to (i) the contents of the containment building, (ii) adjacent buildings, or (iii) equipment, provided that such equipment is not used to effect Repairs .

All other terms and conditions of the Policy remain the same.

This Endorsement does not increase the amount of insurance provided under this Policy.

IN WITNESS WHEREOF, the parties hereto have caused this Endorsement to be executed and attested on their behalf.

INSURER:
Nuclear Electric Insurance Limited

Wilmington, Delaware

Date: As of April 1, 2012

By: _____
David B. Ripsom, President

Attest: _____

MEMBER INSURED:
Florida Power Corporation

Wilmington, Delaware

Date: As of April 1, 2012

By: _____
Attorney-in-Fact

Witness: _____

NUCLEAR ELECTRIC INSURANCE LIMITED
POLICYHOLDER DISCLOSURE

NUCLEAR POLICY RENEWALS

NOTICE OF TERRORISM INSURANCE COVERAGE
EFFECTIVE DECEMBER 26, 2007

Coverage for acts of terrorism is already included in your current policy. However, under NEIL's Payment for Acts of Terrorism endorsement, your recovery for losses stemming from an act of terrorism could be limited by the terms of the endorsement. However, in accordance with the Terrorism Risk Insurance Program Reauthorization Act of 2007, which took effect December 26, 2007, (TRIPRA), NEIL's Payment for Acts of Terrorism endorsement would not cap the damages for any "certified" acts of terrorism under TRIPRA.

You are hereby notified that under TRIPRA, the definition of act of terrorism has changed. As defined in Section 102(1), the term "act of terrorism" means any act that is certified by the Secretary of the Treasury - in concurrence with other specified federal officials - to be an act of terrorism; to be a violent act or an act that is dangerous to human life, property, or infrastructure; to have resulted in damage within the United States, or outside the United States in the case of certain air carriers or vessels or the premises of a United States mission; and to have been committed by an individual or individuals as part of an effort to coerce the civilian population of the United States or to influence the policy or affect the conduct of the United States Government by coercion.

Under your coverage, any losses resulting from certified acts of terrorism may be partially reimbursed by the United States Government under a formula established in TRIPRA. Your policy may contain other exclusions which might affect your coverage. Under the formula, the United States Government generally reimburses 85% of covered terrorism losses exceeding the statutorily established deductible paid by the insurance company providing the coverage. TRIPRA, contains a $100 billion cap that limits U.S. Government reimbursement as well as insurers' liability for losses resulting from certified acts of terrorism when the amount of such losses exceeds $100 billion in any one calendar year. If the aggregate insured losses for all insurers exceed $100 billion, any insurer that has met its deductible will not be liable to pay for any losses in excess of the $100 billion sustained by its insureds. Thus, if the $100 billion cap is reached, your coverage may be reduced.

NEIL is neither increasing, nor attributing any portion of, the annual premium for terrorism coverage, but a surcharge might be added to the premium if, after a certified act of terrorism, the federal Department of Treasury requires a recoupment of certain amounts paid by the federal government in accordance with the terms of TRIPRA.

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

Payments for Acts of Terrorism Endorsement

Member Insured: Florida Power Corporation

Site: Crystal River
Endorsement No. 5
Policy Number: P12-081
Effective Date: April 1, 2012

Effective Time of this Endorsement is 12:01 a.m. Standard Time in Hamilton, Bermuda.

It is hereby understood and agreed that this Policy is amended as follows:

I. The following Section is hereby added to the Policy:

PAYMENTS FOR ACTS OF TERRORISM

In the event that one or more Acts of Terrorism cause Accidental Property Damage under this Policy and under one or more Nuclear Insurance Policies within twelve months from the date the first Accidental Property Damage occurs:

1. Resources Available

The Insureds' maximum recovery for all such Losses under this Policy and all Nuclear Insurance Policies shall be an aggregate of:

(a) $3.24 billion (U.S. dollars)

plus;

(b) such additional amounts as the Insurer recovers for such Losses from reinsurance, indemnity, and any other source, applicable to such Losses.

2. Allocation of Resources

(a) The amount determined under paragraph 1 above shall first be used to pay for all such Losses payable under all applicable Primary Property and Decontamination Liability Insurance Policies (excluding any Losses payable under all Business Interruption and/or Extra Expense Insurance Policy Endorsements), Primary Property and Decontamination Insurance Policies (excluding any Losses payable under all Business Interruption and/or Extra Expense Insurance Policy Endorsements), Operating Facility Policies, Decontamination Liability, Decommissioning Liability and

Excess Property Insurance Policies, Decontamination, Decommissioning and Excess Property Insurance Policies, Blanket Excess Decontamination Liability, Decommissioning Liability and Excess Property Insurance Policies, Blanket Excess Decontamination, Decommissioning and Excess Property Insurance Policies, and Builders' Risk Insurance Policies (excluding any Delay In Startup Losses) (collectively "Property Losses").

(b) If such Property Losses for all Insureds exceed the amount determined under paragraph 1 above, the Insured's maximum recovery shall be the amount determined under paragraph 1 above times a fraction, the numerator of which is the Insured's recovery for the Property Losses resulting from Accidental Property Damage, but for this Section, and the denominator of which is the sum of all Insureds' recovery for Property Losses resulting from Accidental Property Damage under all applicable Nuclear Insurance Policies and Builders' Risk Policies, including this Policy, but for this Section.

(c) Notwithstanding paragraph 1 and subparagraph 2(b) above, if the payments made pursuant to subparagraph 2(b) exhaust the amount determined under paragraph 1, without paying for all the Insured's Property Losses, the Insured shall recover such additional amounts that the Insurer recovers from reinsurance, indemnity, or other source, for the Insured's Property Losses.

3. Declarations Page

Nothing herein shall be construed to entitle the Insured to recover more than the amount of the Policy Limits stated in Item 6 of the Declarations.

4. Relevant Period

The twelve-month period specified above shall commence on the date of the first Accidental Property Damage caused by an Act of Terrorism. The first Accidental Property Damage caused by an Act of Terrorism that occurs after this or any other twelve-month period shall trigger a new twelve-month period.

5. Definitions

For the purposes of this Section only:

(a) "Act of Terrorism" means any act by a person, group, or organization that appears to be intended to: (i) intimidate or coerce a civilian population, or (ii) disrupt any segment of the economy in the country where the insured plant is located; or (iii) influence the policy of a government by intimidation or coercion; or (iv) affect the conduct of a government by

mass destruction; provided, however, that an Act of Terrorism for purposes of this Policy shall not include any act excluded by the War Risk Exclusion.

(b) "Nuclear Insurance Policy" means any Primary Property and Decontamination Liability Insurance Policy, or Primary Property and Decontamination Insurance Policy, or Operating Facility Policy, or any Decontamination Liability, Decommissioning Liability and Excess Property Insurance Policy, or Decontamination, Decommissioning and Excess Property Insurance Policy or any Blanket Excess Decontamination Liability, Decommissioning Liability And Excess Property Insurance Policy, or Blanket Excess Decontamination, Decommissioning And Excess Property Insurance Policy, other than this Policy, issued by the Insurer or by Overseas NEIL Limited.

(c) "Builders' Risk Policies" means any Builders' Risk Insurance Policies issued by the Insurer or by Overseas NEIL Limited.

6. Authorized Changes to this Section

The Insurer's Board of Directors will have the authority to alter or replace the definition of the term "Act of Terrorism" and any other provision of this Section in order to facilitate the availability of resources that may be made available by the Government in the country where the insured plant is located.

IN WITNESS WHEREOF, the parties hereto have caused this Endorsement to be executed and attested on their behalf.

INSURER:
Nuclear Electric Insurance Limited

Wilmington, Delaware

Date: As of April 1, 2012

By: _____
David B. Ripsom, President

Attest: _____

MEMBER INSURED:
Florida Power Corporation

Wilmington, Delaware

Date: As of April 1, 2012

By: _____
Attorney-in-Fact

Witness: _____

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

Class "A" Warehouse and Storage Structures Sublimit Endorsement

Member Insured: Florida Power Corporation

Site: Crystal River — Endorsement No. 6
Policy Number: P12-081 — Effective Date: April 1, 2012

Effective Time of this Endorsement is 12:01 a.m. Standard Time in Hamilton, Bermuda.

1. This Endorsement shall be applicable to the following property:

   a) Warehouse And Shops Building

2. It is hereby understood and agreed that each of the properties described in Paragraph 1, including the contents thereof, shall have a coverage sublimit of $25,000,000 of coverage under this Policy for Property Damage caused directly or indirectly by fire, or fire following lightning or explosion, or by any separate and independent Accident which ensues therefrom.

This Endorsement does not increase the amount of insurance provided under this Policy.

IN WITNESS WHEREOF, the parties hereto have caused this Endorsement to be executed and attested on their behalf.

Wilmington, Delaware

INSURER:
Nuclear Electric Insurance Limited

Date: As of April 1, 2012

By: _____
David B. Ripsom, President

Attest: _____

Wilmington, Delaware

MEMBER INSURED:
Florida Power Corporation

Date: As of April 1, 2012

By: _____
Attorney-in-Fact

Witness: _____

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

Class "B" Warehouse and Storage Structures Sublimit Endorsement

Member Insured: Florida Power Corporation

Site: Crystal River — Endorsement No. 7
Policy Number: P12-081 — Effective Date: April 1, 2012

Effective Time of this Endorsement is 12:01 a.m. Standard Time in Hamilton, Bermuda.

1. This Endorsement shall be applicable to the following property:

   a) Issue Warehouse
   b) Combustible Storage Warehouse
   c) Receiving Warehouse
   d) Low Level Radwaste Storage Building

2. It is hereby understood and agreed that each of the properties described in Paragraph 1, including the contents thereof, shall have a coverage sublimit of $75,000,000 of coverage under this Policy for Property Damage caused directly or indirectly by fire, or fire following lightning or explosion, or by any separate and independent Accident which ensues therefrom.

This Endorsement does not increase the amount of insurance provided under this Policy.

IN WITNESS WHEREOF, the parties hereto have caused this Endorsement to be executed and attested on their behalf.

Wilmington, Delaware

Date: As of April 1, 2012

Attest: _____

INSURER:
Nuclear Electric Insurance Limited

By: _____
David B. Ripsom, President

Wilmington, Delaware

Date: As of April 1, 2012

Witness: _____

MEMBER INSURED:
Florida Power Corporation

By: _____
Attorney-in-Fact

NUCLEAR ELECTRIC INSURANCE LIMITED - Primary Rating Calculation Sheet

Member Insured:	**Florida Power Corporation**			
Site:	**Crystal River**			
Policy Number:	P12-081			
Amount of Insurance:	$500,000,000		2012 Renewal - NEW	
Base Plant Operations Credit:	8.0000%			
Effective Date:	April 1, 2012	Deductible:	$10,000,000	No. of Units
Expiration Date:	April 1, 2013	T/G Deductible:	$10,000,000	1

Annual Premium:	**$1,138,000**	Premium by Unit:	
Retro Premium Adjustment:	**$11,380,000**	Largest Unit	1,138,000
		Total:	1,138,000
Previous Annual Premium:			
Additional Annual Premium:	1,138,000		
Pro-rata Factor:	1.0000		

Primary Premium Due: $1,138,000

Property Rating

	Unit	Unit Status	MWE	MWT	Nuclear Loading	MWT for Weighting
Largest Unit	Unit 3	OP	860	2,609	0.0180	2,609

Weighted Nuclear Rate:		0.0180
Effective Plant Ops Credit:	12.000%	(0.0022)
Nuclear Rate after Plant Ops Credit:		0.0158
Fire Rate:		0.0124
Windstorm Rate:		0.0779
Flood Rate:		0.0030
Earthquake Rate:		0.0035
Gross Property Rate:		0.1127
Deductible Credit:	35.00%	(0.0394)
Property Base Rate:		0.0732
Values Adjustment Factor:	2.1644	x 2.1644
Property Rate:		0.1585

Boiler & Machinery Rating

Date of LC Report:	02-Mar-11	T/G Deductible Credit:	35.00%
Max B&M Penalty Points:	5,440		
Max B&M Credit Points:	4,450		

	Unit	Initial B&M Rate	B&M Penalty Points	B&M Credit Points	Gross B&M Rate	Deductible Credit Factor	Rate after Deductible	TGRA Adjustment	Net B&M Rate
Largest Unit	Unit 3	0.1057	1,585	3,835	0.0983	35.00%	0.0639	(0.0100)	0.0634

Total B&M Rate: 0.0634

Member Insured: **Florida Power Corporation**
Site: **Crystal River**

Combined Rating

Property Rate + B&M Rate:		0.2219		
Program Modifier:	21.10%	(0.0468)		
Rate after Modifier:		0.1751	Property Covered:	0
Site Loss Experience:	30.00%	0.0525	Contam Premium:	0
Final Primary Rate:		0.2276		

VALUES ADJUSTMENT FACTOR

I.	Date of Comm. Ops	MWt	Table Value	MWt x Table Value
Largest Unit	1977	2,609	772,894	2,016,480,446

II. a) Fuel (10,500 times MWt of operating units)		54,789,000
b) Material, Supplies, Spares, etc.		52,477,083
c) Switchyard and High Voltage Substation		99,511,461
d) Cooling Towers/Lake		126,601,107
e) Other		0
f) Combustion turbines	Mwe / Rate	
	216	0

III. Reduction for Aging	3%/Year (maximum of 20%)		IV. Reduction for ACV cover 3%/Year (maximum of 40%)	
Largest Unit	20%	(403,296,089)	40%	0

Total Values Adjustment:	$1,946,563,008
Values Adjustment Percentage:	25.7
VALUES ADJUSTMENT FACTOR:	2.1644

WINDSTORM

Citrus County, FL

	H W R	W R	S W R
Gross E. C. Rate	0.1350	0.1500	0.1940
Windstorm (50% of Gross EC Rate)	0.0675	0.0750	0.0970

SITE LOSS EXPERIENCE FACTOR

Claim Number	Date of Loss	Date of Proof of Loss	Amount $	Factor

Severity:	$136,095,632	30.00%
Frequency:	1	0.00%
Site Loss Experience Factor:		30.00%

Member Insured: **Florida Power Corporation**
Site: **Crystal River**

Property Shall Recommendation Penalties

Shall Rec. Number	Base Score	Action Level	Number of Units Impacted	Deductible Amount	Penalty Amount

B&M Shall Recommendation Penalties

Shall Rec. Number	Base Score	Action Level	Number of Units Impacted	Deductible Amount	Penalty Amount

Total Shall Rec. Penalty Amount: **$0**

Fire and Wind Rating

Delineated Area Name		**REACTOR**
Area Value:		40
Base Rate:		0.0400
Construction:		HWR
Penalties and Credits		
Superior Construction of Schedule Rated Buildings (Bearing Walls) Value		(0.0070)
Superior Construction of Schedule Rated Buildings (Non Bearing Walls) Value		(0.0100)
Superior Construction of Schedule Rated Buildings (Principal Supporting Members) Value		(0.0030)
Reactor Coolant Pumps	98-01-R	0.0010
Area Subtotals		
Occupancy Loading:		0.0100
Delineated Area Fire Rate:		0.0310
Area Fire Rate x Area Value:		1.2400
Area Wind Rate:		0.0675
Area Wind Rate x Area Value:		2.7000
Delineated Area Name		**TURBINE**
Area Value:		25
Base Rate:		0.0400
Construction:		WR
Penalties and Credits		
Superior Construction of Schedule Rated Buildings (Bearing Walls) Value		(0.0040)
Superior Construction of Schedule Rated Buildings (Non Bearing Walls) Value		(0.0050)
Superior Construction of Schedule Rated Buildings (Principal Supporting Members) Value		(0.0010)
TGLO Resv & Purif 3-hr bar	94-03-T	0.0016
Under turbine skirt	94-06-T	0.0128
Transformer exposure	98-02-T	0.0040
Area Subtotals		
Occupancy Loading:		0.0300
Delineated Area Fire Rate:		0.0784
Area Fire Rate x Area Value:		1.9600
Area Wind Rate:		0.0750
Area Wind Rate x Area Value:		1.8750
Delineated Area Name		**RW / AUXILIARY BUILDING**
Area Value:		15
Base Rate:		0.0400
Construction:		HWR
Penalties and Credits		
Superior Construction of Schedule Rated Buildings (Bearing Walls) Value		(0.0070)
Superior Construction of Schedule Rated Buildings (Non Bearing Walls) Value		(0.0100)
Superior Construction of Schedule Rated Buildings (Principal Supporting Members) Value		(0.0030)
Area Subtotals		
Occupancy Loading:		0.0100
Delineated Area Fire Rate:		0.0300
Area Fire Rate x Area Value:		0.4500
Area Wind Rate:		0.0675
Area Wind Rate x Area Value:		1.0125

Delineated Area Name		**DIESEL GENERATOR**
Area Value:		10
Base Rate:		0.0400
Construction:		HWR
Penalties and Credits		
Superior Construction of Schedule Rated Buildings (Bearing Walls) Value		(0.0070)
Superior Construction of Schedule Rated Buildings (Non Bearing Walls) Value		(0.0100)
Superior Construction of Schedule Rated Buildings (Principal Supporting Members) Value		(0.0030)
Containment/drainage	94-09-FP	0.0040
Area Subtotals		
Occupancy Loading:		0.0150
Delineated Area Fire Rate:		0.0390
Area Fire Rate x Area Value:		0.3900
Area Wind Rate:		0.0675
Area Wind Rate x Area Value:		0.6750
Delineated Area Name		**INTAKE STRUCTURE**
Area Value:		10
Base Rate:		0.0400
Construction:		HWR
Penalties and Credits		
Superior Construction of Schedule Rated Buildings (Bearing Walls) Value		(0.0070)
Superior Construction of Schedule Rated Buildings (Non Bearing Walls) Value		(0.0100)
Superior Construction of Schedule Rated Buildings (Principal Supporting Members) Value		(0.0030)
Area Subtotals		
Occupancy Loading:		0.0100
Delineated Area Fire Rate:		0.0300
Area Fire Rate x Area Value:		0.3000
Area Wind Rate:		0.0675
Area Wind Rate x Area Value:		0.6750
Delineated Area Name		**CONTROL COMPLEX**
Area Value:		5
Base Rate:		0.0400
Construction:		HWR
Penalties and Credits		
Superior Construction of Schedule Rated Buildings (Bearing Walls) Value		(0.0070)
Superior Construction of Schedule Rated Buildings (Non Bearing Walls) Value		(0.0100)
Superior Construction of Schedule Rated Buildings (Principal Supporting Members) Value		(0.0030)
Area Subtotals		
Occupancy Loading:		0.0100
Delineated Area Fire Rate:		0.0300
Area Fire Rate x Area Value:		0.1500
Area Wind Rate:		0.0675
Area Wind Rate x Area Value:		0.3375

Delineated Area Name		**INTERMEDIATE BUILDING**
Area Value:		5
Base Rate:		0.0400
Construction:		HWR
Penalties and Credits		
Superior Construction of Schedule Rated Buildings (Bearing Walls) Value		(0.0070)
Superior Construction of Schedule Rated Buildings (Principal Supporting Members) Value		(0.0030)
Area Subtotals		
Occupancy Loading:		0.0200
Delineated Area Fire Rate:		0.0500
Area Fire Rate x Area Value:		0.2500
Area Wind Rate:		0.0675
Area Wind Rate x Area Value:		0.3375
Delineated Area Name		**MISCELLANEOUS AREAS**
Area Value:		5
Base Rate:		0.0400
Construction:		SWR
Penalties and Credits		
Det offices in Cold Machine Shop Mezzanine	00-03-MS	0.0120
Deluge	01-01-APP (12)	0.0040
Auto fire detectors	01-01-APP (24,25)	0.0080
Fire partitions	03-01-HCT	0.0080
Hot Machine Shop combust.	03-03-MS	0.0120
Sprinkle Temp Assembly bldg	05-02-FP	0.0080
Filters - EFP-3 bldg	05-03-GP	0.0080
Area Subtotals		
Occupancy Loading:		0.0100
Delineated Area Fire Rate:		0.1100
Area Fire Rate x Area Value:		0.5500
Area Wind Rate:		0.0970
Area Wind Rate x Area Value:		0.4850
Delineated Area Name		**NUCLEAR ADMIN BUILDING**
Area Value:		5
Base Rate:		0.0400
Construction:		WR
Penalties and Credits		
Superior Construction of Schedule Rated Buildings (Bearing Walls) Value		(0.0040)
Superior Construction of Schedule Rated Buildings (Non Bearing Walls) Value		(0.0050)
Superior Construction of Schedule Rated Buildings (Principal Supporting Members) Value		(0.0010)
Telecom and LAN Rooms bar.	03-02-NAB	0.0080
Area Subtotals		
Occupancy Loading:		0.0200
Delineated Area Fire Rate:		0.0580
Area Fire Rate x Area Value:		0.2900
Area Wind Rate:		0.0750
Area Wind Rate x Area Value:		0.3750

Delineated Area Name		**SWITCHYARD**
Area Value:		5
Base Rate:		0.0500
Construction:		WR
Penalties and Credits		
Substation Control House	98-03-SW	0.0120
Area Subtotals		
Occupancy Loading:		0.0000
Delineated Area Fire Rate:		0.0620
Area Fire Rate x Area Value:		0.3100
Area Wind Rate:		0.0750
Area Wind Rate x Area Value:		0.3750
Delineated Area Name		**TRANSFORMERS**
Area Value:		5
Base Rate:		0.0500
Construction:		N/A
Penalties and Credits		
Startup deluge test	04-03-APP	0.0080
Area Subtotals		
Occupancy Loading:		0.0000
Delineated Area Fire Rate:		0.0580
Area Fire Rate x Area Value:		0.2900
Area Wind Rate:		N/A
Area Wind Rate x Area Value:		N/A
Delineated Area Name		**WAREHOUSES**
Area Value:		5
Base Rate:		0.0400
Construction:		WR
Penalties and Credits		
Area Subtotals		
Occupancy Loading:		0.0200
Delineated Area Fire Rate:		0.0600
Area Fire Rate x Area Value:		0.3000
Area Wind Rate:		0.0750
Area Wind Rate x Area Value:		0.3750
Delineated Area Name		**PLCS**
Penalties and Credits		
3-hr barriers for fire pumps	00-02-FPH	0.0015
Alarm Signaling	01-01-APP (20,21,22,23)	0.0008
Standpipe & Hose	01-01-APP (26,27)	0.0004
System design	94-07-FP	0.0015
Total to add to fire rate		0.0042

Member Insured: **Florida Power Corporation**
Site: **Crystal River**

Fire Rate Totals	
Sum of Fire Rates x Area Values:	6.4800
Sum of Delineated Area Values:	135
Gross Average Fire Rate:	0.0480
PLPS Penalties/Credits:	0.0042
Net Average Fire Rate:	0.0522
Fire Rate Multiplier:	24%
AVERAGE FIRE RATE:	0.0124

Wind Rate Totals	
Sum of Wind Rates x Area Values:	9.2225
Sum of Delineated Area Values:	130
Gross Average Wind Rate:	0.0709
Wind Rate Multiplier:	109.8%
AVERAGE WIND RATE:	0.0779

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Description of Insurance Coverage

The Company has insurance coverage for property damage and costs of replacement power for Crystal River 3 ("CR3") through Nuclear Electric Insurance Limited ("NEIL"). Based on the information known at this time, the Company believes that the delamination occurred during the process of creating an opening in the CR3 containment building to accommodate the steam generator replacement. The information gathered to date shows that the delamination did not exist prior the steam generator replacement efforts and was not the result of normal wear or aging. Consequently, the Company believes that the cost to repair the delamination should be covered under the NEIL property damage policy, subject to the applicable deductible of $10 million.

The NEIL accidental outage policy also provides coverage for replacement power costs up to $4.5 million per week during the outage. These payments, however, do not begin immediately. The weekly payments begin 12 weeks after the date when CR3 would otherwise have been in-service, but for the event for which coverage is being provided. In other words, the weekly payments commence 12 weeks after the date on which CR3 would have come out of the current outage but for the delamination.

We have notified NEIL of our intent to seek coverage for the CR3 delamination and have been in regular contact with NEIL. We are providing NEIL with information regarding the delamination and the repair work, including allowing NEIL access to the plant site. At this time, NEIL has not made a final determination as to coverage, but has indicated that it is unaware of any grounds upon which our claim would be denied.

Repair and Replacement Power Costs

As noted above, the Company believes that the current CR3 outage will be covered by insurance and the following reflects that expectation. Because PEF believes that the outage associated with the delamination at CR3 will be covered by insurance, the Company expects that the cost to repair the plant will be fully covered except for a $10 million deductible. With regard to replacement power, the Company has incurred approximately $110 million in costs through the end of April 2010. Going forward, the amount of replacement power costs the Company incurs will depend upon the length of the outage, fuel prices, the availability of PEF's other generating resources, and the availability and price of wholesale power. Although the Company cannot project with precision the total cost of replacement power for the balance of the CR3 outage, most of those costs should be covered by insurance. Under its NEIL policy, PEF is entitled to $4.5 million per week to defray the cost of replacement power from the date on which the aforementioned 12 week waiting period ended, regardless of actual costs incurred. The Company expects that the insurance payments will equal or exceed the actual replacement power costs during many weeks. During some periods, however, the Company's cost of replacement power will exceed the insurance payments. On a net basis, the Company is likely to incur some costs, over and above the insurance recovery, during the rest of the outage, but the total amount of such costs should be considerably less than the replacement power costs incurred to date.

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NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

NEIL I ACCIDENTAL OUTAGE INSURANCE POLICY

Declarations attached to and made a part of Policy No. E09-015
(Crystal River)

Item 1. Member Insured: Florida Power Corporation
Member Address: d/b/a Progress Energy Florida, Inc.
410 S. Wilmington Street
Raleigh, NC 27601
Respective Interest: Unit 3 100.00%

Item 2. Insurer: Nuclear Electric Insurance Limited

Mailing Address: 1201 N. Market Street, Suite 1100, Wilmington, Delaware 19801

Item 3.

A. Policy Period:

From April 1, 2009 (Date) To April 1, 2010 (Date)

B. Policy Year:

From April 1, 2009 (Date) To April 1, 2010 (Date)

All dates used to determine the Policy Period, Policy Year, or used as the effective date of any endorsement have as their effective time 12:01 a.m. Standard Time in Hamilton, Bermuda.

Item 4. Annual Premium: $600,400

Item 5. A. Multiple: 10

B. Retrospective Premium Adjustment: $6,004,000

Item 6. A. Amount of Insurance:

	Weekly Indemnity	Limit of Liability
Unit 3:	$4,500,000	$490,000,000

The Member Insured may select the Weekly Indemnity it desires with respect to any Unit, provided that the total Weekly Indemnity purchased by all Member Insureds with an interest in the Unit in question does not exceed $4,500,000 and the total Limit of Liability purchased by all Member Insureds with an interest in the Unit in question does not exceed $490,000,000.

B. Payment Periods:

	1st Payment Period	2nd Payment Period	3rd Payment Period
Unit 3:	52.0 Weeks	52.0 Weeks	19.1 Weeks

C. Transit Coverage Limit per Section I.B: $100,000,000

Item 7. Description of Site and Listing of Nuclear Power Generating Units at the Site covered:

All real and personal property known as Crystal River Unit 3 Nuclear Generating Plant

Located in Citrus County, Florida

as specifically outlined in the attached plot plan Florida Power Corporation, Dwg. #CR3-G61- D-0, Rev., 7-11-75; Florida Power Corporation Dwg. #CR3-G86-D, Rev. 11, 10-21-03; Florida Power Corporation Dwg. #CR3-G85-D, Rev. 9, 6-10-04.

showing the insurance site boundary and excluded buildings and areas as filed with Nuclear Electric Insurance Limited in accordance with the Site Description Procedure.

See Attachment 1

Item 8. Deductible Period:

Unit 3: First 12 weeks of any Outage.

Transit Deductible Period: First 26 weeks of any Outage.

Item 9. Insureds:

Florida Power Corporation d/b/a Progress Energy Florida, Inc.

Item 10. Weekly Indemnity, if any, shall be payable as follows:

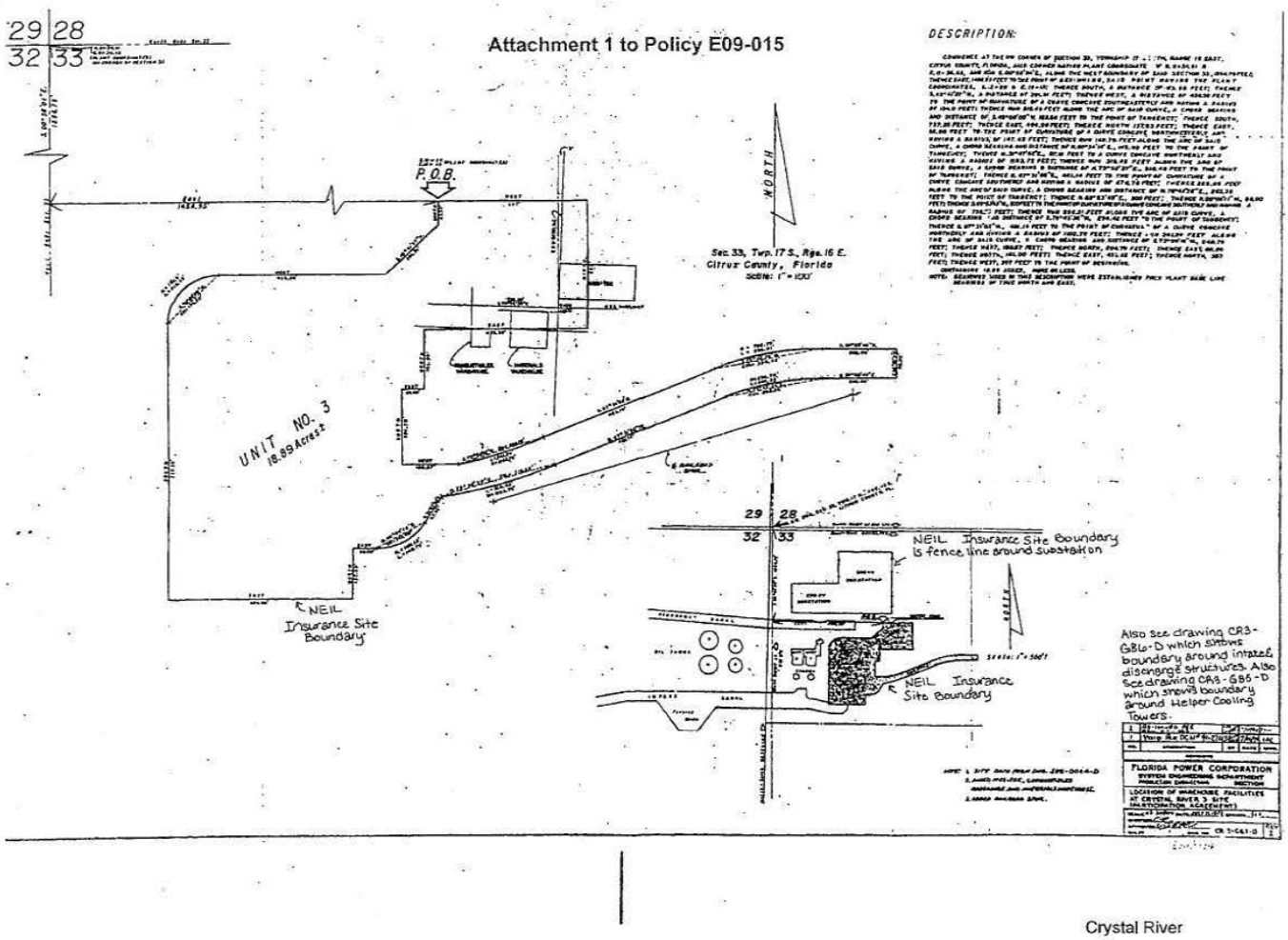
Unit 3: Florida Power Corporation d/b/a Progress Energy Florida, Inc.

whose receipt of such payment shall constitute a release in full of all liability with respect to such payment. The Member Insured may, by written notice to the Insurer, designate other payees.

Item 11. Service of Process to Insured (see Section IV.E.5)

General Counsel
Florida Power Corporation
d/b/a Progress Energy Florida, Inc.
c/o Duane Morris LLP
1100 North Market Street, Suite 1200
Wilmington, DE 19801-1246

Item 12. Any credit allowed by the Insurer against the Premium payable under this Policy for any inspection service fees paid by the Member Insured shall in no way affect or reduce such Premium for the purpose of determining a Retrospective Premium Adjustment.



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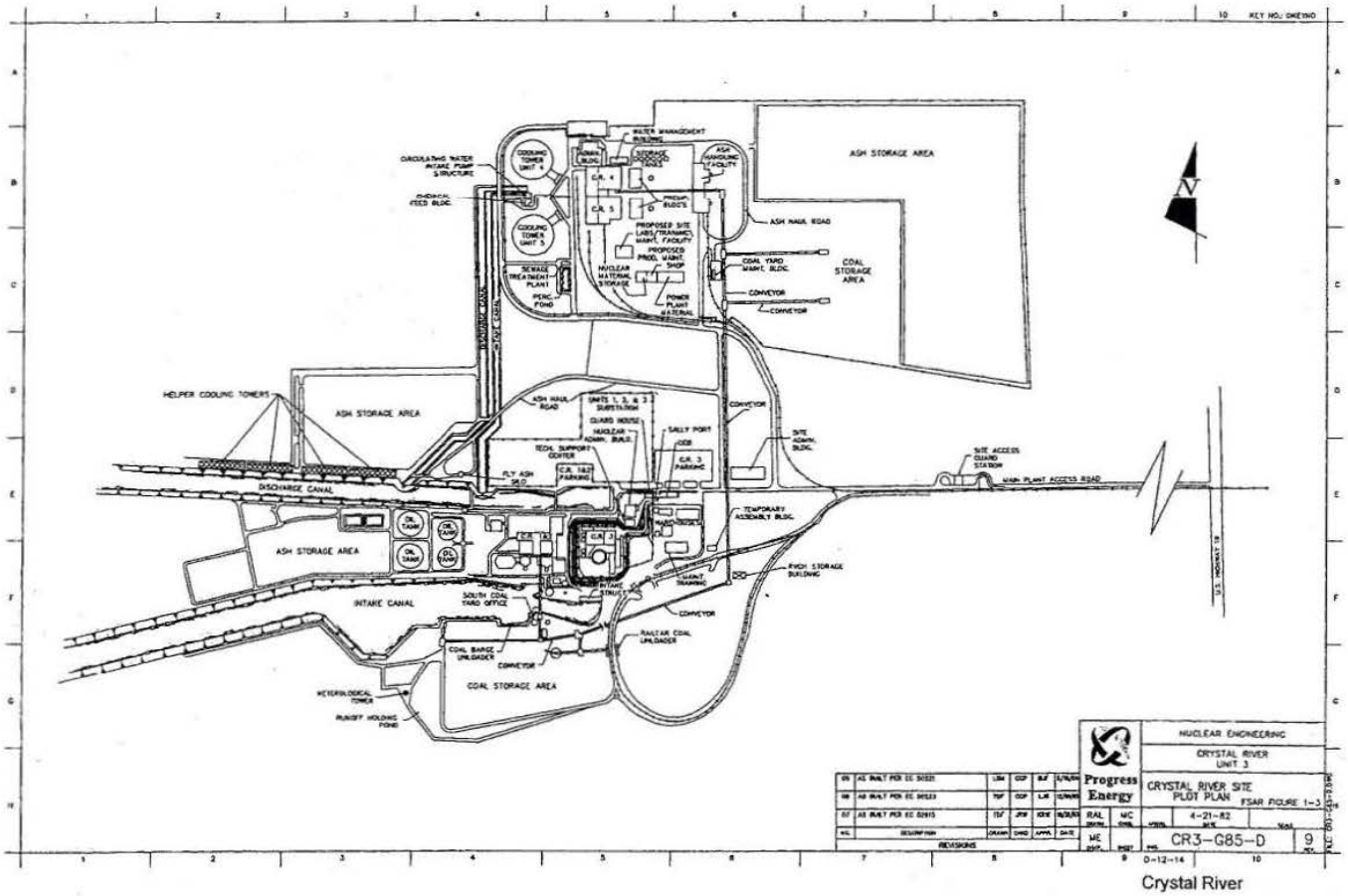

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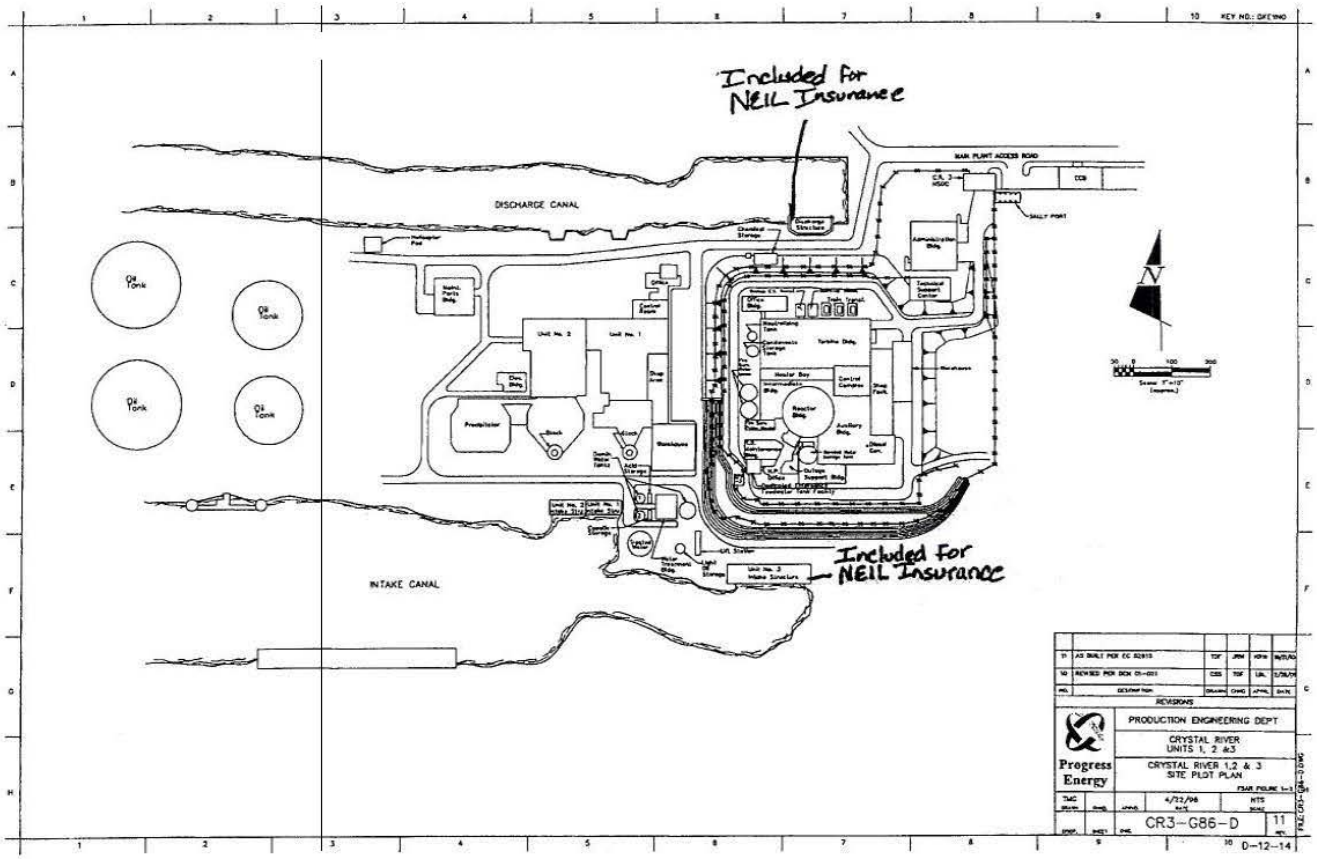

Crystal River

NUCLEAR ELECTRIC INSURANCE LIMITED

NEIL I ACCIDENTAL OUTAGE INSURANCE POLICY

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NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

NEIL I ACCIDENTAL OUTAGE INSURANCE POLICY

POLICY NO. E09-015

This Policy is made by and among the Member Insured (specified in Item 1 of the Declarations) and Nuclear Electric Insurance Limited, a Bermuda mutual company with limited liability (the "Insurer").

The Insurer is only licensed in Bermuda and Delaware and the Insureds (those Insureds specified in Item 9 of the Declarations together with the Member Insured) will not be protected by the guaranty funds of any U.S. jurisdiction.

The Member Insured will be required to execute the Policy in Delaware. The Policy will become effective only upon the acceptance by the Member Insured of the delivery of the Policy at the Insurer's office in Delaware.

I. INSURING AGREEMENT

In consideration of the premium paid, and subject to the terms and conditions of this Policy, the Insurer agrees to pay the Member Insured, after the expiration of the Deductible Period, the amounts hereinafter specified in the event of an Outage at a Unit specified in the Declarations resulting from Accidental Property Damage to Insured Property on site or while Insured Property is in transit to or from the Unit.

IN WITNESS WHEREOF, the parties hereto have caused this Policy to be executed and attested on their behalf.

INSURER:
Nuclear Electric Insurance Limited

Wilmington, Delaware

Date: As of April 1, 2009

By: _____
David B. Ripsom, President

Attest: _____

MEMBER INSURED:
Florida Power Corporation

Wilmington, Delaware

Date: As of April 1, 2009

By: _____
Attorney-in-Fact

Witness: _____

A. Coverage for Accidental Property Damage at the Unit

This Policy provides insurance for an Outage at a Unit specified in the Declarations resulting from Accidental Property Damage occurring to Insured Property.

B. Transit Coverage

This Policy also provides insurance for an Outage at a Unit specified in the Declarations resulting from Accidental Property Damage occurring while Insured Property is in transit to or from the Unit, subject to the limit and Deductible Period shown in the Declarations and the following terms and conditions:

1. For purposes of this coverage, Insured Property includes property that has been purchased for use at the Unit and is in transit to the Unit.

2. This coverage applies only shipments of Insured Property worldwide except for loss or damage in the following countries:

   Afghanistan, Angola, Armenia, Azerbaijan, Bosnia-Herzegovina, Botswana, Burundi, Chechnya, Croatia, Cuba, Democratic Republic of the Congo (former Zaire), Eritrea, Ethiopia, Federal Republic of Yugoslavia, Haiti, Iran, Iraq, Kashmir, Lebanon, Liberia, Libya, Montserrat, Myanmar (Burma), Nigeria, North Korea, Pakistan, Rwanda, Somalia, Sri Lanka, Sudan, Turkish provinces of Agri, Bingol, Bitlis, Diyarbakir, Elazig, Hakkari, Mardin, Mus, Siirt, Urfa and Van, and Yemen,

   or any other country where trade relations are unlawful as determined by the Government of the United States of America, including its agencies, or the governing body of the European Union, including its agencies. No coverage is provided for any shipment beyond 100-nautical miles of the shores of the country of origin or destination for airborne or waterborne shipments, except when the point of exit and entry for the shipment is to be the same country in which case this coverage will remain in effect throughout the shipment.

3 It is a condition of insurance that the Insured Property be packed and shipped in accordance with all applicable laws or regulations having the force of law. Additionally, the Insured is required to use all reasonable means to save and preserve the Insured Property at and after an Accident or when the Insured Property is in danger of physical damage.

Notwithstanding the foregoing, the Insurer shall not be liable under Sections I.A and I.B with respect to any Outage unless the Accidental Property Damage is the direct, efficient and dominant physical cause of the Outage.

C. Outage Duration

1. A Cessation Outage shall be deemed to commence at midnight of the day the Unit ceases generating electric power. A Delay Outage shall be deemed to commence at midnight of the first day on which the Unit could have resumed the generation of electric power but for such Accidental Property Damage. An Outage shall be deemed to end at midnight of the day on which with the exercise of due diligence and dispatch by the Member Insured the Unit could resume generating electric power other than for testing purposes. This provision contemplates the Outage ending when the Unit's generator main breaker is closed, synchronizing the Unit with the electrical grid. At that point, electricity is being generated for commercial purposes. The phrase "other than for testing purposes" is not intended to extend an Outage until all testing is completed. It is intended to extend the Outage to the point where the electricity being generated is used for purposes other than testing purposes.

2. In the event a Unit needs to be shutdown following synchronization to effect repairs for damage directly related to the original Accident, but which were not identifiable until the Unit was restarted, these additional shutdown periods would be indemnifiable as an extension of the original Outage. In any event, no payments will be made for the days of generation when the Unit is synchronized to the grid. It shall be the obligation of the Member Insured to ensure the exercise of due diligence and dispatch by the Operator and the failure of the Operator to exercise such due diligence and dispatch shall be deemed a breach of this obligation on the part of the Member Insured.

3. Any delay in the Unit's resumption of the generation of electric power other than for testing purposes which results from Accidental Property Damage not related to the cause of an Outage, whether occurring prior to or during an Outage, shall constitute a separate Outage and shall be subject to a separate Deductible Period; provided, however, that any such delay which results from Accidental Property Damage occurring while Insured Property, or property that has been purchased for use at this Unit, is in transit to or from the Unit shall not constitute a separate Outage if the property damaged or destroyed was needed to repair or replace other property, the damage to or destruction of which caused the existing Outage. For the purpose of this section only, "in transit" shall include from when the Insured Property to be repaired is removed until it is reinstalled after repairs, or until the property purchased to replace the Insured Property is installed.

D. Payment of Weekly Indemnity

1. Subject to the terms and conditions of this Policy, the Insurer shall pay to the Insureds or their designated payee for each week of the Outage following the Deductible Period the following amounts:

a. 100 percent of the Weekly Indemnity for such Unit each week for the First Payment Period as shown in Item 6B of the Declarations; then

b. 80 percent of the Weekly Indemnity for such Unit each week for the Second Payment Period as shown in Item 6B of the Declarations; and thereafter

c. 80 percent of the Weekly Indemnity for such Unit each week for the Third Payment Period as shown in Item 6B of the Declarations.

d. In the event an Outage of a Unit covered hereunder extends past the Planned Shutdown Date, the Weekly Indemnity for such extended period shall be 10% of the Weekly Indemnity for the Unit specified in Item 6A of the Declarations.

2. The Member Insured shall promptly notify the Insurer in the event that any of the Units specified in Item 7 of the Declarations is to permanently cease operations prior to the scheduled expiration of such Unit's operating license.

E. Net Present Value Payment

The Member Insured may request from the Insurer payment of the net present value of the total amount payable yet unpaid in accordance with Section I.D.1(c), subject to the following conditions and subject to the approval of the Insurer, which approval may be withheld for any reason:

1. The Member Insured relinquishes all rights to any future payment under Section I.D.1(c);

2. The net present value of the amount indicated in Section I.D.1(c) shall be determined utilizing the percentage representing the average investment return of the Insurer's investment account for the twelve (12) months preceding the request; and

3. In the event the Outage ceases prior to the expiration of the Third Payment Period, the Insured shall repay to the Insurer, within sixty (60) days following conclusion of such Outage, the amount received under this Section I.E times a fraction, the numerator of which shall be the number of days remaining in the Third Payment Period and the denominator of which shall be the total number of days in the Third Payment Period.

F. Limitations on Payment

1. The Insurer's obligation to pay the Weekly Indemnity shall terminate when the Outage has ended. Payments for partial weeks of an Outage shall be prorated. In no event shall the Insurer be liable for more than the Limit of Liability specified in Item 6A of the Declarations.

2. In the event of an Outage of more than one Unit by reason of the same Accident, the Weekly Indemnity per Unit shall be limited as follows:

Number of Units Simultaneously Out of Service	Per Unit Indemnity (Percent of Selected Recovery)
1	100% of single unit recovery
2	80% of single unit recovery
3	60% of single unit recovery
4	50% of single unit recovery

Upon start-up of an affected Unit, the limitations on Weekly Indemnity payments, if still applicable, will apply only to those remaining affected Units.

II. EXCLUSIONS

A. General Exclusions

1. This Policy does not cover any Outage resulting from:

   (a) gradual accumulation of radioactive contamination;

   (b) radioactive contamination at the Unit specified in the Declarations resulting from matter released from any source outside the premises of that Unit and for which the Insured is covered or would be entitled to coverage or can make a claim against a third party who is insured under a nuclear energy liability policy issued by the Nuclear Energy Liability Insurance Association or Mutual Atomic Energy Liability Underwriters or any other third party liability insurer, but this exclusion shall not apply to radioactive contamination resulting from matter released from any source while such source is in transit to or from the Unit specified in the Declarations;

(c) any fraudulent, dishonest, or criminal act done by or at the instigation of any Insured, any Operator, a partner or joint venturer in or of any Insured or Operator, or an officer, director or trustee of any Insured or Operator;

(d) Order of Civil Authority, except acts of destruction at the time of and for the purpose of preventing the spread of fire, provided that such fire did not originate from "War Risk" as herein excluded;

(e) any governmental act, decree, order, regulation, statute or law prohibiting or preventing, directly or indirectly, the commencement, recommencement or continuation of any operations at the Unit specified in the Declarations;

(f) any local, state or federal ordinance or law regulating construction or repair of buildings or structures, or suspension, lapse or cancellation of any lease or license, contract or order, or interference at the Unit specified in the Declarations by strikers or other persons with respect to rebuilding, repairing or replacing the Insured Property or with the resumption or continuation of business;

(g) any form of deterioration or wear and tear, including but not limited to

(i) depletion, depreciation, and deterioration, including that of fuel element cladding;

(ii) embrittlement of any kind, including but not limited to hydrogen embrittlement and neutron embrittlement;

(iii) fatigue of any kind, including but not limited to thermal fatigue and high-cycle fatigue;

(iv) rust, erosion, or corrosion of any kind, including but not limited to stress corrosion cracking, unless caused directly by an independent and separate Accident not otherwise excluded, but then only for the Outage caused by such Accident;

(v) pitting, cracking, bulging, blistering, fretting, denting, deformation or distortion of the Insured Property which accompanies or is directly associated with the kinds of Property Damage specified in subparagraphs (ii) through (iv) above;

(vi) shrinking, bulging, expansion, cracking, shifting, rising, settling, sinking, and lateral or other movement of pavements, foundations, walls, floors, ceiling or roofs; or

(h) dampness, dryness, or extremes or changes of temperature of the atmosphere, including but not limited to rust, corrosion or erosion or other resulting Property Damage, unless caused directly by an independent and separate Accident not otherwise excluded, but then only for the Outage caused by such Accident.

2. With respect to Exclusions under Section II.A.(g) and Section II.A.(h), the Insurer shall be liable for any Outage resulting from an independent and separate ensuing Accident not otherwise excluded, but then only for the Outage caused by the ensuing Accident.

3. This Policy does not cover Partial Outages.

B. War Risk Exclusion

1. Subject to paragraph 2 below, the coverage provided under this Policy does not apply to Property Damage caused directly or indirectly by:

   (a) hostile or warlike action in time of peace or war, including action in hindering, combating or defending against an actual, impending or expected attack by any government or sovereign power (de jure or de facto), or by any authority maintaining or using military, naval or air forces; or by military, naval or air forces; or by an agent of any such government, power, authority or forces;

   (b) any weapon of war employing nuclear fission or fusion whether in time of peace or war; or

   (c) insurrection, rebellion, revolution, civil war, usurped power, or action taken by governmental authority in hindering, combating or defending against such an occurrence.

2. This War Risk Exclusion shall only apply to acts which are part of overt military activity.

III. PREMIUM

1. The Member Insured agrees to pay to the Insurer the Premium under the terms and conditions hereinafter set forth. The Premium shall be paid to the Insurer by wire transfer or other method acceptable to the Insurer on or before the beginning of the policy period specified in Item 3A of the Declarations.

2. As a condition precedent to the Insurer's obligations under this Policy, the Member Insured agrees to notify the Insurer that the Insured Property has been classified Category Number Five by the Institute of Nuclear Power Operations

("INPO"), within seven (7) days of being advised by INPO of such classification being put in place, and to pay such additional Premium due hereunder to the Insurer as a result thereof by wire transfer or other method acceptable to the Insurer within twenty (20) business days after demand.

3. The Member Insured further agrees to pay the Insurer the Retrospective Premium Adjustment under the terms and conditions specified under Section V.

IV. CONDITIONS

A. Aggregate Limit of Liability and Reduction of Policy Amount by Loss

The amount of insurance for any Unit as stated in the Declarations is the limit of the Insurer's liability for the aggregate of all Losses resulting from Outages occurring within the policy period for that Unit. Every Outage covered hereunder reduces, as of the date of such Outage, the amount of insurance under this Policy at the Unit where such Outage occurs by the amount of such Loss, and this Policy shall apply thereafter only for the reduced amount. In the case of an Outage covered hereunder, upon payment of an additional premium, the amount of insurance under this Policy may, at the option of the Insurer, be endorsed to its original amount.

B. Assignment

Assignment or transfer of this Policy shall not be valid except with the prior written consent of the Insurer.

C. Choice of Law

1. In view of the diverse locations of the parties hereto and the desirability of unified regulation, the Insureds and Insurer agree that the terms of this Policy shall determine their respective rights and duties and that this Policy shall be construed and enforced in accordance with and governed by the internal law of the State of New York, United States of America.

2. The parties intend that the Insurer conduct its activities so as not to be subject to the insurance regulation of any jurisdiction other than Bermuda and Delaware. Accordingly, the parties expressly recognize and agree that paragraph 1 above does not evidence an intent by the parties to

   (a) give jurisdiction over the Insurer to the insurance regulatory authority of any jurisdiction other than Bermuda and Delaware; or

   (b) make applicable to this Policy any of the insurance laws or regulations (including those which specify the terms of the by-laws and contracts of

mutual insurance companies) of any jurisdiction, including New York, other than to the extent such laws of Bermuda and Delaware are applicable; or

(c) otherwise have the laws of Bermuda or Delaware apply to the construction or enforcement of this Policy.

D. Concealment, Fraud

The Insurer shall have no obligation to make any payment under this Policy if, whether before or after a Loss, any Insured has willfully concealed or misrepresented in writing any material fact or circumstance concerning this insurance or the subject thereof, or the interest of any Insured therein, or in case of any fraud or false swearing by any Insured relating thereto; but the application of this provision shall not affect the Member Insured's obligation to pay the Retrospective Premium Adjustment callable by the Insurer under this Policy, or provide other assurances to the Insurer pursuant to Section V.2.

E. Dispute Resolution

1. The Insurer and the Insured mutually acknowledge that the form, terms and conditions of the Policy have been formulated by representatives of the participating utilities in order to provide insurance coverage which is vital to all participants. It was desired that the Insurer serve as a financially stable and reliable entity, responsive to the coverage needs of its participants, and providing coverage fairly and equitably as to each Insured, but taking equally into account fairness and equity as to all insureds as a group. While every effort has been made to define with clarity and precision the scope of coverage and other policy provisions, the Insurer and the Insured mutually acknowledge that situations may arise where the terms of the Policy are disputed. For the foregoing reasons, the Insurer and the Insured agree that the following principles shall govern the interpretation of the Policy:

   (a) Even-handedness and fairness to both the Insurer and the Insured;

   (b) The intentions of the Insurer and the Insured, including any extrinsic evidence of intent;

   (c) The practice of the Insurer and the Insured in interpreting and applying the Policy;

   (d) The cooperative rather than adversarial relationship between the Insurer and the Insured; and

(e) The contract construction rule of contra proferentem is not applicable to this insurance policy.

2. The Insurer and Insured agree to endeavor to resolve any dispute between them by means of voluntary proceedings to be agreed upon between them. In the event of a dispute, either the Insurer or the Insured may request the other to participate in an alternative dispute resolution proceeding. The Insurer and the Insured acknowledge, depending upon the circumstances, that an appropriate proceeding may include but is not limited to one or more of the following: early neutral evaluation, mediation, mini-trial, neutral fact finding, or senior peer review. In the absence of the parties agreeing to participate in an alternative dispute resolution process, the Insurer will agree, at the request of the Insured, to submit the dispute to senior peer review, unless otherwise determined by the Insurer's Board of Directors. The Insurer agrees to pay the fees and expenses of any neutral party associated with the procedures. The use of any such or other proceeding is voluntary to both the Insurer and Insured, but each acknowledges that it is in the best interests of the mutual enterprise to resolve disputes by such voluntary means where possible, and without the need for final and binding arbitration between them.

3. The Insured and Insurer agree in good faith to consider, in connection with any dispute, the Statement of Dispute Resolution Principles adopted by the Insurer's Board of Directors and Members, as it may be amended from time to time.

4. Any claim or controversy between the Insured and the Insurer as to any matters arising out of or relating to this Policy, which is not settled between themselves, pursuant to paragraph 2 above or otherwise, shall be submitted at the request of either the Insured or the Insurer to arbitration in New York City unless the parties agree as to another location. Arbitration of a dispute is final and binding. The Insured and the Insurer shall try in good faith to agree on the appointment of a sole arbitrator to settle the dispute. In the event the parties cannot agree on the appointment of a sole arbitrator, they can agree to have a sole arbitrator appointed by the then President of the Association of the Bar of the City of New York or in the absence of agreement to do so, a three-person arbitration panel shall be appointed. In the event that either the Insured or the Insurer determines that the dispute is not appropriate for a sole arbitrator, a three-person arbitration panel shall be appointed. In such instance, the Insured shall appoint one arbitrator and the Insurer another; the two so appointed shall select the third. If the two arbitrators fail to agree on a third arbitrator for a period of sixty calendar days from the date of appointment of the second arbitrator, then on request of the Insured or the Insurer such third arbitrator shall be selected by the then President of the Association of the Bar of the City of New York. The Insured and the Insurer may by express agreement determine the arbitral procedures to be followed. In the event the parties do not agree, New York law, including the

statutory rules on arbitration, shall govern all matters of procedure. The arbitrators shall first determine the liability of the parties as to the dispute, claim or controversy, and then, only if necessary, determine the type and amount of relief to be granted. The arbitrators shall award reasonable attorney's fees and costs to the prevailing party in such amount as they determine appropriate, not to exceed the amount of fees and costs incurred by the non-prevailing party. For this purpose, the fees incurred shall be calculated at reasonable prevailing hourly billing rates and include all reasonable out-of-pocket expenses.

5. To the extent that any dispute, claim or controversy between the Insured and the Insurer hereunder is not subject to arbitration for any reason whatever, the United States District Court for the Southern District of New York shall have exclusive jurisdiction thereof. For such purpose, the Insured agree to accept, without objection to form or manner, service of process by registered mail directed to the person identified in Item 11 of the Declarations.

   For such purpose, the Insurer agrees to accept, without objection to form or manner, service of process by registered mail directed to Nuclear Electric Insurance Limited, 1201 Market Street, Suite 1100, Wilmington, Delaware 19801. The foregoing consents to service of process are not intended nor shall they be construed to extend to any dispute, claim, controversy, cause of action, or other matter other than as stated in this paragraph.

F. Headings

The headings in this Policy are inserted for convenience only and shall not be deemed to constitute a part hereof.

G. Evaluations and Compliance with Loss Control Standards

1. The Insurer shall be permitted, but not obligated, to perform or to have performed on its behalf, evaluations of the Insured Property at any reasonable time. All evaluations and evaluation reports made by or on behalf of the Insurer are made solely for insurance purposes. Evaluation reports are based upon the conditions, practices and property observed and information made available at the time of the evaluation, and shall not be deemed to identify all hazards or to indicate that other hazards do not exist. The Insurer and those performing evaluations on its behalf shall not be responsible for the correction or control of any conditions, practices or property. Notwithstanding any other agreement, express or implied, to the contrary, neither the right to make an evaluation nor the making of an evaluation, nor any advice or report resulting therefrom, shall constitute or be construed as an undertaking on behalf of or for the benefit of the Insureds or others to determine or warrant that the facilities, operations or property are safe or healthful, or are in compliance with any law, rule,

regulation, procedure or standard. It shall be the obligation of the Insureds to ensure that the Insurer is accorded the right to conduct an evaluation under this paragraph.

2. Notwithstanding the provisions in Paragraph IV.G.5, upon discovery of a dangerous condition (the "Dangerous Condition) with respect to any property, or part thereof, insured under this Policy or a Primary Policy issued by the Insurer for the Unit insured under this Policy, whether that Primary Policy is issued to the Insured or another party, (the "Affected Property"), and whether discovered as a result of an evaluation or otherwise, a representative of the Insurer may

   (a) request that the Affected Property be taken out of service without delay, and/or

   (b) request that actions be taken to remedy the Dangerous Condition.

3. If a request made under Paragraph IV.G.2 is not complied with the Insurer may immediately suspend coverage as to the Affected Property and as to any Property Damage and/or Accidental Outage that could have been avoided or reduced had the Dangerous Condition been remedied, provided, however, that there will be coverage for Accidental Outage if the Insured can demonstrate that the Property Damage was unrelated to the failure to take the requested action (and there is otherwise coverage under this Policy). Notice of the suspension (which may be made together with either request referred to in Paragraph IV.G.2) shall be written and, notwithstanding any other provisions under this Policy, may be sent to the Member Insured by hand delivery, e-mail, fax or courier.

4. It shall be an obligation under this Policy that the Insured comply with the SHALL Requirements contained in the Insurer's Loss Control Standards.

5. If the Insurer learns of an Insured's failure to comply with, or to take agreed upon actions in accordance with the agreed upon Resolution Plan to correct a failure to comply with, a SHALL Requirement contained in the Insurer's Loss Control Standards, and, as a result and in accordance with the terms of a Primary Policy issued by the Insurer for the Unit insured under this Policy, regardless of whether that Primary Policy is issued to the Insured or another party, the Insurer suspends coverage under that Primary Policy, such suspension of coverage shall apply with equal force and effect to this Policy. The Insurer shall notify the Insured of a suspension of coverage under this Policy in the same notice sent by the Insurer concerning suspension under the Primary Policy. Upon reinstatement of coverage under the Primary Policy, coverage shall be reinstated under this Policy in accordance with the provisions of Paragraph 9 of this Section.

6. If a request is made to remove coverage under a Primary Policy issued by the Insurer for the Unit insured under this Policy, regardless of whether that Primary Policy is

issued to the Insured or another party, such removal of coverage shall have equal effect under this Policy, with the precise scope of such removal to be described in an endorsement to this Policy or as set forth in writing and delivered to the Insured.

7. Any suspension of coverage under Paragraphs IV.G.3 and IV.G.5 of this Policy shall be in accordance with the scope of coverage suspension set forth in writing and delivered to the Insured.

8. The Insurer may immediately suspend coverage under this Policy, in whole or in part, with respect to the Insured Property if (i) the NRC suspends or revokes for any reason the operating license issued with respect to any Unit on such Insured Property, or (ii) the NRC issues a shutdown order with respect to such Unit, or (iii) the NRC issues a confirmatory order keeping such Unit shut down. In the event that the Insurer chooses to suspend coverage under this provision, it shall notify the Member Insured in writing of that decision.

9. The coverage suspended in accordance with Paragraphs IV.G.3 and IV.G.5 above, as well as any coverage removed, may be reinstated by the Insurer, but only by an endorsement issued to form a part of this Policy. The suspension of the insurance under this Policy will not affect the obligation of the Member Insured to pay the Retrospective Premium Adjustment callable by the Insurer under this Policy, or provide other assurances to the Insurer pursuant to Section V.2.

H. Other Insurance

The Insurer shall not be liable if at the time of the Loss there is any other insurance which would attach if this insurance had not been effected, except that this insurance shall apply only as excess and in no event as contributory insurance, and then only after all other insurance has been exhausted.

I. Policy Decisions and Notice

Except as provided in paragraph K of Section IV, all decisions or actions made or taken with respect to this Policy may only be taken or made by the first named Member Insured and all such decisions or actions shall be binding on all Insureds. Such decisions or actions shall include, without limitation, decisions to give or not give notices of losses, to file or not file proofs of loss and to bring or not bring an action under the dispute resolution provision. No decision or action with respect to this Policy may be made or taken by anyone other than the Insurer and the first named Member Insured. The first named Member Insured shall be that Member Insured whose name is listed first in Item 1 of the Declarations. The Insurer and the Insureds agree that all communications between them as to any matter arising under or relating to this Policy shall be made as follows:

1. If to the Insurer: The communication must be sent by the first named Member Insured and must be sent, by facsimile, mail or courier to the Insurer at the address listed in Item 2 of the Declarations.

2. If to the Insureds: The communication must be sent by the Insurer to the first named Member Insured and must be sent, by facsimile, mail or courier to the address listed in Item 1 of the Declarations or to the address of such Member Insured's Delaware Representative. It shall be the obligation of the first named Member Insured to communicate the contents of any notification from the Insurer to the other Insureds.

The Insured's compliance with the provisions of this Section IV.I is a condition precedent to the Insurer's obligations under this Policy.

J. Policy Modifications

This Policy embodies all agreements between the Member Insured and the Insurer or any of their agents relating to this insurance. There shall be no change in the terms, provisions and stipulations of this Policy except in writing hereon or by endorsement added hereto by the Insurer and the Member Insured.

K. Requirements in Case of Loss

1. It shall be an obligation of the Insureds to give, or cause to be given, to the Insurer immediate written notice of any Outage exceeding ten weeks or for which a claim is expected to be made under the Policy. At the time any claim is made, but in no event later than twelve months after completion of an Outage, the Insureds shall complete and file with the Insurer a proof of loss ("Proof of Loss"), in the form approved by the Insurer, signed and sworn to by the Member Insured, stating the knowledge and belief of the Insureds as to the following: the time and origin of the Accident resulting in the Outage, the interest of the Insureds in, or in the output of, the Unit, and all other contracts of insurance, whether valid or not, covering the risks insured hereunder. The Insurer may deny coverage for such Outage if the Insured fails to comply with its obligation to provide immediate written notice thereof, but only if the Insurer demonstrates being prejudiced in its ability to adjust, assess or otherwise investigate the claims as a result of such failure.

2. In the event of an Outage, the Insureds and each of their agents, employees or assigns, shall do all things reasonably necessary or desirable, or to the extent reasonably requested or required by the Insurer with respect to its investigation of such Outage, to the defense, safeguard, recovery and preservation of the damaged Insured Property. It shall be the obligation of the Insureds to exhibit or cause to be exhibited to any person designated by the Insurer, as often as may be

reasonably necessary, any Insured Property at the Unit or any Insured Property damaged in transit to or from the Unit.

3. The Insureds shall submit or cause any person specified by the Insurer who is within the control of the Insureds to submit, to examinations under oath by any person named by the Insurer, and to subscribe the same; and as often as may be reasonably required, and at such reasonable time and place as may be designated by the Insurer or its representative, to produce for examination all books of account, bills, invoices, and other vouchers or documents needed by the Insurer to determine its liability, or, if originals be lost, certified copies thereof; and to permit extracts and copies thereof to be made. Any failure on the part of the Operator to comply with the requirements of this paragraph shall be deemed a breach of this obligation on the part of the Insureds.

L. State Premium Tax

The Insureds represent that they have paid or will pay any applicable state premium tax.

M. Subrogation

1. Except as provided in paragraph 3 below, the Insurer may require from the Insureds an assignment of all right of recovery against any party for any Loss to the extent that payment therefor is made by the Insurer; however, prior to an Accident, the Insured may waive in writing any or all right of recovery against any party for Loss occurring hereunder.

2. The Insurer hereby waives any right of subrogation, acquired by reason of any payment under this Policy arising out of any Outage covered hereunder, against the Insureds and any party furnishing services, materials, parts, or equipment in connection with the planning, construction, maintenance, operation or use of the Insured Property.

3. It is a condition of this Policy that the Insureds shall repay the Insurer any recoveries made by the Insureds on account of any such Outage to the extent that the Insurer would have been entitled to such recoveries had this waiver not been included in this Policy; provided, however, the proceeds of any such recovery shall be applied first to any uncompensated loss incurred by the Insureds, including reimbursement of any deductible amount under this Policy, and then, to the extent any proceeds of such recovery remain, to reimburse the Insurer for any payments made by it to the Insureds.

N. Suit

No suit, action, or proceeding on this Policy for the recovery of any claim shall be sustainable in any court of law or equity or arbitral tribunal unless all the requirements of this Policy shall have been complied with, and unless brought within eighteen (18) months after an Outage has commenced or within twelve (12) months after the expiration of the period for which payment of the Weekly Indemnity is sought, whichever is later.

O. Term and Cancellation

1. This Policy shall commence on the date specified in Item 3A of the Declarations and shall terminate on the date specified in Item 3A of the Declarations. This Policy shall be automatically renewed for successive one-year terms, however either party may cancel this Policy by providing written notice to the other party by registered mail at least three months prior to any anniversary.

2. This Policy may be canceled at any time by the Insurer, upon approval of its Board of Directors, upon sixty (60) days' written notice of cancellation mailed or delivered to the Member Insured, with or without tender of the excess of paid premium above the pro rata premium for the expired time, which excess, if not tendered, shall be refunded on demand. Notice of cancellation shall state that said excess premium, if not tendered, will be refunded on demand.

3. This Policy shall be automatically canceled if (i) the INPO membership of either the Member Insured or the Operator is suspended or canceled by INPO for any reason and (ii) the Member Insured fails to notify the Insurer within five business days after receipt of notice of such suspension or cancellation of membership in INPO, unless the Insurer is otherwise notified during such five business days.

4. In the event that the Member Insured fails to pay to the Insurer any Retrospective Premium Adjustment due under this Policy, due under any Other Insurance Policy as such Member Insured may have with the Insurer, or referred to in Section V, this Policy shall terminate provided that the Insurer notifies the Member Insured in writing of this delinquency and the Member Insured fails to make the required payment within 15 days after receiving such notice by registered mail.

5. Neither the cancellation of the Policy on the part of the Member Insured or the Insurer, nor its automatic termination, shall affect the obligation of the Member Insured to pay the Retrospective Premium Adjustment callable by the Insurer under this Policy, or provide other assurances to the Insurer pursuant to Section V.2.

V. RETROSPECTIVE PREMIUM ADJUSTMENT

The Member Insured agrees to pay to the Insurer the Retrospective Premium Adjustment under the terms and conditions hereinafter set forth.

1. The Insurer may make demand for the Retrospective Premium Adjustment in whole or in one or more parts from time to time, but only to the extent necessary, in the sole discretion of the Board of Directors of the Insurer, to cover Losses incurred by the Insurer under this Policy and all Other Insurance Policies with coverage effective during the Policy Year (specified in Item 3.B of the Declarations).

2. The Insurer, in the sole discretion of the Board of Directors, may require the Member Insured to provide assurance to the Insurer of the Member Insured's ability to satisfy its obligation to pay a Retrospective Premium Adjustment when called. Within twenty (20) business days of receiving notice from the Insurer that such assurance is required, the Member Insured shall notify the Insurer of the option selected to provide the required assurance, which will include, but is not limited to, providing a letter of credit, providing a financial guarantee, purchasing retrospective premium insurance, or paying a Deposit Premium, and implement such option by providing the Insurer with the required documentation or payment, depending on the option selected. The parameters for a letter of credit, a financial guarantee, and the retrospective premium insurance options will be provided to the Member Insured by the Insurer at the time the Insurer requires the Members Insured to take the action. The terms regarding the Deposit Premium are set forth in Paragraph 3 below.

3. If the Member Insured elects to pay a Deposit Premium, the Insurer may require the Deposit Premium to be paid in whole, in part, or in parts. Any Deposit Premium paid to the Insurer will be returned to the Member Insured when, in the sole discretion of the Insurer's Board of Directors, the retention of the Deposit Premium is no longer required. The amount of any Deposit Premium paid shall be a credit against the obligation of the Member Insured to pay a call made for a Retrospective Premium Adjustment and, to the extent thereof, shall be treated as a payment of the Retrospective Premium Adjustment as of the date a call for a Retrospective Premium Adjustment is made. Amounts paid as Deposit Premiums will be held in an interest bearing account and, until such a call is made, interest earned on the Deposit Premium amount will be paid back to the Member Insured on an annual basis, within ninety (90) business days after the end of the applicable calendar year. However, if the Member Insured fails to elect one of the options available pursuant to Paragraph 2 within the time frame required, or at any other time when in the sole discretion of the Insurer's Board of Directors it is in the best interests of the Insurer, the Insurer may make demand upon the Member Insured for a Deposit Premium, whether or not a demand for a Deposit Premium is made

upon any other Member Insured(s). If a demand is made by the Insurer, the Member Insured shall pay the Deposit Premium within twenty (20) business days of demand.

4. That portion of the Retrospective Premium Adjustment demanded by the Insurer shall be paid to the Insurer by wire transfer or other method acceptable to the Insurer within twenty (20) business days after demand. The Insurer may, without first pursuing any rights it may have against any Delinquent Member, make such number of further demands upon the Member Insured, including any Delinquent Member, for further portions of the Retrospective Premium Adjustment, to be payable twenty (20) business days after demand, as may be needed to obtain Retrospective Premium Adjustment from the Member Insureds of the Insurer under this Policy and all Other Insurance Policies with coverage effective during the Policy Year sufficient, in the sole discretion of the Board of Directors of the Insurer, to cover Losses under this Policy and all Other Insurance Policies with coverage effective during the Policy Year. The fact that the Insurer has received sufficient Retrospective Premium Adjustment from such Member Insureds shall not bar the Insurer from pursuing the Insurer's rights against any Delinquent Member.

5. When, for any purpose hereunder, it becomes necessary to calculate the obligation of the Member Insured for the Retrospective Premium Adjustment, it will be calculated as follows:

   (a) The amount of the Retrospective Premium Adjustment shall be equal to the product of (i) the Multiple selected by the Board of Directors of the Insurer as required to meet Losses under this Policy and all Other Insurance Policies with coverage effective during the Policy Year, times (ii) the Premium plus any Additional Premium, or if such is for a period shorter than a calendar year, such Premium and Additional Premium multiplied by a fraction the numerator of which is 365 and the denominator of which is the number of days in the policy period specified in Item 3A of the Declarations.

   (b) The policy year to which any Retrospective Premium Adjustment relates shall be determined by the Board of Directors of the Insurer at the time it makes the call for such Retrospective Premium Adjustment based on the date of the Accident under this Policy or any Other Insurance Policy giving rise to the obligation which such Retrospective Premium Adjustment is designed to satisfy. The aggregate of all Retrospective Premium Adjustments under this Policy shall not exceed the Retrospective Premium Adjustment set forth in Item 5.B of the Declarations.

(c) Subject to the provisions with respect to calls made in the event of failure to pay by Delinquent Members, the amount of any call for a Retrospective Premium Adjustment hereunder shall bear the same relation to the total Retrospective Premium Adjustment, payable by all Member Insureds of the Insurer under such call as the highest Premium plus Additional Premium determined under subparagraph (a)(ii) above bears to the aggregate Premiums plus Additional Premiums, used to calculate the total of all such calls, under this Policy and all Other Insurance Policies with coverage effective during the Policy Year.

(d) The obligation of the Member Insured for the Retrospective Premium Adjustment shall be and remain in full force and effect and all the above calculations shall be made without regard to whether or not the Insurer has any obligation to make payments under this Policy or this Policy is canceled or suspended.

6. When, for any purpose hereunder, it becomes necessary to calculate the obligation of the Member Insured for the Deposit Premium, it will be calculated as follows:

(a) The amount of the Deposit Premium, if required, shall be equal to Retrospective Premium Adjustment listed in Item 5.B of the Declarations, unless otherwise indicated.

(b) The aggregate of the Deposit Premium and any Retrospective Premium Adjustments callable under this Policy shall not exceed the Retrospective Premium Adjustment set forth in Item 5.B of the Declarations.

(c) The amount of the Deposit Premium may be adjusted at the anniversary of this Policy.

(d) The obligation of the Member Insured for the Deposit Premium shall be and remain in full force and effect and all the above calculations shall be made without regard to whether or not the Insurer has any obligation to make payments under this Policy or this Policy is canceled or suspended.

7. The Multiple is no higher than the Multiple in any Other Insurance Policy with insurance coverage effective during the Policy Year.

8. The Board of Directors of the Insurer in its sole discretion may adjust downward the Multiple stated in this Policy and any Other Insurance Policy with coverage effective during the Policy Year to a new lower Multiple, and the Retrospective Premium Adjustment callable under this Policy and any such Other Insurance Policy shall be reduced by a like proportionate amount. No downward adjustment in such Multiple and corresponding adjustment in any such Retrospective

Premium Adjustment may be made with respect to any Retrospective Premium Adjustment which has been assigned by the Insurer, or in any Other Insurance Policy with coverage effective during the Policy Year, if the Multiple in any such Other Insurance Policy, after adjustment, would be less than the Multiple, after adjustment, in this Policy, unless a similar downward adjustment is made in the Multiple in this Policy, together with a corresponding adjustment in the Retrospective Premium Adjustment.

9. The liability of the Member Insured shall be limited to the Premium, Additional Premium the Retrospective Premium Adjustment or any unpaid portion thereof due to the Insurer under the terms of this Policy, and any assurance that may be required pursuant to Section VI.2. No Member Insured shall be subject to any contingent liability or be required to pay any dues or assessments in addition to such Premium, Additional Premium, Retrospective Premium, and any assurance under Section VI.2. Adjustment due under this Policy and those due under any Other Insurance Policies as such Member Insured may have with the Insurer. The liability of the Member Insured for the Retrospective Premium Adjustment for the Policy Year shall cease six (6) years after the end of the Policy Year, unless prior demand is made therefor.

10. It is agreed that the obligation of the Member Insured to pay any Retrospective Premium Adjustment due under any Other Insurance Policy between the Insurer and the Member Insured which terminated on or before the inception date of this Policy is an obligation of the Member Insured under this Policy. It is also agreed that the terms and the amount of such obligation shall be determined by reference to the Other Insurance Policy under which such obligation arose, notwithstanding that such Other Insurance Policy may no longer be in effect.

11. The liability of each Member Insured, if there be more than one, for the Retrospective Premium Adjustment, and any assurance that may be required pursuant to Section VI.2, under this Policy shall be several and not joint and in proportion to their respective interests specified in the Declarations.

12. In the event the Insurer has available credit facilities from lenders, the Board of Directors of the Insurer may, in its sole discretion, utilize such facilities to finance Losses incurred by the Insurer under this Policy and all Other Insurance Policies. The Insurer may assign to the lenders the Insurer's interest in the Retrospective Premium Adjustment, in whole or in part, including, in the event the Insurer defaults on its obligations to such lenders, the right to call such interest assigned. Such assignment may be made and shall only be effective with respect to the financing of those Losses for which the Retrospective Premium Adjustment could be called. In the event any assignment is made, the Insurer shall give prompt notice thereof to the Member Insured. Each Member Insured shall, upon the

request of the Insurer, give acknowledgment of its liability for the Retrospective Premium Adjustment to each of the lenders involved.

VI. MEMBERSHIP

Each Member Insured becomes a Member of the Insurer as part of obtaining insurance from the Insurer, and as such, is entitled to the privileges and benefits, and by entering into this Policy agrees to be subject to and bound by the obligations and duties of Membership. These are more fully set forth in the Insurer's Memorandum of Association and in the Bye-Laws and any amendments thereto, each of which is hereby incorporated into and made a part of this Policy. In no event shall any amendment to the Memorandum of Association or the Bye-Laws increase the amount of Premium or Retrospective Premium Adjustment payable or callable hereunder.

VII. DEFINITIONS

For purposes of this Policy, unless otherwise stated to the contrary, the following capitalized terms shall have the meanings set forth below. Other capitalized terms are included in the Declarations. Unless otherwise stated or required for the meaning of any provision, the singular shall include the plural and the plural, the singular. Whenever a Section or Paragraph number is included in the Policy, it refers to a Policy Section or Paragraph number.

A. "Accident" means a sudden and fortuitous event, an event of the moment, which happens by chance, is unexpected and unforeseeable. Accident does not include any condition which develops, progresses or changes over time, or which is inevitable. The date or time at which Accidental Property Damage is discovered shall be deemed the date or time of an Accident.

B. "Accidental" means caused by an Accident.

C. "Accidental Property Damage" means Property Damage which is caused by an Accident.

D. "Cessation Outage" means the Unit ceases to generate electrical power as a result of Accidental Property Damage.

E. "Deductible Period" means the number of weeks specified in Item 8 of the Declarations during which the Insurer is not liable for payment of the Weekly Indemnity.

F. "Delay Outage" means the Unit is delayed from resuming the generation of electric power other than for testing purposes as a result of Accidental Property Damage that does not cause a Cessation Outage

G. "Delinquent Member" means any member insured, including the Member Insured, who fails to pay a retrospective premium adjustment due under this Policy or any Other Insurance Policy within twenty (20) business days after demand.

H. "Deposit Premium" means the amount that the Member Insured may be required to pay to the Insurer under this Policy, as detailed in to Section VI of this Policy, as security for future Retrospective Premium Adjustments.

I. "Insured Property" means the property specified as such in Item 7 of the Declarations and situated at a location specified therein.

J. "Loss" means any amounts payable by the Insurer pursuant to Section I of the Policy.

K. "Loss Control Standards" means the set of administrative and technical requirements adopted by the Insurer that are intended to minimize the risk of loss at Insured Sites.

L. "Member Insureds of the Insurer" means the Member Insureds under this Policy or the Other Insurance Policies.

M. "NRC" means the Nuclear Regulatory Commission or any governmental body succeeding to the functions and authority thereof.

N. "Operator" means those persons, entities, departments, agencies, or political subdivisions, if any, other than the Member Insured, responsible for operating a Unit covered by the Policy.

O. "Order of Civil Authority" means any order or directive of a federal, state, county, or municipal governmental entity or any department, agency or political subdivision thereof, including, without limitation, an order to replace undamaged Insured Property pursuant to a directive of the NRC.

P. "Other Insurance Policy" means any NEIL I Accidental Outage Insurance Policy other than this Policy, or any Business Interruption and/or Extra Expense Insurance Policy issued by the Insurer or by Overseas NEIL Limited.

Q. "Other Member Insurance Policy" means any insurance policy, other than this Policy, issued by the Insurer to one or more Member Insureds of the Insurer.

R. "Outage" means either a Cessation Outage or Delay Outage.

S. "Partial Outage" means a reduction in output of the Unit's generation of electricity or a delay in the Unit reaching full power generation.

T. "Payment Periods" means the number of weeks shown in Item 6B of the Declarations.

U. "Planned Shutdown Date" means the scheduled expiration date of the operating license of any of the Units specified in Item 7 of the Declarations or the date, as notified by the Member Insured pursuant to Section I.D.2, when such Unit will permanently cease generating electricity.

V. "Primary Policy" means a Primary Property and Decontamination Liability Insurance Policy issued by Nuclear Electric Insurance Limited or a Primary Property and Decontamination Insurance Policy issued by Overseas NEIL Limited, depending on which has been issued to the Insured.

W. "Property Damage" means direct physical damage to or destruction of the Insured Property.

X. "Resolution Plan" means a written document, mutually agreed upon by the Insured and Insurer, that explains the actions to be taken by the Insured to resolve the Inusred's non-compliance with a SHALL Requirement under the Loss Control Standards. The procedures for the development, and closure, of a Resolution Plan are contained in the Company's Loss Control Standards.

Y. "Retrospective Premium Adjustment" means the amount of retrospective premium adjustment called or demanded of the Member Insured under this Policy as calculated pursuant to Section V of this Policy, but not, in the aggregate, in excess of the Retrospective Premium Adjustment specified in Item 5B of the Declarations.

Z. "SHALL Requirement" means a standard within the Loss Control Standards that sets forth a minimum requirement to be met and maintained for the Insured Property to be insurable, and is identified as such within the Loss Control Standards.

AA. "Unit" means a nuclear operating unit.

BB. "Weekly Indemnity" means the amount specified as the weekly indemnity in Item 6A of the Declarations.

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

Reduction in Indemnity Endorsement

Member Insured: Florida Power Corporation

Site: Crystal River — Endorsement No. 1
Policy Number: E09-015 — Effective Date: April 1, 2009

Effective Time of this Endorsement is 12:01 a.m. Standard Time in Hamilton, Bermuda.

1. The Amount of Insurance specified in the Declarations may exceed the amount that would be available were such amount limited to the proportionate ownership interest of the Member Insured in the output of the Unit insured hereunder. The amount exceeding such proportionate interest is made available conditionally because the owner or owners of the remaining interests have not insured their interest and/or the aggregate Amount of Insurance purchased by all co-owners insured at the inception of this Policy is less than the Maximum Amount of Insurance and Weekly Indemnity specified in the Declarations. It is therefore agreed that in the event one or more of such co-owners should apply for and be accepted by the Insurer as a member insured during the term of this Policy, or if at any time the aggregate Amount of Insurance requested by all co-owners insured exceeds the maximum Amount of Insurance and Weekly Indemnity specified in the Declarations, the Board of Directors of the Insurer is empowered and authorized by the Member Insured to reduce the Amount of Insurance specified in the Declarations, and the share of the Weekly Indemnity payable to the Member Insured, to the extent required to reflect correctly the proportionate ownership interest of the Member Insured, including the co-owners in the Maximum Amount of Insurance and Weekly Indemnity.

2. Any reduction in the Weekly Indemnity under the preceding paragraph will be accompanied by a proportionate reduction in the Premium specified in Item 4 of the Declarations.

This Endorsement does not increase the amount of insurance provided in the Policy to which it is attached.

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

IN WITNESS WHEREOF, the parties hereto have caused this Endorsement to be executed and attested on their behalf.

Wilmington, Delaware

Date: As of April 1, 2009

Attest: _____

INSURER:
Nuclear Electric Insurance Limited

By: _____
David B. Ripsom, President

Wilmington, Delaware

Date: As of April 1, 2009

Witness: _____

MEMBER INSURED:
Florida Power Corporation

By: _____
Attorney-in-Fact

NUCLEAR ELECTRIC INSURANCE LIMITED
POLICYHOLDER DISCLOSURE

NUCLEAR POLICY RENEWALS

NOTICE OF TERRORISM INSURANCE COVERAGE
EFFECTIVE DECEMBER 26, 2007

Coverage for acts of terrorism is already included in your current policy. However, under NEIL's Payment for Acts of Terrorism endorsement, your recovery for losses stemming from an act of terrorism could be limited by the terms of the endorsement. However, in accordance with the Terrorism Risk Insurance Program Reauthorization Act of 2007, which took effect December 26, 2007, (TRIPRA), NEIL's Payment for Acts of Terrorism endorsement would not cap the damages for any "certified" acts of terrorism under TRIPRA.

You are hereby notified that under TRIPRA, the definition of act of terrorism has changed. As defined in Section 102(1), the term "act of terrorism" means any act that is certified by the Secretary of the Treasury - in concurrence with other specified federal officials - to be an act of terrorism; to be a violent act or an act that is dangerous to human life, property, or infrastructure; to have resulted in damage within the United States, or outside the United States in the case of certain air carriers or vessels or the premises of a United States mission; and to have been committed by an individual or individuals as part of an effort to coerce the civilian population of the United States or to influence the policy or affect the conduct of the United States Government by coercion.

Under your coverage, any losses resulting from certified acts of terrorism may be partially reimbursed by the United States Government under a formula established in TRIPRA. Your policy may contain other exclusions which might affect your coverage. Under the formula, the United States Government generally reimburses 85% of covered terrorism losses exceeding the statutorily established deductible paid by the insurance company providing the coverage. TRIPRA, contains a $100 billion cap that limits U.S. Government reimbursement as well as insurers' liability for losses resulting from certified acts of terrorism when the amount of such losses exceeds $100 billion in any one calendar year. If the aggregate insured losses for all insurers exceed $100 billion, any insurer that has met its deductible will not be liable to pay for any losses in excess of the $100 billion sustained by its insureds. Thus, if the $100 billion cap is reached, your coverage may be reduced.

NEIL is neither increasing, nor attributing any portion of, the annual premium for terrorism coverage, but a surcharge might be added to the premium if, after a certified act of terrorism, the federal Department of Treasury requires a recoupment of certain amounts paid by the federal government in accordance with the terms of TRIPRA.

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

Payments for Acts of Terrorism Endorsement

Member Insured: Florida Power Corporation

Site: Crystal River
Policy Number: E09-015
Endorsement No. 2
Effective Date: April 1, 2009

Effective Time of this Endorsement is 12:01 a.m. Standard Time in Hamilton, Bermuda.

It is hereby understood and agreed that the Accidental Outage Policy is hereby amended as follows:

I. The following Section is hereby added to the Policy:

PAYMENTS FOR ACTS OF TERRORISM

In the event that one or more Acts of Terrorism cause Accidental Property Damage under this Policy and under one or more Nuclear Insurance Policies within twelve months from the date the first Accidental Property Damage occurs:

1. Resources Available

The Insureds' maximum recovery for all such Losses under this Policy and all Nuclear Insurance Policies shall be an aggregate of:

(a) $3.24 billion (U.S. dollars)

plus;

(b) such additional amounts as the Insurer recovers for such Losses from reinsurance, indemnity, and any other source, applicable to such Losses.

2. Allocation of Resources

(a) The amount determined under paragraph 1 above shall first be used to pay for all such Losses payable under all applicable Primary Property and Decontamination Liability Insurance Policies (excluding any Losses payable under all Business Interruption and/or Extra Expense Insurance Policy Endorsements), Primary Property and Decontamination Insurance Policies (excluding any Losses payable under all Business Interruption and/or Extra Expense Insurance Policy Endorsements), Operating Facility Policies, Decontamination Liability, Decommissioning Liability and

Excess Property Insurance Policies, Decontamination, Decommissioning and Excess Property Insurance Policies, Blanket Excess Decontamination, Decommissioning and Excess Property Insurance Policies, and Blanket Excess Decontamination Liability, Decommissioning Liability and Excess Property Insurance Policies, (collectively "Property Losses").

(b) If such Property Losses for all Insureds exceed the amount determined under paragraph 1 above, the Insured's maximum recovery shall be the amount determined under paragraph 1 above times a fraction, the numerator of which is the Insured's recovery for the Property Losses resulting from Accidental Property Damage, but for this Section, and the denominator of which is the sum of all Insureds' recovery for Property Losses resulting from Accidental Property Damage under all applicable Nuclear Insurance Policies, including this Policy, but for this Section.

(c) Notwithstanding paragraph 1 and subparagraph 2(b) above, if the payments made pursuant to subparagraph 2(b) exhaust the amount determined under paragraph 1, without paying for all the Insured's Property Losses, the Insured shall recover such additional amounts that the Insurer recovers from reinsurance, indemnity, or other source, for the Insured's Property Losses.

3. (a) If all the payments made pursuant to subparagraphs 2(b) and 2(c) above exhaust the resources determined under paragraph 1, the Insurer will not make any payment to any Insureds for Outage Losses under the applicable Nuclear Insurance Policies.

(b) However, if after all such Property Losses have been paid pursuant to subparagraphs 2(b) and 2(c) above, resources remain available under paragraph 1, those resources will be used to pay such Losses under all applicable NEIL I Accidental Outage Policies and the Business Interruption and/or Extra Expense Insurance Policy Endorsements to Primary Property Polices (collectively "Outage Losses").

(c) If such Outage Losses for all Insureds exceed the remaining resources, the Insured's maximum recovery shall be the amount of the remaining proceeds times a fraction, the numerator of which is the Insured's recovery for Outage Losses resulting from Accidental Property Damage, but for this Section, and the denominator of which is the sum of all Insureds' recovery for Outage Losses resulting from Accidental Property Damage under all applicable Nuclear Insurance Policies, including this Policy, but for this Section.

4. Declarations Page

Nothing herein shall be construed to entitle the Insured to recover more than the amount of the Policy Limits stated in Item 6A of the Declarations.

5. Relevant Period

The twelve-month period specified above shall commence on the date of the first Accidental Property Damage caused by an Act of Terrorism. The first Accidental Property Damage caused by an Act of Terrorism that occurs after this or any other twelve-month period shall trigger a new twelve-month period.

6. Definitions

For the purposes of this Section only:

(a) "Act of Terrorism" means any act by a person, group, or organization that appears to be intended to: (i) intimidate or coerce a civilian population, or (ii) disrupt any segment of the economy in the country where the insured plant is located; or (iii) influence the policy of a government by intimidation or coercion; or (iv) affect the conduct of a government by mass destruction; provided, however, that an Act of Terrorism for purposes of this Policy shall not include any act excluded by the War Risk Exclusion.

(b) "Nuclear Insurance Policy" means any Primary Property and Decontamination Insurance Policy, or Primary Property and Decontamination Liability Insurance Policy or Operating Facility Policy, or any Decontamination, Decommissioning and Excess Property Insurance Policy or Decontamination Liability, Decommissioning Liability and Excess Property Insurance Policy, or any Blanket Excess Decontamination Liability, Decommissioning Liability And Excess Property Insurance Policy or Blanket Excess Decontamination, Decommissioning And Excess Property Insurance Policy, or any NEIL I Accidental Outage Insurance Policy or any Business Interruption and/or Extra Expense Insurance Policy, other than this Policy, issued by the Insurer or by Overseas NEIL Limited.

7. Authorized Changes to this Section

The Insurer's Board of Directors will have the authority to alter or replace the definition of the term "Act of Terrorism" and any other provision of this Section in order to facilitate the availability of resources that may be made available by the Government in the country where the insured plant is located.

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

IN WITNESS WHEREOF, the parties hereto have caused this Endorsement to be executed and attested on their behalf.

Wilmington, Delaware

Date: As of April 1, 2009

Attest: _____

INSURER:
Nuclear Electric Insurance Limited

By: _____
David B. Ripsom, President

Wilmington, Delaware

Date: As of April 1, 2009

Witness: _____

MEMBER INSURED:
Florida Power Corporation

By: _____
Attorney-in-Fact

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

Endorsement

Member Insured: Florida Power Corporation

Site: Crystal River
Endorsement No. 3
Policy Number: X10-015
Effective Date: December 20, 2010

Effective Time of this Endorsement is 12:01 a.m.Standard Time in Hamilton, Bermuda.

It is hereby understood and agreed that Item(s) 11 of the Declarations of the Policy are amended to read as follows and not as within stated:

Item 11. Service of Process to Insured (see Section V.9(e)):
General Counsel
Florida Power Corporation d/b/a Progress Energy Florida, Inc.
c/o Duane Morris LLP
222 Delaware Avenue, Suite 1600
Wilmington, DE 19801-1659

IN WITNESS WHEREOF, the parties hereto have caused this Endorsement to be executed and attested on their behalf.

Wilmington, Delaware

INSURER:
Nuclear Electric Insurance Limited

Date: _____

By: _____
David B. Ripsom, President

Attest: _____

Wilmington, Delaware

MEMBER INSURED:
Florida Power Corporation

Date: _____

By: _____
Attorney-in-Fact

Witness: _____

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

Terms & Conditions Endorsement

Member Insured: Florida Power Corporation

Site: Crystal River
Endorsement No. 2
Policy Number: X10-015
Effective Date: July 1, 2010

Effective Time of this Endorsement is 12:01 a.m. Standard Time in Hamilton, Bermuda.

It is hereby understood and agreed that section V.9. (Dispute Resolution) of the Policy is deleted in its entirety and replaced with the following:

V. CONDITIONS

9. Dispute Resolution.

(a) The Insurer and the Insured mutually acknowledge that the form, terms and conditions of the Policy have been formulated by representatives of the companies participating in the mutual enterprise in order to provide insurance coverage which is vital to all participants. It is desired that the Insurer serve as a financially stable and reliable entity, responsive to the coverage needs of its participants, and providing coverage fairly and equitably as to each Insured, but taking equally into account fairness and equity as to all Insureds as a group. While every effort has been made to define with clarity and precision the scope of coverage and other policy provisions, the Insurer and the Insured mutually acknowledge that situations may arise where the terms of the Policy, or the interpretation of the terms, are disputed. For the foregoing reasons, the Insurer and the Insured agree that the following principles shall govern the interpretation of the Policy:

(1) Even handedness and fairness to both the Insurer and the Insured;

(2) In the event of an ambiguity in a policy provision, the intentions of the Insurer and the Insured shall be considered by the Arbitrator(s). Evidence of such intentions is limited to the following extrinsic evidence: reports, notes, meeting minutes, and related materials produced by or given to the Insurer's Board of Directors, Advisory Committees, and Task Forces, and any testimony taken from a present or former employee of the Insurer, member of a Member Advisory Committee, or Director;

(3) The practice of the Insurer and the Insured in interpreting and applying the Policy;

(4) The cooperative rather than adversarial relationship between the Insurer and the Insured; and

(5) The contract construction rule of contra proferentem (construing a contract against the drafter) is not applicable to this insurance policy.

b) The Insurer and Insured will endeavor to resolve any dispute between them by means of a

voluntary process to be agreed upon between them, including, without limitation, early neutral evaluation, mediation, mini-trial, neutral fact finding, or senior peer review. Neither the Insurer nor the Insured may be compelled to participate in any such voluntary process except that, at the request of an Insured, the Insurer agrees to submit the dispute to senior peer review. The Insurer agrees to pay the fees and expenses of any neutral party associated with the use of any process hereunder. Senior peer review is a process in which both sides present their arguments and view of the evidence to a panel of five (5) employees of other NEIL Members, unless the Insured and Insurer agree that a panel of three (3) would be more appropriate. The panel will provide a written non-binding opinion on the merits of the dispute. Though not an exclusive list, panel members may include individuals from NEIL's Member Representatives, Board of Directors, Member Advisory Committees, or Members' Legal Counsel. None of the panelists may be employed by a Member that is an affiliate of the Insured involved in the dispute. The panelists shall be selected by agreement of the Insured and Insurer, but if no agreement is reached within 30 days of the date the senior peer review is requested, the Insurer and Insured shall each submit a list of five names and a NEIL outside Director (as chosen by the Chairman of the Board) shall select the panclists. The panel, with input from the parties, shall establish a schedule for the proceeding, including, if appropriate, the submittal of written materials and oral arguments.

c) The Statement of Dispute Resolution Principles adopted by the Insurer's Board of Directors and Members, as it may be amended from time to time, shall not create any rights or obligations on the parties but shall be used as guidelines for conducting dispute resolution processes hereunder.

d) Any dispute, controversy or claim between the Insurer and the Insured as to any matter arising out of or relating to this Policy, or the breach, termination or invalidity thereof, which is not settled between themselves, pursuant to paragraph 2 above or otherwise, shall be settled by arbitration in accordance with the United Nations Commission on International Trade Law's (UNCITRAL) Arbitration Rules. Arbitration of a dispute is final and binding.

(1) The number of arbitrators shall be one, unless the Insured or the Insurer requests a three-person panel, in which case the number of arbitrators shall be three.

(2) In the event the arbitration is to be decided by a single arbitrator, and the parties cannot agree on the appointment of that arbitrator within sixty (60) days of the notice of arbitration being served, the sole arbitrator shall be selected by the appointing authority specified in paragraph 4.d.

(3) In the event the arbitration is to be decided by three arbitrators, the Insured shall appoint one arbitrator and the Insurer another; the two so appointed arbitrators shall select the third, who will act as the Chairman for the panel. The party which files the notice of arbitration shall include in such notice the identity of its party-appointed arbitrator. Within forty-five (45) days of service of the notice of arbitration, the second party shall notify the party that filed the notice of arbitration of the identity of its party-appointed arbitrator. At the time of the notification of the appointment, each side shall provide the other with a detailed curriculum vitae for the selected arbitrator, which shall include information regarding any potential conflict of interest of the selected arbitrator,

including any financial or personal interest in the result of the arbitration or any past or present relationship with the parties or their representatives. All arbitrators shall be obligated to update his/her potential conflict of interest information throughout the arbitration. If (i) the party filing the notice of arbitration fails to include the identity of its party-appointed arbitrator, or (ii) the second party does not notify the first party of its party-appointed arbitrator within forty-five (45) days of service of the notice of arbitration, or (iii) the two party-appointed arbitrators fail to agree on a third arbitrator within a period of sixty (60) days from the date of appointment of the second arbitrator, then, on request of either party, the missing party-appointed arbitrator or the third arbitrator (as the case may be) shall be selected by the appointing authority specified in paragraph 4.d. There shall be no ex parte communications between a party and any of the arbitrators, except that a party-appointed arbitrator shall be permitted to communicate with the party that appointed him/her concerning (1) the identity of the Chairman and (2) issues associated with arbitrator invoices.

(4) The appointing authority shall be the American Arbitration Association ("AAA") in New York, New York. The AAA shall select arbitrators from the panel of international arbitrators for the International Centre for Dispute Resolution, the international division of the AAA (the "ICDR Roster"). The arbitrators selected from the ICDR Roster shall be U.S. nationals. If for any reason the AAA fails to appoint an arbitrator within thirty (30) days of the date of receipt of the request for such appointment, either party may proceed pursuant to Article 75 of the Civil Practice Law and Rules of the State of New York and make application to the Supreme Court of the State of New York, County of New York for the appointment of the arbitrator.

(5) To the extent there is any inconsistency between the UNCITRAL Arbitration Rules and the provisions of this Policy, the latter shall govern.

(6) The place of the arbitration shall be New York, New York, unless the parties agree upon another location.

(7) Within forty-five (45) days after the appointment of the Chairman, the arbitrators shall conduct an initial conference to which the parties will be invited to attend. At the initial conference, the parties and arbitrators shall discuss, without limitation, (1) the procedures to be followed, (2) scheduling of submissions and hearings, and (3) a timetable for discovery. At a minimum, the discovery order shall require the parties to provide each other non-privileged documents that are requested by the other side and that reasonably relate to the claims and defenses asserted in the arbitration. Following the initial conference, the arbitrators shall issue a Procedural Order to the parties setting forth the procedures and schedule.

(8) Within sixty (60) days of the close of the hearings (or the later of post-hearing oral argument or post-hearing written submissions should the arbitrators authorize them), the arbitrators shall issue their award, which shall be in writing and shall present a detailed statement of the factual and legal bases for the award. The award of the arbitrators shall require a majority of two votes. The arbitrators shall first determine the liability of the

parties as to the dispute, claim or controversy, and then, only if necessary, determine the type and amount of relief to be granted. In no case may the arbitrators order the rescission or reformation of this Policy. Further, unless the arbitrators determine that it is inappropriate under the circumstances of the case, the award shall provide that post-award interest shall begin to accrue at the rate of the Prime Rate, as published in the Wall Street Journal as of the date of the award, plus two (2) percent per annum from the date sixty (60) days after the award is delivered to the parties until the date the award is paid.

(9) The arbitrators shall award reasonable attorney's fees and costs to the prevailing party, not to exceed the amount of fees and costs incurred by the non-prevailing party. For this purpose, the fees incurred shall be calculated at reasonable hourly billing rates and shall include all reasonable out-of-pocket expenses, including, without limitation, the reasonable costs of expert witnesses and consultants. If the Insured has retained counsel on a contingency fee basis, and the Insurer is the prevailing party, the arbitrators shall award the Insurer all of its reasonable attorney's fees and costs (without consideration of the fees and costs incurred by the Insured).

(10) In the event the award is challenged in court and the challenge is denied, the party that challenged the award shall pay the reasonable attorney's fees and costs incurred by the non-challenging party in defending against the challenge to the award.

(11) The parties acknowledge that any dispute resolution proceeding is intended to be confidential and therefore agree to properly maintain and not disclose or reveal any information obtained from the other party pursuant to the terms of a Confidentiality Agreement to be executed between the parties at the beginning of the proceeding (the terms of which shall be determined by the arbitrators in the event that the parties are unable to agree). In the case of arbitration, the written decision of the arbitrator(s) shall be available to other Insureds of NEIL and ONEIL, except that any information within the written decision that the Insured can show is proprietary in nature will be redacted.

e) To the extent that any dispute, claim or controversy between the Insured and the Insurer hereunder is not subject to arbitration for any reason, or to the extent that applicable law otherwise permits the parties to seek provisional relief from the courts prior to the time that the arbitral panel is appointed, the United States District Court for the Southern District of New York (or the Supreme Court of the State of New York, New York County, if federal jurisdiction cannot be attained) shall have exclusive jurisdiction thereof. For such purpose, the Insured agrees to accept, without objection to form or manner, service of process by registered mail or form of overnight mail to the person identified in Item 11 of the Declarations. For such purpose, the Insurer agrees to accept, without objection to form or manner, service of process by registered mail, or overnight mail, directed to the Insurer's General Counsel, at Nuclear Electric Insurance Limited, 1201 Market Street, Suite 1100, Wilmington, Delaware 19801. The foregoing consents to service of process are not intended, nor shall they be construed, to extend to any dispute, claim, controversy, cause of action, or other matter other than as stated in this paragraph.

This Endorsement does not increase the amount of insurance provided under this Policy.

IN WITNESS WHEREOF, the parties hereto have caused this Endorsement to be executed and attested on their behalf.

Wilmington, Delaware

Date: _____

Attest: _____

INSURER:
Nuclear Electric Insurance Limited

By: _____
David B. Ripsom, President

Wilmington, Delaware

Date: _____

Witness: _____

MEMBER INSURED:
Florida Power Corporation

By: _____
Attorney-in-Fact

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13DELAM-FIPUGPOD2-2-000001 - 000007 SETTLEMENT AGREEMENT.pdf	4/18/2013 9:39 AM	PDF File	146 KB
13DELAM-FIPUGPOD2-5-000001 - 000010 NEIL PIR DOC.pdf	4/18/2013 9:40 AM	PDF File	162 KB
13DELAM-FIPUGPOD2-14-000001 - 000071 129683-2012 NEIL PD POLICY.PDF	4/18/2013 9:39 AM	PDF File	2,961 KB
13DELAM-FIPUGPOD2-14-000072 - 000073 129684-DESCRIPTION OF INSURANCE COVERAGE.PDF	4/18/2013 9:39 AM	PDF File	462 KB
13DELAM-FIPUGPOD2-14-000074 - 000117 129685-E09-015 ACCIDENTAL OUTAGE POLICY.PDF	4/18/2013 9:39 AM	PDF File	11,601 KB
13DELAM-FIPUGPOD2-14-000118 - 000159 129687-EXCESS_POLICY[1].PDF	4/18/2013 9:39 AM	PDF File	913 KB
13DELAM-FIPUGPOD2-14-000160 - 00167 129689-EXCESSBLANKT_POLICY[1].PDF	4/18/2013 9:39 AM	PDF File	427 KB
13DELAM-FIPUGPOD2-14-000168 - 000211 129690-OUTAGE_POLICY[2].PDF	4/18/2013 9:39 AM	PDF File	1,357 KB
13DELAM-FIPUGPOD2-15-000001 - 000048 CRYSTAL RIVER 3 AND NEIL PRESS RELEASES.pdf	4/18/2013 9:39 AM	PDF File	658 KB
13DELAM-FIPUGROG1-5-000001 - 000004 Meetings between Officers_1.pdf	4/22/2013 4:39 PM	PDF File	135 KB
Docket 100437 PEF Notice of Service response FIPUG 1st Interrogatories_1.pdf	4/22/2013 4:39 PM	PDF File	72 KB
Docket 100437 PEF Notice of Service responses FIPUG 2d Req for Prod.pdf	4/22/2013 4:40 PM	PDF File	72 KB
Docket 100437 PEF Response FIPUG 1st Interrogatories Nos 1-10_1.pdf	4/22/2013 4:39 PM	PDF File	183 KB
Docket 100437 PEF Response FIPUG 2d Req for Prod Nos 2-17_1.pdf	4/22/2013 4:41 PM	PDF File	224 KB

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NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

DECONTAMINATION LIABILITY, DECOMMISSIONING LIABILITY AND EXCESS PROPERTY INSURANCE POLICY

Declarations attached to and made a part of Policy No. X12-015
(Crystal River)

Item 1. Member Insured: Florida Power Corporation
Member Address: d/b/a Progress Energy Florida, Inc.
410 S. Wilmington Street
Raleigh, North Carolina 27601
Interest: 100.00%

Item 2. Insurer: Nuclear Electric Insurance Limited

Mailing Address: 1201 N. Market Street, Suite 1100, Wilmington, Delaware 19801

Item 3. A. Policy Period:

From April 1, 2012 (Date) To April 1, 2013 (Date)

B. Policy Year:

From April 1, 2012 (Date) To April 1, 2013 (Date)

All dates used to determine the Policy Period, Policy Year, or used as the effective date of any endorsement have as their effective time 12:01 a.m. Standard Time in Hamilton, Bermuda.

Item 4. Premium: $573,534

Item 5. A. Multiple: 10

B. Retrospective Premium Adjustment: $5,735,340

Item 6. The Insurer's maximum Limit of Liability resulting from any one accident for expenses incurred for Decontamination, and Decommissioning and for Excess Property Insurance will not exceed:

$750,000,000

Item 7. Description and location of property covered (if self insured):
N/A

Item 8. The Insurer shall be furnished with copies of all Underlying Insurance Policies and all endorsements thereto within thirty days of the receipt thereof by the Member Insured.

Item 9. Insureds:
Florida Power Corporation d/b/a Progress Energy Florida, Inc. and City of Alachua, Florida; City of Bushnell; City of Gainesville, Florida; City of Kissimmee, Florida; a Municipal Corporation, City of Leesburg, Florida; City of New Smyrna Beach, Florida; Florida and Utilities Commission; City of Ocala; Orlando Utilities Commission and City of Orlando; Seminole Electric Cooperative, Inc., and all contractors and subcontractors as their interest may appear.

Item 10. Loss Payee Clause

A. Expenses covered under the Nuclear Liability Coverage (subsection I.1(a)) shall be adjusted with the Member Insured and payable to:

Florida Power Corporation d/b/a Progress Energy Florida, Inc.

The Member Insured may, by written notice to the Insurer, designate other payees.

B. The expenses covered under the Debris Removal and Decontamination Coverage (subsection I.1(b)), the losses covered under the Property Damage Coverage (subsection I.1(c)), and the losses covered under the Functional Total Loss Coverage (subsection I.2(a)) shall be adjusted with the Member Insured and payable to:

For fire losses only - Loss, if any, shall be payable to Florida Power Corp d/b/a Progress Energy Florida and, except any loss to materials and supplies and except any particular loss less than $50,000 shall be payable:

1) 100% of settlement for property of others, contractors' equipment, debris removal or decontamination shall be made payable to Florida Power Corporation d/b/a Progress Energy Florida, Inc.

2) 91.8% of settlement for loss to, or repair or replacement of described property shall be made payable to the The Bank of New York, Mellon, (Mortgage Trustee) and 8.2% of such settlement shall be made payable to Florida Power Corporation d/b/a Progress Energy Florida, Inc.

The Member Insured may, by written notice to the Insurer, designate other payees.

C. Expenses covered under the Decommissioning Liability Coverage (subsection II.1) shall be adjusted with the Member Insured and payable to:

Florida Power Corporation Decommissioning Trust Fund

The Member Insured may, by written notice to the Insurer, designate other payees.

Item 11. Service of Process to Insured (see Section V.9(e)):

General Counsel
Florida Power Corporation d/b/a Progress Energy Florida, Inc.
c/o Duane Morris LLP
222 Delaware Avenue, Suite 1600
Wilmington, DE 19801-1659

NUCLEAR ELECTRIC INSURANCE LIMITED

DECONTAMINATION LIABILITY, DECOMMISSIONING LIABILITY AND EXCESS PROPERTY INSURANCE POLICY

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Policy No. X12-015

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

DECONTAMINATION LIABILITY, DECOMMISSIONING LIABILITY AND EXCESS PROPERTY INSURANCE POLICY

This Decontamination Liability, Decommissioning Liability and Excess Property Insurance Policy is made by and among the undersigned Member Insured (as hereinafter defined) and Nuclear Electric Insurance Limited, a Bermuda mutual company with limited liability.

The Insurer is only licensed in Bermuda and Delaware and the Insureds will not be protected by the guaranty funds of any U.S. jurisdiction.

The Member Insured will be required to execute the Policy in Delaware. The Policy will become effective only upon the acceptance of the delivery of the Policy by the Member Insured at the Insurer's office in Delaware.

INSURING AGREEMENT

In consideration of the premium paid, and subject to the terms and conditions of this Policy and any endorsements added hereto, the insurer agrees to pay the Member insured for certain expenses and costs resulting from Accidental Property Damage.

IN WITNESS WHEREOF, the Member Insured and the Insurer have caused this Policy to be executed and attested on their behalf.

INSURER:
Nuclear Electric Insurance Limited

Wilmington, Delaware

Date: As of April 1, 2012

By: _____
David B. Ripsom, President

Attest: _____

MEMBER INSURED:
Florida Power Corporation

Wilmington, Delaware

Date: As of April 1, 2012

By: _____
Attorney-in-Fact

Witness: _____

I. DECONTAMINATION LIABILITY AND EXCESS PROPERTY COVERAGE

1. The Insurer agrees to indemnify the Insureds and their legal representatives.

   (a) for all expenses necessarily incurred by the Insureds in discharging their legal obligation or liability to protect the public health and safety following Accidental Property Damage, as required by the Act, provided such expenses would otherwise be covered under paragraphs I.1(b) or I.1(c) hereof, but for this paragraph I.1(a);

   (b) for all expenses necessarily incurred by the Insureds to remove debris of and to decontaminate the Insured Property following Accidental Property Damage; and

   (c) for all other losses covered under the Underlying Insurance Policy;

   which, except with respect to Functional Total Loss Coverage, and as provided in subsection I.7 hereof, would be covered by such Underlying Insurance Policy if the limit of the Underlying Insurance Policy thereunder were not exhausted, but only to the extent that the amount of Accidental Property Damage exceeds the Attachment Point.

2. (a) In the event of Accidental Property Damage which (i) exceeds the Attachment Point and includes Nuclear Liability Coverage; (ii) is covered under paragraphs I.1of the Policy or would be covered under that paragraph but for the availability of insurance under the Underlying Insurance Policies; and (iii) results in permanent cessation of nuclear operations at a Unit, the Insurer agrees to indemnify the Insureds and their legal representatives for the Functional Value of the Unit following Accidental Property Damage.

   (b) If the Member Insured elects to receive the Functional Value of the Unit the Member will not be entitled to receive any additional recovery under the Property Damage Coverage of the Policy.

   (c) In the event that the Unit returns to commercial nuclear operation, the Insureds shall repay to the Insurer the entire amount paid pursuant to paragraph I.2(a), together with interest thereon, calculated quarterly at the 90-day United States Treasury Bill interest rate in effect on the first business day of each calendar quarter.

3. The Insureds' recovery under the Nuclear Liability Coverage or the Debris Removal and Decontamination Coverage shall not be decreased because the Actual Cash Value (or, if applicable, the Replacement Cost) of the Insured Property is less than the Insurer's limit of liability.

4. (a) Except as provided in paragraph I.4(b) below, the amount of insurance available for payment to the Insureds with respect to Losses under the Debris Removal and Decontamination Coverage, the Property Damage Coverage, or the Functional Total Loss Coverage prior to the completion of indemnification under the Nuclear Liability Coverage shall be calculated by subtracting the Specified Nuclear Liability Amount from the Amount specified in Item 6 of the Declarations, as such amount may be reduced pursuant to the terms of this Policy.

(b) At the request of the Insureds, the amount calculated in accordance with paragraph I.4(a) above may be increased to include an amount equal to all or part of the Specified Nuclear Liability Amount, but only to the extent of amounts for which the Member Insured attests that:

(i) the Insureds are entitled to claim under other valid and collectible insurance covering the same expenses covered by the Nuclear Liability Coverage;

(ii) the Insureds will claim under such other insurance and use such proceeds to discharge the Insureds' legal obligation or liability to protect the public health and safety following Accidental Property Damage, as required by the Act; and

(iii) the payment or use of all or part of the Specified Nuclear Liability Amount for Losses under the Debris Removal and Decontamination Coverage, the Property Damage Coverage, and/or the Functional Total Loss Coverage does not violate any regulation or order of the NRC.

5. (a) The Insurer shall be liable hereunder, whether or not an Underlying Insurance Policy provides coverage for Accidental Property Damage caused by:

(i) Windstorm, tornado or hurricane;

(i) Flood, including flood caused by or resulting from hurricane, tornado or windstorm; surface water, waves, tidal water, or tidal wave, overflow of streams or other bodies of water, or spray from any of the foregoing, all whether driven by wind or not, and release of water impounded by a dam at any location specified in the Underlying Insurance Policies (each of which is deemed a "Flood"); and

(iii) Earthquake, volcanic eruption, landslide, subsidence or sinking of land or other earth movement, settlement or other movement of foundations, at any locations specified in the Underlying Insurance Policies.

(b) Accidental Property Damage by windstorm, tornado or hurricane, flood, or earthquake or volcanic eruption shall constitute a single claim hereunder; provided, that

(i) if more than one windstorm, tornado or hurricane should occur within any period of ninety-six hours commencing during the term of this Policy, and such windstorms, tornados or hurricanes have a common origin or are caused by a single Accident, then such windstorms, tornados or hurricanes shall be deemed to be a single windstorm, tornado or hurricane within the meaning hereof;

(ii) if more than one Flood should occur within any period of ninety-six hours commencing during the term of this Policy and such Floods have a common origin or are caused by a single Accident, then such Floods shall be deemed to be a single Flood within the meaning hereof; and

(iii) if more than one earthquake shock or volcanic eruption shall occur within any period of ninety-six hours commencing during the term of this Policy and such earthquake shocks or volcanic eruptions have a common origin or are caused by a single Accident, then such earthquake shocks or volcanic eruptions shall be deemed to be a single earthquake or volcanic eruption within the meaning hereof.

(c) The Insurer is liable hereunder only to the extent that the amount of Accidental Property Damage exceeds the Attachment Point.

6. In the event that Accidental Property Damage under this Policy and under one or more Other Insurance Policies with insurance coverage effective during the Policy Year is caused directly or indirectly by any single Accident which is either listed in paragraph I.5 hereof, or which involves radioactive contamination, or by any Accident which ensues directly or indirectly from an Accident listed in paragraph I.5 hereof or from an Accident involving radioactive contamination, the Insureds agree that:

(a) The Insurer's liability for all such Accidental Property Damage shall not exceed the greater of (A) the Amount of Decontamination Liability, Decommissioning Liability and Excess Property Insurance Requested, as stated in Item 6 of the Declarations, or (B) the highest of the Amount of Decontamination Liability, Decommissioning Liability and Excess Property Insurance Requested stated in the Declarations of the Other Insurance Policies providing coverage with respect to the same Accident.

(b) The Insurer's liability under this Policy shall be the amount determined under paragraph I.6(a) above times a fraction, the numerator of which is

the Insurer's liability for the Accidental Property Damage under this Policy but for this subsection I.6, and the denominator of which is the sum of the Insurer's liability for the Accidental Property Damage under this Policy and all Other Insurance Policies, but for this subsection.

7. Notwithstanding any other provision of this Policy, the Insurer's liability under this Policy shall be the amount payable to the Insureds, but for this provision, less any amount owed to the Insurer by the Insureds, including any Retrospective Premium Adjustment due under this Policy, due under any Other Insurance Policy as such Member Insured may have with the Insurer, or referred to in subsection VI.6.

II. DECOMMISSIONING LIABILITY COVERAGE

1. The Amount of Decommissioning Liability Coverage under this Policy for a Unit shall be equal to the Shortfall for such Unit calculated by using the Decommissioning Target Amount as of the Settlement Date set forth in the Decommissioning Target Document and the amount of the Decommissioning Trust Fund as of the Settlement Date.

2. In the event of Accidental Property Damage which (i) exceeds the Attachment Point and includes Nuclear Liability Coverage; (ii) is covered under paragraph I.1 of this Policy or would be covered under that paragraph but for the availability of other insurance under the Underlying Insurance Policies; and (iii) results in permanent cessation of nuclear operations at the Unit, the Insurer agrees to indemnify the Insureds and their legal representatives for estimated expenses necessarily to be incurred in decommissioning the Unit as described in the Decommissioning Target Document, up to the Amount of Decommissioning Liability Coverage for the Unit determined under subsection II.1 above.

3. Any amounts payable by the Insurer pursuant to subsections II.1 and II.2 shall be deposited into the Decommissioning Trust Fund pursuant to Item 10C of the Declarations. The calculation of the Amount of Decommissioning Liability Coverage shall be made with respect to any claim under subsection II.1 once the Member Insured has certified that the Insureds have discharged their legal obligation or liability to protect the public health and safety, as required by the Act. No payment shall be made with respect to any claim under subsection II.1 until the Member Insured has certified that the Insureds have discharged their legal obligation or liability to protect the public health and safety following Accidental Property Damage, as required by the Act, or has made the attestations referred to in paragraph V.13(b).

4. In the event that the Unit returns to commercial nuclear operation, the Insureds shall return to the Insurer the entire amount paid pursuant to this Section II, together with interest thereon, calculated quarterly at the 90-day United States Treasury Bill interest rate in effect on the first business day of each calendar quarter.

5. The Insureds' recovery under the Decommissioning Liability Coverage shall not be decreased because the Actual Cash Value (or if applicable, the Replacement Cost) of the Insured Property is less than the Insurer's limit of liability.

III. EXCLUSIONS

A. WAR RISK

1. Subject to paragraph 2 below, the coverage provided under this Policy does not apply to Property Damage caused directly or indirectly by:

   (a) hostile or warlike action in time of peace or war, including action in hindering, combating or defending against an actual, impending or expected attack by any government or sovereign power (de jure or de facto), or by any authority maintaining or using military, naval or air forces; or by military, naval or air forces; or by an agent of any such government, power, authority or forces;

   (b) any weapon of war employing nuclear fission or fusion whether in time of peace or war; or

   (c) insurrection, rebellion, revolution, civil war, usurped power, or action taken by governmental authority in hindering, combating or defending against such an occurrence.

2. This War Risk Exclusion shall only apply to acts which are part of overt military activity.

B. OTHER

Notwithstanding any other provision in this Policy, the Insurer shall not be liable for any sums, which the Insured may be obligated to pay as damages:

   (a) because of bodily injury or personal injury; or

   (b) because of damage to property not described in the Declarations, or covered by the Underlying Insurance Policies; or

   (c) for which the Insured is covered or would be entitled to coverage under a nuclear energy liability policy issued by American Nuclear Insurers, Nuclear Energy Liability Insurance Association, Mutual Atomic Energy Liability Underwriters or other third party liability insurer or other third party entity.

IV. PREMIUM

1. The Member Insured agrees to pay to the Insurer the Premium under the terms and conditions hereinafter set forth. The Premium shall be paid to the Insurer by wire transfer or other method acceptable to the Insurer on or before the beginning of the policy period specified in Item 3A of the Declarations.

2. As a condition precedent to the Insurer's obligations under this Policy, the Member Insured agrees to notify the Insurer that the Insured Property has been classified Category Number Five by the Institute of Nuclear Power Operations ("INPO"), within seven (7) days of being advised by INPO of such classification being put in place, and to pay such additional Premium due hereunder to the Insurer as a result thereof by wire transfer or other method acceptable to the Insurer within twenty (20) business days after demand.

3. The Member Insured further agrees to pay the Insurer the Retrospective Premium Adjustment under the terms and conditions specified under Section VI.

V. CONDITIONS

1. Abandonment. There shall be no abandonment to the Insurer of any property.

2. Aggregate Limit of Liability and Reinstatement of Policy Amount by Loss. Notwithstanding any other provision in this Policy, the Insurer's liability under this Policy shall not exceed the Amount of Decontamination Liability, Decommissioning Liability and Excess Property Insurance Requested, as stated in Item 6 of the Declarations. In the case of an Accident covered hereunder, the amount of insurance under this Policy shall be automatically endorsed to its original amount at no additional premium for any subsequent Accident within the Policy Year.

3. Application Form. The application for membership, insurance and undertaking with respect to membership and purchase of insurance made by the Member Insured with respect to becoming a Member of the Insurer, as the same may be amended from time to time (hereinafter referred to as the "Application"), is made as much a part hereof as if the Application were fully set forth herein.

4. Appraisal. In case the Member Insured and the Insurer shall fail to agree as to the amount of Property Damage, then, on the written demand of either, each shall select a competent and disinterested appraiser and notify the other of the appraiser selected within twenty (20) days of such demand. The two appraisers so selected shall first select a competent and disinterested umpire; and failing for fifteen (15) days from the date of selection of the second appraiser to agree upon such umpire, then on request of the Member Insured or the Insurer, such umpire shall be selected by a judge of the United States District Court for the district in which the Insured Property is located. The appraisers shall then appraise the Property

Damage, stating separately Actual Cash Value or, if recovery under the Underlying Insurance Policies is on a Replacement Cost basis, the Replacement Cost, and amount of Property Damage to each item; and, failing to agree, shall submit their differences, only, to the umpire. An award in writing, so itemized, of any two when filed with the Insurer shall determine the amount of Property Damage. Each appraiser shall be paid by the party selecting him and the expenses of appraisal and of the umpire shall be paid equally by the Member Insured on the one hand and the Insurer on the other.

5. Assignment. Assignment of this Policy or any rights hereunder shall not be valid except with the prior written consent of the Insurer.

6. Choice of Law.

   (a) In view of the diverse locations of the parties hereto and the desirability of unified regulation, the Insureds and Insurer agree that the terms of this Policy shall determine their respective rights and duties and that this Policy shall be construed and enforced in accordance with and governed by the internal law of the State of New York, United States of America.

   (b) The parties intend that the Insurer conduct its activities so as not to be subject to the insurance regulation of any jurisdiction other than Bermuda and Delaware. Accordingly, the parties expressly recognize and agree that paragraph (a) above does not evidence an intent by the parties to

      (i) give jurisdiction over the Insurer to the insurance regulatory authority of any jurisdiction other than Bermuda and Delaware; or

      (ii) make applicable to this Policy any of the insurance laws or regulations (including those which specify the terms of the by-laws and contracts of mutual insurance companies) of any jurisdiction, including New York, other than to the extent such laws of Bermuda and Delaware are applicable; or

      (iii) otherwise have the laws of Bermuda or Delaware apply to the construction or enforcement of this Policy.

7. Concealment, Fraud. The Insurer shall have no obligation to make any payments under this Policy if, whether before or after an Accident, any Insured has willfully concealed or misrepresented in writing any material fact or circumstance concerning this insurance or the subject thereof, or the interest of any Insured therein, or in case of any fraud or false swearing by any Insured relating thereto; but the application of this provision shall not affect the Member Insured's obligation to pay the Retrospective Premium Adjustment callable by the Insurer under this Policy, or provide other assurances to the Insurer pursuant to Section VI.2.

8. Currency. All payments required to be made under this Policy by the Member Insured or the Insurer shall be made in United States dollars.

9. Dispute Resolution.

(a) The Insurer and the Insured mutually acknowledge that the form, terms and conditions of the Policy have been formulated by representatives of the companies participating in the mutual enterprise in order to provide insurance coverage which is vital to all participants. It is desired that the Insurer serve as a financially stable and reliable entity, responsive to the coverage needs of its participants, and providing coverage fairly and equitably as to each Insured, but taking equally into account fairness and equity as to all Insureds as a group. While every effort has been made to define with clarity and precision the scope of coverage and other policy provisions, the Insurer and the Insured mutually acknowledge that situations may arise where the terms of the Policy, or the interpretation of the terms, are disputed. For the foregoing reasons, the Insurer and the Insured agree that the following principles shall govern the interpretation of the Policy:

(1) Even-handedness and fairness to both the Insurer and the Insured;

(2) In the event of an ambiguity in a policy provision, the intentions of the Insurer and the Insured shall be considered by the Arbitrator(s). Evidence of such intentions is limited to the following extrinsic evidence: reports, notes, meeting minutes, and related materials produced by or given to the Insurer's Board of Directors, Advisory Committees, and Task Forces, and any testimony taken from a present or former employee of the Insurer, member of a Member Advisory Committee, or Director;

(3) The practice of the Insurer and the Insured in interpreting and applying the Policy;

(4) The cooperative rather than adversarial relationship between the Insurer and the Insured; and

(5) The contract construction rule of contra proferentem (construing a contract against the drafter) is not applicable to this insurance policy.

b) The Insurer and Insured will endeavor to resolve any dispute between them by means of a voluntary process to be agreed upon between them, including, without limitation, early neutral evaluation, mediation, mini-trial, neutral fact finding, or senior peer review. Neither the Insurer nor the Insured may be compelled to participate in any such voluntary process except that, at the request of an Insured, the Insurer agrees to submit the dispute to senior peer

review. The Insurer agrees to pay the fees and expenses of any neutral party associated with the use of any process hereunder. Senior peer review is a process in which both sides present their arguments and view of the evidence to a panel of five (5) employees of other NEIL Members, unless the Insured and Insurer agree that a panel of three (3) would be more appropriate. The panel will provide a written non-binding opinion on the merits of the dispute. Though not an exclusive list, panel members may include individuals from NEIL's Member Representatives, Board of Directors, Member Advisory Committees, or Members' Legal Counsel. None of the panelists may be employed by a Member that is an affiliate of the Insured involved in the dispute. The panelists shall be selected by agreement of the Insured and Insurer, but if no agreement is reached within 30 days of the date the senior peer review is requested, the Insurer and Insured shall each submit a list of five names and a NEIL outside Director (as chosen by the Chairman of the Board) shall select the panelists. The panel, with input from the parties, shall establish a schedule for the proceeding, including, if appropriate, the submittal of written materials and oral arguments.

c) The Statement of Dispute Resolution Principles adopted by the Insurer's Board of Directors and Members, as it may be amended from time to time, shall not create any rights or obligations on the parties but shall be used as guidelines for conducting dispute resolution processes hereunder.

d) Any dispute, controversy or claim between the Insurer and the Insured as to any matter arising out of or relating to this Policy, or the breach, termination or invalidity thereof, which is not settled between themselves, pursuant to paragraph 2 above or otherwise, shall be settled by arbitration in accordance with the United Nations Commission on International Trade Law's (UNCITRAL) Arbitration Rules. Arbitration of a dispute is final and binding.

(1) The number of arbitrators shall be one, unless the Insured or the Insurer requests a three-person panel, in which case the number of arbitrators shall be three.

(2) In the event the arbitration is to be decided by a single arbitrator, and the parties cannot agree on the appointment of that arbitrator within sixty (60) days of the notice of arbitration being served, the sole arbitrator shall be selected by the appointing authority specified in paragraph 4.d.

(3) In the event the arbitration is to be decided by three arbitrators, the Insured shall appoint one arbitrator and the Insurer another; the two so appointed arbitrators shall select the third, who will act as the Chairman for the panel. The party which files the notice of arbitration shall include in such notice the identity of its party-appointed arbitrator. Within forty-five (45) days of service of the

notice of arbitration, the second party shall notify the party that filed the notice of arbitration of the identity of its party-appointed arbitrator. At the time of the notification of the appointment, each side shall provide the other with a detailed curriculum vitae for the selected arbitrator, which shall include information regarding any potential conflict of interest of the selected arbitrator, including any financial or personal interest in the result of the arbitration or any past or present relationship with the parties or their representatives. All arbitrators shall be obligated to update his/her potential conflict of interest information throughout the arbitration. If (i) the party filing the notice of arbitration fails to include the identity of its party-appointed arbitrator, or (ii) the second party does not notify the first party of its party-appointed arbitrator within forty-five (45) days of service of the notice of arbitration, or (iii) the two party-appointed arbitrators fail to agree on a third arbitrator within a period of sixty (60) days from the date of appointment of the second arbitrator, then, on request of either party, the missing party-appointed arbitrator or the third arbitrator (as the case may be) shall be selected by the appointing authority specified in paragraph 4.d. There shall be no *ex parte* communications between a party and any of the arbitrators, except that a party-appointed arbitrator shall be permitted to communicate with the party that appointed him/her concerning (1) the identity of the Chairman and (2) issues associated with arbitrator invoices.

(4) The appointing authority shall be the American Arbitration Association ("AAA") in New York, New York. The AAA shall select arbitrators from the panel of international arbitrators for the International Centre for Dispute Resolution, the international division of the AAA (the "ICDR Roster"). The arbitrators selected from the ICDR Roster shall be U.S. nationals. If for any reason the AAA fails to appoint an arbitrator within thirty (30) days of the date of receipt of the request for such appointment, either party may proceed pursuant to Article 75 of the Civil Practice Law and Rules of the State of New York and make application to the Supreme Court of the State of New York, County of New York for the appointment of the arbitrator.

(5) To the extent there is any inconsistency between the UNCITRAL Arbitration Rules and the provisions of this Policy, the latter shall govern.

(6) The place of the arbitration shall be New York, New York, unless the parties agree upon another location.

(7) Within forty-five (45) days after the appointment of the Chairman, the arbitrators shall conduct an initial conference to which the parties

will be invited to attend. At the initial conference, the parties and arbitrators shall discuss, without limitation, (1) the procedures to be followed, (2) scheduling of submissions and hearings, and (3) a timetable for discovery. At a minimum, the discovery order shall require the parties to provide each other non-privileged documents that are requested by the other side and that reasonably relate to the claims and defenses asserted in the arbitration. Following the initial conference, the arbitrators shall issue a Procedural Order to the parties setting forth the procedures and schedule.

(8) Within sixty (60) days of the close of the hearings (or the later of post-hearing oral argument or post-hearing written submissions should the arbitrators authorize them), the arbitrators shall issue their award, which shall be in writing and shall present a detailed statement of the factual and legal bases for the award. The award of the arbitrators shall require a majority of two votes. The arbitrators shall first determine the liability of the parties as to the dispute, claim or controversy, and then, only if necessary, determine the type and amount of relief to be granted. In no case may the arbitrators order the rescission or reformation of this Policy. Further, unless the arbitrators determine that it is inappropriate under the circumstances of the case, the award shall provide that post-award interest shall begin to accrue at the rate of the Prime Rate, as published in the Wall Street Journal as of the date of the award, plus two (2) percent per annum from the date sixty (60) days after the award is delivered to the parties until the date the award is paid.

(9) The arbitrators shall award reasonable attorney's fees and costs to the prevailing party, not to exceed the amount of fees and costs incurred by the non-prevailing party. For this purpose, the fees incurred shall be calculated at reasonable hourly billing rates and shall include all reasonable out-of-pocket expenses, including, without limitation, the reasonable costs of expert witnesses and consultants. If the Insured has retained counsel on a contingency fee basis, and the Insurer is the prevailing party, the arbitrators shall award the Insurer all of its reasonable attorney's fees and costs (without consideration of the fees and costs incurred by the Insured).

(10) In the event the award is challenged in court and the challenge is denied, the party that challenged the award shall pay the reasonable attorney's fees and costs incurred by the non-challenging party in defending against the challenge to the award.

(11) The parties acknowledge that any dispute resolution proceeding is intended to be confidential and therefore agree to properly maintain and not disclose or reveal any information obtained from the other

party pursuant to the terms of a Confidentiality Agreement to be executed between the parties at the beginning of the proceeding (the terms of which shall be determined by the arbitrators in the event that the parties are unable to agree). In the case of arbitration, the written decision of the arbitrator(s) shall be available to other Insureds of NEIL and ONEIL, except that any information within the written decision that the Insured can show is proprietary in nature will be redacted.

e) To the extent that any dispute, claim or controversy between the Insured and the Insurer hereunder is not subject to arbitration for any reason, or to the extent that applicable law otherwise permits the parties to seek provisional relief from the courts prior to the time that the arbitral panel is appointed, the United States District Court for the Southern District of New York (or the Supreme Court of the State of New York, New York County, if federal jurisdiction cannot be attained) shall have exclusive jurisdiction thereof. For such purpose, the Insured agrees to accept, without objection to form or manner, service of process by registered mail or form of overnight mail to the person identified in Item 11 of the Declarations. For such purpose, the Insurer agrees to accept, without objection to form or manner, service of process by registered mail, or overnight mail, directed to the Insurer's General Counsel, at Nuclear Electric Insurance Limited, 1201 Market Street, Suite 1100, Wilmington, Delaware 19801. The foregoing consents to service of process are not intended, nor shall they be construed, to extend to any dispute, claim, controversy, cause of action, or other matter other than as stated in this paragraph.

10. Errors and Omissions. No inadvertent error, omission or failure in furnishing reports hereunder shall prejudice the Insureds' right of recovery, but shall be corrected when discovered.

11. Headings. The headings in this Policy are inserted for convenience only and shall not be deemed to constitute a part hereof.

12. Evaluations and Compliance with Loss Control Standards

(a) The Insurer shall be permitted, but not obligated, to perform or to have performed on its behalf, evaluations of the Insured Property at any reasonable time. All evaluations and evaluation reports made by or on behalf of the Insurer are made solely for insurance purposes. Evaluation reports are based upon the conditions, practices and property observed and information made available at the time of the evaluation, and shall not be deemed to identify all hazards or to indicate that other hazards do not exist. The Insurer and those performing evaluations on its behalf shall not be responsible for the correction or control of any conditions, practices or property. Notwithstanding any other agreement, express or implied, to the contrary,

neither the right to make an evaluation nor the making of an evaluation, nor any advice or report resulting therefrom, shall constitute or be construed as an undertaking on behalf of or for the benefit of the Insureds or others to determine or warrant that the facilities, operations or property are safe or healthful, or are in compliance with any law, rule, regulation, procedure or standard. It shall be the obligation of the Insureds to ensure that the Insurer is accorded the right to conduct an evaluation under this paragraph.

(b) Notwithstanding the provisions in Paragraph V.12.e, upon discovery of a dangerous condition (the "Dangerous Condition) with respect to any property, or part thereof, insured under this Policy or a Primary Policy issued by the Insurer for Site insured under this Policy (the "Affected Property"), whether discovered as a result of an evaluation or otherwise, a representative of the Insurer may

(1) request that the Affected Property be taken out of service without delay, and/or

(2) request that actions be taken to remedy the Dangerous Condition.

(c) If a request made under Paragraph V.12.b is not complied with, the Insurer may immediately suspend coverage as to the Affected Property and/or as to Property Damage that could have been avoided or reduced had the Dangerous Condition been remedied, provided, however, that there will be coverage for Property Damage if the Insured can demonstrate that the Property Damage was unrelated to the failure to take the requested action (and there is otherwise coverage under this Policy). Notice of the suspension (which may be made together with either request referred to in Paragraph V.12.b) shall be written and, notwithstanding any other provisions under this Policy, may be sent to the Member Insured by hand delivery, e-mail, fax or courier.

(d) It shall be an obligation under this Policy that the Insured comply with the SHALL Requirements contained in the Insurer's Loss Control Standards.

(e) If the Insurer learns of an Insured's failure to comply with, or to take agreed upon actions in accordance with the agreed upon Resolution Plan to correct a failure to comply with, a SHALL Requirement contained in the Insurer's Loss Control Standards, and, as a result and in accordance with the terms of a Primary Policy issued by the Insurer for the Site insured under this Policy the Insurer suspends coverage under that Primary Policy, such suspension of coverage shall apply with equal force and effect to this Policy. The Insurer shall notify the Insured of a suspension of coverage under this Policy in the same notice sent by the Insurer concerning suspension under the Primary Policy. Upon reinstatement of coverage under the Primary Policy, coverage shall be reinstated under this Policy in accordance with the provisions of Paragraph (i) of this Section.

(f) If the Insured requests that coverage be removed under a Primary Policy issued by the Insurer for the Site insured under this Policy, such removal of coverage shall have equal effect under this Policy, with the precise scope of such removal to be described in an endorsement to this Policy or as set forth in writing and delivered to the Insured.

(g) Any suspension of coverage under Paragraphs V.12.c and V.12.e of this policy shall be in accordance with the scope of coverage suspension set forth in writing and delivered to the Insured.

(h) The Insurer may immediately suspend coverage under this Policy, in whole or in part, with respect to the Insured Property if (i) the NRC suspends or revokes for any reason the operating license issued with respect to any Unit on such Insured Property, or (ii) the NRC issues a shutdown order with respect to such Unit, or (iii) the NRC issues a confirmatory order keeping such Unit shut down. In the event that the Insurer chooses to suspend coverage under this provision, it shall notify the Member Insured in writing of that decision.

(i) The coverage suspended in accordance with Paragraphs V.12.c and V.12.e above, as well as any coverage removed, may be reinstated by the Insurer, but only by an endorsement issued to form a part of this Policy. The suspension of the insurance under this Policy will not affect the obligation of the Member Insured to pay the Retrospective Premium Adjustment callable by the Insurer under this Policy, or provide other assurances to the Insurer pursuant to Section VI.2.

13. Loss Payments

(a) Except as provided in subsection V.13.(b) below, it is agreed that payment under this Policy shall be made in the following order:

(i) Losses under Nuclear Liability Coverage.

(ii) Losses under Decommissioning Liability Coverage pursuant to Section II of the Policy.

(iii) Losses under the Debris Removal and Decontamination Coverage, the Property Damage Coverage, and the Functional Total Loss Coverage.

(b) Payment under this Policy may be made with respect to Losses under the Decommissioning Liability Coverage, Debris Removal and Decontamination Coverage, the Property Damage Coverage, and/or Functional Total Loss Coverage prior to completion of indemnification

under the Nuclear Liability Coverage only on the condition that the Member Insured attests that:

(i) no proceeds of this Policy in excess of an amount specified by the Insureds, except as provided in a Proof of Loss filed with the Insurer, are needed to discharge the legal obligation or liability of the Insureds to protect the public health and safety following Accidental Property Damage, as required by the Act; and

(ii) the payment or use of policy proceeds for Losses under the Decommissioning Liability Coverage, Debris Removal and Decontamination Coverage, the Property Damage Coverage, and/or the Functional Total Loss Coverage does not violate any regulation or order of the NRC.

(c) No payments shall be made pursuant to Section I until (i) all amounts payable under all Underlying Insurance Policies have actually been expended for the types of losses and expenses covered thereunder or designated for the type of expenses covered under paragraph I.1(a) or II., and (ii) at least the amount of the Attachment Point has actually been expended for the types of losses and expenses covered under paragraphs I.1(b) or I.1(c) or designated for the type of expenses covered under paragraph I.1(a) hereof.

14. Notifications

(a) The Member Insured shall promptly notify the Insurer in the event that any of the Units specified in Item 7 of the Declarations or in the Declarations of the Primary Underlying Insurance Policy is to permanently cease operations prior to the scheduled expiration of such Unit's operating license.

(b) Policy Modifications. This Policy embodies all agreements between the Member Insured and the Insurer or any of their agents relating to this insurance. There shall be no change in the terms, provisions and stipulations of this Policy except in writing hereon or by endorsement added hereto by agreement of the Insurer and the Member Insured. No amendment to the Primary Underlying Insurance Policy shall increase the Insurer's liability under this Policy without the prior written consent of the Insurer. The granting of such consent shall be wholly within the discretion of the Insurer.

(c) Policy Decisions and Notice. Except as provided in paragraph 16 of Section V of this Policy, all decisions or actions made or taken with respect to this Policy may only be taken or made by the first named Member Insured and all such decisions or actions shall be binding on all Insureds. Such decisions or actions shall include, without limitation,

decisions to give or not give notices of accidents, to file or not file proofs of loss and to bring or not bring an action under the dispute resolution provision. No decision or action with respect to this Policy may be made or taken by anyone other than the Insurer and the first named Member Insured. The first named Member Insured shall be that Member Insured whose name is listed first in Item 1 of the Declarations. The Insurer and the Insureds agree that all communications between them as to any matter arising under or relating to this Policy shall be made as follows:

(i) If to the Insurer: The communication must be sent by the first named Member Insured and must be sent, by facsimile, mail or delivery to the Insurer by the Member Insured's Delaware Representative at the address listed in Item 2 of the Declarations.

(ii) If to the Insureds: The communication must be sent by the Insurer to the first named Member Insured and must be sent, by facsimile, mail or delivery to the address of the Member Insured's Delaware Representative. It shall be the obligation of the first named Member Insured to communicate the contents of any notification from the Insurer to the other Insureds.

The Insured's compliance with the provisions of paragraph (c) is a condition precedent to the Insurer's obligations under this Policy.

(d) Reports. The Member Insured hereby consents, and shall obtain the consent of the Operator, to the Insurer having access to INPO's final Evaluation Reports at the same time such Reports are sent to the Member Insured or the Operator by INPO.

15. Other Insurance.

(a) With respect to a Loss for Accidental Property Damage covered by the Underlying Insurer (a "Joint Loss"), (i) upon receiving payment under this Policy with respect to a Joint Loss, the Insured hereby assigns to the Insurer the proceeds received or receivable under the Underlying Insurance Policies providing insurance coverage to the Insured with respect to the Joint Loss, but only to the extent that the availability of such proceeds would have reduced the Insurer's ultimate liability for the Joint Loss; and (ii) in determining whether the Insurer has paid its share of the Joint Loss, the amounts actually paid by the Insurer shall be reduced by any amounts received by the Insurer from the Insured or the Underlying Insurer providing insurance coverage to the Insured with respect to the Joint Loss in accordance with (i) above.

16. Requirements in Case of Accidental Property Damage.

(a) It shall be the obligation of the Insureds to give or cause to be given immediate detailed written notice to the Insurer of any Accidental Property Damage and to protect the Insured Property from further damage. The Insureds shall separate or cause to be separated, with reasonable promptness, the damaged and undamaged Insured Property, put it in the best possible order, furnish a complete inventory of the destroyed, damaged and undamaged Insured Property, showing in detail quantities, costs, Actual Cash Value or, if recovery under the Underlying Insurance Policies is on a Replacement Cost basis, the Replacement Cost, the estimated amount of Property Damage claimed, and the Functional Value of the Unit. The Insurer may deny coverage for such Accidental Property Damage if the Insured fails to comply with its obligation to provide immediate written notice thereof, but only if the Insurer demonstrates being prejudiced in its ability to adjust, assess or otherwise investigate the claim as a result of such failure.

(b) Within twelve (12) months after the amount of Accidental Property Damage exceeds the Attachment Point, unless such time is extended in writing by the Insurer, the Insureds shall complete and file with the Insurer a proof of loss ("Proof of Loss"), in the form approved by the Insurer, signed and sworn to by the Member Insured, stating the knowledge and belief of the Insureds as to the following:

(i) with respect to Losses under the Nuclear Liability Coverage, the time and origin of the Accidental Property Damage resulting in such Losses, all other contracts of insurance, whether valid or not, covering the risks insured hereunder, the amount of expenses incurred in discharging the Insureds' legal obligation or liability to protect the public health and safety following Accidental Property Damage, as required by the Act, and an attestation by the Member Insured as to the Insureds' obligation or liability to incur such expenses;

(ii) with respect to Losses under the Debris Removal and Decontamination Coverage and/or the Property Damage Coverage, the time and origin of the Accidental Property Damage, the interest of the Insureds and of all others in the Insured Property, the Actual Cash Value or, if recovery under the Underlying Insurance Policies is on a Replacement Cost basis, the Replacement Cost of each item thereof and the amount of Property Damage thereto, all cumbrance thereon, all other contracts of insurance, whether valid or not, covering any of said Insured Property, and changes in the title, use, occupation, location, possession or exposures of said Insured Property since the issuance of this Policy, by whom and for what purpose any building herein described and the several parts thereof

were occupied at the time of the Accident resulting in the Loss and whether or not it then stood on leased ground, and the Insureds shall furnish the Insurer a copy of all descriptions and schedules in all other policies and, if required, verified plans and specifications of any building, fixtures or machinery destroyed or damaged, and an attestation by the Member Insured that (a) no proceeds of this Policy or no proceeds of this Policy in excess of the Specified Nuclear Liability Amount, except as provided in a Proof of Loss filed with the Insurer, are needed to discharge the legal obligation or liability of the Insureds to protect the public health and safety following Accidental Property Damage, as required by the Act; and (b) the payment of policy proceeds for Losses under the Debris Removal and Decontamination Coverage and/or the Property Damage Coverage does not violate any regulation or order of the NRC;

(iii) with respect to Losses under the Functional Total Loss Coverage, the time and origin of the Accidental Property Damage necessitating the cessation of the Unit's operation, the interest of the Insureds and of all others in the Insured Property, the Functional Value of the Unit at the time of the Accident, all encumbrances thereon, all other contracts of insurance, whether valid or not, covering any of said Insured Property and/or the risks insured hereunder, and changes in the title, use, occupancy, location, possession or exposures of said Insured Property since the issuance of this Policy, by whom and for what purpose any building herein described and the several parts thereof were occupied at the time of the Accident resulting in the Loss, and the Insureds shall furnish the Insurer a copy of all descriptions and schedules in all other policies and, if required, verified plans and specifications of any building, fixtures or machinery whether damaged or undamaged, and an attestation by the Member Insured that (a) no proceeds of this Policy or no proceeds of this Policy in excess of the Specified Nuclear Liability Amount, except as provided in a Proof of Loss filed with the Insurer, are needed to discharge the legal obligation or liability of the Insureds to protect the public health and safety following Accidental Property Damage; (b) the Unit incurring the Accidental Property Damage has permanently ceased operation; and (c) the payment of policy proceeds under the Functional Total Loss Coverage does not violate any regulation or order of the NRC; and

(iv) with respect to Losses under the Decommissioning Liability Coverage, the time and origin of the Accidental Property Damage necessitating the cessation of the Unit's operation, all other contracts of insurance, whether valid or not, covering the risks insured hereunder, the current balance of the Decommissioning

Trust Fund, the Decommissioning Target Amount, a copy of the Decommissioning Target Document, if requested by the Insurer, and an estimate of the expenses to be incurred in decommissioning the Unit, and an attestation by the Member Insured that (a) no proceeds of this Policy except as provided in a Proof of Loss filed with the Insurer, are needed to discharge the legal obligation or liability of the Insureds to protect the public health and safety following Accidental Property Damage; (b) the Unit incurring the Accidental Property Damage has permanently ceased operation; and (c) that payment under the Decommissioning Liability Coverage does not violate any regulation or order of the NRC.

(c) It shall be the obligation of the Insureds to exhibit or cause to be exhibited, to any person designated by the Insurer, as often as may be reasonably required, all that remains of any Insured Property, and submit to examinations under oath by any person named by the Insurer, and subscribe the same; and, as often as may be reasonably required, shall produce for examination all books of account, bills, invoices and other vouchers, or other documents needed by the Insurer to determine its liability, or certified copies thereof if originals be lost, at such reasonable time and place as may be designated by the Insurer or its representative, and shall permit extracts and copies thereof to be made.

(d) Any failure on the part of the Operator to comply with the requirements of paragraph V.16(c) shall be deemed a breach of this obligation on the part of the Insureds.

17. State Premium Tax. The Insureds represent that they have paid or will pay any applicable state premium tax.

18. Subrogation.

(a) Except as provided in paragraph V.18(b) below, the Insurer may require from the Insureds an assignment of all right of recovery against any party for Accidental Property Damage to the extent that payment therefore is made by the Insurer; however, prior to an Accident, the Insureds may waive in writing any or all right of recovery against any party for Accidental Property Damage.

(b) The Insurer hereby waives any right of subrogation acquired by reason of any payment under this Policy arising out of any Accidental Property Damage covered hereunder against the Insureds and any party furnishing services, materials, parts, or equipment in connection with the planning, construction, maintenance, operation or use of the Insured Property.

(c) It is a condition of this Policy that the Insureds shall repay the Insurer any recoveries made by the Insureds on account of any Accidental Property

Damage to the extent that the Insurer would have been entitled to such recoveries had this waiver not been included in this Policy; provided, however, the proceeds of any such recovery shall be applied first to any uncompensated Property Damage incurred by the Insureds, including reimbursement of any deductible amount under this Policy, and then, to the extent any proceeds of such recovery remain, to reimburse the Insurer for any payments made by it to the Insureds.

19. Suit. No suit, action, or proceeding on this Policy for the recovery of any claim shall be sustainable in any court of law or equity or arbitral tribunal unless all the requirements of this Policy shall have been complied with, and unless commenced within twelve (12) months after the amount of the Accidental Property Damage exceeds the Attachment Point; provided, however, an extension of time for rendering a Proof of Loss granted by the Insurer with respect to any Accident shall extend the twelve-month period for bringing suit with respect to such Accident by the period of such extension.

20. Term and Cancellation

(a) This Policy shall commence on the date specified in Item 3A of the Declarations and shall terminate on the date specified in Item 3A of the Declarations. This Policy shall be automatically renewed for successive one-year terms, however either party may cancel this Policy by providing written notice to the other party by registered mail at least three months prior to any anniversary.

(b) This Policy may be canceled at any time by the Insurer, upon approval of its Board of Directors, upon sixty (60) days' written notice of cancellation mailed or delivered to the Member Insured, with or without tender of the excess of paid premium above the pro rata premium for the expired time, which excess, if not tendered, shall be refunded on demand. Notice of cancellation shall state that said excess premium, if not tendered, will be refunded on demand.

(c) This Policy shall be automatically canceled if (i) the INPO membership of either the Member Insured or the Operator is suspended or canceled by INPO for any reason and (ii) the Member Insured fails to notify the Insurer within five business days after receipt of notice of such suspension or cancellation of membership in INPO, unless the Insurer is otherwise notified during such five business days.

(d) In the event that the Member Insured fails to pay to the Insurer any Retrospective Premium Adjustment due under this Policy, due under any Other Insurance Policy as such Member Insured may have with the Insurer, or referred to in Section VI, this Policy shall terminate provided that the Insurer notifies the Member Insured in writing of this delinquency

and the Member Insured fails to make the required payment within 15 days after receiving such notice by registered mail.

(e) Cancellation or termination of the Underlying Insurance Policy by the Underlying Insurer automatically cancels or terminates this Policy.

(f) Neither the cancellation of the Policy on the part of the Member Insured or the Insurer, nor its automatic termination, shall affect the obligation of the Member Insured to pay the Retrospective Premium Adjustment callable by the Insurer under this Policy, or provide other assurances to the Insurer pursuant to Section VI.2.

21. Valuations

For purposes of this Policy, except where the Underlying Insurance Policies are written on an Actual Cash Value basis, the value of the Insured Property at the time of an Accident shall be the Replacement Cost of such Insured Property, but only if such Insured Property as is damaged or destroyed is replaced with identical or like kind property on the same premises and intended for the same occupancy and use, and used in connection with a nuclear facility. In all other cases, the value of the Insured Property at the time of the Accident shall be the Actual Cash Value of such Insured Property as is damaged or destroyed, notwithstanding that the Policy may refer to the Replacement Cost of such Insured Property.

22. When Loss Payable.

(a) With respect to Losses under paragraph I.1 and I.2(a), the amount for which the Insurer may be liable shall be payable as soon as practicable and in any event within sixty (60) days after the Proof of Loss, as herein provided, is received by the Insurer and ascertainment of the Loss is made either by agreement between the Member Insured and the Insurer expressed in writing, or by the filing with the Insurer of an award as herein provided. Where only partial Proof of Loss has been provided to the Insurer and the Insurer's liability for the Accidental Property Damage is uncontested, the Insurer may, in its sole discretion, make partial payment to the Insured. Nevertheless, the Insurer shall have no obligation to make such partial payment.

(b) With respect to Losses under Section II, payment shall be made within sixty (60) days after the later of the filing by the Member Insured with the Insurer of the Proof of Loss, as provided herein, or filing by the Member Insured of certification that the Insureds have discharged their legal obligation or liability to protect the public health and safety following Accidental Property Damage, as required by the Act, and ascertainment of the Loss is made by written agreement between the Member Insured and the Insurer or the filing of an award as herein provided.

VI. RETROSPECTIVE PREMIUM ADJUSTMENT

The Member Insured agrees to pay to the Insurer the Retrospective Premium Adjustment under the terms and conditions hereinafter set forth.

1. The Insurer may make demand for the Retrospective Premium Adjustment in whole or in one or more parts from time to time, but only to the extent necessary, in the sole discretion of the Board of Directors of the Insurer, to cover Losses incurred by the Insurer under this Policy and all Other Insurance Policies with coverage effective during the Policy Year (specified in Item 3.B of the Declarations).

2. The Insurer, in the sole discretion of the Board of Directors, may require the Member Insured to provide assurance to the Insurer of the Member Insured's ability to satisfy its obligation to pay a Retrospective Premium Adjustment when called. Within twenty (20) business days of receiving notice from the Insurer that such assurance is required, the Member Insured shall notify the Insurer of the option selected to provide the required assurance, which will include, but is not limited to, providing a letter of credit, providing a financial guarantee, purchasing retrospective premium insurance, or paying a Deposit Premium, and implement such option by providing the Insurer with the required documentation or payment, depending on the option selected. The parameters for a letter of credit, a financial guarantee, and the retrospective premium insurance options will be provided to the Member Insured by the Insurer at the time the Insurer requires the Members Insured to take the action. The terms regarding the Deposit Premium are set forth in Paragraph (c) below.

3. If the Member Insured elects to pay a Deposit Premium, the Insurer may require the Deposit Premium to be paid in whole, in part, or in parts. Any Deposit Premium paid to the Insurer will be returned to the Member Insured when, in the sole discretion of the Insurer's Board of Directors, the retention of the Deposit Premium is no longer required. The amount of any Deposit Premium paid shall be a credit against the obligation of the Member Insured to pay a call made for a Retrospective Premium Adjustment and, to the extent thereof, shall be treated as a payment of the Retrospective Premium Adjustment as of the date a call for a Retrospective Premium Adjustment is made. Amounts paid as Deposit Premiums will be held in an interest bearing account and, until such a call is made, interest earned on the Deposit Premium amount will be paid back to the Member Insured on an annual basis, within ninety (90) business days after the end of the applicable calendar year. However, if the Member Insured fails to elect one of the options available pursuant to Paragraph (b) within the time frame required, or at any other time when in the sole discretion of the Insurer's Board of Directors it is in the best interests of the Insurer, the Insurer may make demand upon the Member Insured for a Deposit Premium, whether or not a demand for a Deposit Premium is made upon any other Member Insured(s). If a demand is made by the Insurer, the

Member Insured shall pay the Deposit Premium within twenty (20) business days of demand.

4. That portion of the Retrospective Premium Adjustment demanded by the Insurer shall be paid to the Insurer by wire transfer or other method acceptable to the Insurer within twenty (20) business days after demand. The Insurer may, without first pursuing any rights it may have against any Delinquent Member, make such number of further demands upon the Member Insured, including any Delinquent Member, for further portions of the Retrospective Premium Adjustment, to be payable twenty (20) business days after demand, as may be needed to obtain Retrospective Premium Adjustment from the Member Insureds of the Insurer under this Policy and all Other Insurance Policies with coverage effective during the Policy Year sufficient, in the sole discretion of the Board of Directors of the Insurer, to cover Losses under this Policy and all Other Insurance Policies with coverage effective during the Policy Year. The fact that the Insurer has received sufficient Retrospective Premium Adjustment from such Member Insureds shall not bar the Insurer from pursuing the Insurer's rights against any Delinquent Member.

5. When, for any purpose hereunder, it becomes necessary to calculate the obligation of the Member Insured for the Retrospective Premium Adjustment, it will be calculated as follows:

   a) The amount of the Retrospective Premium Adjustment shall be equal to the product of (i) the Multiple selected by the Board of Directors of the Insurer as required to meet Losses under this Policy and all Other Insurance Policies with coverage effective during the Policy Year, times (ii) the Premium plus any Additional Premium, or if such is for a period shorter than a calendar year, such Premium and Additional Premium multiplied by a fraction the numerator of which is 365 and the denominator of which is the number of days in the policy period specified in Item 3A of the Declarations.

   b) The policy year to which any Retrospective Premium Adjustment relates shall be determined by the Board of Directors of the Insurer at the time it makes the call for such Retrospective Premium Adjustment based on the date of the Accident under this Policy or any Other Insurance Policy giving rise to the obligation which such Retrospective Premium Adjustment is designed to satisfy. The aggregate of all Retrospective Premium Adjustments under this Policy shall not exceed the Retrospective Premium Adjustment set forth in Item 5.B of the Declarations.

   c) Subject to the provisions with respect to calls made in the event of failure to pay by Delinquent Members, the amount of any call for a Retrospective Premium Adjustment hereunder shall bear the same relation to the total Retrospective Premium Adjustment, payable by all Member Insureds of the Insurer under such call as the highest Premium plus Additional

Premium determined under subparagraph (a)(ii) above bears to the aggregate Premiums plus Additional Premiums, used to calculate the total of all such calls, under this Policy and all Other Insurance Policies with coverage effective during the Policy Year.

d) The obligation of the Member Insured for the Retrospective Premium Adjustment shall be and remain in full force and effect and all the above calculations shall be made without regard to whether or not the Insurer has any obligation to make payments under this Policy or this Policy is canceled or suspended.

6. When, for any purpose hereunder, it becomes necessary to calculate the obligation of the Member Insured for the Deposit Premium, it will be calculated as follows:

a) The amount of the Deposit Premium, if required, shall be equal to Retrospective Premium Adjustment listed in Item 5.B of the Declarations, unless otherwise indicated.

b) The aggregate of the Deposit Premium and any Retrospective Premium Adjustments callable under this Policy shall not exceed the Retrospective Premium Adjustment set forth in Item 5.B of the Declarations.

c) The amount of the Deposit Premium may be adjusted at the anniversary of this Policy.

d) The obligation of the Member Insured for the Deposit Premium shall be and remain in full force and effect and all the above calculations shall be made without regard to whether or not the Insurer has any obligation to make payments under this Policy or this Policy is canceled or suspended.

7. The Multiple is no higher than the Multiple in any Other Insurance Policy with insurance coverage effective during the Policy Year.

8. The Board of Directors of the Insurer in its sole discretion may adjust downward the Multiple stated in this Policy and any Other Insurance Policy with coverage effective during the Policy Year to a new lower Multiple, and the Retrospective Premium Adjustment callable under this Policy and any such Other Insurance Policy shall be reduced by a like proportionate amount. No downward adjustment in such Multiple and corresponding adjustment in any such Retrospective Premium Adjustment may be made with respect to any Retrospective Premium Adjustment which has been assigned by the Insurer, or in any Other Insurance Policy with coverage effective during the Policy Year, if the Multiple in any such Other Insurance Policy, after adjustment, would be less than the Multiple, after adjustment, in this Policy, unless a similar downward adjustment is made in the Multiple in this Policy, together with a corresponding adjustment in the Retrospective Premium Adjustment.

9. The liability of the Member Insured shall be limited to the Premium, Additional Premium the Retrospective Premium Adjustment or any unpaid portion thereof due to the Insurer under the terms of this Policy, and any assurance that may be required pursuant to Section VI.2. No Member Insured shall be subject to any contingent liability or be required to pay any dues or assessments in addition to such Premium, Additional Premium, Retrospective Premium, and any assurance under Section VI.2. Adjustment due under this Policy and those due under any Other Insurance Policies as such Member Insured may have with the Insurer. The liability of the Member Insured for the Retrospective Premium Adjustment for the Policy Year shall cease six (6) years after the end of the Policy Year, unless prior demand is made therefor.

10. It is agreed that the obligation of the Member Insured to pay any Retrospective Premium Adjustment due under any Other Insurance Policy between the Insurer and the Member Insured which terminated on or before the inception date of this Policy is an obligation of the Member Insured under this Policy. It is also agreed that the terms and the amount of such obligation shall be determined by reference to the Other Insurance Policy under which such obligation arose, notwithstanding that such Other Insurance Policy may no longer be in effect.

11. The liability of each Member Insured, if there be more than one, for the Retrospective Premium Adjustment, and any assurance that may be required pursuant to Section VI.2, under this Policy shall be several and not joint and in proportion to their respective interests specified in the Declarations.

12. In the event the Insurer has available credit facilities from lenders, the Board of Directors of the Insurer may, in its sole discretion, utilize such facilities to finance Losses incurred by the Insurer under this Policy and all Other Insurance Policies. The Insurer may assign to the lenders the Insurer's interest in the Retrospective Premium Adjustment, in whole or in part, including, in the event the Insurer defaults on its obligations to such lenders, the right to call such interest assigned. Such assignment may be made and shall only be effective with respect to the financing of those Losses for which the Retrospective Premium Adjustment could be called. In the event any assignment is made, the Insurer shall give prompt notice thereof to the Member Insured. Each Member Insured shall, upon the request of the Insurer, give acknowledgment of its liability for the Retrospective Premium Adjustment to each of the lenders involved.

VII. MEMBERSHIP

Each Member Insured becomes a member of the Insurer as part of obtaining insurance from the Insurer, and as such, is entitled to the privileges and benefits, and by entering into this Policy agrees to be subject to and bound by, the obligations and duties, of membership. These are more fully set forth in the Insurer’s Memorandum of Association and in the Bye-Laws and any amendments thereto, each of which is hereby incorporated into and made a part of this Policy. In no event shall any amendment to the Insurer’s

Memorandum of Association or the Bye-Laws increase the amount of Premium or Retrospective Premium Adjustment payable or callable hereunder.

VIII. DEFINITIONS

For purposes of this Policy, unless otherwise stated to the contrary, the following capitalized terms shall have the meanings set forth below. Unless otherwise stated or required for the meaning of any provision, the singular shall include the plural and the plural, the singular. Whenever the terms "Accident", "Accidental Property Damage", "Loss", "Member Insured", "Multiple", "Policy Year", "Premium" and "Retrospective Premium Adjustment" are used in this Policy with both capitalization and reference to this Policy, the Other Insurance Policies, or Other Member Insurance Policies, they shall refer to the defined meanings given such terms in this Policy, the Other Insurance Policies, and the Other Member Insurance Policies, respectively and to which they so refer.

1. "Accident" means a sudden and fortuitous event, an event of the moment, which happens by chance, is unexpected and unforeseeable. Accident does not include any condition which develops, progresses or changes over time, or which is inevitable. The date of the accident shall be the later of when such Accident occurred or is discovered; provided, however, that no Accident is covered hereunder which occurred while the Insured was not insured by the Insurer under this Policy or a predecessor policy issued by the Insurer.

2. "Accidental" means caused by an Accident.

3. "Accidental Property Damage" means Property Damage caused by an Accident.

4. "Act" means the Atomic Energy Act of 1954, 42 U.S.C. §2011, et seq., as amended, and the regulations promulgated pursuant thereto.

5. "Actual Cash Value" means the amount determined by taking the Replacement Cost of the Insured Property and reducing it by straight-line depreciation at a rate of three percent (3%) per year, subject to a maximum depreciation of fifty percent (50%).

6. “Amount of Decommissioning Liability Coverage" means the amount payable for decommissioning liability expenses pursuant to subsection II.2, as calculated under the formula set forth in subsection II.1.

7. "Attachment Point" means the greater of (i) the amount covered by all the Underlying Insurance Policies or (ii) $500,000,000.

8. "Debris Removal and Decontamination Coverage" means the coverage provided pursuant to paragraph I.1(b).

9. "Declarations" means the declarations attached to, and made a part of, the Policy.

10. "Decommissioning Target Amount" means the amount approved by the Insurer as necessary to meet the costs of decommissioning the Unit, as adjusted to the Settlement Date.

11. "Decommissioning Target Document" means the document submitted by the Insured in estimating the costs of decommissioning the Unit after the Accident leading to decommissioning. The document shall include information required under 10 C.F.R. §50.75 and the cost estimates shall be based on then currently available industry data. The document shall be subject to the approval of the Insurer.

12. "Decommissioning Trust Fund" means the external sinking fund described by the NRC pursuant to 10 C.F.R. §50.75 to pay the costs of decommissioning the Unit at the end of its licensed life.

13. "Delinquent Member" means any member insured, including the Member Insured, who fails to pay a retrospective premium adjustment due under this Policy or any Other Insurance Policy within twenty (20) business days after demand.

14. "Deposit Premium" means the amount that the Member Insured may be required to pay to the Insurer under this Policy, as detailed in to Section VI of this Policy, as security for future Retrospective Premium Adjustments.

15 "FERC" means the Federal Energy Regulatory Commission or any governmental body succeeding to the functions and authority thereof.

16. "Functional Age" means the remaining operating life of the Unit, stated as a percentage, as determined by dividing the number of years remaining on the Unit's Operating License as of the date of Accident, including any extension of the License that has been approved by the NRC as of the date of Accident, by the maximum number of years of operation permitted under the Unit's operating license issued by the NRC, including any extension of the License that has been approved by the NRC as of the date of the Accident, but in no case less than 25%

17. "Functional Total Loss Coverage" means the coverage provided pursuant to subsection I.2.

18. "Functional Value" means the amount determined by multiplying the Generation Replacement Value for the Unit by the Functional Age.

19. "Generation Replacement Value" means value generated by the following formula: COST x 1,000 x MWe, where COST means the total overnight cost figure, on a kilowatt basis, as reported by the Energy Information Administration of the Department of Energy in its forecast for advanced nuclear construction in effect as of the Date of Accident multiplied by .9 (90%), and MWe means the

Megawatt Electric rating of the Unit as most recently reported by the Insured in documents filed with the Securities Exchange Commission (SEC).

20. "INPO" means the Institute of Nuclear Power Operations.

21. "Insured Property" means the property specified as such in Item 7 of the Declarations and situated at a location specified therein, or if not so identified, then the property as described in the Underlying Insurance Policies.

22. "Insureds" means, collectively, the Persons listed in Item 9 of the Declarations and the Member Insureds, which Persons may hereinafter be referred to individually as an "Insured."

23. "Insurer" means Nuclear Electric Insurance Limited.

24. "Loss" means, collectively, the expenses covered under paragraph I.1(a) of the Policy, the expenses covered under paragraph I.1(b) of the Policy, the losses covered under paragraph I.1(c) of the Policy, the losses covered under paragraph I.2(a) of the Policy, and the expenses covered under subsection II.1 of the Policy. With respect to Sections IV and VI, Loss shall include, where applicable and without limitation, all costs of the Insurer attributable to paying, financing, litigating and settling such expenses and losses.

25. “Loss Control Standards” means the set of administrative and technical requirements adopted by the Insurer that are intended to minimize the risk of loss at Insured Sites.

26. "Member Insurance Program" means any program approved as such in accordance with the Bye-Laws of the Insurer.

27. “Member Insureds” means, collectively, the undersigned Persons, each of whom is subject to the rights and obligations hereof. The Member Insureds may hereinafter be referred to individually as a “Member Insured.”

28. “Member Insureds of the Insurer” means the Member Insureds under this Policy or the Other Insurance Policies.

29. "Multiple" means the multiple selected by the Board of Directors of the Insurer (but not greater than the multiple specified in Item 5A of the Declarations) pursuant to paragraphs VI.3(a) and VI.3(b).

30. "NRC" means the Nuclear Regulatory Commission or any governmental body succeeding to the functions and authority thereof.

31. "Nuclear Liability Coverage" means the coverage provided pursuant to paragraph I.1(a).

32. "Operator" means those Persons, if any, other than the Member Insured, responsible for operating the Unit or Units covered by the Policy.

33. "Other Insurance Policy" means any Decontamination Liability, Decommissioning Liability and Excess Property Insurance Policy or Blanket Excess Decontamination Liability, Decommissioning Liability and Excess Property Insurance Policy, other than this Policy, issued by the Insurer, or any Decontamination, Decommissioning and Excess Property Insurance Policy or Blanket Excess Decontamination, Decommissioning and Excess Property Insurance Policy issued by Overseas NEIL Limited.

34. "Other Member Insurance Policy" means any insurance policy, other than this Policy, issued by the Insurer to one or more Member Insureds of the Insurer under a Member Insurance Program.

35. "Person" means an individual, a partnership, a corporation, an association, a joint stock company, a trust, a joint venture, an unincorporated organization or a governmental entity or any department, agency or political subdivision thereof.

36. "Policy" means this Decontamination Liability, Decommissioning Liability and Excess Property Insurance Policy, including the Declarations, as it may hereafter be revised, amended or endorsed.

37. "Policy Year" means the policy year set forth in Item 3.B. of the Declarations.

38. "Premium" means the amount specified in Item 4 of the Declarations.

39. “Primary Policy” means a Primary Property and Decontamination Liability Insurance Policy issued by Nuclear Electric Insurance Limited or a Primary Property and Decontamination Insurance Policy issued by Overseas NEIL Limited, depending on which has been issued to the Insured.

40. "Property Damage" means direct physical damage to or destruction of Insured Property.

41. "Property Damage Coverage" means the coverage provided pursuant to paragraph I.1(c).

42. "Replacement Cost" means the cost incurred for the repair or replacement of the Insured Property that sustained Accidental Property Damage. For purposes of determining Actual Cash Value pursuant to Section I hereof, in the event the replacement property is not readily available, then Replacement Cost for such Insured Property shall be the original book value of the damaged component, less any applicable AFUDC, adjusted for inflation using the applicable Handy Whitman Index.

43. “Resolution Plan” means a written document, mutually agreed upon by the Insured and Insurer, that explains the actions to be taken by the Insured to resolve the Inusred’s non-compliance with a SHALL Requirement under the Loss Control Standards. The procedures for the development, and closure, of a Resolution Plan are contained in the Company’s Loss Control Standards.

44. "Retrospective Premium Adjustment" means the amount of retrospective premium adjustment called or demanded of the Member Insured under this Policy as calculated pursuant to Section VI of this Policy, but not, in the aggregate, in excess of the Retrospective Premium Adjustment specified in Item 5B of the Declarations.

45. "Settlement Date" means the date on which the Member Insured certifies that the Insureds have discharged their legal obligation or liability to protect the public health and safety and to remove debris of and decontaminate the Insured Property following Accidental Property Damage.

46. “SHALL Requirement” means a standard within the Loss Control Standards that sets forth a minimum requirement to be met and maintained for the Insured Property to be insurable, and is identified as such within the Loss Control Standards.

47. "Shortfall" means the Decommissioning Target Amount minus the balance in the Decommissioning Trust Fund as of the Settlement Date.

48. "Specified Nuclear Liability Amount" means the amount described under subparagraph V.13(b)(i).

49. "Underlying Insurance Policy" means the primary insurance policy and each excess policy other than this Policy covering the first party liability and/or property risks of the Insured with respect to the Insured Property, but shall not mean any third party nuclear energy liability policy issued by American Nuclear Insurers, Nuclear Energy Liability Insurance Association or other third party liability insurer or other third party entity.

NUCLEAR ELECTRIC INSURANCE LIMITED
POLICYHOLDER DISCLOSURE

NUCLEAR POLICY RENEWALS

NOTICE OF TERRORISM INSURANCE COVERAGE
EFFECTIVE DECEMBER 26, 2007

Coverage for acts of terrorism is already included in your current policy. However, under NEIL's Payment for Acts of Terrorism endorsement, your recovery for losses stemming from an act of terrorism could be limited by the terms of the endorsement. However, in accordance with the Terrorism Risk Insurance Program Reauthorization Act of 2007, which took effect December 26, 2007, (TRIPRA), NEIL's Payment for Acts of Terrorism endorsement would not cap the damages for any "certified" acts of terrorism under TRIPRA.

You are hereby notified that under TRIPRA, the definition of act of terrorism has changed. As defined in Section 102(1), the term "act of terrorism" means any act that is certified by the Secretary of the Treasury - in concurrence with other specified federal officials - to be an act of terrorism; to be a violent act or an act that is dangerous to human life, property, or infrastructure; to have resulted in damage within the United States, or outside the United States in the case of certain air carriers or vessels or the premises of a United States mission; and to have been committed by an individual or individuals as part of an effort to coerce the civilian population of the United States or to influence the policy or affect the conduct of the United States Government by coercion.

Under your coverage, any losses resulting from certified acts of terrorism may be partially reimbursed by the United States Government under a formula established in TRIPRA. Your policy may contain other exclusions which might affect your coverage. Under the formula, the United States Government generally reimburses 85% of covered terrorism losses exceeding the statutorily established deductible paid by the insurance company providing the coverage. TRIPRA, contains a $100 billion cap that limits U.S. Government reimbursement as well as insurers' liability for losses resulting from certified acts of terrorism when the amount of such losses exceeds $100 billion in any one calendar year. If the aggregate insured losses for all insurers exceed $100 billion, any insurer that has met its deductible will not be liable to pay for any losses in excess of the $100 billion sustained by its insureds. Thus, if the $100 billion cap is reached, your coverage may be reduced.

NEIL is neither increasing, nor attributing any portion of, the annual premium for terrorism coverage, but a surcharge might be added to the premium if, after a certified act of terrorism, the federal Department of Treasury requires a recoupment of certain amounts paid by the federal government in accordance with the terms of TRIPRA.

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

Payments for Acts of Terrorism Endorsement

Member Insured: Florida Power Corporation

Site: Crystal River
Endorsement No. 1
Policy Number: X12-015
Effective Date: April 1, 2012

Effective Time of this Endorsement is 12:01 a.m. Standard Time in Hamilton, Bermuda.

It is hereby understood and agreed that this Policy is hereby amended as follows:

I. The following Section is hereby added to the Policy:

PAYMENTS FOR ACTS OF TERRORISM

In the event that one or more Acts of Terrorism cause Accidental Property Damage under this Policy and under one or more Nuclear Insurance Policies within twelve months from the date the first Accidental Property Damage occurs:

1. Resources Available

The Insureds' maximum recovery for all such Losses under this Policy and all Nuclear Insurance Policies shall be an aggregate of:

(a) $3.24 billion (U.S. dollars)

plus;

(b) such additional amounts as the Insurer recovers for such Losses from reinsurance, indemnity, and any other source, applicable to such Losses.

2. Allocation of Resources

(a) The amount determined under paragraph 1 above shall first be used to pay for all such Losses payable under all applicable Primary Property and Decontamination Liability Insurance Policies (excluding any Losses payable under all Business Interruption and/or Extra Expense Insurance Policy Endorsements), Primary Property and Decontamination Insurance Policies (excluding any Losses payable under all Business Interruption and/or Extra Expense Insurance Policy Endorsements), Operating Facility Policies, Decontamination Liability, Decommissioning Liability and Excess Property Insurance Policies, Decontamination, Decommissioning

and Excess Property Insurance Policies, Blanket Excess Decontamination Liability, Decommissioning Liability and Excess Property Insurance Policies, and Blanket Excess Decontamination, Decommissioning and Excess Property Insurance Policies (collectively "Property Losses").

(b) If such Property Losses for all Insureds exceed the amount determined under paragraph 1 above, the Insured's maximum recovery shall be the amount determined under paragraph 1 above times a fraction, the numerator of which is the Insured's recovery for the Property Losses resulting from Accidental Property Damage, but for this Section, and the denominator of which is the sum of all Insureds' recovery for Property Losses resulting from Accidental Property Damage under all applicable Nuclear Insurance Policies, including this Policy, but for this Section.

(c) Notwithstanding paragraph 1 and subparagraph 2(b) above, if the payments made pursuant to subparagraph 2(b) exhaust the amount determined under paragraph 1, without paying for all the Insured's Property Losses, the Insured shall recover such additional amounts that the Insurer recovers from reinsurance, indemnity, or other source, for the Insured's Property Losses.

3. Declarations Page

Nothing herein shall be construed to entitle the Insured to recover more than the amount of the Policy Limits stated in Item 6 of the Declarations.

4. Relevant Period

The twelve-month period specified above shall commence on the date of the first Accidental Property Damage caused by an Act of Terrorism. The first Accidental Property Damage caused by an Act of Terrorism that occurs after this or any other twelve-month period shall trigger a new twelve-month period.

5. Definitions

For the purposes of this Section only:

(a) "Act of Terrorism" means any act by a person, group, or organization that appears to be intended to: (i) intimidate or coerce a civilian population, or (ii) disrupt any segment of the economy in the country where the insured plant is located; or (iii) influence the policy of a government by intimidation or coercion; or (iv) affect the conduct of a government by mass destruction; provided, however, that an Act of Terrorism for purposes of this Policy shall not include any act excluded by the War Risk Exclusion.

(b) "Nuclear Insurance Policy" means any Primary Property and Decontamination Liability Insurance Policy, or Primary Property and Decontamination Insurance Policy, or Operating Facility Policy, or any Decontamination Liability, Decommissioning Liability and Excess Property Insurance Policy, or Decontamination, Decommissioning and Excess Property Insurance Policy or any Blanket Excess Decontamination Liability, Decommissioning Liability And Excess Property Insurance Policy, or Blanket Excess Decontamination, Decommissioning And Excess Property Insurance Policy, other than this Policy, issued by the Insurer or by Overseas NEIL Limited.

6. Authorized Changes to this Section

The Insurer's Board of Directors will have the authority to alter or replace the definition of the term "Act of Terrorism" and any other provision of this Section in order to facilitate the availability of resources that may be made available by the Government in the country where the insured plant is located.

IN WITNESS WHEREOF, the parties hereto have caused this Endorsement to be executed and attested on their behalf.

INSURER:
Nuclear Electric Insurance Limited

Wilmington, Delaware

Date: As of April 1, 2012

By: _____
David B. Ripsom, President

Attest: _____

MEMBER INSURED:
Florida Power Corporation

Wilmington, Delaware

Date: As of April 1, 2012

By: _____
Attorney-in-Fact

Witness: _____

NEIL II - Rating Calculation Sheet

Member Insured:	Florida Power Corporation		
Site:	**Crystal River**		
Policy Number:	X12-015		
Recovery Limit:	$750,000,000	2012 Renewal	
Effective Date:	April 1, 2012		
Expiration Date:	April 1, 2013		Number of Units: 1

Gross Nuclear Loading per Million:			$1,032
Multi-Unit Charge:		0.00%	$0
Net Nuclear Loading:			$1,032
Base Plant Operations Credit:	8.000%		
Effective Plant Operations Credit:		12.000%	
NEIL Primary Credit:		10.000%	
Total Credits:		22.000%	$(227)
Nuclear Loading After Credits:			$805
Program Modifier:		0.0000%	$0
Rate per Million:			$804.9600

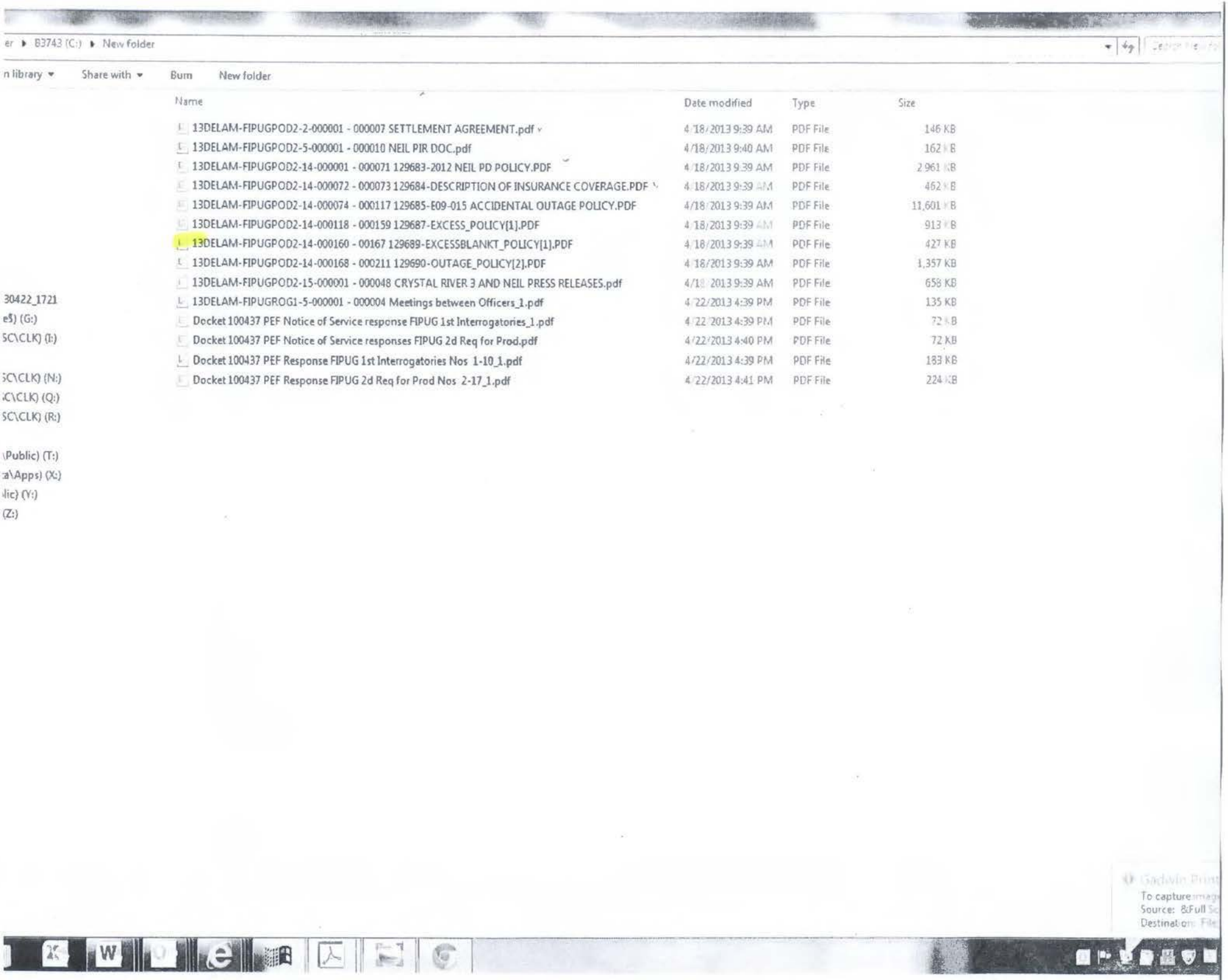
Premium for first	$500	Million (100% of rate):	$402,480
Premium for	$250	Million xs $500 Million (85% of rate):	$171,054
Premium for	$0	Million xs $1,000 Million (75% of rate):	$0

Annual Premium at Effective Recovery Limit: **$573,534**

Retrospective Premium Adjustment (10 times Annual Premium): $5,735,340

Previous Annual Premium:		
Additional Annual Premium:	0.00%	$573,534
Pro-rata Factor:		1.0000

NEIL II PREMIUM DUE: **$573,534**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4/18/2013 9:39 AM PDF File 462 KB
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4/18/2013 9:39 AM PDF File 658 KB
13DELAM-FIPUGROG1-5-000001 - 000004 Meetings between Officers_1.pdf
4/22/2013 4:39 PM PDF File 135 KB
Docket 100437 PEF Notice of Service response FIPUG 1st Interrogatories_1.pdf
4/22/2013 4:39 PM PDF File 72 KB
Docket 100437 PEF Notice of Service responses FIPUG 2d Req for Prod.pdf
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NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

BLANKET EXCESS DECONTAMINATION LIABILITY, DECOMMISSIONING LIABILITY AND EXCESS PROPERTY INSURANCE POLICY

Declarations attached to and made a part of Policy No. BX12-004

Item 1.

Member Insured: Carolina Power & Light Company
Member Address: c/o Progress Energy, Inc.
410 S. Wilmington Street
Raleigh, North Carolina 27601

NEIL II Underlying Policy No. X12-004 100.00%

NEIL II Underlying Policy No. X12-070 100.00%

NEIL II Underlying Policy No. X12-005 100.00%

Member Insured: Florida Power Corporation
Member Address: d/b/a Progress Energy Florida, Inc.
410 S. Wilmington Street
Raleigh, North Carolina 27601

NEIL II Underlying Policy No. X12-015 100.00%

Item 2. Insurer: Nuclear Electric Insurance Limited

Mailing Address: 1201 N. Market Street, Suite 1100, Wilmington, Delaware 19801

Item 3. A. Policy Period:

From April 1, 2012 (Date) to April 1, 2013 (Date)

B. Policy Year:

From April 1, 2012 (Date) to April 1, 2013 (Date)

All dates used to determine the Policy Period, Policy Year, or used as the effective date of any endorsement have as their effective time 12:01 a.m. Standard Time in Hamilton, Bermuda.

Item 4. Premium Payments required from each Member Insured:

	Premium Amount
Brunswick	$584,889
Crystal River	$452,593
Harris	$348,148
Robinson	$478,704
Total Premium Payable	$1,864,334

Item 5. A. Multiple: 10

B. Maximum Retrospective Premium Adjustment for each Member Insured:

	Retrospective Premium Adjustment
Brunswick	$5,848,890
Crystal River	$4,525,930
Harris	$3,481,480
Robinson	$4,787,040
Total Retrospective Premium Adjustment	$18,643,340

Item 6. Amount of Blanket Limit: $1,000,000,000

Item 7. Description and location of property covered (if self insured):
Identical to Item 7 of the Declarations of each of the NEIL II Policies identified under Item 1 of the Declarations of this Policy.

Item 8. Attachment Point: $1,250,000,000

Item 9. Insureds:

Identical to Item 9 of the Declarations of each of the NEIL II Policies identified under Item 1 of the Declarations of this Policy.

Item 10. Loss Payee Clause:

Identical to Item 10 of the Declarations of each of the NEIL II Policies identified under Item 1 of the Declarations of this Policy.

Policy No. BX12-004

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

AND EXCESS PROPERTY BLANKET EXCESS
DECONTAMINATION LIABILITY,
DECOMMISSIONING LIABILITY INSURANCE POLICY

This is a blanket excess policy. There is no reinstatement of the Blanket Limit after a loss. The blanket limit amount set forth in Item 6 of the Declarations is shared among the Member Insureds identified in Item 1 of the Declarations. This Policy follows the form of the NEIL II Policies identified under Item 1 of the Declarations. No provision of this Policy shall be construed to make any changes in any of these NEIL II Policies.

This Blanket Excess Decontamination Liability, Decommissioning Liability and Excess Property Insurance Policy is made by and among the undersigned Member Insureds and Nuclear Electric Insurance Limited, a Bermuda mutual company with limited liability.

The Insurer is only licensed in Bermuda and Delaware and the Insureds will not be protected by the guaranty funds of any U.S. jurisdiction.

The Member Insureds will be required to execute the Policy in Delaware. The Policy will become effective only upon the acceptance of the delivery of the Policy by the Member Insureds at the Insurer's office in Delaware. The Policy will only become effective if this procedure is followed.

I. INSURING AGREEMENT

In consideration of the premium paid, and subject to the terms and conditions of this Policy, the Insurer agrees to pay an amount up to the Blanket Limit Amount for Losses insured under one or more of the NEIL II Policies identified under Item 1 of the Declarations, subject to such Losses exceeding the Attachment Point.

IN WITNESS WHEREOF, the parties hereto have caused this Policy to be executed and attested on their behalf.

Wilmington, Delaware

INSURER:
Nuclear Electric Insurance Limited

Date: As of April 1, 2012

By: _____
David B. Ripsom, President

Attest: _____

Wilmington, Delaware

MEMBER INSURED:
Carolina Power & Light Company

Date: As of April 1, 2012

By: _____
Attorney-in-Fact

Witness: _____

Wilmington, Delaware

MEMBER INSURED:
Florida Power Corporation

Date: As of April 1, 2012

By: _____
Attorney-in-Fact

Witness: _____

II. BLANKET LIMIT AMOUNT

The Blanket Limit amount set forth under Item 6 of the Declarations is the maximum amount the Insurer will pay during the Policy Period for any and all Losses that are covered under this Policy.

Every Loss covered under this Policy reduces, as of the date of such Loss, the Blanket Limit available under this Policy by the amount of such Loss, and this Policy shall apply thereafter only for the reduced amount.

III. FOLLOWING FORM PROVISIONS

The NEIL II Policies identified under Item 1 of the Declarations are incorporated herein and made a part hereof, with the following exceptions.

A. The Declarations pages of each of the NEIL II Policies are replaced with the Declarations pages of this Policy.

B. Section I of the NEIL II Policy, *Definitions*, is amended as follows:

The following Definition is amended to read as follows:

"Attachment Point" means the greater of (i) the amount covered by all the Underlying Insurance Policies or (ii) the amount specified in Item 8 of the Declarations.

C. Section 1.6 of the NEIL II Policy, *Decontamination Liability and Excess Property Coverage*, is amended as follows:

6. In the event that Accidental Property Damage under this Policy, and under one or more Other Insurance Policies with insurance coverage effective during the Policy Year is caused directly or indirectly by any single Accident which is either listed in paragraph I.5 hereof, or which involves radioactive contamination, or by any Accident which ensues directly or indirectly from an Accident listed in paragraph I.5 hereof or from an Accident involving radioactive contamination, the Insureds agree that:

(a) The Insurer's liability for all such Accidental Property Damage shall not exceed the greater of (A) sum of the Amount of Blanket Limit, as stated in Item 6 of the Declarations, plus the Amount of Decontamination Liability, Decommissioning Liability and Excess Property Insurance Requested, as stated in Item 6 of the Declarations of the NEIL II Policy, or (B) the highest of the Amount of Decontamination Liability, Decommissioning Liability and Excess Property Insurance Requested, as stated in the Declarations of the Other Insurance Policies, or (C) the sum of the Amount of Decontamination Liability, Decommissioning Liability and Excess Property Insurance

Requested, as stated in the Declarations of the Other Insurance Policies, plus the Amount of Blanket Limit of the Blanket Limit Following Form Policy providing coverage with respect to the same Accident.

(b) The Insurer's liability under this Policy shall be the amount determined under paragraph I.6(a) above times a fraction, the numerator of which is the Insurer's liability for the Accidental Property Damage under this Policy and the NEIL II Policy but for this subsection I.6, and the denominator of which is the sum of the Insurer's liability for the Accidental Property Damage under this Policy, and the NEIL II Policy, and all Other Insurance Policies and all other Blanket Limit Following Form Policies, but for this subsection.

NEIL II – Blanket Rating Calculation Sheet

Member Insured:	**Carolina Power & Light Company and Florida Power Corporation**		
Site:	**Brunswick, Crystal River, Harris and Robinson**		
Policy Number:	BX12-004		
Recovery Limit:	$1,000,000,000	2012 Renewal	Layer / Limits in Layer
Attachment Point:	$1,250,000,000	$750,000,000 (of NEIL II Layer)	0 – 0.5 BB: 0
Effective Date:	April 1, 2012		0.5 – 1.0 BB: 250,000,000
Expiration Date:	April 1, 2013	Number of Sites: 4	> 1.0 BB: 750,000,000

Sites	Annual Premium	Retro Premium	Previous Annual Premium	Additional Annual Premium	Pro-Rata Factor	Blanket Premium Due
Brunswick	**$584,889**	$5,848,890		584,889		**584,889**
Crystal River	**$452,593**	$4,525,930		452,593		**452,593**
Harris	**$348,148**	$3,481,480		348,148		**348,148**
Robinson	**$478,704**	$4,787,040		478,704		**478,704**
Totals	**$1,864,334**	$18,643,340	$0	$1,864,334	1.0000	**$1,864,334**

Sites	NEIL II Policy	Premium for 1st $1 MM in Underlying Policy	Premium 0-0.5 BB	Premium 0.5–1.0 BB	Premium >1.0 BB	100% Premium	Blanket %	Premium x Blanket %	Share of Blanket Premium
Brunswick	X12-004	1,040.2560	$0	$221,054	$585,144	$806,198	100.00%	**$806,198**	31.37%
Crystal River	X12-015	804.9600	$0	$171,054	$452,790	$623,844	60.00%	**$374,306**	24.28%
Harris	X12-070	619.2000	$0	$131,580	$348,300	$479,880	60.00%	**$287,928**	18.67%
Robinson	X12-005	851.4000	$0	$180,923	$478,913	$659,835	60.00%	**$395,901**	25.68%
Totals								**$1,864,333**	

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Name	Date modified	Type	Size
13DELAM-FIPUGPOD2-2-000001 - 000007 SETTLEMENT AGREEMENT.pdf	4/18/2013 9:39 AM	PDF File	146 KB
13DELAM-FIPUGPOD2-5-000001 - 000010 NEIL PIR DOC.pdf	4/18/2013 9:40 AM	PDF File	162 KB
13DELAM-FIPUGPOD2-14-000001 - 000071 129683-2012 NEIL PD POLICY.PDF	4/18/2013 9:39 AM	PDF File	2,961 KB
13DELAM-FIPUGPOD2-14-000072 - 000073 129684-DESCRIPTION OF INSURANCE COVERAGE.PDF	4/18/2013 9:39 AM	PDF File	462 KB
13DELAM-FIPUGPOD2-14-000074 - 000117 129685-E09-015 ACCIDENTAL OUTAGE POLICY.PDF	4/18/2013 9:39 AM	PDF File	11,601 KB
13DELAM-FIPUGPOD2-14-000118 - 000159 129687-EXCESS_POLICY[1].PDF	4/18/2013 9:39 AM	PDF File	913 KB
13DELAM-FIPUGPOD2-14-000160 - 00167 129689-EXCESSBLANKT_POLICY[1].PDF	4/18/2013 9:39 AM	PDF File	427 KB
13DELAM-FIPUGPOD2-14-000168 - 000211 129690-OUTAGE_POLICY[2].PDF	4/18/2013 9:39 AM	PDF File	1,357 KB
13DELAM-FIPUGPOD2-15-000001 - 000048 CRYSTAL RIVER 3 AND NEIL PRESS RELEASES.pdf	4/18/2013 9:39 AM	PDF File	658 KB
13DELAM-FIPUGROG1-5-000001 - 000004 Meetings between Officers_1.pdf	4/22/2013 4:39 PM	PDF File	135 KB
Docket 100437 PEF Notice of Service response FIPUG 1st Interrogatories_1.pdf	4/22/2013 4:39 PM	PDF File	72 KB
Docket 100437 PEF Notice of Service responses FIPUG 2d Req for Prod.pdf	4/22/2013 4:40 PM	PDF File	72 KB
Docket 100437 PEF Response FIPUG 1st Interrogatories Nos 1-10_1.pdf	4/22/2013 4:39 PM	PDF File	183 KB
Docket 100437 PEF Response FIPUG 2d Req for Prod Nos 2-17_1.pdf	4/22/2013 4:41 PM	PDF File	224 KB

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NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

NEIL I ACCIDENTAL OUTAGE INSURANCE POLICY

Declarations attached to and made a part of Policy No. E12-015
(Crystal River)

Item 1. Member Insured: Florida Power Corporation
Member Address: d/b/a Progress Energy Florida, Inc.
410 S. Wilmington Street
Raleigh, NC 27601
Respective Interest: Unit 3 100.00%

Item 2. Insurer: Nuclear Electric Insurance Limited

Mailing Address: 1201 N. Market Street, Suite 1100, Wilmington, Delaware 19801

Item 3.

A. Policy Period:

From April 1, 2012 (Date) To April 1, 2013 (Date)

B. Policy Year:

From April 1, 2012 (Date) To April 1, 2013 (Date)

All dates used to determine the Policy Period, Policy Year, or used as the effective date of any endorsement have as their effective time 12:01 a.m. Standard Time in Hamilton, Bermuda.

Item 4. Premium: $595,488

Item 5. A. Multiple: 10

B. Retrospective Premium Adjustment: $5,954,880

Item 6. A. Amount of Insurance:

	Weekly Indemnity	Limit of Liability
Unit 3:	$4,500,000	$490,000,000

The Member Insured may select the Weekly Indemnity it desires with respect to any Unit, provided that the total Weekly Indemnity purchased by all Member Insureds with an interest in the Unit in question does not exceed $4,500,000 and the total Limit of Liability purchased by all Member Insureds with an interest in the Unit in question does not exceed $490,000,000.

B. Payment Periods:

	1st Payment Period	2nd Payment Period	3rd Payment Period
Unit 3:	52.0 Weeks	52.0 Weeks	19.1 Weeks

C. Transit Coverage Limit per Section I.B: $100,000,000

D. Course of Construction Coverage Limit per Section I.G: $50,000,000 per project

Item 7. Description of Site and Listing of Nuclear Power Generating Units at the Site covered:
All real and personal property known as Crystal River Unit 3 Nuclear Generating Plant

Located in Citrus County, Florida as specifically outlined in the attached plot plan Florida Power Corporation, Dwg. #CR3-G61- D-0, Rev., 7-11-75; Florida Power Corporation Dwg. #CR3-G86-D, Rev. 11, 10-21-03; Florida Power Corporation Dwg. #CR3-G85-D, Rev. 9, 6-10-04, showing the insurance site boundary and excluded buildings and areas as filed with Nuclear Electric Insurance Limited in accordance with the Site Description Procedure.

See Attachment 1

Item 8. Deductible Period:

Unit 3: First 12 weeks of any Outage.

Transit Deductible Period: First 26 weeks of any Outage.

Item 9. Insureds:
Florida Power Corporation d/b/a Progress Energy Florida, Inc.

Item 10. Weekly Indemnity, if any, shall be payable as follows:

Unit 3: Florida Power Corporation d/b/a Progress Energy Florida, Inc.

whose receipt of such payment shall constitute a release in full of all liability with respect to such payment. The Member Insured may, by written notice to the Insurer, designate other payees.

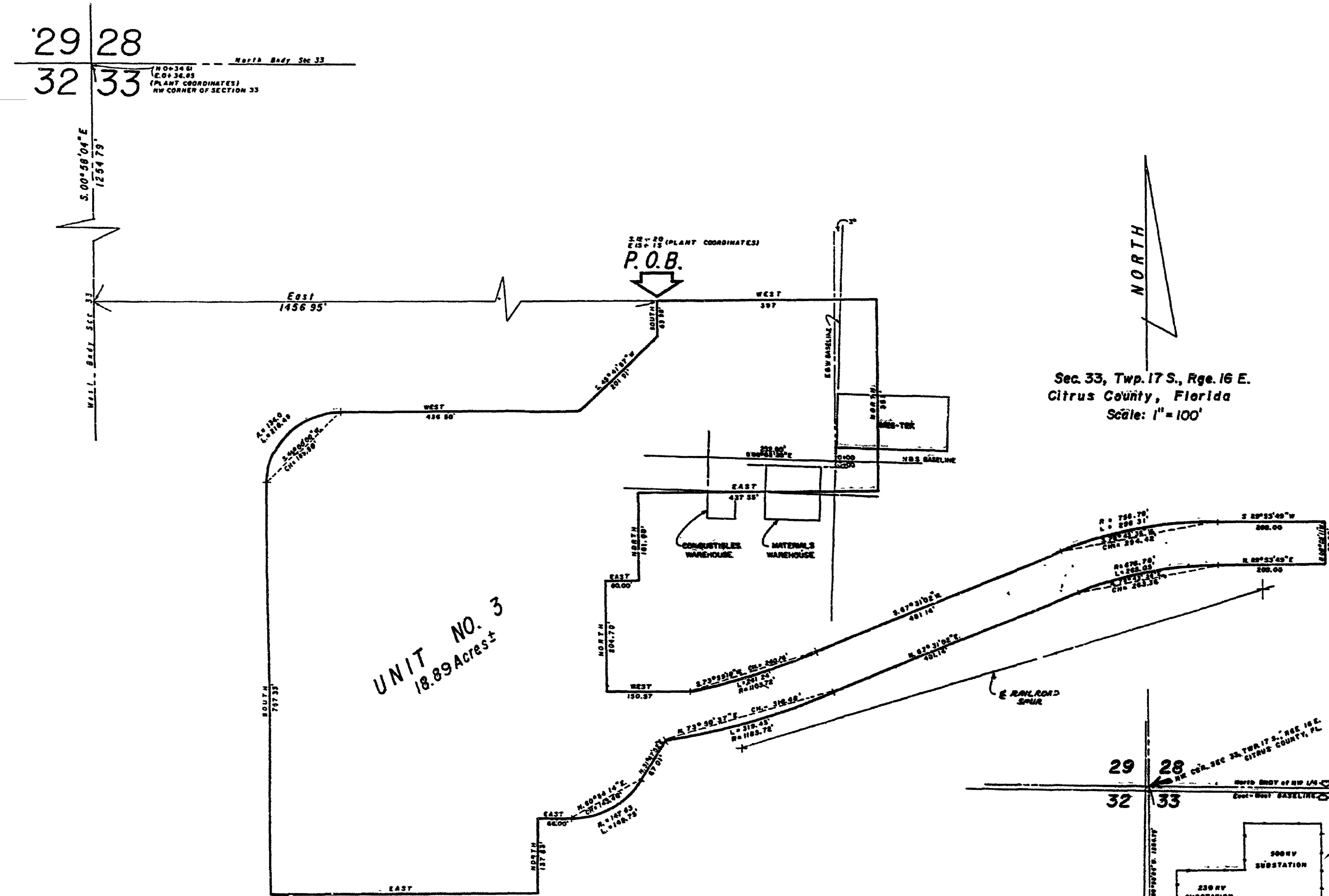
Item 11. Service of Process to Insured (see Section IV.E.5)

General Counsel
Florida Power Corporation
d/b/a Progress Energy Florida, Inc.
c/o Duane Morris LLP
222 Delaware Avenue, Suite 1600
Wilmington, DE 19801-1659

Item 12. Any credit allowed by the Insurer against the Premium payable under this Policy for any inspection service fees paid by the Member Insured shall in no way affect or reduce such Premium for the purpose of determining a Retrospective Premium Adjustment.

Item 13. The following Pricing Source(s) shall be used when completing the Accidental Outage Claims Adjustment Form:

Unit 3: SOCO hub

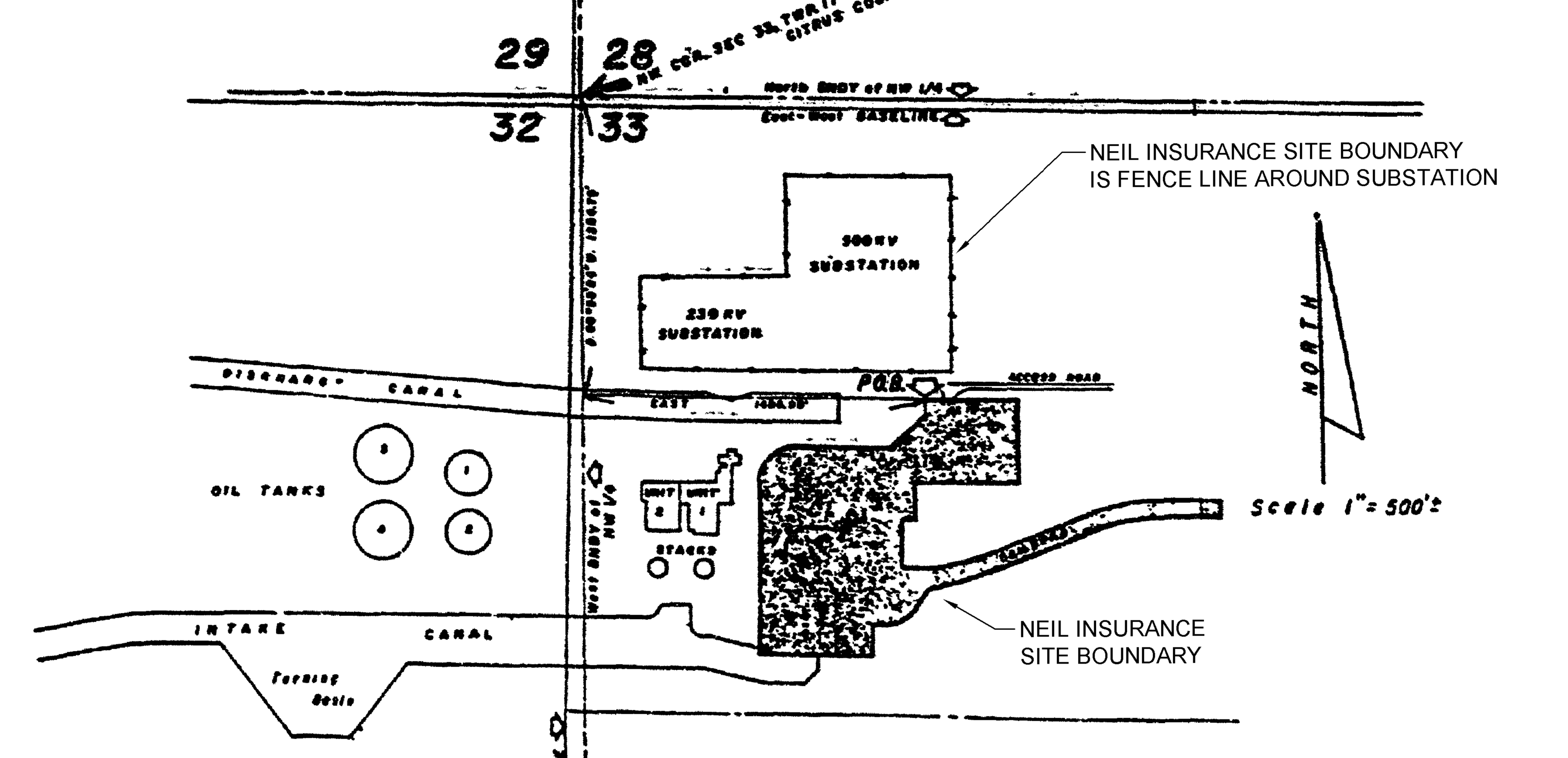


DESCRIPTION:

COMMENCE AT THE NW CORNER OF SECTION 33, TOWNSHIP 17 . TH, RANG. 16 EAST, CITRUS COUNTY, FLORIDA, SAID CORNER HAVING PLANT COORDINATE OF N 0+34 61 & E. 0+36 85, AND RUN S.00°58'04"E., ALONG THE WEST BOUNDARY OF SAID SECTION 33, 1254 79 FEET; THENCE EAST, 1456 95 FEET TO THE POINT OF BEGINNING, SAID POINT HAVING THE PLANT COORDINATES, S.12+20 & E.15+15, THENCE SOUTH, A DISTANCE OF 63.98 FEET; THENCE S.45°41'57"W, A DISTANCE OF 201 91 FEET; THENCE WEST, A DISTANCE OF 436.50 FEET TO THE POINT OF CURVATURE OF A CURVE CONCAVE SOUTHEASTERLY AND HAVING A RADIUS OF 134.0 FEET THENCE RUN 210.49 FEET ALONG THE ARC OF SAID CURVE, A CHORD BEARING AND DISTANCE OF S.45°00'00"W. 189.50 FEET TO THE POINT OF TANGENCY; THENCE SOUTH, 757 33 FEET, THENCE EAST, 464 00 FEET; THENCE NORTH 137 83 FEET; THENCE EAST, 66.00 FEET TO THE POINT OF CURVATURE OF A CURVE CONCAVE NORTHWESTERLY AND HAVING A RADIUS OF 147.43 FEET; THENCE RUN 149 75 FEET ALONG THE ARC OF SAID CURVE, A CHORD BEARING AND DISTANCE OF N.60°54'14"E, 143 40 FEET TO THE POINT OF TANGENCY; THENCE N.31°47'52"E, 87 01 FEET TO A CURVE CONCAVE NORTHERLY AND HAVING A RADIUS OF 1183.72 FEET, THENCE RUN 319 43 FEET ALONG THE ARC OF SAID CURVE, A CHORD BEARING & DISTANCE OF N.73°50'37"E, 318.48 FEET TO THE POINT OF TANGENCY; THENCE N 67°31'02"E., 481 14 FEET TO THE POINT OF CURVATURE OF A CURVE CONCAVE SOUTHERLY AND HAVING A RADIUS OF 676.78 FEET; THENCE 265.05 FEET ALONG THE ARC OF SAID CURVE, A CHORD BEARING AND DISTANCE OF N.78°43'36"E., 253.36 FEET TO THE POINT OF TANGENCY; THENCE N.89°53'49"E, 200 FEET; THENCE N 00°06'11"W., 80.00 FEET, THENCE S.89°53'49"W., 200 FEET TO THE POINT OF CURVATURE OF A CURVE CONCAVE SOUTHERLY AND HAVING A RADIUS OF 756.78 FEET; THENCE RUN 296 31 FEET ALONG THE ARC OF SAID CURVE, A CHORD BEARING AND DISTANCE OF S.78°43 36"W., 294 42 FEET TO THE POINT OF TANGENCY; THENCE S.67°31'02"W., 481 14 FEET TO THE POINT OF CURVATURE OF A CURVE CONCAVE NORTHERLY AND HAVING A RADIUS OF 1103.72 FEET, THENCE RUN 241.24 FEET ALONG THE ARC OF SAID CURVE, A CHORD BEARING AND DISTANCE OF S.73°59'18"W, 240 76 FEET, THENCE WEST, 150.57 FEET; THENCE NORTH, 204.70 FEET; THENCE EAST, 60.00 FEET; THENCE NORTH, 161.00 FEET; THENCE EAST, 437 55 FEET; THENCE NORTH, 353 FEET; THENCE WEST, 397 FEET TO THE POINT OF BEGINNING

CONTAINING 18.89 ACRES, MORE OR LESS.

NOTE BEARINGS USED IN THIS DESCRIPTION WERE ESTABLISHED FROM PLANT BASE LINE BEARINGS OF TRUE NORTH AND EAST



ALSO SEE DRAWING CR3-G86-D WHICH SHOWS BOUNDARY AROUND INTAKE & DISCHARGE STRUCTURES. ALSO SEE DRAWING CR3-G85-D WHICH SHOWS BOUNDARY AROUND HELPER COOLING TOWERS.

NOTE: 1. SITE DATA FROM DWG SUR-0064-D
2. ADDED MES-TEK, COMBUSTIBLES WAREHOUSE AND MATERIALS WAREHOUSE.
3. ADDED RAILROAD SPUR.

NO.	DESCRIPTION	BY	DATE	APPR
2	RE ISSUED PER DCN 94-162	LDL	7/11/94	LSM
1	VOID PER DCN# 91-276	KS	7/16/91	LDL

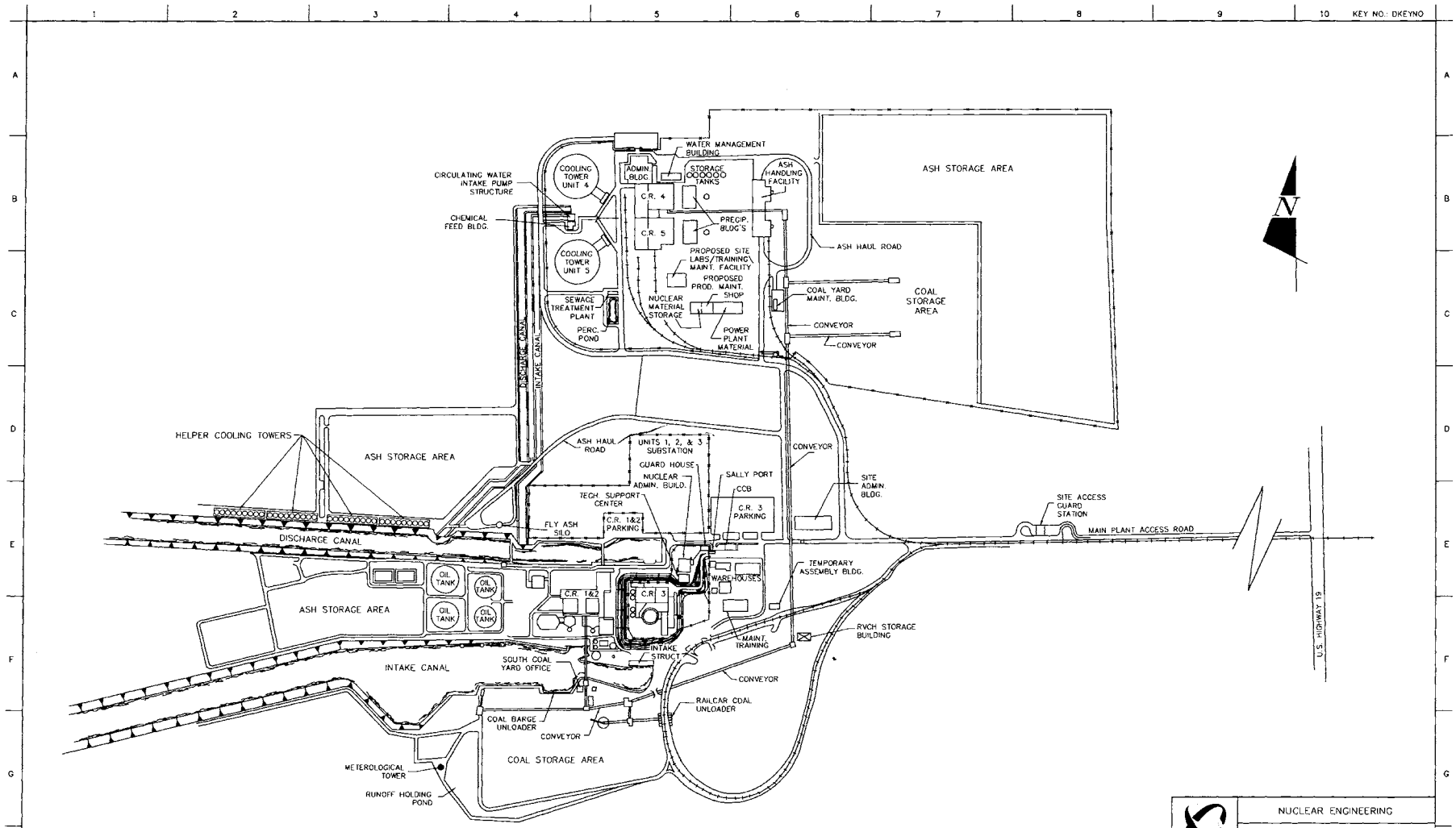
REVISIONS

FLORIDA POWER CORPORATION
SYSTEM ENGINEERING DEPARTMENT
PRODUCTION ENGINEERING SECTION

LOCATION OF WAREHOUSE FACILITIES AT CRYSTAL RIVER 3 SITE (PARTICIPATION AGREEMENT)

SCALE AS SHOWN DATE JULY 11, 1975 DRAWN GLK
CHECKED C.R.
APPROVED
SHEET 1 DWG. NO. CR 3-G61-D REV 2

BRUNING 40-21 23005



NO.	DESCRIPTION	DRAWN	CHKD	APPR	DATE
09	AS BUILT PER EC 50221	LSM	CGP	BJF	6/10/04
08	AS BUILT PER EC 50223	TDF	CGP	LJS	12/03/03
07	AS BUILT PER EC 52915	TDF	JRW	KRW	10/21/03

REVISIONS

Progress Energy

NUCLEAR ENGINEERING

CRYSTAL RIVER UNIT 3

CRYSTAL RIVER SITE PLOT PLAN FSAR FIGURE 1-3

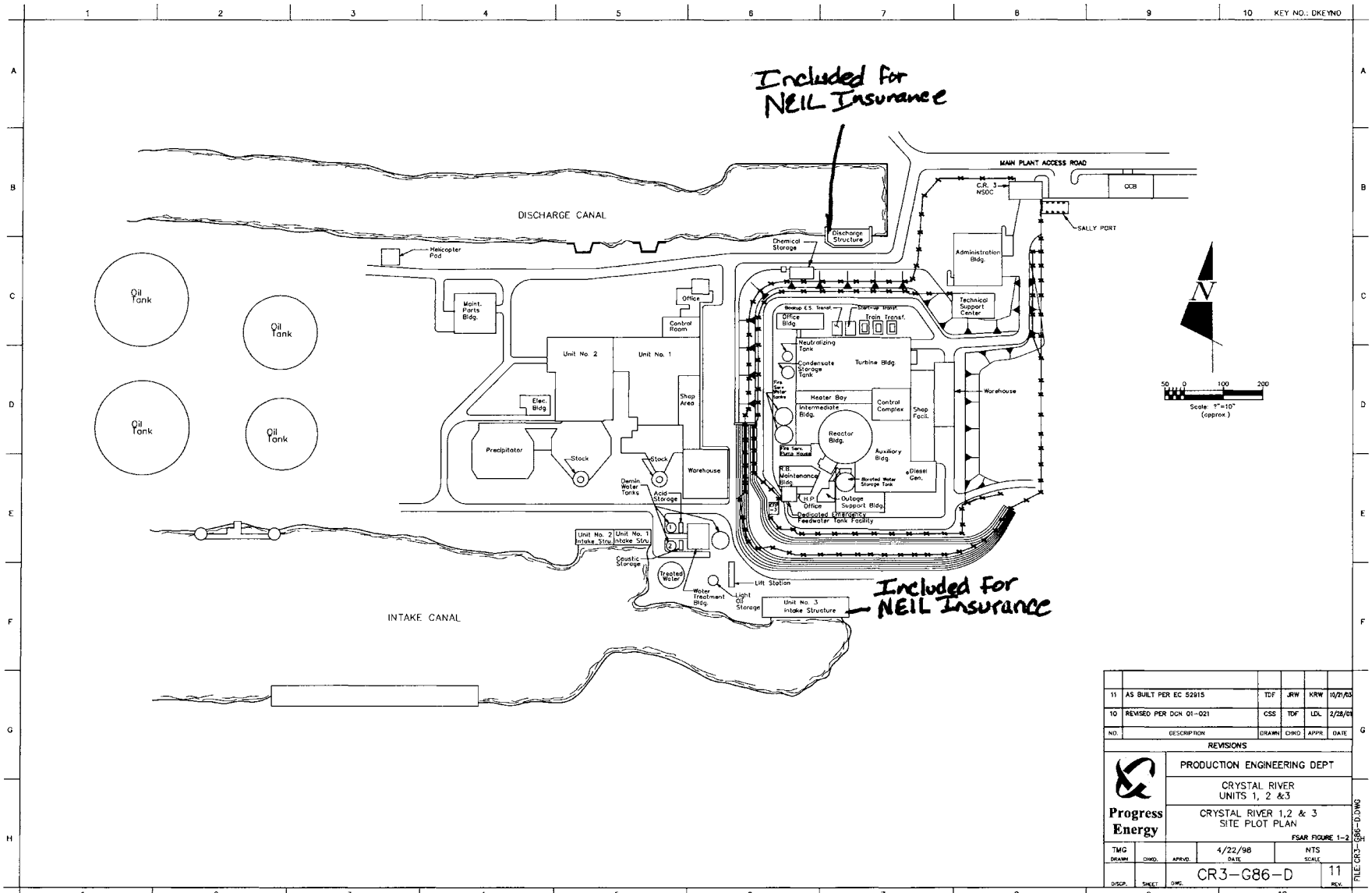
RAL DRAWN | MC CHKD | 4-21-82 DATE | SCALE

ME DSGN | SHEET | CR3-G85-D DWG | 9 REV

D-12-14

FILE: CR3-G85-D.DWG

Crystal River



Crystal River

NUCLEAR ELECTRIC INSURANCE LIMITED

NEIL I ACCIDENTAL OUTAGE INSURANCE POLICY

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NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

NEIL I ACCIDENTAL OUTAGE INSURANCE POLICY

POLICY NO. E12-015

This Policy is made by and among the Member Insured (specified in Item 1 of the Declarations) and Nuclear Electric Insurance Limited, a Bermuda mutual company with limited liability (the "Insurer").

The Insurer is only licensed in Bermuda and Delaware and the Insureds (those Insureds specified in Item 9 of the Declarations together with the Member Insured) will not be protected by the guaranty funds of any U.S. jurisdiction.

The Member Insured will be required to execute the Policy in Delaware. The Policy will become effective only upon the acceptance by the Member Insured of the delivery of the Policy at the Insurer's office in Delaware.

I. INSURING AGREEMENT

In consideration of the premium paid, and subject to the terms and conditions of this Policy, the Insurer agrees to pay the Member Insured, after the expiration of the Deductible Period, the amounts hereinafter specified in the event of an Outage at a Unit specified in the Declarations resulting from Accidental Property Damage to Insured Property on site or while Insured Property is in transit to or from the Unit.

In Witness Whereof, the Insurer and the Member Insured have caused this Policy to be executed and attested on their behalf in Wilmington, Delaware.

INSURER:
Nuclear Electric Insurance Limited

Wilmington, Delaware

Date: As of April 1, 2012

By: _____
David B. Ripsom, President

Attest: _____

MEMBER INSURED:
Florida Power Corporation

Wilmington, Delaware

Date: As of April 1, 2012

By: _____
Attorney-in-Fact

Witness: _____

A. Coverage for Accidental Property Damage at the Unit

This Policy provides insurance for an Outage at a Unit specified in the Declarations resulting from Accidental Property Damage occurring to Insured Property.

B. Transit Coverage

This Policy also provides insurance for an Outage at a Unit specified in the Declarations resulting from Accidental Property Damage occurring while Insured Property is in transit to or from the Unit, subject to the limit and Deductible Period shown in the Declarations and the following terms and conditions:

1. For purposes of this coverage, Insured Property includes property that has been purchased for use at the Unit and is in transit to the Unit.

2. This coverage applies only shipments of Insured Property worldwide except for loss or damage in the following countries:

   Afghanistan, Angola, Armenia, Azerbaijan, Bosnia-Herzegovina, Botswana, Burundi, Chechnya, Croatia, Cuba, Democratic Republic of the Congo (former Zaire), Eritrea, Ethiopia, Federal Republic of Yugoslavia, Haiti, Iran, Iraq, Kashmir, Lebanon, Liberia, Libya, Montserrat, Myanmar (Burma), Nigeria, North Korea, Pakistan, Rwanda, Somalia, Sri Lanka, Sudan, Turkish provinces of Agri, Bingol, Bitlis, Diyarbakir, Elazig, Hakkari, Mardin, Mus, Siirt, Urfa and Van, and Yemen,

   or any other country where trade relations are unlawful as determined by the Government of the United States of America, including its agencies, or the governing body of the European Union, including its agencies. No coverage is provided for any shipment beyond 100-nautical miles of the shores of the country of origin or destination for airborne or waterborne shipments, except when the point of exit and entry for the shipment is to be the same country in which case this coverage will remain in effect throughout the shipment.

3 It is a condition of insurance that the Insured Property be packed and shipped in accordance with all applicable laws or regulations having the force of law. Additionally, the Insured is required to use all reasonable means to save and preserve the Insured Property at and after an Accident or when the Insured Property is in danger of physical damage.

Notwithstanding the foregoing, the Insurer shall not be liable under Sections I.A and I.B with respect to any Outage unless the Accidental Property Damage is the direct, efficient and dominant physical cause of the Outage.

C. Outage Duration

1. A Cessation Outage shall be deemed to commence at midnight of the day the Unit ceases generating electric power. A Delay Outage shall be deemed to commence at midnight of the first day on which the Unit could have resumed the generation of electric power but for such Accidental Property Damage. An Outage shall be deemed to end at midnight of the day on which with the exercise of due diligence and dispatch by the Member Insured the Unit could resume generating electric power other than for testing purposes. This provision contemplates the Outage ending when the Unit's generator main breaker is closed, synchronizing the Unit with the electrical grid. At that point, electricity is being generated for commercial purposes. The phrase "other than for testing purposes" is not intended to extend an Outage until all testing is completed. It is intended to extend the Outage to the point where the electricity being generated is used for purposes other than testing purposes.

2. In the event a Unit needs to be shutdown following synchronization to effect repairs for damage directly related to the original Accident, but which were not identifiable until the Unit was restarted, these additional shutdown periods would be indemnifiable as an extension of the original Outage. In any event, no payments will be made for the days of generation when the Unit is synchronized to the grid. It shall be the obligation of the Member Insured to ensure the exercise of due diligence and dispatch by the Operator and the failure of the Operator to exercise such due diligence and dispatch shall be deemed a breach of this obligation on the part of the Member Insured.

3. Any delay in the Unit's resumption of the generation of electric power other than for testing purposes which results from Accidental Property Damage not related to the cause of an Outage, whether occurring prior to or during an Outage, shall constitute a separate Outage and shall be subject to a separate Deductible Period; provided, however, that any such delay which results from Accidental Property Damage occurring while Insured Property, or property that has been purchased for use at this Unit, is in transit to or from the Unit shall not constitute a separate Outage if the property damaged or destroyed was needed to repair or replace other property, the damage to or destruction of which caused the existing Outage. For the purpose of this section only, “in transit” shall include from when the Insured Property to be repaired is removed until it is reinstalled after repairs, or until the property purchased to replace the Insured Property is installed.

D. Payment of Weekly Indemnity

1. Subject to the terms and conditions of this Policy, the Insurer shall pay to the Insureds or their designated payee for each week of the Outage following the Deductible Period the following amounts:

a. 100 percent of the Weekly Indemnity for such Unit each week for the First Payment Period as shown in Item 6B of the Declarations; then

b. 80 percent of the Weekly Indemnity for such Unit each week for the Second Payment Period as shown in Item 6B of the Declarations; and thereafter

c. 80 percent of the Weekly Indemnity for such Unit each week for the Third Payment Period as shown in Item 6B of the Declarations.

d. In the event an Outage of a Unit covered hereunder extends past the Planned Shutdown Date, the Weekly Indemnity for such extended period shall be 10% of the Weekly Indemnity for the Unit specified in Item 6A of the Declarations.

2. The Member Insured shall promptly notify the Insurer in the event that any of the Units specified in Item 7 of the Declarations is to permanently cease operations prior to the scheduled expiration of such Unit's operating license.

E. Net Present Value Payment

The Member Insured may request from the Insurer payment of the net present value of the total amount payable yet unpaid in accordance with Section I.D.1(c), subject to the following conditions and subject to the approval of the Insurer, which approval may be withheld for any reason:

1. The Member Insured relinquishes all rights to any future payment under Section I.D.1(c);

2. The net present value of the amount indicated in Section I.D.1(c) shall be determined utilizing the percentage representing the average investment return of the Insurer's investment account for the twelve (12) months preceding the request;

3. In the event the Outage ceases prior to the expiration of the Third Payment Period, the Insured shall repay to the Insurer, within sixty (60) days following conclusion of such Outage, the amount received under this Section I.E times a fraction, the numerator of which shall be the number of days remaining in the Third Payment Period and the denominator of which shall be the total number of days in the Third Payment Period; and

4. At the time that an Insured makes a request for a net present value payment under the provision of this Section I.E, the Insured shall be required to complete the Accidental Outage Claims Adjustment Form, as part of the Proof of Loss filing, in order to determine the Weekly Indemnity amount to be used in the Policy. The Weekly Indemnity amount determined with that Proof of Loss filing will be used

for the entire period of time for which a net present value payment is sought under this paragraph.

F. Limitations on Payment

1. The Insurer's obligation to pay the Weekly Indemnity shall terminate when the Outage has ended. Payments for partial weeks of an Outage shall be prorated. In no event shall the Insurer be liable for more than the Limit of Liability specified in Item 6A of the Declarations.

2. In the event of an Outage of more than one Unit by reason of the same Accident, the Weekly Indemnity per Unit shall be limited as follows:

Number of Units Simultaneously Out of Service	Per Unit Indemnity (Percent of Selected Recovery)
1	100% of single unit recovery
2	80% of single unit recovery
3	60% of single unit recovery
4	50% of single unit recovery

Upon start-up of an affected Unit, the limitations on Weekly Indemnity payments, if still applicable, will apply only to those remaining affected Units.

G. Course of construction

The Insurer's liability under this Policy shall not exceed the course of construction limit per Project, as specified in Item 6.D. of the Declarations, in the event of an Outage at a unit specified in the Declarations resulting from Accidental Property Damage to property, tools, materials, supplies, equipment, and machinery involved or used in the activities described below (each of which shall be referred to separately as a "Project"):

1. Steam generator replacement(s),

2. Reactor head replacement(s),

3. Nuclear Steam Supply System (NSSS) Pressurizer replacement(s),

4. Main condenser replacement(s) and/or full retubing,

5. Major component replacement(s) along the turbine/generator shaft line, including the high, intermediate, and low pressure turbine rotors, and the generator rotor and stator,

6. Component replacement(s) associated with power up-rates that are anticipated to exceed a 1.0% increase in rated thermal power,

7. Emergency diesel generator replacement(s),

8. Moisture separator/feed water heater replacement(s),

9. Vessel Internal Component replacement(s), and

10. Large crane replacement(s), limited to the turbine overhead or gantry crane, BWR refueling floor crane, and PWR containment polar crane

The course of construction sublimit in Item 6 of the Declarations shall also apply in the event of an Outage at a Unit specified in the Declarations resulting from Property Damage that ensues from, arises out of or is caused by any Projects described in subsections 1 through 10 above or resulting from Property Damage that could have been avoided or reduced if the Project had not been undertaken.

However, the course of construction sublimit in Item 6 of the Declarations shall not apply if the Property Damage is caused by a natural hazard or the Insured can demonstrate that the cause of the Property Damage causing the Outage was unrelated to the Projects described in subsections 1 through 10 above and there is otherwise coverage under this Policy.

II. EXCLUSIONS

A. General Exclusions

1. This Policy does not cover any Outage resulting from:

   (a) gradual accumulation of radioactive contamination;

   (b) radioactive contamination at the Unit specified in the Declarations resulting from matter released from any source outside the premises of that Unit and for which the Insured is covered or would be entitled to coverage or can make a claim against a third party who is insured under a nuclear energy liability policy issued by the Nuclear Energy Liability Insurance Association or Mutual Atomic Energy Liability Underwriters or any other third party liability insurer, but this exclusion shall not apply to radioactive contamination resulting from matter released from any source while such source is in transit to or from the Unit specified in the Declarations;

(c) any fraudulent, dishonest, or criminal act done by or at the instigation of any Insured, any Operator, a partner or joint venturer in or of any Insured or Operator, or an officer, director or trustee of any Insured or Operator;

(d) Order of Civil Authority, except acts of destruction at the time of and for the purpose of preventing the spread of fire, provided that such fire did not originate from "War Risk" as herein excluded;

(e) any governmental act, decree, order, regulation, statute or law prohibiting or preventing, directly or indirectly, the commencement, recommencement or continuation of any operations at the Unit specified in the Declarations;

(f) any local, state or federal ordinance or law regulating construction or repair of buildings or structures, or suspension, lapse or cancellation of any lease or license, contract or order, or interference at the Unit specified in the Declarations by strikers or other persons with respect to rebuilding, repairing or replacing the Insured Property or with the resumption or continuation of business;

(g) any form of deterioration or wear and tear, including but not limited to

(i) depletion, depreciation, and deterioration, including that of fuel element cladding;

(ii) embrittlement of any kind, including but not limited to hydrogen embrittlement and neutron embrittlement;

(iii) fatigue of any kind, including but not limited to thermal fatigue and high-cycle fatigue;

(iv) rust, erosion, or corrosion of any kind, including but not limited to stress corrosion cracking, unless caused directly by an independent and separate Accident not otherwise excluded, but then only for the Outage caused by such Accident;

(v) pitting, cracking, bulging, blistering, fretting, denting, deformation or distortion of the Insured Property which accompanies or is directly associated with the kinds of Property Damage specified in subparagraphs (ii) through (iv) above;

(vi) shrinking, bulging, expansion, cracking, shifting, rising, settling, sinking, and lateral or other movement of pavements, foundations, walls, floors, ceiling or roofs; or

(h) dampness, dryness, or extremes or changes of temperature of the atmosphere, including but not limited to rust, corrosion or erosion or other resulting Property Damage, unless caused directly by an independent and separate Accident not otherwise excluded, but then only for the Outage caused by such Accident.

2. With respect to Exclusions under Section II.A.(g) and Section II.A.(h), the Insurer shall be liable for any Outage resulting from an independent and separate ensuing Accident not otherwise excluded, but then only for the Outage caused by the ensuing Accident.

3. This Policy does not cover Partial Outages.

B. War Risk Exclusion

1. Subject to paragraph 2 below, the coverage provided under this Policy does not apply to Property Damage caused directly or indirectly by:

(a) hostile or warlike action in time of peace or war, including action in hindering, combating or defending against an actual, impending or expected attack by any government or sovereign power (de jure or de facto), or by any authority maintaining or using military, naval or air forces; or by military, naval or air forces; or by an agent of any such government, power, authority or forces;

(b) any weapon of war employing nuclear fission or fusion whether in time of peace or war; or

(c) insurrection, rebellion, revolution, civil war, usurped power, or action taken by governmental authority in hindering, combating or defending against such an occurrence.

2. This War Risk Exclusion shall only apply to acts which are part of overt military activity.

III. PREMIUM

1. The Member Insured agrees to pay to the Insurer the Premium under the terms and conditions hereinafter set forth. The Premium shall be paid to the Insurer by wire transfer or other method acceptable to the Insurer on or before the beginning of the policy period specified in Item 3A of the Declarations.

2. As a condition precedent to the Insurer's obligations under this Policy, the Member Insured agrees to notify the Insurer that the Insured Property has been classified Category Number Five by the Institute of Nuclear Power Operations ("INPO"), within seven (7) days of being advised by INPO of such classification

being put in place, and to pay such additional Premium due hereunder to the Insurer as a result thereof by wire transfer or other method acceptable to the Insurer within twenty (20) business days after demand.

3. The Member Insured further agrees to pay the Insurer the Retrospective Premium Adjustment under the terms and conditions specified under Section V.

IV. CONDITIONS

A. Aggregate Limit of Liability and Reduction of Policy Amount by Loss

The amount of insurance for any Unit as stated in the Declarations is the limit of the Insurer's liability for the aggregate of all Losses resulting from Outages occurring within the policy period for that Unit. Every Outage covered hereunder reduces, as of the date of such Outage, the amount of insurance under this Policy at the Unit where such Outage occurs by the amount of such Loss, and this Policy shall apply thereafter only for the reduced amount. In the case of an Outage covered hereunder, upon payment of an additional premium, the amount of insurance under this Policy may, at the option of the Insurer, be endorsed to its original amount.

B. Assignment

Assignment or transfer of this Policy shall not be valid except with the prior written consent of the Insurer.

C. Choice of Law

1. In view of the diverse locations of the parties hereto and the desirability of unified regulation, the Insureds and Insurer agree that the terms of this Policy shall determine their respective rights and duties and that this Policy shall be construed and enforced in accordance with and governed by the internal law of the State of New York, United States of America.

2. The parties intend that the Insurer conduct its activities so as not to be subject to the insurance regulation of any jurisdiction other than Bermuda and Delaware. Accordingly, the parties expressly recognize and agree that paragraph 1 above does not evidence an intent by the parties to

   (a) give jurisdiction over the Insurer to the insurance regulatory authority of any jurisdiction other than Bermuda and Delaware; or

   (b) make applicable to this Policy any of the insurance laws or regulations (including those which specify the terms of the by-laws and contracts of mutual insurance companies) of any jurisdiction, including New York,

other than to the extent such laws of Bermuda and Delaware are applicable; or

(c) otherwise have the laws of Bermuda or Delaware apply to the construction or enforcement of this Policy.

D. Concealment, Fraud

The Insurer shall have no obligation to make any payment under this Policy if, whether before or after a Loss, any Insured has willfully concealed or misrepresented in writing any material fact or circumstance concerning this insurance or the subject thereof, or the interest of any Insured therein, or in case of any fraud or false swearing by any Insured relating thereto; but the application of this provision shall not affect the Member Insured's obligation to pay the Retrospective Premium Adjustment callable by the Insurer under this Policy, or provide other assurances to the Insurer pursuant to Section V.2.

E. Dispute Resolution

1. The Insurer and the Insured mutually acknowledge that the form, terms and conditions of the Policy have been formulated by representatives of the companies participating in the mutual enterprise in order to provide insurance coverage which is vital to all participants. It is desired that the Insurer serve as a financially stable and reliable entity, responsive to the coverage needs of its participants, and providing coverage fairly and equitably as to each Insured, but taking equally into account fairness and equity as to all Insureds as a group. While every effort has been made to define with clarity and precision the scope of coverage and other policy provisions, the Insurer and the Insured mutually acknowledge that situations may arise where the terms of the Policy, or the interpretation of the terms, are disputed. For the foregoing reasons, the Insurer and the Insured agree that the following principles shall govern the interpretation of the Policy:

a. Even-handedness and fairness to both the Insurer and the Insured;

b. In the event of an ambiguity in a policy provision, the intentions of the Insurer and the Insured shall be considered by the Arbitrator(s). Evidence of such intentions is limited to the following extrinsic evidence: reports, notes, meeting minutes, and related materials produced by or given to the Insurer's Board of Directors, Advisory Committees, and Task Forces, and any testimony taken from a present or former employee of the Insurer, member of a Member Advisory Committee, or Director;

c. The practice of the Insurer and the Insured in interpreting and applying the Policy;

d. The cooperative rather than adversarial relationship between the Insurer and the Insured; and

e. The contract construction rule of contra proferentem (construing a contract against the drafter) is not applicable to this insurance policy.

2. The Insurer and Insured will endeavor to resolve any dispute between them by means of a voluntary process to be agreed upon between them, including, without limitation, early neutral evaluation, mediation, mini-trial, neutral fact finding, or senior peer review. Neither the Insurer nor the Insured may be compelled to participate in any such voluntary process except that, at the request of an Insured, the Insurer agrees to submit the dispute to senior peer review. The Insurer agrees to pay the fees and expenses of any neutral party associated with the use of any process hereunder. Senior peer review is a process in which both sides present their arguments and view of the evidence to a panel of five (5) employees of other NEIL Members, unless the Insured and Insurer agree that a panel of three (3) would be more appropriate. The panel will provide a written non-binding opinion on the merits of the dispute. Though not an exclusive list, panel members may include individuals from NEIL's Member Representatives, Board of Directors, Member Advisory Committees, or Members' Legal Counsel. None of the panelists may be employed by a Member that is an affiliate of the Insured involved in the dispute. The panelists shall be selected by agreement of the Insured and Insurer, but if no agreement is reached within 30 days of the date the senior peer review is requested, the Insurer and Insured shall each submit a list of five names and a NEIL outside Director (as chosen by the Chairman of the Board) shall select the panelists. The panel, with input from the parties, shall establish a schedule for the proceeding, including, if appropriate, the submittal of written materials and oral arguments.

3. The Statement of Dispute Resolution Principles adopted by the Insurer's Board of Directors and Members, as it may be amended from time to time, shall not create any rights or obligations on the parties but shall be used as guidelines for conducting dispute resolution processes hereunder.

4. Any dispute, controversy or claim between the Insurer and the Insured as to any matter arising out of or relating to this Policy, or the breach, termination or invalidity thereof, which is not settled between themselves, pursuant to paragraph 2 above or otherwise, shall be settled by arbitration in accordance with the United Nations Commission on International Trade Law's (UNCITRAL) Arbitration Rules. Arbitration of a dispute is final and binding.

   a. The number of arbitrators shall be one, unless the Insured or the Insurer requests a three-person panel, in which case the number of arbitrators shall be three.

   b. In the event the arbitration is to be decided by a single arbitrator, and the parties cannot agree on the appointment of that arbitrator within sixty (60) days of the notice of arbitration being served, the sole arbitrator shall be selected by the appointing authority specified in paragraph 4.d.

   c. In the event the arbitration is to be decided by three arbitrators, the Insured shall appoint one arbitrator and the Insurer another; the two so appointed arbitrators shall select the third, who will act as the Chairman for the panel. The party which files the

notice of arbitration shall include in such notice the identity of its party-appointed arbitrator. Within forty-five (45) days of service of the notice of arbitration, the second party shall notify the party that filed the notice of arbitration of the identity of its party-appointed arbitrator. At the time of the notification of the appointment, each side shall provide the other with a detailed curriculum vitae for the selected arbitrator, which shall include information regarding any potential conflict of interest of the selected arbitrator, including any financial or personal interest in the result of the arbitration or any past or present relationship with the parties or their representatives. All arbitrators shall be obligated to update his/her potential conflict of interest information throughout the arbitration. If (i) the party filing the notice of arbitration fails to include the identity of its party-appointed arbitrator, or (ii) the second party does not notify the first party of its party-appointed arbitrator within forty-five (45) days of service of the notice of arbitration, or (iii) the two party-appointed arbitrators fail to agree on a third arbitrator within a period of sixty (60) days from the date of appointment of the second arbitrator, then, on request of either party, the missing party-appointed arbitrator or the third arbitrator (as the case may be) shall be selected by the appointing authority specified in paragraph 4.d. There shall be no *ex parte* communications between a party and any of the arbitrators, except that a party-appointed arbitrator shall be permitted to communicate with the party that appointed him/her concerning (1) the identity of the Chairman and (2) issues associated with arbitrator invoices.

d. The appointing authority shall be the American Arbitration Association ("AAA") in New York, New York. The AAA shall select arbitrators from the panel of international arbitrators for the International Centre for Dispute Resolution, the international division of the AAA (the "ICDR Roster"). The arbitrators selected from the ICDR Roster shall be U.S. nationals. If for any reason the AAA fails to appoint an arbitrator within thirty (30) days of the date of receipt of the request for such appointment, either party may proceed pursuant to Article 75 of the Civil Practice Law and Rules of the State of New York and make application to the Supreme Court of the State of New York, County of New York for the appointment of the arbitrator.

e. To the extent there is any inconsistency between the UNCITRAL Arbitration Rules and the provisions of this Policy, the latter shall govern.

f. The place of the arbitration shall be New York, New York, unless the parties agree upon another location.

g. Within forty-five (45) days after the appointment of the Chairman, the arbitrators shall conduct an initial conference to which the parties will be invited to attend. At the initial conference, the parties and arbitrators shall discuss, without limitation, (1) the procedures to be followed, (2) scheduling of submissions and hearings, and (3) a timetable for discovery. At a minimum, the discovery order shall require the parties to provide each other non-privileged documents that are requested by the other side and that reasonably relate to the claims and defenses asserted in the arbitration.

Following the initial conference, the arbitrators shall issue a Procedural Order to the parties setting forth the procedures and schedule.

h. Within sixty (60) days of the close of the hearings (or the later of post-hearing oral argument or post-hearing written submissions should the arbitrators authorize them), the arbitrators shall issue their award, which shall be in writing and shall present a detailed statement of the factual and legal bases for the award. The award of the arbitrators shall require a majority of two votes. The arbitrators shall first determine the liability of the parties as to the dispute, claim or controversy, and then, only if necessary, determine the type and amount of relief to be granted. In no case may the arbitrators order the rescission or reformation of this Policy. Further, unless the arbitrators determine that it is inappropriate under the circumstances of the case, the award shall provide that post-award interest shall begin to accrue at the rate of the Prime Rate, as published in the Wall Street Journal as of the date of the award, plus two (2) percent per annum from the date sixty (60) days after the award is delivered to the parties until the date the award is paid.

i. The arbitrators shall award reasonable attorney's fees and costs to the prevailing party, not to exceed the amount of fees and costs incurred by the non-prevailing party. For this purpose, the fees incurred shall be calculated at reasonable hourly billing rates and shall include all reasonable out-of-pocket expenses, including, without limitation, the reasonable costs of expert witnesses and consultants. If the Insured has retained counsel on a contingency fee basis, and the Insurer is the prevailing party, the arbitrators shall award the Insurer all of its reasonable attorney's fees and costs (without consideration of the fees and costs incurred by the Insured).

j. In the event the award is challenged in court and the challenge is denied, the party that challenged the award shall pay the reasonable attorneys' fees and costs incurred by the non-challenging party in defending against the challenge to the award.

k. The Parties acknowledge that any dispute resolution proceeding is intended to be confidential and therefore agree to properly maintain and not disclose or reveal any information obtained from the other party pursuant to the terms of a Confidentiality Agreement to be executed between the Parties at the beginning of the proceeding (the terms of which shall be determined by the arbitrators in the event that the parties are unable to agree). In the case of arbitration, the written decision of the arbitrator(s) shall be available to other Insureds of NEIL and ONEIL, except that any information within the written decision that the Insured can show is proprietary in nature will be redacted.

5. To the extent that any dispute, claim or controversy between the Insured and the Insurer hereunder is not subject to arbitration for any reason, or to the extent that applicable law otherwise permits the parties to seek provisional relief from the courts prior to the time that the arbitral panel is appointed, the United States District Court for the Southern District of New York (or the Supreme Court of the State of New York, New York

County, if federal jurisdiction cannot be attained) shall have exclusive jurisdiction thereof. For such purpose, the Insured agrees to accept, without objection to form or manner, service of process by registered mail or form of overnight mail to the person identified in Item 11 of the Declarations. For such purpose, the Insurer agrees to accept, without objection to form or manner, service of process by registered mail, or overnight mail, directed to the Insurer's General Counsel, at Nuclear Electric Insurance Limited, 1201 Market Street, Suite 1100, Wilmington, Delaware 19801. The foregoing consents to service of process are not intended, nor shall they be construed, to extend to any dispute, claim, controversy, cause of action, or other matter other than as stated in this paragraph.

F. Headings

The headings in this Policy are inserted for convenience only and shall not be deemed to constitute a part hereof.

G. Evaluations and Compliance with Loss Control Standards

1. The Insurer shall be permitted, but not obligated, to perform or to have performed on its behalf, evaluations of the Insured Property at any reasonable time. All evaluations and evaluation reports made by or on behalf of the Insurer are made solely for insurance purposes. Evaluation reports are based upon the conditions, practices and property observed and information made available at the time of the evaluation, and shall not be deemed to identify all hazards or to indicate that other hazards do not exist. The Insurer and those performing evaluations on its behalf shall not be responsible for the correction or control of any conditions, practices or property. Notwithstanding any other agreement, express or implied, to the contrary, neither the right to make an evaluation nor the making of an evaluation, nor any advice or report resulting therefrom, shall constitute or be construed as an undertaking on behalf of or for the benefit of the Insureds or others to determine or warrant that the facilities, operations or property are safe or healthful, or are in compliance with any law, rule, regulation, procedure or standard. It shall be the obligation of the Insureds to ensure that the Insurer is accorded the right to conduct an evaluation under this paragraph.

2. Notwithstanding the provisions in Paragraph IV.G.5, upon discovery of a dangerous condition (the "Dangerous Condition) with respect to any property, or part thereof, insured under this Policy or a Primary Policy issued by the Insurer for the Unit insured under this Policy, whether that Primary Policy is issued to the Insured or another party, (the "Affected Property"), and whether discovered as a result of an evaluation or otherwise, a representative of the Insurer may

   (a) request that the Affected Property be taken out of service without delay, and/or

   (b) request that actions be taken to remedy the Dangerous Condition.

3. If a request made under Paragraph IV.G.2 is not complied with the Insurer may immediately suspend coverage as to the Affected Property and as to any Property Damage and/or Accidental Outage that could have been avoided or reduced had the Dangerous Condition been remedied, provided, however, that there will be coverage for Accidental Outage if the Insured can demonstrate that the Property Damage was unrelated to the failure to take the requested action (and there is otherwise coverage under this Policy). Notice of the suspension (which may be made together with either request referred to in Paragraph IV.G.2) shall be written and, notwithstanding any other provisions under this Policy, may be sent to the Member Insured by hand delivery, e-mail, fax or courier.

4. It shall be an obligation under this Policy that the Insured comply with the SHALL Requirements contained in the Insurer's Loss Control Standards.

5. If the Insurer learns of an Insured's failure to comply with, or to take agreed upon actions in accordance with the agreed upon Resolution Plan to correct a failure to comply with, a SHALL Requirement contained in the Insurer's Loss Control Standards, and, as a result and in accordance with the terms of a Primary Policy issued by the Insurer for the Unit insured under this Policy, regardless of whether that Primary Policy is issued to the Insured or another party, the Insurer suspends coverage under that Primary Policy, such suspension of coverage shall apply with equal force and effect to this Policy. The Insurer shall notify the Insured of a suspension of coverage under this Policy in the same notice sent by the Insurer concerning suspension under the Primary Policy. Upon reinstatement of coverage under the Primary Policy, coverage shall be reinstated under this Policy in accordance with the provisions of Paragraph 9 of this Section.

6. If a request is made to remove coverage under a Primary Policy issued by the Insurer for the Unit insured under this Policy, regardless of whether that Primary Policy is issued to the Insured or another party, such removal of coverage shall have equal effect under this Policy, with the precise scope of such removal to be described in an endorsement to this Policy or as set forth in writing and delivered to the Insured.

7. Any suspension of coverage under Paragraphs IV.G.3 and IV.G.5 of this Policy shall be in accordance with the scope of coverage suspension set forth in writing and delivered to the Insured.

8. The Insurer may immediately suspend coverage under this Policy, in whole or in part, with respect to the Insured Property if (i) the NRC suspends or revokes for any reason the operating license issued with respect to any Unit on such Insured Property, or (ii) the NRC issues a shutdown order with respect to such Unit, or (iii) the NRC issues a confirmatory order keeping such Unit shut down. In the event that the Insurer chooses to suspend coverage under this provision, it shall notify the Member Insured in writing of that decision.

9. The coverage suspended in accordance with Paragraphs IV.G.3 and IV.G.5 above, as well as any coverage removed, may be reinstated by the Insurer, but only by an endorsement issued to form a part of this Policy. The suspension of the insurance under this Policy will not affect the obligation of the Member Insured to pay the Retrospective Premium Adjustment callable by the Insurer under this Policy, or provide other assurances to the Insurer pursuant to Section V.2.

H. Other Insurance

The Insurer shall not be liable if at the time of the Loss there is any other insurance which would attach if this insurance had not been effected, except that this insurance shall apply only as excess and in no event as contributory insurance, and then only after all other insurance has been exhausted.

I. Policy Decisions and Notice

Except as provided in paragraph K of Section IV, all decisions or actions made or taken with respect to this Policy may only be taken or made by the first named Member Insured and all such decisions or actions shall be binding on all Insureds. Such decisions or actions shall include, without limitation, decisions to give or not give notices of losses, to file or not file proofs of loss and to bring or not bring an action under the dispute resolution provision. No decision or action with respect to this Policy may be made or taken by anyone other than the Insurer and the first named Member Insured. The first named Member Insured shall be that Member Insured whose name is listed first in Item 1 of the Declarations. The Insurer and the Insureds agree that all communications between them as to any matter arising under or relating to this Policy shall be made as follows:

1. If to the Insurer: The communication must be sent by the first named Member Insured and must be sent, by facsimile, mail or courier to the Insurer at the address listed in Item 2 of the Declarations.

2. If to the Insureds: The communication must be sent by the Insurer to the first named Member Insured and must be sent, by facsimile, mail or courier to the address listed in Item 1 of the Declarations or to the address of such Member Insured's Delaware Representative. It shall be the obligation of the first named Member Insured to communicate the contents of any notification from the Insurer to the other Insureds.

The Insured's compliance with the provisions of this Section IV.I is a condition precedent to the Insurer's obligations under this Policy.

J. Policy Modifications

This Policy embodies all agreements between the Member Insured and the Insurer or any of their agents relating to this insurance. There shall be no change in the terms, provisions and stipulations of this Policy except in writing hereon or by endorsement added hereto by the Insurer and the Member Insured.

K. Requirements in Case of Loss

1. It shall be an obligation of the Insureds to give, or cause to be given, to the Insurer immediate written notice of any Outage exceeding ten weeks or for which a claim is expected to be made under the Policy. At the time any claim is made, but in no event later than twelve months after completion of an Outage, the Insureds shall complete and file with the Insurer a proof of loss ("Proof of Loss"), in the form approved by the Insurer, signed and sworn to by the Member Insured, stating the knowledge and belief of the Insureds as to the following: the time and origin of the Accident resulting in the Outage, the interest of the Insureds in, or in the output of, the Unit, and all other contracts of insurance, whether valid or not, covering the risks insured hereunder. The Insured shall be required to complete the Accidental Outage Claims Adjustment Form, as part of the Proof of Loss filing, in order to determine the Weekly Indemnity amount. The Insurer may deny coverage for such Outage if the Insured fails to comply with its obligation to provide immediate written notice thereof, but only if the Insurer demonstrates being prejudiced in its ability to adjust, assess or otherwise investigate the claims as a result of such failure.

2. In the event of an Outage, the Insureds and each of their agents, employees or assigns, shall do all things reasonably necessary or desirable, or to the extent reasonably requested or required by the Insurer with respect to its investigation of such Outage, to the defense, safeguard, recovery and preservation of the damaged Insured Property. It shall be the obligation of the Insureds to exhibit or cause to be exhibited to any person designated by the Insurer, as often as may be reasonably necessary, any Insured Property at the Unit or any Insured Property damaged in transit to or from the Unit.

3. The Insureds shall submit or cause any person specified by the Insurer who is within the control of the Insureds to submit, to examinations under oath by any person named by the Insurer, and to subscribe the same; and as often as may be reasonably required, and at such reasonable time and place as may be designated by the Insurer or its representative, to produce for examination all books of account, bills, invoices, and other vouchers or documents needed by the Insurer to determine its liability, or, if originals be lost, certified copies thereof; and to permit extracts and copies thereof to be made. Any failure on the part of the Operator to comply with the requirements of this paragraph shall be deemed a breach of this obligation on the part of the Insureds.

L. State Premium Tax

The Insureds represent that they have paid or will pay any applicable state premium tax.

M. Subrogation

1. Except as provided in paragraph 3 below, the Insurer may require from the Insureds an assignment of all right of recovery against any party for any Loss to the extent that payment therefor is made by the Insurer; however, prior to an Accident, the Insured may waive in writing any or all right of recovery against any party for Loss occurring hereunder.

2. The Insurer hereby waives any right of subrogation, acquired by reason of any payment under this Policy arising out of any Outage covered hereunder, against the Insureds and any party furnishing services, materials, parts, or equipment in connection with the planning, construction, maintenance, operation or use of the Insured Property.

3. It is a condition of this Policy that the Insureds shall repay the Insurer any recoveries made by the Insureds on account of any such Outage to the extent that the Insurer would have been entitled to such recoveries had this waiver not been included in this Policy; provided, however, the proceeds of any such recovery shall be applied first to any uncompensated loss incurred by the Insureds, including reimbursement of any deductible amount under this Policy, and then, to the extent any proceeds of such recovery remain, to reimburse the Insurer for any payments made by it to the Insureds.

N. Suit

No suit, action, or proceeding on this Policy for the recovery of any claim shall be sustainable in any court of law or equity or arbitral tribunal unless all the requirements of this Policy shall have been complied with, and unless brought within eighteen (18) months after an Outage has commenced or within twelve (12) months after the expiration of the period for which payment of the Weekly Indemnity is sought, whichever is later.

O. Term and Cancellation

1. This Policy shall commence on the date specified in Item 3A of the Declarations and shall terminate on the date specified in Item 3A of the Declarations. This Policy shall be automatically renewed for successive one-year terms, however either party may cancel this Policy by providing written notice to the other party by registered mail at least three months prior to any anniversary.

2. This Policy may be canceled at any time by the Insurer, upon approval of its Board of Directors, upon sixty (60) days' written notice of cancellation mailed or delivered to the Member Insured, with or without tender of the excess of paid premium above the pro rata premium for the expired time, which excess, if not tendered, shall be refunded on demand. Notice of cancellation shall state that said excess premium, if not tendered, will be refunded on demand.

3. This Policy shall be automatically canceled if (i) the INPO membership of either the Member Insured or the Operator is suspended or canceled by INPO for any reason and (ii) the Member Insured fails to notify the Insurer within five business days after receipt of notice of such suspension or cancellation of membership in INPO, unless the Insurer is otherwise notified during such five business days.

4. In the event that the Member Insured fails to pay to the Insurer any Retrospective Premium Adjustment due under this Policy, due under any Other Insurance Policy as such Member Insured may have with the Insurer, or referred to in Section V, this Policy shall terminate provided that the Insurer notifies the Member Insured in writing of this delinquency and the Member Insured fails to make the required payment within 15 days after receiving such notice by registered mail.

5. Neither the cancellation of the Policy on the part of the Insured or the Insurer, nor its automatic termination, shall affect the obligation of the Member Insured to pay the Retrospective Premium Adjustment callable by the Insurer under this Policy, or provide other assurances to the Insurer pursuant to Section V.2.

V. RETROSPECTIVE PREMIUM ADJUSTMENT

The Member Insured agrees to pay to the Insurer the Retrospective Premium Adjustment under the terms and conditions hereinafter set forth.

1. The Insurer may make demand for the Retrospective Premium Adjustment in whole or in one or more parts from time to time, but only to the extent necessary, in the sole discretion of the Board of Directors of the Insurer, to cover Losses incurred by the Insurer under this Policy and all Other Insurance Policies with coverage effective during the Policy Year (specified in Item 3.B of the Declarations).

2. The Insurer, in the sole discretion of the Board of Directors, may require the Member Insured to provide assurance to the Insurer of the Member Insured's ability to satisfy its obligation to pay a Retrospective Premium Adjustment when called. Within twenty (20) business days of receiving notice from the Insurer that such assurance is required, the Member Insured shall notify the Insurer of the option selected to provide the required assurance, which will include, but is not limited to, providing a letter of credit, providing a financial guarantee, purchasing retrospective premium insurance, or paying a Deposit Premium, and implement such option by providing the Insurer with the required documentation or payment, depending on the option selected. The parameters for a letter of credit, a financial guarantee, and the retrospective premium insurance options will be provided to the Member Insured by the Insurer at the time the Insurer requires the Members Insured to take the action. The terms regarding the Deposit Premium are set forth in Paragraph 3 below.

3. If the Member Insured elects to pay a Deposit Premium, the Insurer may require the Deposit Premium to be paid in whole, in part, or in parts. Any Deposit Premium paid to the Insurer will be returned to the Member Insured when, in the sole discretion of the Insurer's Board of Directors, the retention of the Deposit Premium is no longer required. The amount of any Deposit Premium paid shall be a credit against the obligation of the Member Insured to pay a call made for a Retrospective Premium Adjustment and, to the extent thereof, shall be treated as a payment of the Retrospective Premium Adjustment as of the date a call for a Retrospective Premium Adjustment is made. Amounts paid as Deposit Premiums will be held in an interest bearing account and, until such a call is made, interest earned on the Deposit Premium amount will be paid back to the Member Insured on an annual basis, within ninety (90) business days after the end of the applicable calendar year. However, if the Member Insured fails to elect one of the options available pursuant to Paragraph 2 within the time frame required, or at any other time when in the sole discretion of the Insurer's Board of Directors it is in the best interests of the Insurer, the Insurer may make demand upon the Member Insured for a Deposit Premium, whether or not a demand for a Deposit Premium is made upon any other Member Insured(s). If a demand is made by the Insurer, the Member Insured shall pay the Deposit Premium within twenty (20) business days of demand.

4. That portion of the Retrospective Premium Adjustment demanded by the Insurer shall be paid to the Insurer by wire transfer or other method acceptable to the Insurer within twenty (20) business days after demand. The Insurer may, without first pursuing any rights it may have against any Delinquent Member, make such number of further demands upon the Member Insured, including any Delinquent Member, for further portions of the Retrospective Premium Adjustment, to be payable twenty (20) business days after demand, as may be needed to obtain Retrospective Premium Adjustment from the Member Insureds of the Insurer under this Policy and all Other Insurance Policies with coverage effective during

the Policy Year sufficient, in the sole discretion of the Board of Directors of the Insurer, to cover Losses under this Policy and all Other Insurance Policies with coverage effective during the Policy Year. The fact that the Insurer has received sufficient Retrospective Premium Adjustment from such Member Insureds shall not bar the Insurer from pursuing the Insurer's rights against any Delinquent Member.

5. When, for any purpose hereunder, it becomes necessary to calculate the obligation of the Member Insured for the Retrospective Premium Adjustment, it will be calculated as follows:

(a) The amount of the Retrospective Premium Adjustment shall be equal to the product of (i) the Multiple selected by the Board of Directors of the Insurer as required to meet Losses under this Policy and all Other Insurance Policies with coverage effective during the Policy Year, times (ii) the Premium plus any Additional Premium, or if such is for a period shorter than a calendar year, such Premium and Additional Premium multiplied by a fraction the numerator of which is 365 and the denominator of which is the number of days in the policy period specified in Item 3A of the Declarations.

(b) The policy year to which any Retrospective Premium Adjustment relates shall be determined by the Board of Directors of the Insurer at the time it makes the call for such Retrospective Premium Adjustment based on the date of the Accident under this Policy or any Other Insurance Policy giving rise to the obligation which such Retrospective Premium Adjustment is designed to satisfy. The aggregate of all Retrospective Premium Adjustments under this Policy shall not exceed the Retrospective Premium Adjustment set forth in Item 5.B of the Declarations.

(c) Subject to the provisions with respect to calls made in the event of failure to pay by Delinquent Members, the amount of any call for a Retrospective Premium Adjustment hereunder shall bear the same relation to the total Retrospective Premium Adjustment, payable by all Member Insureds of the Insurer under such call as the highest Premium plus Additional Premium determined under subparagraph (a)(ii) above bears to the aggregate Premiums plus Additional Premiums, used to calculate the total of all such calls, under this Policy and all Other Insurance Policies with coverage effective during the Policy Year.

(d) The obligation of the Member Insured for the Retrospective Premium Adjustment shall be and remain in full force and effect and all the above calculations shall be made without regard to whether or not the Insurer has any obligation to make payments under this Policy or this Policy is canceled or suspended.

6. When, for any purpose hereunder, it becomes necessary to calculate the obligation of the Member Insured for the Deposit Premium, it will be calculated as follows:

   (a) The amount of the Deposit Premium, if required, shall be equal to Retrospective Premium Adjustment listed in Item 5.B of the Declarations, unless otherwise indicated.

   (b) The aggregate of the Deposit Premium and any Retrospective Premium Adjustments callable under this Policy shall not exceed the Retrospective Premium Adjustment set forth in Item 5.B of the Declarations.

   (c) The amount of the Deposit Premium may be adjusted at the anniversary of this Policy.

   (d) The obligation of the Member Insured for the Deposit Premium shall be and remain in full force and effect and all the above calculations shall be made without regard to whether or not the Insurer has any obligation to make payments under this Policy or this Policy is canceled or suspended.

7. The Multiple is no higher than the Multiple in any Other Insurance Policy with insurance coverage effective during the Policy Year.

8. The Board of Directors of the Insurer in its sole discretion may adjust downward the Multiple stated in this Policy and any Other Insurance Policy with coverage effective during the Policy Year to a new lower Multiple, and the Retrospective Premium Adjustment callable under this Policy and any such Other Insurance Policy shall be reduced by a like proportionate amount. No downward adjustment in such Multiple and corresponding adjustment in any such Retrospective Premium Adjustment may be made with respect to any Retrospective Premium Adjustment which has been assigned by the Insurer, or in any Other Insurance Policy with coverage effective during the Policy Year, if the Multiple in any such Other Insurance Policy, after adjustment, would be less than the Multiple, after adjustment, in this Policy, unless a similar downward adjustment is made in the Multiple in this Policy, together with a corresponding adjustment in the Retrospective Premium Adjustment.

9. The liability of the Member Insured shall be limited to the Premium, Additional Premium the Retrospective Premium Adjustment or any unpaid portion thereof due to the Insurer under the terms of this Policy, and any assurance that may be required pursuant to Section V.2. No Member Insured shall be subject to any contingent liability or be required to pay any dues or assessments in addition to such Premium, Additional Premium, Retrospective Premium, and any assurance under Section V.2. Adjustment due under this Policy and those due under any Other Insurance Policies as such Member Insured may have with the Insurer. The

liability of the Member Insured for the Retrospective Premium Adjustment for the Policy Year shall cease six (6) years after the end of the Policy Year, unless prior demand is made therefor.

10. It is agreed that the obligation of the Member Insured to pay any Retrospective Premium Adjustment due under any Other Insurance Policy between the Insurer and the Member Insured which terminated on or before the inception date of this Policy is an obligation of the Member Insured under this Policy. It is also agreed that the terms and the amount of such obligation shall be determined by reference to the Other Insurance Policy under which such obligation arose, notwithstanding that such Other Insurance Policy may no longer be in effect.

11. The liability of each Member Insured, if there be more than one, for the Retrospective Premium Adjustment, and any assurance that may be required pursuant to Section V.2, under this Policy shall be several and not joint and in proportion to their respective interests specified in the Declarations.

12. In the event the Insurer has available credit facilities from lenders, the Board of Directors of the Insurer may, in its sole discretion, utilize such facilities to finance Losses incurred by the Insurer under this Policy and all Other Insurance Policies. The Insurer may assign to the lenders the Insurer's interest in the Retrospective Premium Adjustment, in whole or in part, including, in the event the Insurer defaults on its obligations to such lenders, the right to call such interest assigned. Such assignment may be made and shall only be effective with respect to the financing of those Losses for which the Retrospective Premium Adjustment could be called. In the event any assignment is made, the Insurer shall give prompt notice thereof to the Member Insured. Each Member Insured shall, upon the request of the Insurer, give acknowledgment of its liability for the Retrospective Premium Adjustment to each of the lenders involved.

VI. MEMBERSHIP

Each Member Insured becomes a Member of the Insurer as part of obtaining insurance from the Insurer, and as such, is entitled to the privileges and benefits, and by entering into this Policy agrees to be subject to and bound by the obligations and duties of Membership. These are more fully set forth in the Insurer’s Memorandum of Association and in the Bye-Laws and any amendments thereto, each of which is hereby incorporated into and made a part of this Policy. In no event shall any amendment to the Memorandum of Association or the Bye-Laws increase the amount of Premium or Retrospective Premium Adjustment payable or callable hereunder.

VII. DEFINITIONS

For purposes of this Policy, unless otherwise stated to the contrary, the following capitalized terms shall have the meanings set forth below. Other capitalized terms are included in the Declarations. Unless otherwise stated or required for the meaning of any provision, the singular shall include the plural and the plural, the singular. Whenever a Section or Paragraph number is included in the Policy, it refers to a Policy Section or Paragraph number.

A. "Accident" means a sudden and fortuitous event, an event of the moment, which happens by chance, is unexpected and unforeseeable. Accident does not include any condition which develops, progresses or changes over time, or which is inevitable. The date or time at which Accidental Property Damage is discovered shall be deemed the date or time of an Accident.

B. "Accidental" means caused by an Accident.

C. "Accidental Property Damage" means Property Damage which is caused by an Accident.

D. "Cessation Outage" means the Unit ceases to generate electrical power as a result of Accidental Property Damage.

E. "Deductible Period" means the number of weeks specified in Item 8 of the Declarations during which the Insurer is not liable for payment of the Weekly Indemnity.

F. "Delay Outage" means the Unit is delayed from resuming the generation of electric power other than for testing purposes as a result of Accidental Property Damage that does not cause a Cessation Outage

G. "Delinquent Member" means any member insured, including the Member Insured, who fails to pay a retrospective premium adjustment due under this Policy or any Other Insurance Policy within twenty (20) business days after demand.

H. “Deposit Premium” means the amount that the Member Insured may be required to pay to the Insurer under this Policy, as detailed in to Section V of this Policy, as security for future Retrospective Premium Adjustments.

I. "Insured Property" means the property specified as such in Item 7 of the Declarations and situated at a location specified therein.

J. "Loss" means any amounts payable by the Insurer pursuant to Section I of the Policy.

K. “Loss Control Standards” means the set of administrative and technical requirements adopted by the Insurer that are intended to minimize the risk of loss at Insured Sites.

L. "Member Insureds of the Insurer" means the Member Insureds under this Policy or the Other Insurance Policies.

M. "NRC" means the Nuclear Regulatory Commission or any governmental body succeeding to the functions and authority thereof.

N. “Operator” means those persons, entities, departments, agencies, or political subdivisions, if any, other than the Member Insured, responsible for operating a Unit covered by the Policy.

O. "Order of Civil Authority" means any order or directive of a federal, state, county, or municipal governmental entity or any department, agency or political subdivision thereof, including, without limitation, an order to replace undamaged Insured Property pursuant to a directive of the NRC.

P. "Other Insurance Policy" means any NEIL I Accidental Outage Insurance Policy other than this Policy, or any Business Interruption and/or Extra Expense Insurance Policy issued by the Insurer or by Overseas NEIL Limited.

Q. "Other Member Insurance Policy" means any insurance policy, other than this Policy, issued by the Insurer to one or more Member Insureds of the Insurer.

R. "Outage" means either a Cessation Outage or Delay Outage.

S. "Partial Outage" means a reduction in output of the Unit’s generation of electricity or a delay in the Unit reaching full power generation.

T. "Payment Periods" means the number of weeks shown in Item 6B of the Declarations.

U. "Planned Shutdown Date" means the scheduled expiration date of the operating license of any of the Units specified in Item 7 of the Declarations or the date, as notified by the Member Insured pursuant to Section I.D.2, when such Unit will permanently cease generating electricity.

V. “Primary Policy” means a Primary Property and Decontamination Liability Insurance Policy issued by Nuclear Electric Insurance Limited or a Primary Property and Decontamination Insurance Policy issued by Overseas NEIL Limited, depending on which has been issued to the Insured.

W. "Property Damage" means direct physical damage to or destruction of the Insured Property.

X. “Resolution Plan” means a written document, mutually agreed upon by the Insured and Insurer, that explains the actions to be taken by the Insured to resolve the Inusred’s non-compliance with a SHALL Requirement under the Loss Control Standards. The procedures for the development, and closure, of a Resolution Plan are contained in the Company’s Loss Control Standards.

Y. "Retrospective Premium Adjustment" means the amount of retrospective premium adjustment called or demanded of the Member Insured under this Policy as calculated pursuant to Section V of this Policy, but not, in the aggregate, in excess of the Retrospective Premium Adjustment specified in Item 5B of the Declarations.

Z. “SHALL Requirement” means a standard within the Loss Control Standards that sets forth a minimum requirement to be met and maintained for the Insured Property to be insurable, and is identified as such within the Loss Control Standards.

AA. “Unit” means a nuclear operating unit.

BB. "Weekly Indemnity" means the lesser of the amount specified as the Weekly Indemnity in Item 6A of the Declarations or the amount calculated on Line EE of the Accidental Outage Claims Adjustment Form that is to be completed as part of the Insured’s Proof of Loss filing.

CC. “Pricing Source” means an acceptable benchmark source of electricity pricing information for the region in which the Unit insured is physically located. Acceptable Pricing Sources are the Electric Power Market, as defined by FERC in the U.S., OMEL in Spain, and Belpex in Belgium, from which benchmark replacement electricity day ahead weekly weighted average pricing shall be obtained for use in the completion of the Accidental Outage Claims Adjustment Form. The Pricing Source for each Unit insured is listed in Item 13 of the Declarations of this Policy.

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

Reduction in Indemnity Endorsement

Member Insured: Florida Power Corporation

Site: Crystal River Endorsement No. 1
Policy Number: E12-015 Effective Date: April 1, 2012

Effective Time of this Endorsement is 12:01 a.m. Standard Time in Hamilton, Bermuda.

1. The Amount of Insurance specified in the Declarations may exceed the amount that would be available were such amount limited to the proportionate ownership interest of the Member Insured in the output of the Unit insured hereunder. The amount exceeding such proportionate interest is made available conditionally because the owner or owners of the remaining interests have not insured their interest and/or the aggregate Amount of Insurance purchased by all co-owners insured at the inception of this Policy is less than the Maximum Amount of Insurance and Weekly Indemnity specified in the Declarations. It is therefore agreed that in the event one or more of such co-owners should apply for and be accepted by the Insurer as a member insured during the term of this Policy, or if at any time the aggregate Amount of Insurance requested by all co-owners insured exceeds the maximum Amount of Insurance and Weekly Indemnity specified in the Declarations, the Board of Directors of the Insurer is empowered and authorized by the Member Insured to reduce the Amount of Insurance specified in the Declarations, and the share of the Weekly Indemnity payable to the Member Insured, to the extent required to reflect correctly the proportionate ownership interest of the Member Insured, including the co-owners in the Maximum Amount of Insurance and Weekly Indemnity.

2. Any reduction in the Weekly Indemnity under the preceding paragraph will be accompanied by a proportionate reduction in the Premium specified in Item 4 of the Declarations.

This Endorsement does not increase the amount of insurance provided in the Policy to which it is attached.

IN WITNESS WHEREOF, the parties hereto have caused this Endorsement to be executed and attested on their behalf.

Wilmington, Delaware

Date: As of April 1, 2012

Attest: _____

INSURER:
Nuclear Electric Insurance Limited

By: _____
David B. Ripsom, President

Wilmington, Delaware

Date: As of April 1, 2012

Witness: _____

MEMBER INSURED:
Florida Power Corporation

By: _____
Attorney-in-Fact

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

Terms & Conditions Endorsement

Member Insured: Florida Power Corporation

Site: Crystal River
Endorsement No. 2
Policy Number: E12-015
Effective Date: April 1, 2012

Effective Time of this Endorsement is 12:01 a.m. Standard Time in Hamilton, Bermuda.

As used herein, EPC Contract shall refer to the Engineering, Procurement and Construction contract that Progress Energy Florida, Inc. shall enter into for the repairs to the Containment Structure at the Insured Unit.

As used herein, Repairs shall refer to all work performed by the contractor under the EPC Contract.

For the purposes of this Endorsement the Containment Structure shall be defined as the buttresses, ring girder, dome, liner, panels, bays, and tendons of the containment building. For reference, the containment building is labeled as the reactor building in the plot plan Progress Energy Dwg. #CR3-G86-D, Rev. 11, 10-21-03.

This Policy does not cover any Outage resulting from any Accidental Property Damage to the Containment Structure. This Policy also does not cover Accidental Property Damage to tools, materials, supplies, equipment and machinery, including those belonging to contractors' and subcontractors', used to effect Repairs.

This Endorsement shall not serve to limit the recovery for, or otherwise exclude any Outage resulting from any Accidental Property Damage to (i) the contents of the containment building, (ii) adjacent buildings, or (iii) equipment, provided that such equipment is not used to effect Repairs .

All other terms and conditions remain the same.

This Endorsement does not increase the amount of insurance provided under this Policy.

IN WITNESS WHEREOF, the parties hereto have caused this Endorsement to be executed and attested on their behalf.

INSURER:
Nuclear Electric Insurance Limited

Wilmington, Delaware

Date: As of April 1, 2012

By: _____
David B. Ripsom, President

Attest: _____

MEMBER INSURED:
Florida Power Corporation

Wilmington, Delaware

Date: As of April 1, 2012

By: _____
Attorney-in-Fact

Witness: _____

NUCLEAR ELECTRIC INSURANCE LIMITED
POLICYHOLDER DISCLOSURE

NUCLEAR POLICY RENEWALS

NOTICE OF TERRORISM INSURANCE COVERAGE
EFFECTIVE DECEMBER 26, 2007

Coverage for acts of terrorism is already included in your current policy. However, under NEIL's Payment for Acts of Terrorism endorsement, your recovery for losses stemming from an act of terrorism could be limited by the terms of the endorsement. However, in accordance with the Terrorism Risk Insurance Program Reauthorization Act of 2007, which took effect December 26, 2007, (TRIPRA), NEIL's Payment for Acts of Terrorism endorsement would not cap the damages for any "certified" acts of terrorism under TRIPRA.

You are hereby notified that under TRIPRA, the definition of act of terrorism has changed. As defined in Section 102(1), the term "act of terrorism" means any act that is certified by the Secretary of the Treasury - in concurrence with other specified federal officials - to be an act of terrorism; to be a violent act or an act that is dangerous to human life, property, or infrastructure; to have resulted in damage within the United States, or outside the United States in the case of certain air carriers or vessels or the premises of a United States mission; and to have been committed by an individual or individuals as part of an effort to coerce the civilian population of the United States or to influence the policy or affect the conduct of the United States Government by coercion.

Under your coverage, any losses resulting from certified acts of terrorism may be partially reimbursed by the United States Government under a formula established in TRIPRA. Your policy may contain other exclusions which might affect your coverage. Under the formula, the United States Government generally reimburses 85% of covered terrorism losses exceeding the statutorily established deductible paid by the insurance company providing the coverage. TRIPRA, contains a $100 billion cap that limits U.S. Government reimbursement as well as insurers' liability for losses resulting from certified acts of terrorism when the amount of such losses exceeds $100 billion in any one calendar year. If the aggregate insured losses for all insurers exceed $100 billion, any insurer that has met its deductible will not be liable to pay for any losses in excess of the $100 billion sustained by its insureds. Thus, if the $100 billion cap is reached, your coverage may be reduced.

NEIL is neither increasing, nor attributing any portion of, the annual premium for terrorism coverage, but a surcharge might be added to the premium if, after a certified act of terrorism, the federal Department of Treasury requires a recoupment of certain amounts paid by the federal government in accordance with the terms of TRIPRA.

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

Payments for Acts of Terrorism Endorsement

Member Insured: Florida Power Corporation

Site: Crystal River | Endorsement No. 3
Policy Number: E12-015 | Effective Date: April 1, 2012

Effective Time of this Endorsement is 12:01 a.m. Standard Time in Hamilton, Bermuda.

It is hereby understood and agreed that the Accidental Outage Policy is hereby amended as follows:

I. The following Section is hereby added to the Policy:

PAYMENTS FOR ACTS OF TERRORISM

In the event that one or more Acts of Terrorism cause Accidental Property Damage under this Policy and under one or more Nuclear Insurance Policies within twelve months from the date the first Accidental Property Damage occurs:

1. Resources Available

The Insureds' maximum recovery for all such Losses under this Policy and all Nuclear Insurance Policies shall be an aggregate of:

(a) $3.24 billion (U.S. dollars)

plus;

(b) such additional amounts as the Insurer recovers for such Losses from reinsurance, indemnity, and any other source, applicable to such Losses.

2. Allocation of Resources

(a) The amount determined under paragraph 1 above shall first be used to pay for all such Losses payable under all applicable Primary Property and Decontamination Liability Insurance Policies (excluding any Losses payable under all Business Interruption and/or Extra Expense Insurance Policy Endorsements), Primary Property and Decontamination Insurance Policies (excluding any Losses payable under all Business Interruption and/or Extra Expense Insurance Policy Endorsements), Operating Facility Policies, Decontamination Liability, Decommissioning Liability and

Excess Property Insurance Policies, Decontamination, Decommissioning and Excess Property Insurance Policies, Blanket Excess Decontamination, Decommissioning and Excess Property Insurance Policies, Blanket Excess Decontamination Liability, Decommissioning Liability and Excess Property Insurance Policies, and Builders' Risk Insurance Policies (excluding any Delay In Startup Losses), (collectively "Property Losses").

(b) If such Property Losses for all Insureds exceed the amount determined under paragraph 1 above, the Insured's maximum recovery shall be the amount determined under paragraph 1 above times a fraction, the numerator of which is the Insured's recovery for the Property Losses resulting from Accidental Property Damage, but for this Section, and the denominator of which is the sum of all Insureds' recovery for Property Losses resulting from Accidental Property Damage under all applicable Nuclear Insurance Policies and Builders' Risk Policies, including this Policy, but for this Section.

(c) Notwithstanding paragraph 1 and subparagraph 2(b) above, if the payments made pursuant to subparagraph 2(b) exhaust the amount determined under paragraph 1, without paying for all the Insured's Property Losses, the Insured shall recover such additional amounts that the Insurer recovers from reinsurance, indemnity, or other source, for the Insured's Property Losses.

3. (a) If all the payments made pursuant to subparagraphs 2(b) and 2(c) above exhaust the resources determined under paragraph 1, the Insurer will not make any payment to any Insureds for Outage Losses or Delay In Startup Losses, under the applicable Nuclear Insurance Policies or Builders' Risk Policies, respectively.

(b) However, if after all such Property Losses have been paid pursuant to subparagraphs 2(b) and 2(c) above, resources remain available under paragraph 1, those resources will be used to pay such Losses under all applicable NEIL I Accidental Outage Policies and the Business Interruption and/or Extra Expense Insurance Policy Endorsements to Primary Property Polices (collectively "Outage Losses"), and Delay in Startup Losses under a Builders' Risk Policy.

(c) If such Outage Losses for all Insureds exceed the remaining resources, the Insured's maximum recovery shall be the amount of the remaining proceeds times a fraction, the numerator of which is the Insured's recovery for Outage Losses and Delay In Startup Losses resulting from Accidental Property Damage, but for this Section, and the denominator of which is the sum of all Insureds' recovery for Outage Losses and Delay In Startup

Losses resulting from Accidental Property Damage under all applicable Nuclear Insurance Policies, including this Policy, and Builders' Risk Policies, but for this Section.

4. Declarations Page

Nothing herein shall be construed to entitle the Insured to recover more than the amount of the Policy Limits stated in Item 6A of the Declarations.

5. Relevant Period

The twelve-month period specified above shall commence on the date of the first Accidental Property Damage caused by an Act of Terrorism. The first Accidental Property Damage caused by an Act of Terrorism that occurs after this or any other twelve-month period shall trigger a new twelve-month period.

6. Definitions

For the purposes of this Section only:

(a) "Act of Terrorism" means any act by a person, group, or organization that appears to be intended to: (i) intimidate or coerce a civilian population, or (ii) disrupt any segment of the economy in the country where the insured plant is located; or (iii) influence the policy of a government by intimidation or coercion; or (iv) affect the conduct of a government by mass destruction; provided, however, that an Act of Terrorism for purposes of this Policy shall not include any act excluded by the War Risk Exclusion.

(b) "Nuclear Insurance Policy" means any Primary Property and Decontamination Insurance Policy, or Primary Property and Decontamination Liability Insurance Policy or Operating Facility Policy, or any Decontamination, Decommissioning and Excess Property Insurance Policy or Decontamination Liability, Decommissioning Liability and Excess Property Insurance Policy, or any Blanket Excess Decontamination Liability, Decommissioning Liability And Excess Property Insurance Policy or Blanket Excess Decontamination, Decommissioning And Excess Property Insurance Policy, or any NEIL I Accidental Outage Insurance Policy or any Business Interruption and/or Extra Expense Insurance Policy, other than this Policy, issued by the Insurer or by Overseas NEIL Limited.

(c) "Builders' Risk Policies" means any Builders' Risk Insurance Policies issued by the Insurer or by Overseas NEIL Limited.

7. Authorized Changes to this Section

The Insurer's Board of Directors will have the authority to alter or replace the definition of the term "Act of Terrorism" and any other provision of this Section in order to facilitate the availability of resources that may be made available by the Government in the country where the insured plant is located.

IN WITNESS WHEREOF, the parties hereto have caused this Endorsement to be executed and attested on their behalf.

Wilmington, Delaware

INSURER:
Nuclear Electric Insurance Limited

Date: As of April 1, 2012

By: _____
David B. Ripsom, President

Attest: _____

Wilmington, Delaware

MEMBER INSURED:
Florida Power Corporation

Date: As of April 1, 2012

By: _____
Attorney-in-Fact

Witness: _____

NEIL I - Rating Calculation Sheet

Member:	**Florida Power Corporation**
Site:	**Crystal River**
Policy Number:	E12-015
Effective Date :	April 1, 2012
Expiration Date:	April 1, 2013
Program Modifier:	0.00%
Base Premium:	$714,000

2012 Renewal

Deductibles, Limits and Premium

	Deductible (weeks)	First Payment Period	Second Payment Period	Third Payment Period	Base Weekly Indemnity	Weekly Indemnity	Limit of Liability	Annual Premium
Unit 3	12	52.0	52.0	19.1	3,500,000	4,500,000	490,000,000	$595,488

Total Annual Premium	**$595,488**
Retrospective Premium:	$5,954,880

Previous Annual Premium:	
Additional Annual Premium:	595,488
Pro Rata Factor	1.0000

TOTAL PREMIUM DUE: $595,488

Credits Applied

	Base Plant Operations	Fire	Natural Hazards	Spare Comp.	Effective Plant Operations	Boiler & Machinery	TGRA	Deductible Factor	Total Credits	Rate Credit (100% - Total Credits)
Unit 3	8.000%	6.472%	1.250%	4.940%	4.000%	14.920%	2.45%	3.500%	37.532%	62.468%

Interdependency Factors

Effect of:	Unit 3	Uninsured Units:
On Unit 3:		6

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13DELAM-FIPUGPOD2-2-000001 - 000007 SETTLEMENT AGREEMENT.pdf	4/18/2013 9:39 AM	PDF File	146 KB
13DELAM-FIPUGPOD2-5-000001 - 000010 NEIL PIR DOC.pdf	4/18/2013 9:40 AM	PDF File	162 KB
13DELAM-FIPUGPOD2-14-000001 - 000071 129683-2012 NEIL PD POLICY.PDF	4/18/2013 9:39 AM	PDF File	2,961 KB
13DELAM-FIPUGPOD2-14-000072 - 000073 129684-DESCRIPTION OF INSURANCE COVERAGE.PDF	4/18/2013 9:39 AM	PDF File	462 KB
13DELAM-FIPUGPOD2-14-000074 - 000117 129685-E09-015 ACCIDENTAL OUTAGE POLICY.PDF	4/18/2013 9:39 AM	PDF File	11,601 KB
13DELAM-FIPUGPOD2-14-000118 - 000159 129687-EXCESS_POLICY[1].PDF	4/18/2013 9:39 AM	PDF File	913 KB
13DELAM-FIPUGPOD2-14-000160 - 00167 129689-EXCESSBLANKT_POLICY[1].PDF	4/18/2013 9:39 AM	PDF File	427 KB
13DELAM-FIPUGPOD2-14-000168 - 000211 129690-OUTAGE_POLICY[2].PDF	4/18/2013 9:39 AM	PDF File	1,357 KB
13DELAM-FIPUGPOD2-15-000001 - 000048 CRYSTAL RIVER 3 AND NEIL PRESS RELEASES.pdf	4/18/2013 9:39 AM	PDF File	658 KB
13DELAM-FIPUGROG1-5-000001 - 000004 Meetings between Officers_1.pdf	4/22/2013 4:39 PM	PDF File	135 KB
Docket 100437 PEF Notice of Service response FIPUG 1st Interrogatories_1.pdf	4/22/2013 4:39 PM	PDF File	72 KB
Docket 100437 PEF Notice of Service responses FIPUG 2d Req for Prod.pdf	4/22/2013 4:40 PM	PDF File	72 KB
Docket 100437 PEF Response FIPUG 1st Interrogatories Nos 1-10_1.pdf	4/22/2013 4:39 PM	PDF File	183 KB
Docket 100437 PEF Response FIPUG 2d Req for Prod Nos 2-17_1.pdf	4/22/2013 4:41 PM	PDF File	224 KB

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Crystal River Nuclear Plant to be retired; company evaluating sites for potential new gas-fueled generation Feb. 5, 2013

CRYSTAL RIVER, FLA. -

Following a comprehensive analysis, Progress Energy Florida, a subsidiary of Duke Energy, announced today that it will retire the Crystal River Nuclear Plant (CR3) in Citrus County, Fla. The plant has been safely shut down and offline since late 2009.

The company is reviewing alternatives to replace the power produced by the unit, including the potential construction of a new, state-of-the-art natural gas-fueled plant. The company is evaluating a number of potential sites for new plant capacity that may be needed in the future to meet Florida customer needs, including sites in Citrus County.

The energy complex's four coal plants remain in service in Citrus County.

"We believe the decision to retire the nuclear plant is in the best overall interests of our customers, investors, the state of Florida and our company," said Jim Rogers, chairman, president and CEO of Duke Energy. "This has been an arduous process of modeling, engineering, analysis and evaluation over many months. The decision was very difficult, but it is the right choice."

"The Crystal River Nuclear Plant has been an important part of our generation fleet for three decades," said Alex Glenn, state president, Progress Energy Florida. "We are very sensitive to the impact on our employees at the plant and on the Citrus County economy.

"We are working to place as many employees affected by today's announcement in other positions within the company, and we are committed to working with Citrus County to lessen the effects as much as possible," he said.

The company's decision comes after a comprehensive, months-long engineering analysis of the damaged CR3 containment structure. The nuclear unit, which began operating in 1977, had been shut down in the fall of 2009 for refueling and replacement of its steam generators when a delamination, or crack, occurred in the outer layer of the containment building's concrete wall.

The process of repairing the damage and restoring the unit to service resulted in additional delaminations in other sections of the containment structure in 2011.

During the ensuing months, Progress Energy – and, more recently, Duke Energy – evaluated the ability to successfully repair the unit, the risks associated with any repair and the repair scope as well as the likely costs and schedule.

A report completed in late 2012 confirmed that repairing the plant was a viable option but that the nature and potential scope of repairs brought increased risks that could raise the cost dramatically and extend the schedule.

NEIL coverage claims resolution
In addition, the company and its insurance carrier, Nuclear Electric Insurance Limited (NEIL), have reached a resolution of the company's coverage claims through a mediation process. Under the terms of the mediator's proposal, NEIL will pay an additional $530 million.

Along with the $305 million NEIL has already paid, customers will receive $835 million in insurance proceeds. This will be the largest claim payout in the history of NEIL.

"We believe accepting the mediator's proposal is in the overall best interests of our customers and shareholders, and the monies we receive will go directly to customers to reduce their electric bills," Rogers said.

Timing and next steps
The company is working to develop a comprehensive decommissioning plan. The plan will determine resource needs as well as the scope, schedule and other elements of the decommissioning.

The company intends to use the SAFSTOR option for decommissioning. Generally, this involves placing the facility into a safe storage configuration, requiring limited staffing to monitor plant conditions, until the eventual dismantling and decontamination activities occur, usually in 40 to 60 years.

Additional specifics about the decommissioning plan are being developed and will be provided in the future.

Meeting customer needs
As it has done through the extended outage, Progress Energy Florida will continue to serve customers reliably in the coming years through a combination of power generation, energy efficiency and purchasing power in the energy market.

Meanwhile, the company is evaluating the potential to build a new, state-of-the-art, natural gas-fueled power plant, which could come online as early as 2018. There is no definitive plan for new generating capacity at this time.

Employees
Approximately 600 full-time employees work at the Crystal River Nuclear Plant. Many will remain onsite to work through the closing and decommissioning of the unit. The company will work with employees to help as many as possible make the transition to positions in other Duke Energy organizations.

The coal-fired units and employees are not affected by today's announcement.

As previously announced, the company expects to retire the two older coal-fired plants (units 1 and 2) in the coming years – most likely in the 2015-2018 time frame – due to changing federal regulations, but there is no specific retirement plan for the units today.

The company has invested more than $1 billion in recent years in adding advanced emission controls on the newer coal-fired plants (Crystal River units 4 and 5) and plans to continue to operate those units for many years to meet customer electricity demands.

Progress Energy Florida
Progress Energy Florida, a subsidiary of Duke Energy (NYSE: DUK), provides electricity and related services to more than 1.6 million customers in Florida. The company is headquartered in St. Petersburg, Fla., and serves a territory encompassing more than 20,000 square miles including the cities of St. Petersburg and Clearwater, as well as the Central Florida area surrounding Orlando. Progress Energy Florida is pursuing a balanced approach to meeting the future energy needs of the region. That balance includes increased energy-efficiency programs, investments in renewable energy technologies and a state-of-the-art electricity system. More information is available at www.progress-energy.com.

Headquartered in Charlotte, N.C., Duke Energy is a Fortune 250 company traded on the New York Stock Exchange under the symbol DUK. More information about the company is available at: www.duke-energy.com.

Progress Energy Florida Issues Statement Regarding Filing of Crystal River Nuclear Plant Engineering Report October 1, 2012

ST. PETERSBURG, FLA. -

Below is a statement issued today by Alex Glenn, incoming president of Progress Energy Florida, a subsidiary of Duke Energy.

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Today, we provided to the Florida Public Service Commission the report from Zapata Inc., regarding its independent review of the potential repair plan for the Crystal River Nuclear Plant (CR3).

As part of the ongoing evaluation of the pending decision to repair or retire the unit, and given the complexity of the issue, Duke Energy commissioned the independent technical review in March to further analyze the potential scope, risks, costs and schedule of the prospective repair. Independent evaluations such as this are common in the nuclear industry when addressing complex matters, particularly a first-of-a-kind engineering, construction and licensing project like the one contemplated at CR3.

The review found that the current repair plan appears to be technically feasible, but significant risks and technical issues still need to be resolved, including the ultimate scope of any repair work. The Zapata report estimated the repair cost at approximately $1.49 billion. Progress Energy's prior assessment indicated expected repair cost of $900 million to $1.3 billion, with the costs trending up. The report confirmed, as Progress Energy's assessment had indicated, that an increase in the scope of repairs will increase the cost and extend the schedule.

Zapata also prepared approximate estimates for more extensive work based on potential unplanned scenarios, up to and including its worst-case scenario. This scenario assumed that the company would perform Progress Energy's more limited scope of work, and at the conclusion of that work, additional damage would occur in the dome and in the lower elevations, which would force the replacement of each. Under the worst-case scenario, Zapata estimated that the cost could be $3.43 billion with a 96-month schedule.

We have not made a final decision on whether to repair or retire CR3. The decision and schedule will be driven by the final analysis, not vice-versa. The evolving analysis also will provide increasing detail on cost and schedule expectations.

As part of our ongoing commitment to safety and doing what is best for our customers, joint owners and investors, we will carefully analyze and settle each finding as we continue to evaluate the technical and licensing implications, estimated costs and the time required to make the repair.

We will proceed with a repair option only if there is a high degree of confidence that the repair can be successfully completed and licensed within the final estimated costs and schedule, and is in the best interests of our customers, joint owners and investors.

Progress Energy Florida
Progress Energy Florida, a subsidiary of Duke Energy (NYSE: DUK), provides electricity and related services to more than 1.6 million customers in Florida. The company is headquartered in St. Petersburg, Fla., and serves a territory encompassing more than 20,000 square miles including the cities of St. Petersburg and Clearwater, as well as the Central Florida area surrounding Orlando. Progress Energy Florida is pursuing a balanced approach to meeting the future energy needs of the region. That balance includes increased energy-efficiency programs, investments in

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01/20/2012

Progress Energy Florida reaches multi-year agreement with consumer advocates

Progress Energy Florida reaches multi-year agreement with consumer advocates regarding Crystal River nuclear outage, Levy County nuclear project and related rate issues

Company schedules conference call for analysts on Jan. 23 at 11 a.m.

ST. PETERSBURG, Fla. (Jan. 20, 2012) – Today, Progress Energy filed a comprehensive settlement agreement with the Florida Public Service Commission (FPSC) that will help moderate electricity costs for customers in the coming years.

Developed collaboratively with the Office of Public Counsel and other consumer advocates, the agreement provides customers a refund of a portion of Crystal River Nuclear Plant (CR3) replacement fuel costs and rate certainty related to the company's proposed Levy County nuclear project and base rates.

"This agreement reflects the hard work of numerous organizations and individuals who recognize that the lingering slow economy continues to affect many of our customers," said Vincent Dolan, Progress Energy Florida president and CEO. "The agreement helps to ensure the continued safe, reliable and environmentally sound operation of the electric system that serves more than 1.6 million Florida families and businesses."

The agreement:

• Provides for a $288 million refund to customers of replacement power costs associated with the ongoing CR3 outage;

• Removes CR3 from base rates while the company continues to analyze options for the plant;

• Limits costs customers will be charged through 2017 for the proposed Levy County nuclear project; and

• Allows for base rates to adjust in 2013, better reflecting the true costs for the company to maintain and improve the electric system.

If approved by the FPSC, the settlement will take effect with the first billing cycle of January 2013.

Crystal River Nuclear Plant

As a resolution of the CR3 outage issues pending in the current docket before the FPSC, Progress Energy Florida will remove its existing nuclear plant from base rates starting in 2013 while the company continues to

evaluate options for the plant. In addition, the company will refund customers $288 million for replacement power costs associated with the ongoing outage.

Discussions are continuing with Nuclear Electric Insurance Limited (NEIL) related to insurance coverage. The outer portion of the concrete containment structure delaminated, or separated, during work to replace CR3's steam generators.

Proposed Levy County nuclear project

Under the settlement, the portion of the nuclear cost-recovery monthly fee (part of customers' monthly bills) for the proposed Levy County nuclear project, including funding to complete the license application process with the Nuclear Regulatory Commission (NRC), will be fixed from 2013 through 2017.

"We continue to believe additional carbon-free nuclear energy should be a part of our future, particularly as the cost of environmental regulations on other forms of electricity generation become increasingly stringent and expensive," Dolan said. "This approach helps customers in the short term while we all press through these difficult economic times."

The company's application for the combined license for the proposed Levy County nuclear project remains on track before the NRC and the combined license is expected to be issued in early 2013.

Base rates

Base rates cover a regulated electric company's cost of producing and delivering electricity to customers' homes and businesses, including maintenance expenses for power plants, power lines and similar costs. Progress Energy's current base rate agreement expires at the end of 2012.

Under the settlement, starting in 2013 base rates will increase $150 million to cover the cost to continue to provide safe, reliable and environmentally sound energy to Progress Energy's more than 1.6 million homes and businesses in Florida. This increase will be largely offset in 2013 and 2014 by the fuel refund. The new base rates exclude the CR3 plant costs until the unit returns to service.

When all the agreement provisions are factored in, the estimated 2013 total adjustment for the average residential bill is approximately $4.93, or 4 percent, over current rates.

The total customer bill for 2013 and beyond will change as additional components of the bill, such as fuel, energy efficiency and environmental investments, rise and fall with changes in costs. Those expenses are filed and reviewed with the FPSC each year separate from the base rate.

Progress Energy will hold a conference call with the investment community on Monday, Jan. 23, 2012, at 11

a.m. ET (8 a.m. PT). Investors, media and the public may listen to the conference call by dialing (913) 312-0648, confirmation code 1051274. If you encounter problems, please contact Investor Relations at (919) 546-6057.

About Progress Energy

Progress Energy (NYSE: PGN), headquartered in Raleigh, N.C., is a Fortune 500 energy company with more than 22,000 megawatts of generation capacity and approximately $10 billion in annual revenues. Progress Energy includes two major electric utilities that serve about 3.1 million customers in the Carolinas and Florida. The company has earned the Edison Electric Institute's Edison Award, the industry's highest honor, in recognition of its operational excellence, and was the first utility to receive the prestigious J.D. Power and Associates Founder's Award for customer service. The company is pursuing a balanced strategy for a secure energy future, which includes aggressive energy-efficiency programs, investments in renewable energy technologies and a state-of-the-art electricity system. Progress Energy celebrated a century of service in 2008. Visit the company’s website at www.progress-energy.com.

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12/05/2011

NRC approves indirect transfer of Progress Energy nuclear station licenses as part of the process to merge with Duke Energy

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CHARLOTTE -- The Nuclear Regulatory Commission on Friday approved the transfer of indirect control of Progress Energy's nuclear plants to include Duke Energy as the ultimate parent corporation on the licenses for these facilities.

The action was pursued as part of the proposed merger of the two energy companies.

According to the application, Progress Energy's two business units -- Progress Energy Carolinas and Progress Energy Florida -- will continue to have the responsibilities associated with owning and operating their nuclear stations.

The indirect license transfers also won't affect the financial qualifications, decommissioning funding assurance, or technical qualifications associated with the stations. No physical changes will be made to the facilities and there will be no changes in day-to-day operations, the application stated.

Progress Energy Carolinas operates units 1 and 2 at Brunswick Steam Electric Plant, Southport, N.C.; Shearon Harris Nuclear Power plant unit 1, New Hill, N.C.; and H.B. Robinson Steam Electric Plant unit 2, Hartsville, S.C.

Progress Energy Florida operates Crystal River Nuclear Generating Plant unit 3, Crystal River, Fla.

Duke Energy operates McGuire Nuclear Station units 1 and 2, Huntersville, N.C.; Catawba Nuclear Station units 1 and 2, York County, S.C.; and Oconee Nuclear Station units 1, 2 and 3, Oconee County, S.C.

The 12 combined nuclear generators have a capacity of roughly 9,500 MW, or about 16.6 percent of the merged company's total electricity capacity of 57,200 MW.

Eleven of the 12 units have obtained 20-year license extensions. Crystal River's license is due to expire in 2016 and an application for renewal was filed with the NRC in 2008 and is under review

When the merger is complete, the new Duke Energy will operate the largest regulated nuclear fleet in the country. To date, the companies have submitted the following merger-related applications, in addition to the NRC filing:

- North Carolina Utilities Commission, which held hearings in September
- Public Service Commission of South Carolina, which has scheduled hearings on the proposed joint-dispatch agreement for the Carolinas Dec. 12
- Kentucky Public Service Commission, which has approved the merger
- Federal Energy Regulatory Commission, which has conditionally approved the merger
- Hart-Scott-Rodino filing with the U.S. Department of Justice and Federal Trade Commission
- Assignment of Authorization filings with the Federal Communications Commission, which were approved July 27

The companies are working toward a merger close date of Jan 1, 2012, but the final closing date will ultimately be determined by the regulatory approvals schedule.

About Duke Energy

Duke Energy is one of the largest electric power holding companies in the United States. Its regulated utility operations serve approximately 4 million customers located in five states in the Southeast and Midwest, representing a population of approximately 12 million people. Its commercial power and international business segments own and operate diverse power generation assets in North America and Latin America, including a growing portfolio of renewable energy assets in the United States. Headquartered in Charlotte, N.C., Duke Energy is a Fortune 500 company traded on the New York Stock Exchange under the symbol DUK. More information about the company is available on the Internet at: www.duke-energy.com.

About Progress Energy

Progress Energy (NYSE: PGN), headquartered in Raleigh, N.C., is a Fortune 500 energy company with more than 22,000 megawatts of generation capacity and approximately $10 billion in annual revenues. Progress Energy includes two major electric utilities that serve about 3.1 million customers in the Carolinas and Florida. The company has earned the Edison Electric Institute's Edison Award, the industry's highest honor, in recognition of its operational excellence, and was the first utility to receive the prestigious J.D. Power and Associates Founder's Award for customer service. The company is pursuing a balanced strategy for a secure energy future, which includes aggressive energy-efficiency programs, investments in renewable energy technologies and a state-of-the-art electricity system. Progress Energy celebrated a century of service in 2008. Visit the company’s website at www.progress-energy.com.

Public Service Commission approves fuel costs

ST. PETERSBURG, Fla. (Nov. 22, 2011) Today, the Florida Public Service Commission (PSC) approved Progress Energy Florida's 2012 fuel costs - the final element of the total 2012 price. The overall price for a residential customer using 1,000 kilowatt-hours (kWh) per month will be $123.19 beginning with January 2012 billing. This change comes after two years of bill reductions and represents a 3 percent increase compared to $119.34 per 1,000 kWh per month currently charged.

The average commercial customer bill will increase 3 to 4 percent, and the average industrial customer bill will increase 4 to 5 percent. New prices will take effect with the first billing cycle in January 2012.

"The 2012 price reflects our prior decision to reduce short-term spending on the proposed Levy County nuclear project and is offset by an increase in fuel costs due to the unavailability of the Crystal River Nuclear Plant," said Vincent Dolan, president and CEO of Progress Energy Florida. "We remain committed to return the Crystal River Nuclear Plant to service, as it is our lowest-cost generation unit and provides carbon-free electricity to the more than 1.6 million families and businesses that depend on us."

Below is a summary of the approved clauses, based on a monthly, 1,000-kWh residential bill:

- New nuclear generation: $2.86; a $2.67 decrease of nearly 50 percent
- Energy-efficiency programs: $2.88; an 11-cent decrease
- Environmental compliance: $5.45; a 54-cent increase
- Fuel: $48.60; a $3.99 increase
- Purchased power: $11.74; a $2 increase

Previously, the PSC approved a nearly 50 percent reduction to the new nuclear generation charge, a slight reduction to the energy conservation charge and a modest increase to the environmental compliance charges.

The company's environmental compliance charges recover the costs of environmental investments required by state and federal law. Environmental improvements at our two largest coal-fired units, Crystal River 4 and 5, now allow the company to use lower-cost coal while reducing the plant's average annual emissions by 80 percent (nitrogen oxides by approximately 93 percent and sulfur dioxide by approximately 97 percent).

The largest portion of the 3 percent increase is the fuel charge, which recovers the actual cost of fuel, mainly natural gas and coal, used to generate electricity. Due to the extended outage at the company's Crystal River Nuclear Plant, Progress Energy Florida is using more natural gas, which is the lowest-possible-cost resource next to nuclear, to meet customer needs. In 2012, residential customers will pay about 6 cents more per 1,000-kWh for fuel due to the extended outage. The company makes no profit from the fuel portion of the customer

bill. Progress Energy also received an increase to its purchased power charge in order to lock agreements for more natural gas-fired purchased power at today's very low natural gas prices. Utilities routinely purchase power to ensure customers's energy needs are met in the most cost-effective manner possible.

The base rate portion of the customer bill will remain stable through 2012 following a 2010 agreement Progress Energy pursued with consumer advocate groups, the Florida Attorney General and the Office of Public Counsel.

For more information about Florida rates and a detailed breakdown of a current residential customer bill, visit http://www.progress-energy.com/floridarates.

Progress Energy encourages customers to learn all they can about using energy wisely to save energy and money. Customers can save up to 20 percent on their energy costs by making changes at home. Adjusting the thermostat two or three degrees warmer in summer and cooler in winter, turning off computers, monitors and game systems when not in use, regularly changing air filters, replacing incandescent light bulbs with compact-fluorescent bulbs, and sealing windows and doors can result in significant savings. For more energy-efficiency tips, as well as details about Progress Energy programs and incentives, visit http://www.progress-energy.com/save.

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02/11/2010

Progress Energy announces 2009 fourth-quarter and full-year results; affirms full-year 2010 earnings guidance

View earnings package in PDF

Highlights:

Fourth Quarter 2009

- Reports fourth-quarter GAAP earnings of $0.59 per share, compared to $0.41 per share for the same period last year
- Reports fourth-quarter ongoing earnings of $142 million, or $0.50 per share, compared to $123 million, or $0.47 per share, for the same period last year

Full Year 2009

- Reports 2009 GAAP earnings of $2.75 per share, compared to $3.17 per share in 2008, primarily driven by the activities related to discontinued non-utility businesses
- Reports 2009 ongoing earnings of $846 million, or $3.03 per share, compared to $776 million, or $2.96 per share, for the same period last year
- Affirms 2010 ongoing earnings guidance of $2.85 to $3.05 per share

RALEIGH, N.C. (February 11, 2010) – Progress Energy [NYSE: PGN] announced fourth-quarter reported GAAP earnings of $164 million, or $0.59 per share, compared with reported GAAP earnings of $107 million, or $0.41 per share, for the same period last year. Fourth-quarter ongoing earnings were $142 million, or $0.50 per share, compared to $123 million, or $0.47 per share, last year. The significant drivers in ongoing earnings were increased revenues for interim and limited rate relief, favorable returns on nuclear and environmental investments and lower depreciation and amortization, partially offset by increased O&M. (See the discussion later in this release for a reconciliation of ongoing earnings per share to reported GAAP earnings per share.)

Full-year reported GAAP earnings were $767 million, or $2.75 per share, compared with reported GAAP earnings of $830 million, or $3.17 per share, for the same period last year. Full-year ongoing earnings were $846 million, or $3.03 per share, compared to $776 million, or $2.96 per share, last year. The company benefited from increased revenues for interim and limited rate relief, favorable returns on nuclear and environmental investments and favorable weather, partially offset by lower retail growth and usage and share dilution. (See the discussion later in this release for a reconciliation of ongoing earnings per share to reported GAAP earnings per share.)

“In the extremely tough economy of 2009, Progress Energy aggressively managed its costs and met its financial goals while reliably and responsibly serving customers,” said Bill Johnson, chairman, president and CEO. “The still-sluggish economy will make 2010 another challenging year, and the recent regulatory decision in Florida exacerbates that challenge. But we are working in a focused, constructive way to meet our short-term priorities while also creating long-term value for our customers and shareholders. I believe strongly in the ability of our employees and the future growth prospects of the communities we serve.”

Progress Energy affirms its 2010 ongoing earnings guidance range of $2.85 to $3.05 per share. The ongoing earnings guidance excludes the impact, if any, from discontinued operations, CVO mark-to-market adjustments, potential impairments, valuation allowances and plant retirement charges. Progress Energy is not able to provide a corresponding GAAP equivalent for the 2010 earnings guidance due to the uncertain nature and amount of these adjustments.

Progress Energy will host a conference call and webcast at 10 a.m. ET today to review fourth-quarter and full-year 2009 financial performance, as well as discuss 2010 earnings guidance and provide an overall business update. Additional details are provided at the end of this earnings release.

See pages 3-6 for detailed fourth-quarter and full-year 2009 earnings variance analyses for Progress Energy Carolinas (PEC), Progress Energy Florida (PEF) and Corporate and Other Businesses segments.

RECENT DEVELOPMENTS

Financial and Regulatory

- The Florida Public Service Commission (FPSC) ruled on PEF's request for a $500 million increase in base rates. The FPSC denied any increase in base rates above the $132 million limited rate relief that was approved in July 2009 for placing the repowered Bartow Plant in service.
- Filed with the FPSC a status update regarding the Crystal River Unit 3 (CR3) steam generator replacement outage, which currently estimates that all repairs will be completed so that CR3 will return to service by mid-2010.
- Received final orders from the FPSC for all of PEF's proposed 2010 recovery for fuel, environmental and energy-efficiency costs.
- Filed with the FPSC a motion for reconsideration of the order setting PEF's 10-year energy conservation goals.
- Received approval from the North Carolina Utilities Commission (NCUC) to decrease the fuel component of customer rates and adjust the components of energy-efficiency programs and renewable energy resources, resulting in a slight net reduction in customer bills, effective December 1, 2009.

State-of-the-Art Power Plants

- Filed with the NCUC a plan to retire by the end of 2017 the 11 remaining North Carolina coal-fired units that do not have flue-gas desulfurization controls (scrubbers).
    - Filed with the NCUC a plan to build a 600-megawatt (MW) natural gas-fired plant to replace the coal-fired units at the Sutton Plant, in conjunction with their retirement in 2014. The project would represent an estimated investment of approximately $600 million and significantly reduce overall emissions.
- Began operating PEF's first scrubber at Crystal River Unit 5 in December 2009.

Alternative Energy and Energy Efficiency

- Placed online two solar photovoltaic (PV) arrays as part of PEC's SunSenseSM commercial solar PV program:
    - 250-kilowatt array in Raleigh, N.C., built by Carolina Solar Energy; and
    - 250-kilowatt array in Cary, N.C., built by FLS Energy.
- Signed agreement with Advanced Green Technologies to purchase the energy produced by a 1.27-MW PV array in New Bern, N.C., which brings the total amount of solar-generated electricity scheduled to be purchased by PEC to more than 10 MW.

- Received approval from the FPSC for a 20-year renewable energy contract with Florida Biomass Energy, effective January 2013, which will generate up to 60 MW of electricity through the burning of waste wood and specially grown vegetation.
- Issued a request for proposals for 40 to 75 MW of electricity generated from wood biomass in North Carolina starting in 2013.
- Received approval from the NCUC for PEC's Residential Lighting Program, which offers discounts at area retailers for energy-efficient compact fluorescent light bulbs. Cost recovery for this program is currently under review.
- Announced partnership with the City of Orlando, Orange County and the Orlando Utilities Commission to establish Get Ready Central Florida, an initiative aimed at paving the way for electric vehicles.

Awards, Honors & Recognitions

- PEC received the top ranking in customer satisfaction among large utilities nationally and the highest ranking in the South region for the second year in a row in the latest J.D. Power & Associates survey of business customers.
- Set new winter peak-demand records in both Florida and the Carolinas during January 2010.

Press releases regarding various announcements are available on the company's Web site at www.progress-energy.com/aboutus/news.

2009 BUSINESS HIGHLIGHTS

Below are the fourth-quarter and full-year 2009 earnings variance analyses for the company's segments. See the reconciliation tables on pages 6-8 and on pages S-1 and S-2 of the supplemental data for a reconciliation of ongoing earnings per share to GAAP earnings per share. Also see the attached supplemental data schedules for additional information on PEC and PEF operating revenues, energy sales, energy supply, weather impacts and other topics.

QUARTER-OVER-QUARTER ONGOING EPS VARIANCE ANALYSIS

Progress Energy Carolinas

- Reported fourth-quarter ongoing earnings per share of $0.38, compared with $0.40 for the same period last year; GAAP earnings per share of $0.34, compared with $0.40 for the same period last year.
- Reported primary quarter-over-quarter ongoing earnings per share favorability of:
  - $0.06 depreciation and amortization primarily due to depreciation associated with accelerated cost-recovery program for nuclear generating assets recognized during 2008, partially offset by impact of depreciable asset base increases
  - $0.01 wholesale revenues
  - $0.01 interest expense
  - $0.01 income taxes
- Reported primary quarter-over-quarter ongoing earnings per share unfavorability of:
- $(0.03) net retail growth and usage

- $(0.03) O&M primarily due to higher pension and benefit costs and higher storm costs
- $(0.02) other margin
- $(0.01) other
- $(0.02) share dilution primarily due to Progress Energy's issuance of 14.4 million shares of common stock in January 2009

- 12,000 net increase in the average number of customers for the three months ended December 31, 2009, compared to the same period in 2008

Progress Energy Florida

- Reported fourth-quarter ongoing earnings per share of $0.28, compared with $0.22 for the same period last year; GAAP earnings per share of $0.27, compared with $0.19 for the same period last year.
- Reported primary quarter-over-quarter ongoing earnings per share favorability of:
  - $0.08 retail rates primarily due to impact of interim and limited base rate relief
  - $0.06 other margin primarily due to the net impact of returns on nuclear and environmental cost-recovery clause assets
  - $0.03 income taxes primarily due to accelerated amortization of tax-related regulatory assets in 2008 and the tax impacts related to certain employee benefit trusts
  - $0.02 weather
  - $0.02 other primarily due to investment gains on certain employee benefit trusts
    $0.01 interest expense
- Reported primary quarter-over-quarter ongoing earnings per share unfavorability of:
- $(0.07) O&M primarily due to higher plant outage and maintenance costs and higher pension costs
- $(0.03) AFUDC equity primarily due to placing the repowered Bartow Plant in service in June 2009
- $(0.03) depreciation and amortization primarily due to impact of depreciable asset base increases
- $(0.01) wholesale revenues
- $(0.02) share dilution primarily due to Progress Energy's issuance of 14.4 million shares of common stock in January 2009

- 6,000 net decrease in the average number of customers for the three months ended December 31, 2009, compared to the same period in 2008

Corporate and Other Businesses (includes primarily Holding Company Debt and Discontinued Operations

Reported fourth-quarter ongoing after-tax expenses of $0.16 per share, compared with after-tax expenses of $0.15 per share for the same period last year; GAAP after-tax expenses of $0.02 per share, compared with after-tax expenses of $0.18 per share for the same period last year.

- Reported primary quarter-over-quarter ongoing after-tax expenses per share favorability of:
  - $0.03 other primarily due to investment gains on certain employee benefit trusts
  - $0.01 share dilution
- Reported primary quarter-over-quarter ongoing after-tax expenses per share unfavorability of:
- $(0.03) interest expense primarily due to higher average debt outstanding at the Parent
- $(0.02) income taxes primarily due to changes in tax estimates

YEAR-OVER-YEAR ONGOING EPS VARIANCE ANALYSIS

Progress Energy Carolinas

- Reported full-year ongoing earnings per share of $1.93, compared with $2.04 for the same period last year; GAAP earnings per share of $1.87, compared with $2.04 for the same period last year.
- Reported primary year-over-year ongoing earnings per share favorability of:
  - $0.12 depreciation and amortization primarily due to depreciation associated with accelerated cost-recovery program for nuclear generating assets and Clean Smokestacks Act amortization recognized during 2008, partially offset by impact of depreciable asset base increases
  - $0.05 weather
  - $0.03 interest expense primarily due to lower interest rates on variable rate debt, partially offset by higher interest as a result of higher average debt outstanding

- $0.02 AFUDC equity primarily due to increased eligible construction project costs
- $0.01 income taxes

- Reported primary year-over-year ongoing earnings per share unfavorability of:

- $(0.13) net retail growth and usage
- $(0.03) other operating primarily due to prior-year gain on land sales and higher property and payroll taxes
- $(0.03) other primarily due to lower interest income, primarily due to lower unrecovered deferred fuel balances
- $(0.02) other margin primarily due to higher non-fuel clause recoverable purchased power expenses
- $(0.13) share dilution primarily due to Progress Energy's issuance of 14.4 million shares of common stock in January 2009

- 14,000 net increase in the average number of customers for 2009, compared to 2008

Progress Energy Florida

- Reported full-year ongoing earnings and GAAP earnings per share of $1.65, compared with $1.47 for the same period last year.
- Reported primary year-over-year ongoing earnings per share favorability of:
  - $0.20 other margin primarily due to the net impact of returns on nuclear and environmental cost-recovery clause assets
  - $0.19 retail rates primarily due to impact of interim and limited base rate relief
  - $0.08 weather
  - $0.06 income taxes primarily due to deduction related to nuclear decommissioning trust funds
  - $0.03 AFUDC equity primarily due to increased eligible construction project costs
  - $0.02 wholesale revenues primarily due to increased capacity charges from new and amended contracts entered into in 2008
  - $0.02 other primarily due to investment gains on certain employee benefit trusts
- Reported primary year-over-year ongoing earnings per share unfavorability of:

- $(0.10) retail growth and usage

- $(0.07) depreciation and amortization primarily due to impact of depreciable asset base increases
- $(0.06) O&M primarily due to higher pension costs and higher plant outage and maintenance costs, partially offset by the impact of a change in our earned vacation policy
- $(0.05) interest expense primarily due to higher average debt outstanding
- $(0.03) other operating primarily due to regulatory disallowance of fuel costs and prior-year gain on land sales
- $(0.11) share dilution primarily due to Progress Energy's issuance of 14.4 million shares of common stock in January 2009

- 8,000 net decrease in the average number of customers for 2009, compared to 2008

Corporate and Other Businesses (includes primarily Holding Company Debt and Discontinued Operations)

- Reported full-year ongoing after-tax expenses of $0.55 per share, compared with after-tax expenses of $0.55 per share for the same period last year; GAAP after-tax expenses of $0.77 per share, compared with after-tax expenses of $0.34 per share for the same period last year.
- Reported primary year-over-year ongoing after-tax expenses per share favorability of:
  - $0.04 other primarily due to investment gains on certain employee benefit trusts
  - $0.04 share dilution primarily due to Progress Energy's issuance of 14.4 million shares of common stock in January
- Reported primary year-over-year ongoing after-tax expenses per share unfavorability of:
- $(0.06) interest expense primarily due to higher average debt outstanding at the Parent
- $(0.02) income taxes primarily due to the impact on the Corporate tax position resulting from the deductions taken by the Utilities related to nuclear decommissioning trust funds

ONGOING EARNINGS ADJUSTMENTS

Progress Energy's management uses ongoing earnings per share to evaluate the operations of the company and to establish goals for management and employees. Management believes this non-GAAP measure is appropriate for understanding the business and assessing our potential future performance, because excluded items are limited to those that we believe are not representative of our fundamental core earnings. Ongoing earnings as presented here

may not be comparable to similarly titled measures used by other companies. The following table provides a reconciliation of ongoing earnings per share to reported GAAP earnings per share.

**Previously reported 2008 earnings per share have been restated to reflect the adoption of new accounting guidance that changed the calculation of the number of average common shares outstanding.*

Reconciling adjustments from ongoing earnings to GAAP earnings are as follows:

Tax Levelization

Generally accepted accounting principles require companies to apply an effective tax rate to interim periods that is consistent with a company's estimated annual tax rate. The company projects the effective tax rate for the year and then, based upon projected operating income for each quarter, raises or lowers the tax expense recorded in that quarter to reflect the projected tax rate. The resulting tax adjustment increased earnings per share by $0.02 for the quarter and decreased earnings per share by $0.03 for the same period last year, but has no impact on the company's annual earnings. Because this adjustment varies by quarter but has no impact on annual earnings, management does not consider this adjustment to be representative of the company's ongoing earnings.

Discontinued Operations

The company has reduced its business risk by exiting nonregulated businesses to focus on the core operations of the utilities. The discontinued operations of these nonregulated businesses increased earnings per share by $0.09 for the quarter and decreased earnings per share by $0.03 for the same period last year. See page S-5 of the supplemental data for further information on the impact of discontinued operations. Due to disposition of these assets, management does not view this activity as representative of the ongoing operations of the company.

Contingent Value Obligation (CVO) Mark-to-Market

In connection with the acquisition of Florida Progress Corporation, Progress Energy issued 98.6 million CVOs. Each CVO represents the right of the holder to receive contingent payments based on net after-tax cash flows above certain levels of four synthetic fuels facilities purchased by subsidiaries of Florida Progress Corporation in October 1999. The CVO liability is valued at fair value, and unrealized gains and losses from changes in fair value are recognized in earnings each quarter. The CVO mark-to-market increased earnings per share by $0.03 for the quarter and increased earnings per share by $0.01 for the same period last year. Progress Energy is unable to predict the changes in the fair value of the CVOs, and management does not consider this adjustment to be representative of the company's ongoing earnings.

Impairment

The company recorded impairments of certain investments of its Affordable Housing portfolio. The impairments had no impact on earnings for the quarter or for the same period last year. Management believes this adjustment is not representative of the company's ongoing quarterly earnings.

Valuation Allowance and Related Net Operating Loss Carry Forward

Progress Energy previously recorded a deferred tax asset for a state net operating loss carry forward upon the sale of Progress Ventures Inc.'s nonregulated generation facilities and energy marketing and trading operations. In the fourth quarter of 2008, the company recorded an additional deferred tax asset related to the state net operating loss carry forward due to a change in estimate based on 2007 tax return filings. The company also evaluated the total state net operating loss carry forward for potential impairment and partially impaired it by recording a valuation allowance, which more than offset the change in estimate. The net impact resulted in decreased earnings per share by $0.01 for the prior-year quarter. Management does not believe this net valuation allowance is representative of the ongoing operations of the company.

Plant Retirement Charges

The company recognized charges for the impact of PEC's decision to retire certain coal-fired generating units, with resulting reduced emissions for compliance with the Clean Smokestacks Act's 2013 emission targets. The charges decreased earnings per share by $0.05 for the quarter. Since the coal-fired generating units will be retired prior to the

end of their estimated useful lives, management does not consider these charges to be representative of the company's ongoing earnings.

* * * *

Progress Energy's conference call with the investment community will be held today at 10 a.m. ET (7 a.m. PT). Investors, media and the public may listen to the conference call by dialing 913-312-1489, confirmation code 4282428. If you encounter problems, please contact Investor Relations at (919) 546-6057. A playback of the call will be available from 1 p.m. ET February 11 through midnight February 25. To listen to the recorded call, dial 719-457-0820 and enter confirmation code 4282428.

A webcast of the live conference call will be available at www.progress-energy.com/webcast. The webcast will be archived on the site for at least 30 days following the call for those unable to listen in real time. The webcast will include audio of the conference call and a slide presentation referred to by management during the call. The slide presentation will be available for download beginning at 9:30 a.m. ET today at www.progress-energy.com/webcast.

Progress Energy (NYSE: PGN), headquartered in Raleigh, N.C., is a Fortune 500 energy company with more than 22,000 megawatts of generation capacity and $9 billion in annual revenues. Progress Energy includes two major electric utilities that serve approximately 3.1 million customers in the Carolinas and Florida. The company has earned the Edison Electric Institute's Edison Award, the industry's highest honor, in recognition of its operational excellence, and was the first utility to receive the prestigious J.D. Power and Associates Founder's Award for customer service. The company is pursuing a balanced strategy for a secure energy future, which includes aggressive energy-efficiency programs, investments in renewable energy technologies and a state-of-the-art electricity system. Progress Energy celebrated a century of service in 2008. Visit the company's Web site at www.progress-energy.com.

Caution Regarding Forward-Looking Information:

This release contains forward-looking statements within the meaning of the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. The matters discussed in this document involve estimates, projections, goals, forecasts, assumptions, risks and uncertainties that could cause actual results or outcomes to differ materially from those expressed in the forward-looking statements.

Examples of factors that you should consider with respect to any forward-looking statements made throughout this document include, but are not limited to, the following: the impact of fluid and complex laws and regulations, including those relating to the environment and energy policy; our ability to recover eligible costs and earn an adequate return on investment through the regulatory process; the ability to successfully operate electric generating facilities and deliver electricity to customers; the impact on our facilities and businesses from a terrorist attack; the ability to meet the anticipated future need for additional baseload generation and associated transmission facilities in our regulated service territories and the accompanying regulatory and financial risks; our ability to meet current and future renewable energy requirements; the inherent risks associated with the operation and potential construction of nuclear facilities, including environmental, health, regulatory and financial risks; the financial resources and capital needed to comply with environmental laws and regulations; weather and drought conditions that directly influence the production, delivery and demand for electricity; recurring seasonal fluctuations in demand for electricity; the ability to recover in a timely manner, if at all, costs associated with future significant weather events through the regulatory process; fluctuations in the price of energy commodities and purchased power and our ability to recover such costs through the regulatory process; our ability to control costs, including operations and maintenance expense (O&M) and large construction projects; the ability of our subsidiaries to pay upstream dividends or distributions to Progress Energy; current economic conditions; the ability to successfully access capital markets on favorable terms; the stability of commercial credit markets and our access to short- and long-term credit; the impact that increases in leverage or reductions in cash flow may have on us; our ability to maintain our current credit ratings and the impacts in the event our credit ratings are downgraded; the investment performance of our nuclear decommissioning trust (NDT) funds; the investment performance of the assets of our pension and benefit plans and resulting impact on future funding requirements; the impact of potential goodwill impairments; our ability to fully utilize tax credits generated from the previous production and sale of qualifying synthetic fuels under Internal Revenue Code Section 29/45K (Section 29/45K); and the outcome of any ongoing or future litigation or similar disputes and the impact of any such outcome or related settlements. Many of these risks similarly impact our nonreporting subsidiaries. These and other risk factors are detailed from time to time in our filings with the SEC. All such factors are difficult to predict, contain uncertainties that may materially affect actual results and may be beyond our control. New factors emerge from time to time, and it is not possible for management to predict all such factors, nor can management assess the effect of each such factor on us.

Any forward-looking statement is based on information current as of the date of this document and speaks only as of

the date on which such statement is made, and we undertake no obligation to update any forward-looking statement or statements to reflect events or circumstances after the date on which such statement is made.

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Contacts: Corporate Communications – (919) 546-6189 or toll-free (877) 641-NEWS (6397)

06/27/2011

Progress Energy provides update on Crystal River Nuclear Plant outage

Highlights:

- Initial plan favors repair of plant containment structure
- Under plan, company estimates nuclear plant would return to service in 2014
- Repair cost estimate between $900 million and $1.3 billion
- Announces webcast and conference call Tuesday, June 28, at 10 a.m. ET

CRYSTAL RIVER, Fla. (June 27, 2011) – Progress Energy Florida has provided an update to the Nuclear Regulatory Commission (NRC) and the Florida Public Service Commission (FPSC) regarding the status of its Crystal River Nuclear Plant. Based on an initial review, the company believes that repairing the unit is the best option, and is taking steps to complete more detailed engineering and construction analyses. At this time, the company estimates that the unit would return to service in 2014.

Progress Energy will meet with the FPSC July 14 to discuss the company's plan in more detail and determine the appropriate timing for moving forward, in coordination with regulators.

"This would be a major repair, requiring significant cooperation and coordination with state and federal regulators and others," said Vincent Dolan, Progress Energy Florida president and CEO. "Based on our initial review, our objective is to return the plant to service to ensure that it continues to be a safe, dependable and emission-free resource to meet our customers' energy needs reliably and affordably for many years to come. The Crystal River Nuclear Plant is our least-cost resource to operate, and with it in service, our customers save about $300 million a year in fuel costs. That translates to significant savings over the life of the plant.

"In the meantime, nuclear safety remains our top priority. The plant remains shut down and in a safe condition. We will continue to provide energy from other company and purchased resources to meet our customers' needs for reliable electricity."

Initial damage to the plant's containment building occurred in late 2009 while workers were creating an opening in the structure to facilitate the replacement of the steam generators inside. The work to create the opening caused a delamination (or separation) in the concrete at the periphery of the containment building. The unit was already shut down for refueling and maintenance at the time the damage was found.

In mid-March this year, during the final stages of returning the unit to service, work was suspended while engineers investigated and subsequently determined that a second delamination had occurred in another area of the structure. Similar to the initial delamination, the second separation occurred about nine inches from the

outer surface of the concrete. The Crystal River Nuclear Plant containment structure is about 42 inches thick, contains both horizontal and vertical tensioned steel tendons, and is lined with a 3/8-inch-thick steel plate.

Progress Energy engaged outside engineering experts to perform an analysis of possible repair options for the second delamination. The consultants analyzed 22 potential repair options and ultimately narrowed those to four. Progress Energy, along with independent experts, reviewed the four options for technical issues, constructability, and licensing feasibility as well as cost.

Based on that initial analysis, the company selected the best repair option. The option would entail systematically removing and replacing concrete in the containment structure walls. The planned option does not include the area where concrete was replaced during the initial repair. The preliminary cost estimate for this repair is between $900 million and $1.3 billion.

The company is moving forward systematically and will perform additional detailed engineering analyses and designs, which could affect any final repair plan. This process will lead to more certainty for the cost and schedule of the repair. The company will continue to refine and assess the plan (and the prudence of continuing to pursue it) based on new developments and analyses as the process moves forward. A number of factors could affect the repair plan, the return-to-service date and costs, including regulatory reviews, the ultimate work scope, engineering designs, testing, weather and other developments.

Progress Energy maintains insurance for property damage and incremental costs of replacement power resulting from prolonged accidental outages through Nuclear Electric Insurance Limited (NEIL). As of May 31, 2011, the company has spent approximately $214 million on the repair and $375 million on replacement power costs. NEIL has paid claims of $265 million during that period. Of the $265 million received, $103 million covered repair costs and $162 million covered replacement power. Progress Energy is insured for up to $2.25 billion per event for property damage and up to $490 million for replacement power.

Joint owner indemnification for replacement power costs

The company estimates it will record approximately $45 million in pretax expense in the second quarter for the indemnification obligation to the Crystal River Nuclear Plant joint owners for replacement power costs for 2012 and 2013. The joint owners' indemnification agreement expires at the end of 2013. Nine parties own a total of approximately 8 percent of the nuclear plant.

Because this charge relates solely to future years, it will be excluded from the calculation of ongoing earnings. Therefore, this does not affect previously announced earnings guidance for the year.

About the Crystal River Nuclear Plant

The Crystal River Nuclear Plant is located near Crystal River, Fla., and is capable of generating 860 megawatts (MW) of power to help serve Progress Energy Florida's 1.6 million customers. The plant went into service in March 1977. Its current license expires in 2016. The company filed for a license renewal with the Nuclear Regulatory Commission (NRC) in 2008, requesting an additional 20 years of operation.

Webcast and conference call

Progress Energy will host a conference call with the investment community Tuesday, June 28, at 10 a.m. ET (7 a.m. PT). Investors, media and the public may listen to the conference call by dialing (913) 312-0666 and entering confirmation code 3833391. If you encounter problems, please contact Investor Relations at (919) 546-6057.

A webcast of the live conference call will be available at www.progress-energy.com/investor . The webcast will be archived on the site for at least 30 days following the call for those unable to listen in real time. The webcast will include audio of the conference call and a slide presentation. The slide presentation will be available for download beginning at 9:30 a.m. ET Tuesday at www.progress-energy.com/investor.

Progress Energy (NYSE: PGN), headquartered in Raleigh, N.C., is a Fortune 500 energy company with more than 22,000 megawatts of generation capacity and approximately $10 billion in annual revenues. Progress Energy includes two major electric utilities that serve about 3.1 million customers in the Carolinas and Florida. The company has earned the Edison Electric Institute's Edison Award, the industry's highest honor, in recognition of its operational excellence, and was the first utility to receive the prestigious J.D. Power and Associates Founder's Award for customer service. The company is pursuing a balanced strategy for a secure energy future, which includes aggressive energy-efficiency programs, investments in renewable energy technologies and a state-of-the-art electricity system. Progress Energy celebrated a century of service in 2008. Visit the company's website at www.progress-energy.com .

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04/04/2011

Progress Energy provides update on Crystal River Nuclear Plant outage

Engineering analysis under way

CRYSTAL RIVER, Fla. (April 4, 2011) – Progress Energy Florida has notified the Nuclear Regulatory Commission (NRC) and the Florida Public Service Commission (FPSC) that the Crystal River Nuclear plant will remain out of service while the company conducts a thorough engineering analysis and review of the new delamination. Options to return the plant to service will be analyzed after the report is complete. The company cannot estimate a return to service date for CR3 at this time.

In mid March, final retensioning of tendons within the Crystal River Nuclear plant containment building was suspended while engineers investigated evidence of an additional delamination (or separation) resulting from the tendon retensioning work. The initial damage occurred in late 2009 in the concrete at the periphery of the containment building while creating an opening in the structure to facilitate the replacement of the steam generators inside. The unit was already shut down for refueling and maintenance at the time the damage was found.

The plant has been shut down since September of 2009 and there continues to be no threat to public health and safety. Progress Energy continues to coordinate repair and restart plans with Nuclear Regulatory Commission officials.

“The Crystal River Nuclear Plant has been an important asset in providing carbon-free, reliable power for decades to our customers,” said Vincent Dolan, president and chief executive officer of Progress Energy Florida. “We are doing a careful and systematic review of the new delamination and the options to return the plant to service. In the meantime, nuclear safety remains our top priority. The plant remains shut down and in a safe condition. We will continue to provide energy from other company and purchased resources to meet our customers’ needs for reliable electricity.”

Progress Energy maintains insurance for property damage and incremental costs of replacement power resulting from prolonged accidental outages through Nuclear Electric Insurance Limited (NEIL). As of December 31, 2010, the company has spent approximately $150 million on the repair and $290 million on replacement power costs. NEIL has paid $181 million during that time period. Of the $181 million received, $117 million covered replacement power and $64 million covered repair costs.

The Crystal River Nuclear Plant is located near Crystal River, Fla. and is capable of generating 860 MW of power to help serve Progress Energy Florida’s 1.6 million customers. The plant went into service in March of 1977. Its current license expires in 2016. The company filed for a license renewal with the NRC in 2008, requesting an additional 20 years of operation.

Progress Energy (NYSE: PGN), headquartered in Raleigh, N.C., is a Fortune 500 energy company with more than 22,000 megawatts of generation capacity and approximately $10 billion in annual revenues. Progress Energy includes two major electric utilities that serve about 3.1 million customers in the Carolinas and Florida. The company has earned the Edison Electric Institute's Edison Award, the industry's highest honor, in recognition of its operational excellence, and was the first utility to receive the prestigious J.D. Power and Associates Founder's Award for customer service. The company is pursuing a balanced strategy for a secure energy future, which includes aggressive energy-efficiency programs, investments in renewable energy technologies and a state-of-the-art electricity system. Progress Energy celebrated a century of service in 2008. Visit the company’s website at www.progress-energy.com.

11/30/2010

Progress Energy provides update on Crystal River Nuclear Plant outage

Concrete placement complete; company now targeting first quarter return to service

CRYSTAL RIVER, Fla. (Nov. 30, 2010) – Progress Energy Florida notified the Florida Public Service Commission today that the company has completed concrete replacement and is completing the extensive computer modeling necessary to finish the remaining repair work at the company's Crystal River Nuclear Plant. The company is now making preparations for pre-start testing and is targeting return to service in the first quarter of 2011.

The updated schedule reflects the additional time required to complete computer analysis that is needed to determine the correct sequence to re-tighten a network of hundreds of horizontal and vertical tendons that provide structural integrity inside the walls of the concrete-and-steel containment building.

Workers completed the concrete replacement last month. Once the interior tendons are re-tightened, a series of structural tests will be completed. After those tests, the unit will return to normal operation.

Progress Energy will continue to coordinate repair and restart plans with Nuclear Regulatory Commission officials.

A portion of the building was damaged late last year during the process of creating an opening in the structure to remove and replace the steam generators inside. The unit was already shut down for refueling and maintenance at the time the damage was found. The damage was delamination (or separation) of a portion of the concrete at the periphery of the containment building.

The repair schedule and return-to-service date are affected by a number of factors, including regulatory reviews by the NRC and other agencies as appropriate, emergent work, engineering designs, computerized modeling, testing, weather and other developments.

"From the start of this process, we have been focused on making repairs that will ensure the plant continues to be a safe, dependable and emission-free resource to meet our customers' energy needs reliably and affordably for many years to come," said Vincent Dolan, Progress Energy Florida President and CEO. "Protecting public health and safety is our primary objective."

"We have successfully completed the majority of the complex, first-of-a-kind repairs and we're moving forward cautiously and deliberately as we focus on the final phase of the containment building repair and conduct pre-restart testing activities."

As of Sept. 30, Progress Energy Florida has spent approximately $117 million on the repair. Final estimates for the total repair cost are being calculated. These estimates will be driven, in large part, by the final repair activities, and potential issues beyond our control, such as weather, which could affect construction, and regulatory reviews. Progress Energy Florida expects that the cost of the repair work will be partially paid by insurance. Through Oct. 30, the company has received a total of $117 million from its insurance provider, Nuclear Electric Insurance Limited (NEIL), and expects to file additional claims. Of that total, $81 million is for replacement power costs and $36 million toward the cost of the repairs.

Progress Energy (NYSE: PGN), headquartered in Raleigh, N.C., is a Fortune 500 energy company with more than 22,000 megawatts of generation capacity and approximately $10 billion in annual revenues. Progress Energy includes two major electric utilities that serve about 3.1 million customers in the Carolinas and Florida. The company has earned the Edison Electric Institute's Edison Award, the industry's highest honor, in recognition of its operational excellence, and was the first utility to receive the prestigious J.D. Power and Associates Founder's Award for customer service. The company is pursuing a balanced strategy for a secure energy future, which includes aggressive energy-efficiency programs, investments in renewable energy technologies and a state-of-the-art electricity system. Progress Energy celebrated a century of service in 2008. Visit the company’s website at www.progress-energy.com.

05/05/2009

Progress Energy announces 2009 first-quarter results; on track for full-year 2009 earnings guidance

Highlights:

- **Reports first-quarter GAAP earnings of $0.66 per share, compared to $0.80 per share for the same period last year, with prior-year results including gains from the divestiture of non-utility businesses**
- **Reports first-quarter ongoing earnings of $0.66 per share, compared to $0.56 per share for the same period last year**
- **On track for 2009 ongoing earnings guidance of $2.95 to $3.15 per share**

RALEIGH, N.C. (May 5, 2009) -- Progress Energy [NYSE: PGN] announced first-quarter GAAP earnings of $182 million, or $0.66 per share, compared with GAAP earnings of $209 million, or $0.80 per share, for the same period last year. First-quarter ongoing earnings were $182 million, or $0.66 per share, compared to $148 million, or $0.56 per share, last year.The significant drivers in ongoing earnings per share were increased wholesale revenues, favorable AFUDC equity and a return to normal weather, which were partially offset by share dilution, increased interest expense and lower retail growth and usage. (See the discussion later in this release for a reconciliation of ongoing earnings per share to GAAP earnings per share.)

"In the midst of this economic slowdown, we delivered solid financial results in the first quarter by living within our means and aggressively managing our business," said Bill Johnson, chairman, president and CEO. "Strong residential sales in the Carolinas and favorable wholesale contracts were able to offset continued retail weakness in Florida and lower industrial demand.

"We continue to secure the energy future for our customers by investing in our two utilities and working constructively with policymakers and regulators. We recently completed the first phase of the Clean Smokestacks Act emission reductions at our fossil plants in the Carolinas, and we are continuing environmental and efficiency upgrades at our Crystal River Plant in Florida. In addition, we expect to complete the repowering of our Bartow Plant from oil to natural gas in June. Meanwhile, at both utilities, we are making good progress in a wide array of energy-efficiency and renewable-energy initiatives.

"In addition, we successfully raised $1.9 billion in the capital markets and made several important regulatory filings, which should position us well to execute our plan in these challenging economic times," Johnson said.

Progress Energy affirms its 2009 ongoing earnings guidance range of $2.95 to $3.15 per share. The ongoing earnings guidance excludes the impact, if any, from CVO mark-to-market adjustment, potential impairments

and discontinued operations. Progress Energy is not able to provide a corresponding GAAP equivalent for the 2009 earnings guidance due to the uncertain nature and amount of these adjustments.

See pages 3-4 for a detailed first-quarter earnings variance analysis for the Progress Energy Carolinas (PEC), Progress Energy Florida (PEF) and Corporate and Other Businesses segments.

RECENT DEVELOPMENTS

Financial and Regulatory

- Issued $750 million of senior unsecured notes at the holding company on March 19, 2009, comprised of $300 million 5-year notes at 6.05% and $450 million 10-year notes at 7.05%.
- Announced plans to shift the construction schedule for the Levy County nuclear project, which will move the commercial operation dates by a minimum of 20 months.
- Filed 2010 nuclear cost-recovery estimates with the Florida Public Service Commission, seeking approval to spread certain costs over five years.
- Received approval from the FPSC to decrease 2009 customer bills by $404 million, or approximately 11 percent, through reduced fuel cost projections and deferred nuclear pre-construction cost recovery, with new rates effective April 2009.
- Filed petitions with the FPSC for a 2010 base rate increase of approximately $499 million, including proposals for a portion of the rate increase, approximately $76 million, to be effective starting in July 2009.
- Filed a petition with the FPSC for expedited approval of the following accounting orders, which will not affect PEF's rates:
- Deferral of $52.5 million in 2009 pension expenses
- Authorization to charge $33.1 million in estimated 2009 storm hardening expenses against the Storm Damage Reserve

State-of-the-Art Power Plants

- Began outage at the 720-megawatt, coal-fired Crystal River Unit 5, to improve the unit's operational efficiency and install environmental control equipment that will reduce nitrogen oxide emissions by more than 90 percent.
- Placed in service the last environmental compliance project under the first phase of the Clean Smokestacks Act emission reductions, which included projects at PEC's Asheville, Lee, Mayo and Roxboro plants.
- Selected BE&K Construction Company, a division of KBR, Inc., as provider of general construction services for a 600-megawatt, natural gas-fueled power plant to be built at PEC's Richmond County Energy Complex. This plant is expected to be placed in service in mid-2011.

Alternative Energy & Energy Efficiency

- Placed online a 1.2-megawatt solar array, owned and operated by SunEdison, at PEC's Sutton Plant in eastern North Carolina. PEC will purchase the electricity from SunEdison under a 20-year solar power agreement.
- Achieved 1-megawatt total capacity milestone for solar photovoltaic generation systems across PEF's service territory.
- Announced plans to purchase renewable energy output from a new 50-megawatt biomass-fueled cogeneration plant developed by Peregrine Energy Corporation at Sonoco's Hartsville, S.C. manufacturing complex, scheduled to begin operation in 2012.
- Announced agreement with Carolina Solar Energy to purchase the energy produced by a new 650-kilowatt solar photovoltaic plant near Roxboro, N.C., scheduled to begin operation later this year.
- Received approval from the NCUC for several energy-efficiency programs:
    - Energy Efficiency for Business -- available to commercial, industrial and government customers for both new construction and retrofit applications
    - Residential Home Energy Improvement Program -- offers customers a variety of incentives for energy-efficiency improvements to existing homes
    - Residential Solar Water Heating Pilot -- up to 150 customers will be offered a $1,000 incentive to participate in the study

Awards, Honors & Recognitions

- Received EEI emergency-assistance award, recognizing the largest off-system deployment in the company's history in response to Hurricane Ike. Progress Energy has earned seven EEI storm-response awards, receiving the emergency-response award five times and the emergency-assistance award twice.

Press releases regarding various announcements are available on the company's Web site at www.progress-energy.com/aboutus/news.

FIRST-QUARTER 2009 BUSINESS HIGHLIGHTS

Below are the first-quarter 2009 highlights for the company's business units. See the reconciliation tables on pages 5-6 and on page S-1 of the supplemental data for a reconciliation of ongoing earnings per share to GAAP earnings per share. Also see the attached supplemental data schedules for additional information on PEC and PEF electric revenues, energy sales, energy supply, weather impacts and other information.

Progress Energy Carolinas

- Reported first-quarter ongoing earnings per share of $0.47, compared with $0.46 for the same period last year; GAAP earnings per share of $0.46, compared with $0.47 for the same period last year.
- Reported primary quarter-over-quarter ongoing earnings per share favorability of:
  - $0.03 weather due to prior-year unfavorability
  - $0.02 wholesale revenues primarily due to higher transmission revenues resulting from the Open Access Transmission Tariff rates that went into effect on July 1, 2008
  - $0.02 AFUDC equity primarily due to increased eligible construction project costs
  - $0.02 depreciation and amortization primarily due to lower Clean Smokestacks Act amortization, partially offset by the impact of depreciable asset base increases. PEC has ceased recording Clean Smokestacks Act amortization in accordance with a regulatory order.
  - $0.02 income taxes primarily due to the deduction related to nuclear decommissioning trust funds
- Reported primary quarter-over-quarter ongoing earnings per share unfavorability of:
  - $(0.02) other retail margin
  - $(0.02) O&M primarily due to higher nuclear plant outage and maintenance costs
  - $(0.02) other primarily due to seasonal losses on a balanced billing program, lower interest income and investment losses
  - $(0.01) retail growth and usage
  - $(0.03) share dilution
- 18,000 net increase in the average number of customers for the three months ended March 31, 2009, compared to the same period in 2008

Progress Energy Florida

- Reported first-quarter ongoing earnings per share of $0.33, compared with $0.26 for the same period last year; GAAP earnings per share of $0.32, compared with $0.26 for the same period last year.
- Reported primary quarter-over-quarter ongoing earnings per share favorability of:
  - $0.04 weather due to prior-year unfavorability
  - $0.04 wholesale revenues primarily due to new and amended contracts that were not in effect in first quarter 2008

- $0.04 AFUDC equity primarily due to increased eligible construction project costs
- $0.04 income taxes primarily due to the deduction related to nuclear decommissioning trust funds
- $0.02 other retail margin

- Reported primary quarter-over-quarter ongoing earnings per share unfavorability of:
  - $(0.04) interest expense primarily due to higher average debt outstanding
  - $(0.02) retail growth and usage
  - $(0.01) depreciation and amortization
  - $(0.01) O&M
  - $(0.01) other
  - $(0.02) share dilution
- 8,000 net decrease in the average number of customers for the three months ended March 31, 2009, compared to the same period in 2008

Corporate and Other Businesses (includes primarily Holding Company Debt)

- Reported first-quarter ongoing after-tax expenses of $0.14 per share compared with ongoing after-tax expenses of $0.16 per share for the same period last year; GAAP after-tax expenses of $0.12 per share, compared with after-tax income of $0.07 per share for the same period last year.
- Reported primary quarter-over-quarter ongoing after-tax expenses per share favorability of:
  - $0.03 other primarily due to lower workers' compensation expense, investment gains of certain employee benefit trusts resulting from market conditions and higher interest income.
  - $0.01 share dilution
- Reported primary quarter-over-quarter ongoing after-tax expenses per share unfavorability of:
  - $(0.02) income taxes primarily due to the impact on the Corporate tax position resulting from the deductions taken by the Utilities related to nuclear decommissioning trust funds

ONGOING EARNINGS ADJUSTMENTS

Progress Energy's management uses ongoing earnings per share to evaluate the operations of the company and to establish goals for management and employees. Management believes this presentation is appropriate and enables investors to more accurately compare the company's ongoing financial performance over the periods presented. Ongoing earnings as presented here may not be comparable to similarly titled measures

used by other companies. The following table provides a reconciliation of ongoing earnings per share to reported GAAP earnings per share.

Progress Energy, Inc.

Reconciliation of Ongoing Earnings per Share to Reported GAAP Earnings per Share

Three months ended March 31

	2009	2008*
Ongoing earnings per share	$0.66	$0.56
Tax levelization	(0.02)	0.01
Discontinued operations	–	0.23
CVO mark-to-market	0.02	–
Reported GAAP earnings per share	$0.66	$0.80
Shares outstanding (millions)	277	260

** Previously reported first quarter 2008 earnings per share has been restated to reflect the adoption of new accounting guidance that changed the calculation of the number of average common shares outstanding.*

Reconciling adjustments from ongoing earnings to GAAP earnings are as follows:

Tax Levelization

Generally accepted accounting principles require companies to apply an effective tax rate to interim periods that is consistent with a company's estimated annual tax rate. The company projects the effective tax rate for the year and, then, based upon projected operating income for each quarter, raises or lowers the tax expense recorded in that quarter to reflect the projected tax rate. The resulting tax adjustment decreased earnings per share by $0.02 for the quarter and increased earnings per share by $0.01 for the same period last year, but has no impact on the company's annual earnings. Because this adjustment varies by quarter but has no impact on annual earnings, management believes this adjustment is not representative of the company's ongoing quarterly earnings.

Discontinued Operations

The company has reduced its business risk by exiting nonregulated businesses to focus on the core operations of the utilities. The discontinued operations of these nonregulated businesses had no impact on earnings for the quarter and increased earnings per share by $0.23 for the same period last year. See page S-3 of the supplemental data for further information on the impact of discontinued operations. Due to disposition of these assets, management does not view this activity as representative of the ongoing operations of the company.

Contingent Value Obligation (CVO) Mark-to-Market

In connection with the acquisition of Florida Progress Corporation, Progress Energy issued 98.6 million CVOs. Each CVO represents the right of the holder to receive contingent payments based on net after-tax cash flows above certain levels of four synthetic fuels facilities purchased by subsidiaries of Florida Progress Corporation in October 1999. The CVO liability is valued at fair value, and unrealized gains and losses from changes in fair value are recognized in earnings each quarter. The CVO mark-to-market increased earnings per share by $0.02 for the quarter and had no impact on earnings for the same period last year. Progress Energy is unable to predict the changes in the fair value of the CVOs, and management does not consider the adjustment to be a component of ongoing earnings.

* * * *

Progress Energy's conference call with the investment community will be held May 5, 2009, at 10 a.m. ET (7 a.m. PT). Investors, media and the public may listen to the conference call by dialing 913-312-1524, confirmation code 4790789. If you encounter problems, please contact Investor Relations at (919) 546-6057. A playback of the call will be available from 1 p.m. EST May 5 through midnight May 19. To listen to the recorded call, dial 719-457-0820 and enter confirmation code 4790789.

A webcast of the live conference call will be available at www.progress-energy.com/webcast. The webcast will be available in Windows Media format. The webcast will be archived on the site for at least 30 days following the call for those unable to listen in real time. The webcast will include audio of the conference call and a slide presentation referred to by management during the call. The slide presentation will be available for download beginning at 9:30 a.m. ET today at www.progress-energy.com/webcast.

Progress Energy (NYSE: PGN), headquartered in Raleigh, N.C., is a Fortune 500 energy company with more than 21,000 megawatts of generation capacity and $9 billion in annual revenues. Progress Energy includes two major electric utilities that serve approximately 3.1 million customers in the Carolinas and Florida. The company has earned the Edison Electric Institute's Edison Award, the industry's highest honor, in recognition of its operational excellence, and was the first utility to receive the prestigious J.D. Power and Associates Founder's Award for customer service. The company is pursuing a balanced strategy for a secure energy future, which includes aggressive energy-efficiency programs, investments in renewable energy technologies and a state-of-

the-art electricity system. Progress Energy celebrated a century of service in 2008. Visit the company's Web site at www.progress-energy.com.

Caution Regarding Forward-Looking Information:

This release contains forward-looking statements within the meaning of the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. The matters discussed in this document involve estimates, projections, goals, forecasts, assumptions, risks and uncertainties that could cause actual results or outcomes to differ materially from those expressed in the forward-looking statements.

Examples of factors that you should consider with respect to any forward-looking statements made throughout this document include, but are not limited to, the following: the impact of fluid and complex laws and regulations, including those relating to the environment and the Energy Policy Act of 2005; the ability to meet the anticipated future need for additional baseload generation and associated transmission facilities in our regulated service territories and the accompanying regulatory and financial risks; the financial resources and capital needed to comply with environmental laws and renewable energy portfolio standards and our ability to recover related eligible costs under cost-recovery clauses or base rates; our ability to meet current and future renewable energy requirements; the inherent risks associated with the operation and potential construction of nuclear facilities, including environmental, health, regulatory and financial risks; the impact on our facilities and businesses from a terrorist attack; weather and drought conditions that directly influence the production, delivery and demand for electricity; recurring seasonal fluctuations in demand for electricity; the ability to recover in a timely manner, if at all, costs associated with future significant weather events through the regulatory process; economic fluctuations and the corresponding impact on our customers, including downturns in the housing and consumer credit markets; fluctuations in the price of energy commodities and purchased power and our ability to recover such costs through the regulatory process; our ability to control costs, including O&M and large construction projects; the ability of our subsidiaries to pay upstream dividends or distributions to Progress Energy; the duration and severity of the current financial market distress that began in the third quarter of 2008; the ability to successfully access capital markets on favorable terms; the stability of commercial credit markets and our access to short- and long-term credit; the impact that increases in leverage may have on us; our ability to maintain our current credit ratings and the impact on our financial condition and ability to meet our cash and other financial obligations in the event our credit ratings are downgraded; our ability to fully utilize tax credits generated from the previous production and sale of qualifying synthetic fuels under Internal Revenue Code Section 29/45K; the investment performance of our nuclear decommissioning trust funds; the investment performance of the assets of our pension and benefit plans and resulting impact on future funding requirements; the impact of goodwill impairments; the outcome of any ongoing or future litigation or similar disputes and the impact of any such outcome or related settlements; and unanticipated changes in operating expenses and capital expenditures. Many of these risks similarly impact our nonreporting subsidiaries. These and other risk factors are detailed from time to time in our filings with the SEC. All such factors are difficult to predict, contain uncertainties that may materially affect actual results and may be beyond

our control. New factors emerge from time to time, and it is not possible for management to predict all such factors, nor can management assess the effect of each such factor on us.

Any forward-looking statement is based on information current as of the date of this document and speaks only as of the date on which such statement is made, and we undertake no obligation to update any forward-looking statement or statements to reflect events or circumstances after the date on which such statement is made.

# # #

02/12/2009

Progress Energy announces 2008 fourth-quarter and full-year results; affirms 2009 earnings guidance

(View news release and financials in PDF)

Highlights:

Fourth Quarter 2008

- **Reports fourth-quarter GAAP earnings of $0.41 per share, compared to $0.40 per share for the same period last year**
- **Reports fourth-quarter ongoing earnings of $123 million, or $0.47 per share, compared to $104 million, or $0.40 per share, for the same period last year**

Full Year 2008

- **Reports 2008 GAAP earnings of $3.19 per share, compared to $1.97 per share in 2007, primarily driven by the divestiture of non-utility businesses**
- **Reports 2008 ongoing earnings of $776 million, or $2.98 per share, compared to $695 million, or $2.72 per share, for the same period last year**
- **Affirms 2009 ongoing earnings guidance range of $2.95 to $3.15 per share**

RALEIGH, N.C. (February 12, 2009) -- Progress Energy [NYSE: PGN] announced fourth-quarter reported GAAP earnings of $107 million, or $0.41 per share, compared with reported GAAP earnings of $103 million, or $0.40 per share, for the same period last year. Fourth-quarter ongoing earnings were $123 million, or $0.47 per share, compared to $104 million, or $0.40 per share, last year.The significant drivers in ongoing earnings were favorable AFUDC equity, lower depreciation and amortization and higher other retail margin, which were partially offset by lower excess generation revenues and increased interest expense. (See the discussion later in this release for a reconciliation of ongoing earnings per share to reported GAAP earnings per share.)

Full-year reported GAAP earnings were $830 million, or $3.19 per share, compared with reported GAAP earnings of $504 million, or $1.97 per share, for the same period last year. Reported GAAP earnings for 2007 reflected a loss on the divestiture of non-utility businesses. Full-year ongoing earnings were $776 million, or $2.98 per share, compared to $695 million, or $2.72 per share, last year.The company benefited from favorable AFUDC equity, an increase in net retail base rates related to the Hines Energy Complex and higher other retail margin, which were partially offset by increased interest expense and income taxes. (See the discussion later in this release for a reconciliation of ongoing earnings per share to reported GAAP earnings per share.)

Progress Energy affirmed its 2009 ongoing earnings guidance range of $2.95 to $3.15 per share. The ongoing earnings guidance excludes the impact, if any, from CVO mark-to-market adjustment, potential impairments and discontinued operations. Progress Energy is not able to provide a corresponding GAAP equivalent for the 2009 earnings guidance due to the uncertain nature and amount of these adjustments.

"Despite the global financial crisis and economic slowdown, we successfully delivered on our 2008 financial goals with full-year ongoing earnings of $2.98," said Bill Johnson, chairman, president and CEO. "We know that 2009 will be a challenging year for our company and our customers. We are aggressively controlling costs to effectively manage our business, maintain high levels of reliability and minimize the impact of rising costs of fuels and new energy policies on our customers."

See pages 4-6 for detailed fourth-quarter and full-year earnings variance analyses for the Progress Energy Carolinas (PEC), Progress Energy Florida (PEF) and Corporate and Other Businesses segments.

RECENT DEVELOPMENTS

- Increased quarterly dividend to 62.0 cents per share from 61.5 cents per share, representing the 21st consecutive year of dividend growth for the company's common stock.
- Issued 14.375 million shares of common stock for net proceeds of approximately $523 million in January 2009, which were used to reduce borrowings under Progress Energy's revolving credit facility and for general corporate purposes.
- Filed proposal with Florida Public Service Commission (FPSC) to decrease customer bills in 2009 by approximately 11 percent through reduced fuel cost projections and deferred nuclear pre-construction cost recovery.
- Filed with the FPSC a test year letter requesting a permanent base rate increase in 2010 of approximately $475 million to $550 million annually. This letter formally indicates PEF's intent to initiate a base rate proceeding and is required because the current base rate settlement agreement will expire at the end of this year. Also, PEF indicated that it may seek limited and/or interim base rate relief for 2009.
- Met a new peak-demand record set by PEF's customers in early February 2009, as well as an unprecedented one-day usage record, reflecting increasing energy needs.
- Signed a contract with Westinghouse Electric Company LLC and Stone & Webster, Inc., a subsidiary of The Shaw Group, Inc., for the engineering, procurement and construction of two 1,105-net megawatt nuclear reactors for a proposed advanced-design nuclear power plant in Levy County, Fla. (Levy).
- Received final orders from the FPSC for all of PEF's proposed 2009 recovery for fuel, environmental and energy-efficiency costs.

- Announced agreement with the Florida Department of Environmental Protection (FDEP) to retire the two oldest coal-fired units at the Crystal River Energy Complex in Citrus County (approximately 866 megawatts) if the Levy County nuclear plant is built. The coal units would be retired after the second new nuclear unit at Levy completes its first fuel cycle, which the company estimates to be around 2020.
- Received recommendation from the FDEP staff to receive a site certification for Levy.
- Received notice that the U.S. Court of Appeals for the D.C. Circuit remanded the 2005 Clean Air Interstate Rule (CAIR) without vacatur to the Environmental Protection Agency (EPA), which leaves the existing rule in effect while the EPA remedies CAIR's existing flaws, as identified by the court.
- Submitted Crystal River Nuclear Plant's (CR 3) license-renewal application to the U.S. Nuclear Regulatory Commission (NRC), requesting 20 additional years of operation through 2036, with a decision expected in 2011.
- Received approval from the NRC for the renewal of the Harris Nuclear Plant's operating license for 20 additional years through 2046.
- Signed a contract for PEC to continue to supply power to the N.C. Electric Membership Corporation (NCEMC) for a 20-year period beginning in 2013, increasing supply up to a total of approximately 2,750 megawatts by the end of the contract term. Current contracts from PEC supply NCEMC with approximately 1,245 megawatts.
- Received from the North Carolina Utilities Commission (NCUC) a certificate of environmental compatibility and public convenience and necessity to construct approximately 64 miles of 230-kilovolt transmission line in eastern North Carolina.
- Met a new peak-demand record set by PEC's customers in Western N.C. in January 2009.
- Received final order from the NCUC to spread the recovery of PEC's deferred fuel and fuel-related cost balance over three years with interest.
- Made a number of announcements relating to energy conservation, demand-side management (DSM) / energy efficiency (EE), and renewable energy:
- Received approval from the NCUC for recovery of costs associated with compliance with renewable energy portfolio standards in North Carolina.
- Entered into a settlement agreement with several interveners, which was filed with the NCUC, to recover all DSM/EE program and measure costs with a potential return, net lost revenues for three years and performance incentives.
- Filed with South Carolina Public Service Commission a settlement agreement with interveners to recover all DSM/EE program and measure costs, net lost revenues for three years and performance incentives.
- Filed three new energy-efficiency programs with the NCUC, including a residential solar water heating program.

- Partnered with Ford Motor Company and Electric Power Research Institute to test a Ford Escape plug-in hybrid vehicle (PHEV) as part of a national PHEV demonstration program.
- Successfully completed negotiations on a new three-year contract with the International Brotherhood of Electrical Workers, which represents approximately 2,000 craft and technical employees at PEF.
- Progress Energy's two utilities achieved top-quartile ranking in the latest business customer satisfaction survey from J.D. Power & Associates. PEC was ranked highest in the competitive South region.

Press releases regarding various announcements are available on the company's Web site at http://progress-energy.com.

2008 BUSINESS HIGHLIGHTS

Below are the fourth-quarter and full-year 2008 earnings variance analyses for the company's business units. See the reconciliation table on pages 7-8 and pages S-1 and S-2 of the supplemental data for a reconciliation of ongoing earnings per share to reported GAAP earnings per share. Also see the attached supplemental data schedules for additional information on PEC and PEF electric revenues, energy sales, energy supply, weather impacts and other information.

QUARTER-OVER-QUARTER ONGOING EPS VARIANCE ANALYSIS

Progress Energy Carolinas

- Reported fourth-quarter ongoing earnings per share of $0.40, compared with $0.34 for the same period last year; reported GAAP earnings per share of $0.40, compared with $0.33 for the same period last year
- Reported primary quarter-over-quarter ongoing earnings per share favorability of:
  - $0.06 depreciation and amortization primarily due to lower depreciation expense associated with PEC's accelerated cost recovery program for nuclear generating assets, lower GridSouth amortization and lower Clean Smokestacks Act amortization
  - $0.03 other retail margin primarily due to the impact of the comprehensive energy bill implementation and the expiration of a power buyback agreement, partially offset by higher purchased power expense resulting from increased economical purchases in 2008
  - $0.02 weather
  - $0.02 AFUDC equity related to increased eligible construction project costs
  - $0.02 income taxes primarily due to changes in tax estimates, partially offset by lower deduction for domestic production activities

- Reported primary quarter-over-quarter ongoing earnings per share unfavorability of:
  - $(0.06) wholesale revenues primarily due to lower excess generation revenues driven by unfavorable market dynamics due to higher relative fuel costs and lower revenues related to capacity contracts with two major customers
  - $(0.03) other
- 21,000 net increase in the average number of customers for the three months ended Dec. 31, 2008, compared to the same period in 2007

Progress Energy Florida

- Reported fourth-quarter ongoing earnings per share of $0.22, compared with $0.20 for the same period last year; reported GAAP earnings per share of $0.19, compared with $0.19 for the same period last year
- Reported primary quarter-over-quarter ongoing earnings per share favorability of:
  - $0.06 AFUDC equity related to increased eligible construction project costs
  - $0.03 net retail base rate increase related to the Hines Energy Complex
  - $0.03 other retail margin primarily due to returns on increased environmental expenditures and the impact of nuclear cost recovery approved in 2008
  - $0.03 O&M primarily due to lower employee benefit costs and lower sales and use tax audit adjustment
  - $0.02 wholesale revenues primarily due to several new and amended contracts
- Reported primary quarter-over-quarter ongoing earnings per share unfavorability of:
  - $(0.04) other primarily due to investment losses of certain employee benefit trusts resulting from the decline in market conditions
  - $(0.04) income taxes primarily due to the closure of certain federal tax years and positions in the prior year and the accelerated amortization of tax-related regulatory assets
  - $(0.03) retail growth and usage
  - $(0.03) interest expense primarily due to higher average debt outstanding, partially offset by favorable AFUDC debt related to increased eligible construction project costs
  - $(0.01) weather
- 5,000 net decrease in the average number of customers for the three months ended Dec. 31, 2008, compared to the same period in 2007

Corporate and Other Businesses (includes primarily Holding Company Debt)

- Reported fourth-quarter ongoing expenses of $0.15 per share, compared with expenses of $0.14 per share for the same period last year; reported GAAP expenses of $0.18 per share, compared with expenses of $0.12 per share for the same period last year

YEAR-OVER-YEAR ONGOING EPS VARIANCE ANALYSIS

Progress Energy Carolinas

- Reported full-year ongoing earnings and reported GAAP earnings per share of $2.04, compared with $1.95 for the same period last year
- Reported primary year-over-year ongoing earnings per share favorability of:
  - $0.11 other retail margin primarily due to the impact of the comprehensive energy bill implementation and the expiration of a power buyback agreement, partially offset by higher purchased power expense resulting from increased economical purchases in 2008
  - $0.08 retail growth and usage
  - $0.07 AFUDC equity primarily related to eligibility of certain Clean Smokestacks Act compliance and other increased eligible construction project costs
  - $0.02 O&M primarily due to the impact of the comprehensive energy bill implementation
- Reported primary year-over-year ongoing earnings per share unfavorability of:
  - $(0.09) wholesale revenues primarily due to lower excess generation revenues driven by unfavorable market dynamics due to higher relative fuel costs and lower revenues related to capacity contracts with two major customers
  - $(0.07) weather
  - $(0.03) other primarily due to lower interest income resulting from lower eligible deferred fuel and temporary investment balances
- 24,000 net increase in the average number of customers for 2008, compared to 2007

Progress Energy Florida

- Reported full-year ongoing earnings and reported GAAP earnings per share of $1.47, compared with $1.23 for the same period last year
- Reported primary year-over-year ongoing earnings per share favorability of:

- $0.21 AFUDC equity related to increased eligible construction project costs
- $0.13 net retail base rate increase related to the Hines Energy Complex
- $0.11 wholesale revenues primarily due to several new and amended contracts
- $0.04 other retail margin primarily due to returns on increased environmental expenditures and increased rental revenue on electric property
- $0.04 O&M primarily due to lower employee benefit costs and lower sales and use tax audit adjustment, partially offset by higher outage and maintenance costs
- $0.01 other

- Reported primary year-over-year ongoing earnings per share unfavorability of:
  - $(0.09) interest expense primarily due to higher average debt outstanding, partially offset by favorable AFUDC debt related to increased eligible construction project costs and an interest benefit resulting from the current year resolution of tax matters
  - $(0.07) retail growth and usage
  - $(0.06) income taxes primarily due to the closure of certain federal tax years and positions in the prior year, the accelerated amortization of tax-related regulatory assets and lower deduction for domestic production activities
  - $(0.04) other primarily due to investment losses of certain employee benefit trusts resulting from the decline in market conditions
  - $(0.03) depreciation primarily due to the impact of higher depreciable base, partially offset by a write-off in 2007 of leasehold improvements primarily related to vacated office space
  - $(0.01) weather
- No net change in the average number of customers for 2008, compared to 2007

Corporate and Other Businesses (includes primarily Holding Company Debt)

- Reported full-year ongoing expenses of $0.53 per share, compared with expenses of $0.46 per share for the same period last year; reported GAAP expenses of $0.32 per share, compared with expenses of $1.21 per share for the same period last year
- Reported primary year-over-year ongoing expenses per share unfavorability of:

- $(0.08) income taxes primarily due to a prior-year benefit from the closure of certain federal tax years and positions related to divested subsidiaries and changes in tax estimates
- $(0.04) interest expense primarily due to a decrease in interest allocated to discontinued operations and a prior-year benefit from the closure of certain federal tax years and positions primarily related to divested subsidiaries

- Reported primary year-over-year ongoing expenses per share favorability of:
  - $0.05 other primarily due to decreased corporate overhead resulting from divestitures and decreased legal expenses, partially offset by investment losses of certain employee benefit trusts resulting from the decline in market conditions

ONGOING EARNINGS ADJUSTMENTS

Progress Energy's management uses ongoing earnings per share to evaluate the operations of the company and to establish goals for management and employees. Management believes this presentation is appropriate and enables investors to more accurately compare the company's ongoing financial performance over the periods presented. Ongoing earnings as presented here may not be comparable to similarly titled measures used by other companies. The following table provides a reconciliation of ongoing earnings per share to reported GAAP earnings per share.

Progress Energy nuclear plants set generation record in 2008

RALEIGH, N.C. (Jan. 27, 2009) - Progress Energy's four nuclear plants in the Carolinas and Florida set a record for safe, efficient, carbon-free electricity generation in 2008.

The company's five reactors at four sites generated more than 35.1 billion kilowatt-hours of electricity in 2008, surpassing the previous record of 35 billion kilowatt-hours set in 2003. The total generation from the company's nuclear plants in 2008 is equal to the annual usage of nearly 2.5 million households. Last year, Progress Energy's nuclear plants generated 46 percent of the energy provided to customers in the Carolinas service territory and 18 percent of the energy provided to customers in Florida.

"Along with efficiency programs and renewable energy, nuclear power continues to be an important part of our balanced approach to meet the growing electricity demand of homes and businesses that depend on us," said Bill Johnson. "As our country sets energy policies to address global climate change, advanced, carbon-free nuclear energy continues to be the best technology available to provide reliable electricity day in and day out."

"We are committed to operating safe and secure nuclear facilities," said Jim Scarola, senior vice president and chief nuclear officer. "We take extensive measures to ensure all of our sites are well-maintained and well-protected. In fact, our safety records are among the best in the nation thanks to the dedication and the hard work of the professionals who work at each of our facilities."

Progress Energy operates the two-unit Brunswick Nuclear Plant located near Southport, N.C., and single reactors at the Crystal River Nuclear Plant near Crystal River, Fla., the Harris Nuclear Plant in New Hill, N.C. and the H.B. Robinson Nuclear Plant near Hartsville, S.C.

Progress Energy maintains a mix of generating resources in the Carolinas and Florida, including plants that use coal, natural gas and oil, as well as hydroelectric power, in addition to nuclear plants. The company also purchases energy from a variety of resources, including solar and other renewable energy plants. Increased nuclear production means less reliance on other fuel sources, which reduces the impact of volatile fossil fuel prices on customer bills.

Progress Energy recently submitted a license-renewal application to the U.S. Nuclear Regulatory Commission (NRC), seeking a 20-year operating extension for the Crystal River Nuclear Plant. The federal agency has already approved license renewals for the company's other three plants.

Progress Energy (NYSE: PGN), headquartered in Raleigh, N.C., is a Fortune 500 energy company with more than 21,000 megawatts of generation capacity and $9 billion in annual revenues. Progress Energy includes two major electric utilities that serve approximately 3.1 million customers in the Carolinas and Florida. The company has earned the Edison Electric Institute's Edison Award, the industry's highest honor, in recognition of its

operational excellence, and was the first utility to receive the prestigious J.D. Power and Associates Founder's Award for customer service. The company is pursuing a balanced strategy for a secure energy future, which includes aggressive energy-efficiency programs, investments in renewable energy technologies and a state-of-the-art electricity system. Progress Energy celebrated a century of service in 2008. Visit the company's Web site at www.progress-energy.com .

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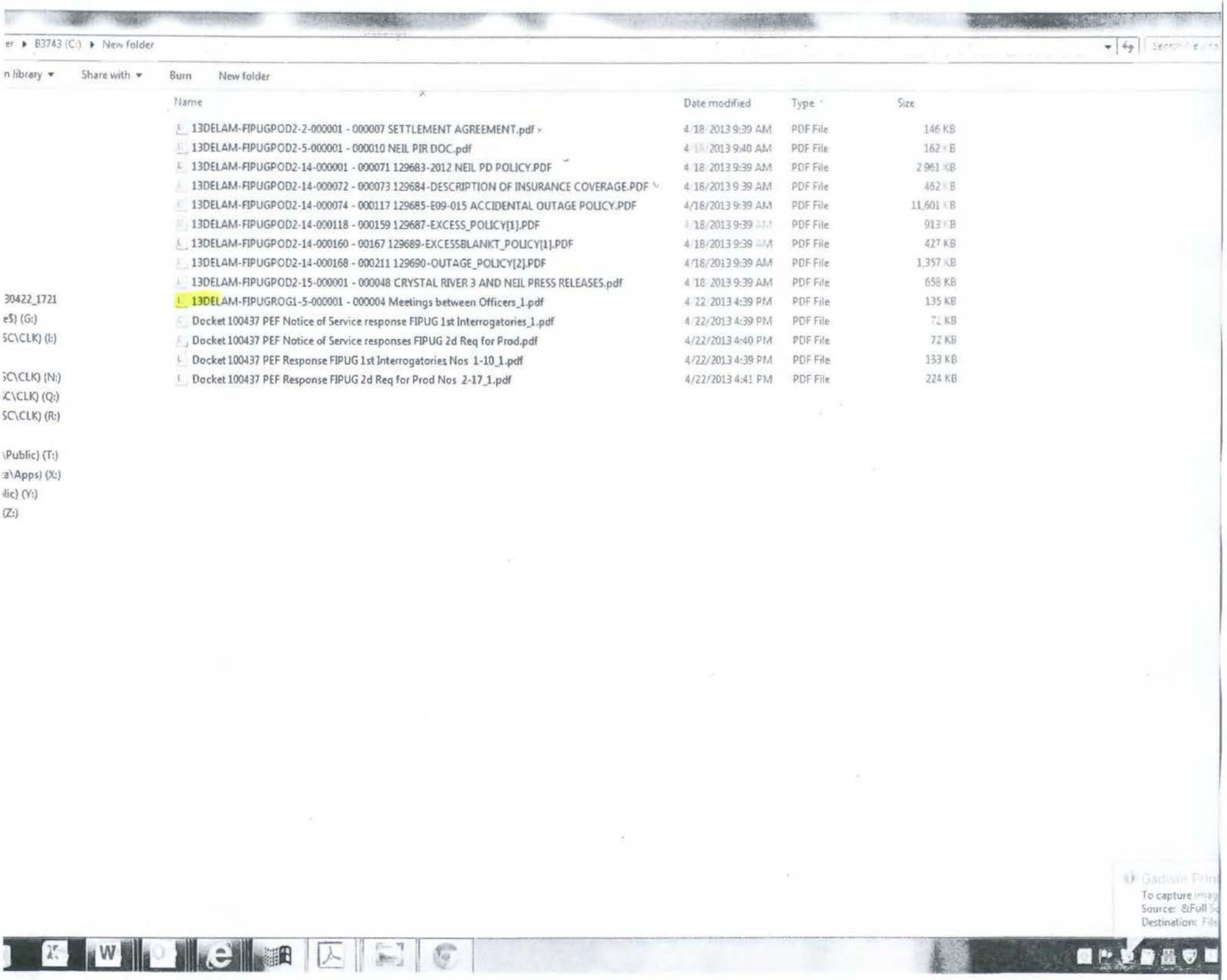

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Docket 100437 PEF Notice of Service response FIPUG 1st Interrogatories_1.pdf	4/22/2013 4:39 PM	PDF File	72 KB
Docket 100437 PEF Notice of Service responses FIPUG 2d Req for Prod.pdf	4/22/2013 4:40 PM	PDF File	72 KB
Docket 100437 PEF Response FIPUG 1st Interrogatories Nos 1-10_1.pdf	4/22/2013 4:39 PM	PDF File	153 KB
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FIPUG 1st Set of Interrogatories - Questions 5 & 6
Meetings Between Officers of PEF/Duke and NEIL

Officers Referenced in Responses Below

Progress Energy
Bill Johnson, CEO*
Jeff Lyash, Executive VP
John McArthur, Executive VP
John Elnitsky, VP
David Fountain, VP
Jon Franke, VP
Garry Miller, VP
Alex Glenn, Gen. Counsel

NEIL Sr. Management Team
David Ripsom, CEO
Ken Manne, VP
Harry Phillips, VP
Bruce Sassi, VP
Greg Wilks, VP

Duke Energy
Jim Rogers - Chairman, Pres., CEO
Dhiaa Jamil - Executive VP, CNO
Marc Manly - Executive VP; Pres. Duke Comm'l Bus. Org.
Jim Reisch - Director
Paul Newton, special legal counsel to the CEO

Meeting Dates	Officer Participants	Subjects/Issues Discussed
9/20/2010	Progress - Franke, Miller NEIL - Manne, Phillips, Wilks	NEIL was questioning the secondary (vertical) cracking discovered during Bay 34 repairs. Meeting was to provide NEIL with additional details regarding this cracking.
5/25/2011	Progress - Franke, Miller NEIL - Sr. Management Team	The meeting was to bring NEIL up-to-date regarding the delamination event on 3/14/2011. Discussed repairs completed and events leading up to the delamination of Bay 56, location of the additional damage, root cause of the additional damage,

		condition assessment and status of the Containment Bld, risk mitigation plans and the status of repair plan development.
6/30/2011	Progress - Elnitsky, Franke, Glenn NEIL - Sr. Management Team	Purpose was to provide additional details and address NEIL coverage questions about the delamination of Bay 56 and other areas of Containment Bld. on 3/14/2011. Progress personnel discussed the repair option identification and evaluation process, repair option selection criteria and the technical, licensing and construction issues considered in selecting the repair option. NEIL discussed their coverage and indicated that no coverage decision has been made. A timeline for NEIL's investigation and making a coverage decision was discussed.
10/18/2011	Progress - Fountain, Lyash NEIL - Sr. Management Team	Reviewed the additional delamination that occurred involving Bay 12 and other areas, the location of additional damage and the current condition of the Containment Building. The Joint Steering Committee consisting of personnel from Progress and NEIL was formed to hold weekly calls to facilitate the ongoing investigation and claim process.
10/25/2011 12/20/2012	Progress - Elnitsky, Fountain NEIL - Manne, Sassi, Wilks	Weekly Jt. Steering Committee calls to review open items and provide direction to the working/technical teams from both sides, in order to progress toward resolution of insurance coverage issues before the December NEIL Board meeting.
12/2/2011	Progress - Fountain, Johnson, McArthur, Lyash NEIL - Sr. Management Group	NEIL management presented the investigation results to-date by their consultants/experts.

		NEIL indicated that they would not be in a position to make a coverage recommendation at their next Board meeting on Dec. 9, 2011. NEIL also requested that Progress not submit additional claims until some of the open issues had been resolved.
12/6/2011	Progress - Johnson NEIL - Ripsom	Telephone call - discussed detensioning of Containment Building and builders' risk policy.
2/14/2012	Progress - Johnson NEIL - Ripsom	Telephone call - NEIL agreed that they would process for payment Progress' claim for costs through July, 2011, associated with the 2009 delamination damage.
2/28/2012	Progress - Fountain, Lyash, Miller NEIL - Manne and Wilks	Phone call on Feb. 28, 2012, to summarize NEIL's coverage issues. From this, Progress would develop an executive level response to be presented at an executive level meeting with NEIL.
4/16/2012	Progress - Johnson, Lyash, Fountain, Miller Duke - Jamil NEIL - Sr. Management Team	Primary purpose of the meeting was to respond to issues raised by NEIL in the 2/28/12 call. The focus of discussion was a presentation by Garry Miller covering in detail: events from initial 2009 delamination to present.
5/2/2012	Progress - Johnson Duke - Rogers NEIL - Ripsom	Discussion of PEF's insurance claims and NEIL's views and issues as well as potential for resolution through mediation.
7/19/2012 9/25/2012	Duke - Rogers NEIL - Ripsom	Discussion of PEF's insurance claims and NEIL's views and issues as well as potential for resolution through mediation.

11/19/2012 11/20/2012	Duke - Rogers, Manly, Jamil, Reinsch, Glenn, Newton NEIL - Ripsom	Discussion re mediation issues.
11/29/2012 11/30/2012	Duke - Manly, Jamil, Reinsch, Glenn, Newton NEIL - Ripsom	Discussion re mediation issues.
12/21/2012	Duke - Rogers, Manly, Jamil, Reinsch, Glenn, Newton NEIL - Ripsom	Discussion re mediation issues.

* Bill Johnson was also a member of the NEIL Board of Directors, but Mr. Johnson did not interface with Duke Energy in that capacity.

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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Examination of the outage and replacement fuel/power costs associated with the CR3 steam generator replacement project, by Progress Energy Florida, Inc.	DOCKET NO.: 100437-EI Filed: April 22, 2013

PROGRESS ENERGY FLORIDA, INC.'S
NOTICE OF SERVICE

Progress Energy Florida, Inc. ("PEF"), hereby gives notice of service of PEF's Responses to Florida Industrial Power Users Group's First Set of Interrogatories to Progress Energy Florida, Inc. (Nos. 1-10).

Respectfully submitted,

John T. Burnett
Deputy General Counsel
Dianne M. Triplett
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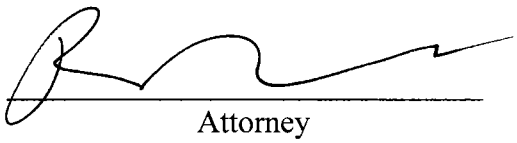
CERTIFICATE OF SERVICE

I HEREBY CERTIFY a true and correct copy of the foregoing has been furnished to counsel and parties of record as indicated below via electronic and U.S. Mail this 22nd day of April, 2013.



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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Examination of the outage and replacement fuel/power costs associated with the CR3 steam generator replacement project, by Progress Energy Florida, Inc.	DOCKET NO.: 100437-EI Filed: April 22, 2013

PROGRESS ENERGY FLORIDA, INC.'S
NOTICE OF SERVICE

Progress Energy Florida, Inc. ("PEF"), hereby gives notice of service of PEF's Responses to FIPUG's Second Request for Production of Documents to Progress Energy Florida, Inc. (Nos. 2-17).

Respectfully submitted,

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CERTIFICATE OF SERVICE

I HEREBY CERTIFY a true and correct copy of the foregoing has been furnished to counsel and parties of record as indicated below via electronic and U.S. Mail this 22nd day of April, 2013.

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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Examination of the outage and replacement fuel/power costs associated with the CR3 steam generator replacement project, by Progress Energy Florida, Inc.	DOCKET NO.: 100437-EI FILED: April 22, 2013

RESPONSE TO THE FLORIDA INDUSTRIAL POWER USERS GROUP'S FIRST SET OF INTERROGATORIES TO PROGRESS ENERGY FLORIDA (Nos. 1-10)

Progress Energy Florida, Inc. ("PEF"), responds to FIPUG's First Set of Interrogatories to PEF (Nos. 1-10), as follows:

GENERAL RESPONSES AND OBJECTIONS

PEF incorporates and restates its General Responses and Objections to FIPUG's First Set of Interrogatories (Nos. 1-10), filed on April 11, 2013, as if those responses and objections were fully set forth herein.

INTERROGATORIES

1. Please identify the following persons and their respective involvement, at all materials times, with the NEIL insurance coverage issue for the Crystal River 3 outage:

1) Alex Glenn

2) Gary Little

3) Julie Moran

RESPONSE:

Subject to PEF's Objections filed on April 11, 2013:

1) Alex Glenn – Served as General Counsel (GC) for PEF until he was promoted to President for PEF. That promotion was announced in August

2012 and Mr. Glenn assumed responsibilities as PEF President from that point forward. Mr. Glenn officially assumed the position as PEF President in December 2012. As GC Mr. Glenn was responsible for the legal affairs of PEF, which included oversight of the NEIL claims process. As the Company President, Mr. Glenn was and is responsible for achieving the Company's financial and operational goals, advancing the Company's rate and regulatory initiatives, and overseeing state and local regulatory and governmental relations, economic development, and community affairs. In particular, with respect to CR3, Mr. Glenn's responsibilities as PEF President included leading the Company's evaluation of whether to repair or retire CR3 and, starting more extensively in 2012, he was involved in the NEIL claims process and in the negotiation process with NEIL including the mediation process. Mr. Glenn also participated in the senior management decision to recommend the NEIL settlement and presented the recommendation on behalf of senior management to the Duke Energy Board of Directors.

2) **Gary Little – Manager, Corp. Insurance – Progress Energy. Mr. Little was involved in reporting the CR3 delamination events to NEIL, and coordinating NEIL's investigation activities and the NEIL claim process with Progress personnel. Particularly in regard to the initial Bay 34 delamination and repair – Mr. Little coordinated and led NEIL on-site claim review meetings, and submitted periodic partial repair and outage related claim payment requests (Partial Proofs of Loss) based on these meetings. Mr. Little coordinated communications with NEIL, including investigative and update meetings with NEIL personnel, and information requests for the initial Bay 34 delamination, and continued to assist in these areas up to the beginning of mediation activities.**

3) **Julie Moran – Sr. Claim Coordinator – NEIL. Ms. Moran coordinated Partial Proofs of Loss submitted by PEF and coordinated approved claim payments to PEF.**

2. Who is the company's person most knowledgeable about PEF's claims for NEIL insurance coverage associated with the Crystal River 3 outage?

RESPONSE:

Subject to PEF's Objections filed on April 11, 2013, Gary Little prior to the merger with Duke Energy and Alex Glenn post merger.

3. Identify any and all insurance experts, consultants, adjusters or counsel you asked to assist you evaluate the value of the NEIL insurance coverage associated with the Crystal River 3 outage.

RESPONSE:

Subject to PEF's Objections filed on April 11, 2013, please see PEF's response to OPC's Seventh Set of Interrogatories, Number 90.

4. Identify any documents authored by anyone identified in response to interrogatory number 3 above.

RESPONSE:

Please see PEF's Privilege Log to OPC's Eighth Set of Requests for Production of Documents previously produced.

5. Identify any meetings or discussions that occurred between any officer or director of Progress Energy Florida, Inc. with any officer or director of NEIL regarding the Crystal River 3 outage and NEIL insurance monies and detail what was discussed at said meetings or discussions.

RESPONSE:

Subject to PEF's Objections filed on April 11, 2013, please see documents attached in Bates range 13DELAM-FIPUGROG1-5-000001 through 13DELAM-FIPUGROG1-5-000004.

6. Identify any meetings or discussions that occurred between any officer or director of Duke Energy with any officer or director of NEIL regarding the Crystal River 3 outage and NEIL insurance monies and detail what was discussed at said meetings or discussions.

RESPONSE:

Please see response to Interrogatory Number 5.

7. When did Alex Glenn stop serving as general counsel to PEF?

RESPONSE:

Subject to PEF's Objections filed on April 11, 2013, Mr. Glenn officially stopped serving as PEF's General Counsel on December 1, 2012.

8. Who made the decision to accept the mediator's proposal to resolve all outstanding insurance issues with NEIL?

RESPONSE:

Subject to PEF's Objections filed on April 11, 2013, the Duke Energy Board of Directors made the decision.

9. Please provide all of the reasons you decided to accept the mediator's proposal to resolve all outstanding insurance issues with NEIL and identify any documents you relied upon in making that decision.

RESPONSE:

Subject to PEF's Objections filed on April 11, 2013, PEF responds that the Company's decision to settle with NEIL by accepting the mediator's proposal was based on the Company's NEIL policies, which establish the terms and conditions of coverage, the information the Company obtained regarding the CR3 containment building delaminations, the repair plan for the CR3 containment building, and the decision to retire CR3. PEF will further explain the reasons for accepting the mediator's proposal and settling with NEIL in its forthcoming pre-filed testimony on the remaining issues in accordance with the pending schedule for filing testimony in this docket.

10. Identify all documents in your possession that relate to NEIL insurance monies or coverage and Crystal River 3.

RESPONSE:

Subject to PEF's Objections filed on April 11, 2013, please see documents produced in PEF's Tallahassee document repository under Topics 18a, b, c, & d. See also

documents previously produced in response to OPC's First Request for Production Numbers 7 & 8; OPC's Third Request for Production Numbers 33 & 34; OPC's Seventh Request for Production Numbers 63, 64, 65 & 66; OPC's Eighth Request for Production Numbers 72, 73, 74 & 82; and White Springs Second Revised Request for Production Numbers 3, 4, 5, 6, 7, 8 & 11.

AFFIDAVIT

STATE OF FLORIDA

COUNTY OF PINELLAS

BEFORE ME, the undersigned authority, personally appeared R. ALEXANDER GLENN, who deposed and stated that PEF's Responses to FIPUG's First Set of Interrogatories to Progress Energy Florida (Nos. 1-10) are true and correct to the best of his information and belief.

ON BEHALF OF PROGRESS ENERGY FLORIDA, INC.

_____

R. ALEXANDER GLENN

Sworn to and subscribed before me this _____ day of _____, 2013.

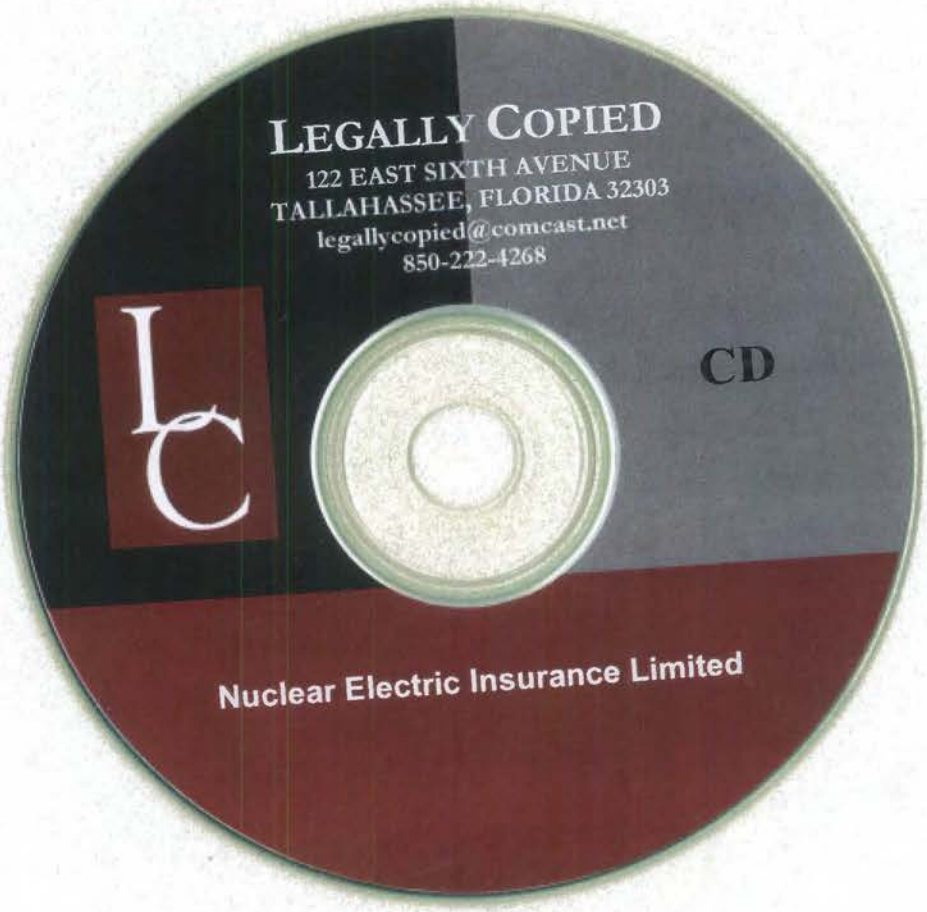
_____

NOTARY PUBLIC

State of _____ at Large

My Commission Expires:

_____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850-222-4268
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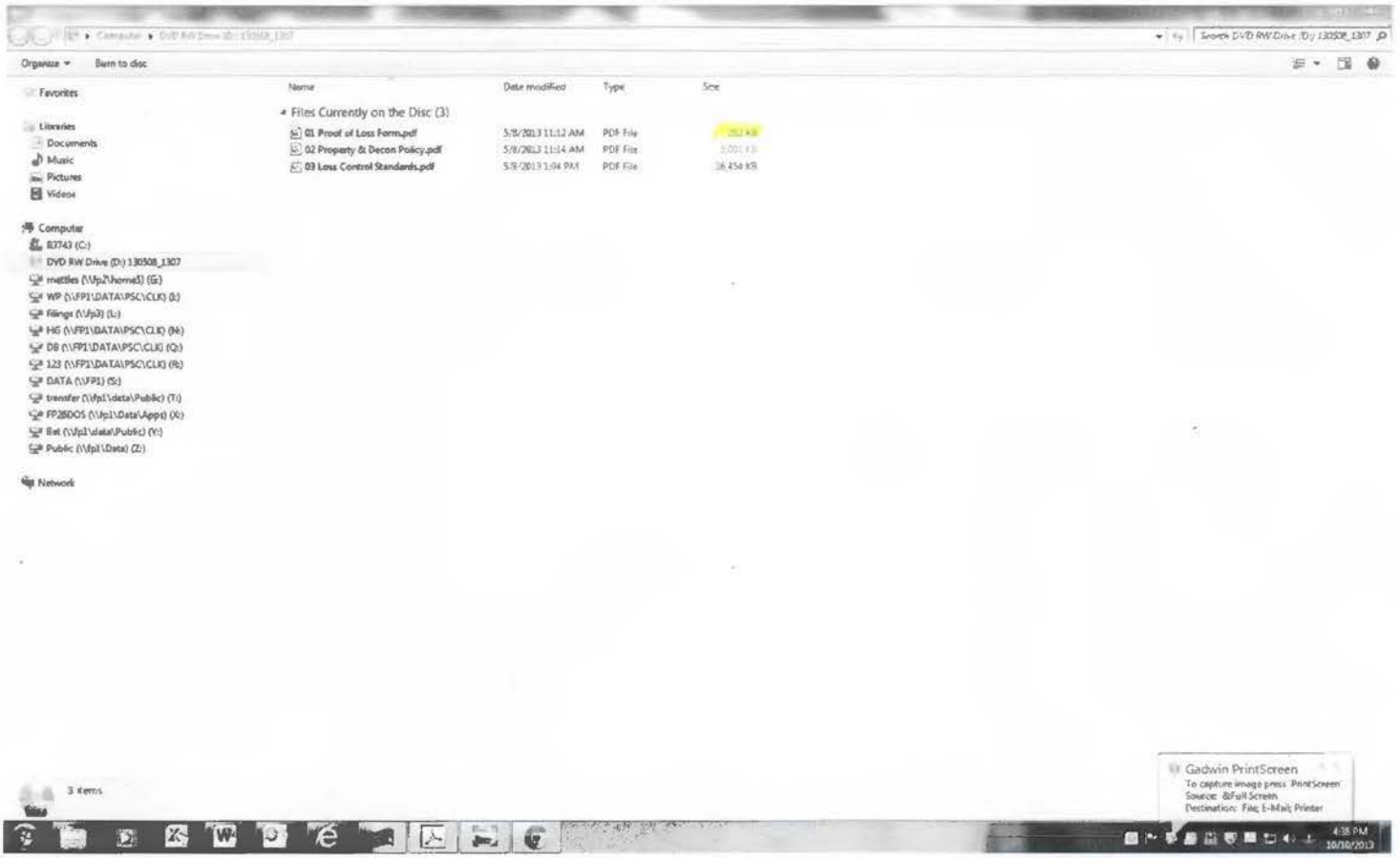
Nuclear Electric Insurance Limited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Size
Files Currently on the Disc (3)
01 Proof of Loss Form.pdf
5/8/2013 11:12 AM
PDF File
02 Property & Decon Policy.pdf
5/8/2013 11:14 AM
PDF File
03 Loss Control Standards.pdf
5/8/2013 1:04 PM
PDF File
36,454 KB
3 items
Gadwin PrintScreen
To capture image press PrintScreen
Source: &Full Screen
Destination: File; E-Mail; Printer
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10/10/2013

NUCLEAR ELECTRIC INSURANCE LIMITED
PRIMARY PROPERTY
SWORN STATEMENT
IN
PROOF OF LOSS

This form may be customized to fit the appropriate application i.e., Property, BI, EE, Excess

Policy No.: _____

Inception Date: _____

Expiration Date: _____

TO: **INSURER:**
NUCLEAR ELECTRIC
INSURANCE LIMITED
1201 Market Street, Suite 1100
Wilmington, Delaware 19801

FROM: **INSURED:**
_____

_____

Unless otherwise indicated, capitalized terms used herein shall have the meanings set forth in the Policy.

1. At the time of the Accidental Property Damage described herein, you insured _____ (name of plant) under the above-referenced policy (the "Policy") against Property Damage caused by an Accident and against expenses for decontamination of the Insured Property necessarily incurred by the Insured to discharge a legal obligation or liability to protect the public health and safety.

2. The Accidental Property Damage occurred on or about _____ o'clock a.m./p.m., on the ___ day of _____, 20___. The cause and origin of the said Accidental Property Damage were:
_____
_____

3. (a) Each item of Insured Property damaged, (b) the actual cash value or, if recovery is on a replacement cost basis, the replacement cost of each such item, and (c) the amount of Property Damage to each such item is as follows:
_____
_____.

9. The Insured hereby attests that payment of $ _____ of Policy proceeds pursuant to this (Partial) Proof of Loss should be made to the payee listed in Item 10B of the Declarations to the Policy and such payment would not violate any regulation or order of the U.S. Nuclear Regulatory Commission.

Insured: _____
By: _____
Title: _____

STATE OF _____

COUNTY OF _____

Subscribed and sworn to before me this ____ day of _____, 20___.

_____
Notary Public

My Commission expires _____.

CLAIMS NOTIFICATION SHEET
SAMPLE

Date: October 15,2009

To: Nuclear Electric Insurance Limited ("NEIL")

Via: Insured's Delaware Representative

From: Florida Power Corp. (Progress Energy Florida) ("Insured")

Plant: Crystal River Unit 3

Policy No: P09-081

Policy Period: 4/1/09 – 4/1/10

1. This notification is being provided in accordance with the Requirements in Case of Loss provision in the NEIL Primary Property Policy which requires the Insureds to give immediate written notice to NEIL of any Accidental Property Damage and/or with the Requirements in Case of Loss provision in the NEIL I Accidental Outage Policy which requires immediate detailed written notice to NEIL of any loss exceeding ten weeks or for which a claim is expected to be made. This notification is not a Proof of Loss.

2. Description of Incident Claimed Event (including date, time and origin):

CR3 is currently in an outage which will involve replacing the steam generators. While accessing the containment building during the week of Oct. 5th, a separation in the containment building wall was found about 9 inches from the outer wall. See attached.

Statement of Insured. The Insured hereby acknowledges and agrees that any claim by it against NEIL relating to the above incident which results in any dispute with NEIL is governed by the Dispute Resolution and Choice of Law provisions in the Policy. In any event, and regardless of the enforceability and applicability of such provisions, the Insured hereby irrevocably requests and elects to have any such dispute resolved in all respects in accordance with the manner set forth in such provisions as if they were fully set forth herein.

Florida Power Corp.(Progress Energy Florida)
(Name of Insured)

By _____

10/15/09
Date


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Organize
Burn to disc
Favorites
Libraries
Documents
Music
Pictures
Videos
Computer
B3743 (C:)
DVD RW Drive (D:) 130508_1307
metfiles (\\fp2\home3) (G:)
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123 (\\FP1\DATA\PSC\CLK) (R:)
DATA (\\FP1) (S:)
transfer (\\fp1\data\Public) (T:)
FP2SDOS (\\fp1\Data\-Apps) (X:)
Bat (\\fp1\data\Public) (Y:)
Public (\\fp1\Data) (Z:)
Network
Name
Date modified
Type
Size
Files Currently on the Disc (3)
01 Proof of Loss Form.pdf
5/6/2013 11:12 AM
PDF File
02 Property & Decon Policy.pdf
11:14 AM
PDF File
03 Loss Control Standards.pdf
5/5/2013 1:04 PM
PDF File
2 items
PrintScreen
To capture image press PrintScreen
Source: &Full Screen
Destination: File; E-Mail; Printer
4:38 PM
10/10/2013

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

PRIMARY PROPERTY AND DECONTAMINATION LIABILITY INSURANCE POLICY

Declarations attached to and made a part of Policy No. P09-081
(Crystal River)

Item 1. Member Insured: Florida Power Corporation
Member Address: d/b/a Progress Energy Florida, Inc.
410 S. Wilmington Street
Raleigh, North Carolina 27601
Respective Interest: 100%

Item 2. Insurer: Nuclear Electric Insurance Limited

Mailing Address: 1201 N. Market Street, Suite 1100, Wilmington, Delaware 19801

Item 3.

A. Policy Period:

From 12:01 a.m. (Time) on April 1, 2009 (Date) to 12:01 a.m. (Time)

on April 1, 2010 (Date), Standard Time in Hamilton, Bermuda.

B. Policy Year:

From 12:01 a.m. (Time) on April 1, 2009 (Date) to 12:01 a.m. (Time)

on April 1, 2010 (Date), Standard Time in Hamilton, Bermuda.

Item 4. Annual Premium: $973,000

Item 5. A. Multiple: 10

B. Retrospective Premium Adjustment: $9,730,000

Item 6. Amount of Insurance: $500,000,000

Item 7. Description and location of property covered:

All real and personal property known as Crystal River Unit 3 Nuclear Generating Plant located in Citrus County, Florida as specifically oulined in the attached plot plan Florida Power Corporation, Dwg. #CR3-G61-D-0, Rev.. 7-11-75; Progress Energy Dwg. #CR3-G86-D, Rev. 11, 10-21-03; Progress Energy Dwg. #CR3-G85-D, Rev. 9, 6/10/04 showing the insurance site boundary and excluded buildings and areas as filed with Nuclear Electric Insurance Limited in accordance with the Site Description Procedure.

The Paint Shop and its contents are excluded from all coverage except for radioactive decontamination.

See Attachment 1

Item 8. Deductibles:

Deductible Amount:

$2,500,000

Deductible for any Loss under Section V.M.1 (Windstorm Loss):

$10,000,000 plus 10% of the amount of the Loss in excess of $10,000,000

Transit Deductible Amount:

$100,000

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

Endorsement

Member Insured: Florida Power Corporation

Site: Crystal River — Endorsement No. 6
Policy Number: P09-081 — Effective Date: April 1, 2009

Effective Time of this Endorsement is 12:01 a.m.Standard Time in Hamilton, Bermuda.

It is hereby understood and agreed that in consideration of a return premium of $(241,500), Item(s) 4, 5.B and 8 of the Declarations of the Policy are amended to read as follows and not as within stated:

Item 4. Annual Premium: $731,500

Item 5.

B. Retrospective Premium Adjustment: $7,315,000

Item 8. Deductibles

Deductible Amount:

$10,000,000

Deductible for any Loss under Section V.M.1 (Windstorm Loss):

$10,000,000 plus 10% of the amount of the Loss in excess of $10,000,000

Transit Deductible Amount:

$100,000

This reflects an increase in the deductible from $2,500,000 to $10,000,000.

IN WITNESS WHEREOF, the parties hereto have caused this Endorsement to be executed and attested on their behalf.

Wilmington, Delaware

Date: _____

Attest: _____

INSURER:
Nuclear Electric Insurance Limited

By: _____
David B. Ripsom, President

Wilmington, Delaware

Date: _____

Witness: _____

MEMBER INSURED:
Florida Power Corporation

By: _____
Attorney-in-Fact

Item 9. Insureds:

Florida Power Corporation d/b/a Progress Energy Florida, Inc. and City of Alachua, Florida; City of Bushnell; City of Gainesville, Florida; City of Kissimmee, Florida; a Municipal Corporation, City of Leesburg, Florida; City of New Smyrna Beach, Florida; Florida and Utilities Commission; City of Ocala; Orlando Utilites Commission and City of Orlando; Seminole Electric Cooperative, Inc., and all contractors and subcontractors as their interest may appear.

Item 10. Loss Payee Clause:

A. Expenses covered under Section I.A.2 shall be adjusted with the Member Insured and payable to:

Florida Power Corporation d/b/a Progress Energy Florida, Inc.

The Member Insured may, by written notice to the Insurer, designate other payees.

B. All other covered Losses shall be adjusted with the Member Insured and payable to:

For fire losses only - Loss, if any, shall be payable to Florida Power Corp d/b/a Progress Energy Florida and, except any loss to materials and supplies and except any particular loss less than $50,000 shall be payable:

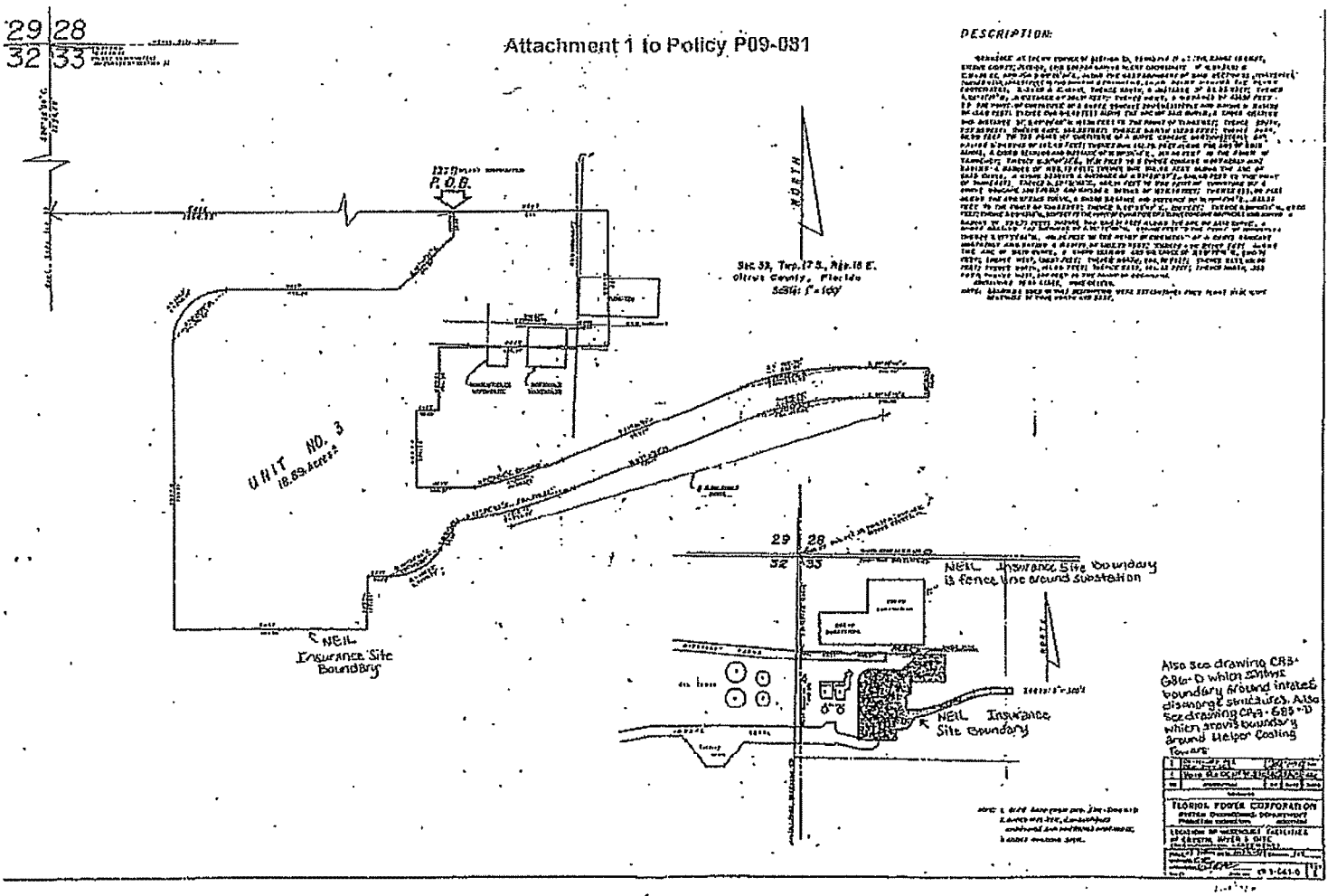
(1) 100% of settlement for property of others, contractors' equipment, debris removal or decontamination shall be made payable to Florida Power Corporation d/b/a Progress Energy Florida, Inc.

(2) 91.8% of settlement for loss to, or repair or replacement of described property shall be made payable to The Bank of New York, Mellon, (Mortgage Trustee) and 8.2% of such settlement shall be made payable to Florida Power Corporation d/b/a Progress Energy Florida, Inc.

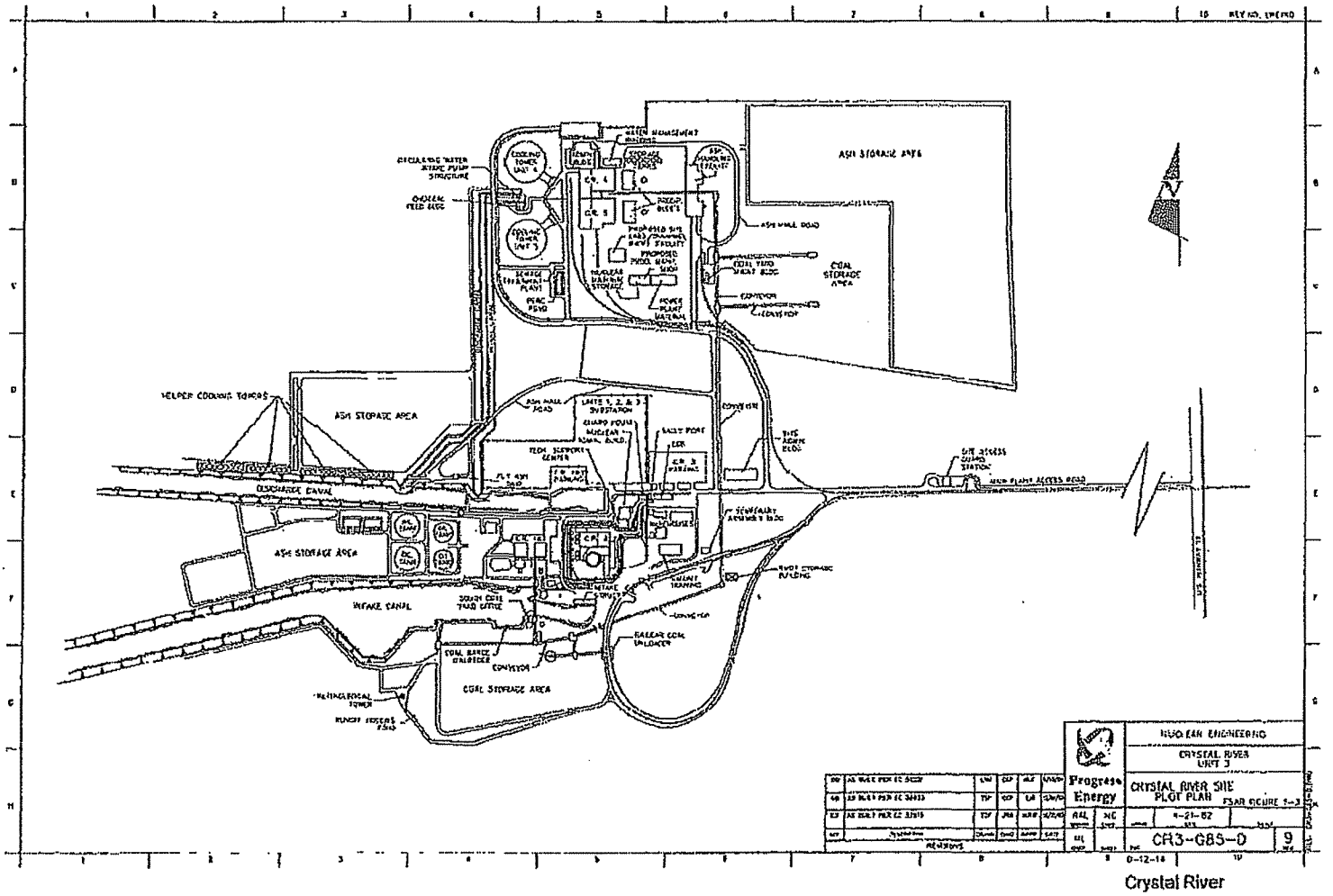
The Member Insured may, by written notice to the Insurer, designate other payees.

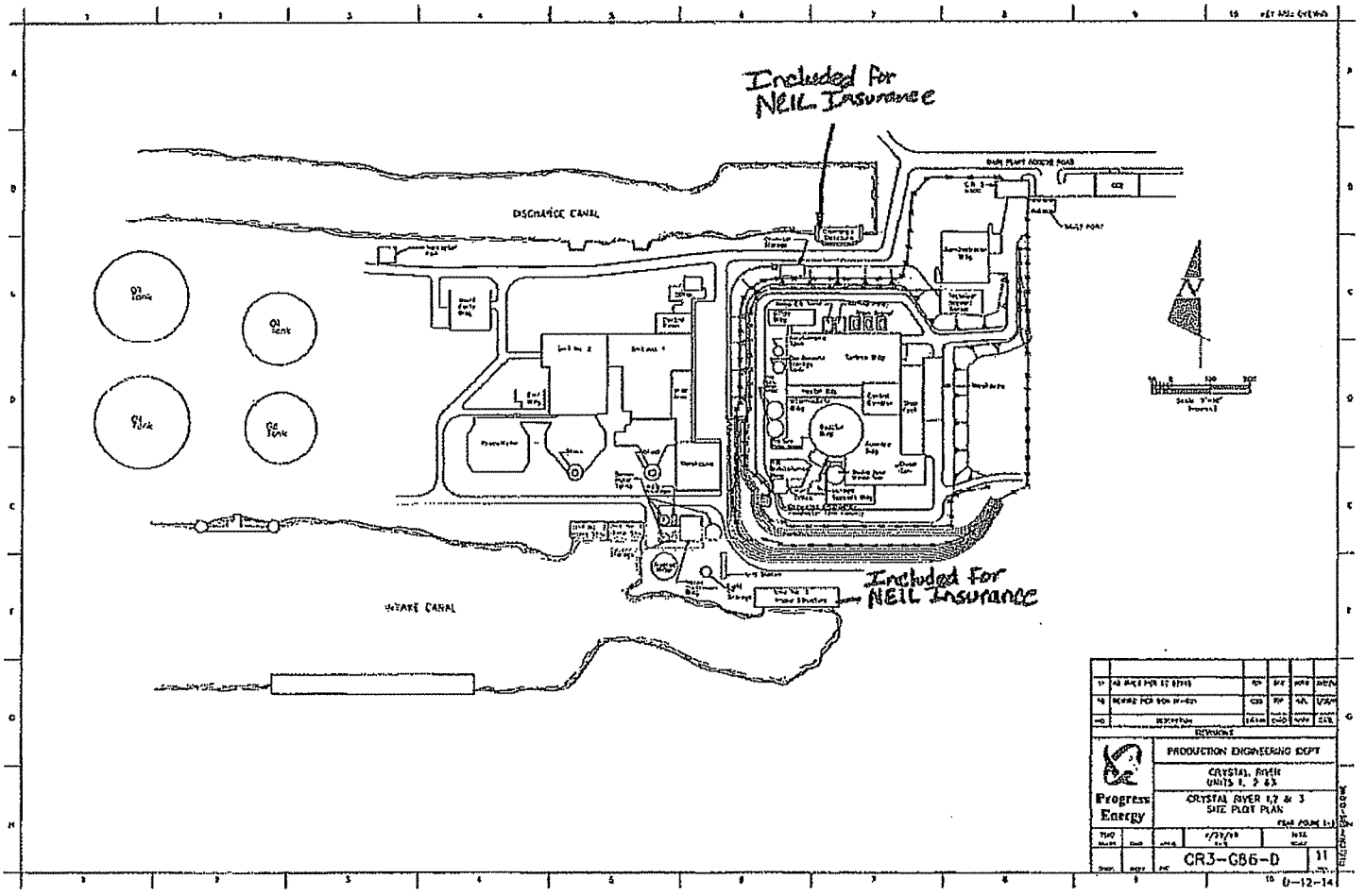
Item 11. Service of Process to Insured (see Section V.G.5):

General Counsel
Florida Power Corporation d/b/a Progress Energy Florida, Inc.
c/o Duane Morris LLP
1100 N. Market Street, Suite 1200
Wilmington, DE 19801-1246



Crystal River


ASH STORAGE AREA
COAL STORAGE AREA
HELPER COOLING TOWERS
DISCHARGE CANAL
INTAKE CANAL
Progress Energy
CRYSTAL RIVER SITE PLOT PLAN
FSAR FIGURE 2.1-3
CR3-G85-D
Crystal River



Crystal River

NUCLEAR ELECTRIC INSURANCE LIMITED

PRIMARY PROPERTY AND DECONTAMINATION LIABILITY INSURANCE POLICY

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Policy No. P09-081

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

PRIMARY PROPERTY AND DECONTAMINATION LIABILITY
INSURANCE POLICY

This Policy is made by and among the Member Insured (specified in Item 1 of the Declarations) and Nuclear Electric Insurance Limited, a Bermuda mutual company with limited liability (the "Insurer").

The Insurer is only licensed in Bermuda and Delaware and the Insureds (those Insureds specified in Item 9 of the Declarations together with the Member Insured) will not be protected by the guaranty funds of any U.S. jurisdiction.

The Member Insured will be required to execute the Policy in Delaware. The Policy will become effective only upon the acceptance by the Member Insured of the delivery of the Policy at the Insurer's office in Delaware.

I. INSURING AGREEMENT

In consideration of the premium paid, and subject to the terms and conditions of this Policy, the Insurer agrees to pay the Member Insured, subject to the Deductible, for certain expenses and costs resulting from Accidental Property Damage.

In Witness Whereof, the Insurer and the Member Insured have caused this Policy to be executed and attested on their behalf in Wilmington, Delaware.

Wilmington, Delaware

INSURER:
Nuclear Electric Insurance Limited

Date: As of April 1, 2009

By: _____
David B. Ripsom, President

Attest: _____

Wilmington, Delaware

MEMBER INSURED:
Florida Power Corporation

Date: As of April 1, 2009

By: _____
Attorney-in-Fact

Witness: _____

A. Coverage

1. This Policy insures against Property Damage caused by an Accident, unless otherwise excluded, subject to the terms and conditions of this Policy.

2. This Policy also insures against expenses necessarily incurred by the Insureds in discharging their legal obligation to protect the public health and safety following Accidental Property Damage, unless otherwise excluded, subject to the terms and conditions of this Policy.

3. (a) In the event that Accidental Property Damage under this Policy and under one or more Other Insurance Policies with insurance coverage effective during the Policy Year is caused directly or indirectly by Flood, earthquake or volcanic eruption, the Member Insured agrees that:

   (i) The Insurer's liability for all Losses resulting from Accidental Property Damage shall not exceed the greater of (A) the Amount of Insurance stated in Item 6 of the Declarations, or (B) the highest of the Amount of Insurance stated in the declarations of the Other Insurance Policies providing coverage with respect to the same Accident; and

   (ii) The Insurer's liability under this Policy shall be the amount determined under subparagraph (a)(i) above times a fraction, the numerator of which is the Insurer's liability for the Losses resulting from Accidental Property Damage under this Policy, but for this paragraph (a), and the denominator of which is the sum of the Insurer's liability for Losses resulting from Accidental Property Damage under this Policy and all Other Insurance Policies, but for this paragraph (a).

B. Territorial Limits

This Policy covers Insured Property worldwide except for loss or damage in the following countries:

Afghanistan, Angola, Armenia, Azerbaijan, Bosnia-Herzegovina, Botswana, Burundi, Chechnya, Croatia, Cuba, Democratic Republic of the Congo (former Zaire), Eritrea, Ethiopia, Federal Republic of Yugoslavia, Haiti, Iran, Iraq, Kashmir, Lebanon, Liberia, Libya, Montserrat, Myanmar (Burma), Nigeria, North Korea, Pakistan, Rwanda, Somalia, Sri Lanka, Sudan, Turkish provinces of Agri, Bingol, Bitlis, Diyarbakir, Elazig, Hakkari, Mardin, Mus, Siirt, Urfa and Van, and Yemen,

or any other country where trade relations are unlawful as determined by the Government of the United States of America, including its agencies, or the governing body of the European Union, including its agencies.

C. **Property Insured**

This Policy covers the property specified as such in Item 7 of the Declarations and situated at a location specified therein, and as provided in Section I.E.2 and in Section I.D.

D. **Property of Others**

Subject to its terms and conditions, this Policy also covers the personal property of employees and others at the location described in the Declarations unless otherwise excluded.

E. **Extensions of Coverage**

1. **Debris Removal and Decontamination**

This Policy also shall pay for expenses necessarily incurred by the Insureds in removing debris of and in decontaminating the Insured Property covered by this Policy following Accidental Property Damage, unless otherwise excluded.

2. **Transit Damage**

This Policy also shall pay for the Property Damage caused by an Accident, unless otherwise excluded, to Insured Property in transit and to property insured under Section I.D while such property is in transit, subject to a total sublimit of $10,000,000 and the following terms and conditions:

(a) For purposes of this coverage, Insured Property includes property that has been purchased for use at the site and is in transit to the site.

(b) This coverage applies to shipments of Insured Property worldwide and to the temporary storage of such Insured Property while at a repair facility, except that

1) No coverage is provided while the Insured Property is within the borders of any country excepted from the Territorial Limits defined in Section I.B; and

2) No coverage is provided for any shipment beyond 100-nautical miles of the shores of the country of origin or destination for airborne or waterborne shipments, except when the point of exit and entry for the shipment is to be the same country in which case this coverage will remain in effect throughout the shipment.

(c) It is a condition of this insurance that the Insured Property be packed and shipped in accordance with all applicable laws or regulations having the force of law.

(d) This coverage is excess of any valid and collectible coverage from the seller or shipper.

Each and every Loss covered under this Section I.E.2 shall be adjusted separately, and from the amount of such Loss, or, if there is contributing insurance, from the Insurer's pro-rata share of such Loss, there shall be deducted the Transit Deductible Amount stipulated in Item 8 of the Declarations.

3. **Expediting Expense**

This Policy shall also pay for the reasonable extra costs to make temporary repairs or temporary replacement and to expedite the permanent repair or replacement of Insured Property damaged by an Accident, unless otherwise excluded, including overtime and the extra cost of express or other rapid means of transportation. This coverage is subject to a sublimit of the greater of $2,500,000 or an amount equal to ten percent (10%) of the loss (excluding the Expediting Expense), but not to exceed a maximum sublimit of $10,000,000.

4. **Regulatory Code**

This Policy shall also cover the additional cost of repair or replacement of Insured Property arising out of Accidental Property Damage, necessitated by enforcement of any state or federal statute, regulation, ordinance or other rule having the force of law relating to minimum standards of construction or engineering or licensing, qualification or certification (hereinafter referred to as "Code") which is in effect at the time of the Accident and to which the Insured Property is subject. All such costs are subject to a total sublimit of $2,500,000 and to the requirement that the costs involved are actually, directly and necessarily incurred in order to comply with any Code governing repair and/or replacement, or continued or renewed licensing, qualification or certification of the Insured Property which has sustained Accidental Property Damage.

5. **Removal from Premises**

If Insured Property is necessarily removed from any location specified in the Declarations for preservation from imminent physical damage, this Policy also covers such Insured Property for a period of forty-five (45) business days from the commencement of such removal, during removal, at any place to which such Insured Property has been removed, and during return; provided, however, this provision does not apply to Property Damage by radioactive contamination except as otherwise provided in Section I.E.2. The Member Insured shall notify the Insurer of any such removal within ten (10) business days after its commencement.

II. PRIORITY FOR DECONTAMINATION LIABILITY EXPENSES

1. Whenever the estimated expenses covered under Section I.A.2 exceed $100,000,000, except as provided in paragraph 2 below, it is agreed that payment under this Policy shall be first made with respect to Losses incurred under Section I.A.2, and then, to the extent proceeds of this Policy are not so utilized, with respect to Losses incurred under Section I.A.1.

2. Payment under this Policy may be made with respect to Losses covered under Section I.A.1 prior to the completion of payments under Section I.A.2 only on the following conditions:

(a) The Member Insured must attest that:

(i) no proceeds of this Policy in excess of an amount specified by the Insureds ("Specified Nuclear Liability Amount"), except as provided in a Proof of Loss filed with the Insurer, are needed to discharge the legal obligation or liability of the Insureds under the Atomic Energy Act of 1954, 42 U.S.C. Section 2011 et seq. as amended, and the regulations promulgated pursuant thereto (the "Act") to protect the public health and safety following Accidental Property Damage; and

(ii) the payment or use of policy proceeds for Losses covered under Section I.A.1 does not violate any regulation or order of the Nuclear Regulatory Commission or any governmental body succeeding to the functions and authorities thereof ("NRC").

(b) Except as provided in paragraph (c) below, the amount of insurance available for payment to the Insureds with respect to Losses covered under Section I.A.1 prior to the indemnification under Section I.A.2 shall be calculated by subtracting the Specified Nuclear Liability Amount from the amount of insurance specified in Item 6 of the Declarations, as it may be reduced pursuant to the terms of this Policy.

(c) At the request of the Member Insured, the amount calculated in accordance with subparagraph 2(b) above, may be increased to include an amount equal to all or part of the Specified Nuclear Liability Amount; but only to the extent of amounts for which the Member Insured attests:

(i) that the Insureds are entitled under other valid and collectible insurance covering the same expenses covered by Section I.A.2;

(ii) that the Insureds will claim under such other insurance and use such claimed proceeds to discharge their legal obligation or liability under the Act to protect the public health and safety following Accidental Property Damage; and

(iii) that the payment or use of all or part of the Specified Nuclear Liability Amount for Losses covered under Section I.A.1 does not violate any regulation or order of the NRC.

III. EXCLUSIONS

A. General Exclusions

1. The coverage provided under this Policy does not apply to Property Damage caused by or resulting from:

(a) gradual accumulation of radioactive contamination;

(b) radioactive contamination at any location specified in the Declarations, resulting from matter released from any source outside the premises of that location and for which the Insured is covered or would be entitled to coverage or can make a claim against a third party who is insured under a nuclear energy liability policy issued by the Nuclear Energy Liability Insurance Association or Mutual Atomic Energy Liability Underwriters or any other third party liability insurer, but this exclusion shall not apply to radioactive contamination resulting from matter released from any source while such source is in transit from any location specified in the Declarations;

(c) failure of the Insureds to use all reasonable means to save and preserve the Insured Property at and after an Accident or when the Insured Property is in danger of Property Damage;

(d) unexplained or mysterious disappearance of Insured Property, or shortage disclosed upon taking inventory;

(e) delay, inherent vice, loss of use, or loss of market;

(f) any fraudulent, dishonest, or criminal act done by or at the instigation of any Insured, any Operator, a partner or joint venturer in or of any Insured or Operator, or an officer, director or trustee of any Insured or Operator;

(g) any order or directive of a federal, state, county, or municipal governmental entity or any department, agency or political subdivision thereof, including, without limitation, an order to replace undamaged Insured Property pursuant to a directive of the NRC, except acts of destruction at the time of and for the purpose of preventing the spread of Accidental Property Damage;

(h) seizure, destruction or confiscation by order or directive of any federal, state, county, or municipal governmental entity or any department, agency or political subdivision thereof, or risks of contraband or illegal transportation or trade;

(i) or attributable to manufacturing or processing operations which result in damage to stock or materials while such stock or materials are being actually worked upon;

(j) any form of deterioration or wear and tear, including but not limited to

(i) depletion, depreciation, and deterioration, including that of fuel element cladding;

(ii) embrittlement of any kind, including but not limited to hydrogen embrittlement and neutron embrittlement;

(iii) fatigue of any kind, including but not limited to thermal fatigue and high-cycle fatigue;

(iv) rust, erosion, or corrosion of any kind, including but not limited to stress corrosion cracking, unless caused directly by an independent and separate Accident not otherwise excluded, but then only for the Property Damage caused by such Accident;

(v) pitting, cracking, bulging, blistering, fretting, denting, deformation or distortion of the Insured Property which accompanies or is directly associated with the kinds of Property Damage specified in paragraphs (ii) through (iv) above; and

(vi) shrinking, bulging, expansion, cracking, shifting, rising, settling, sinking, and lateral or other movement of pavements, foundations, walls, floors, ceiling or roofs;

(k) dampness, dryness, or extremes or changes of temperature of the atmosphere, including but not limited to rust, corrosion or erosion or other resulting Property Damage, unless caused directly by an independent and separate Accident not otherwise excluded, but then only for the Property Damage caused by such Accident;

(l) Flood, unless otherwise provided by endorsement added hereto; or

(m) earthquake, volcanic eruption, landslide, subsidence or sinking of land or other earth movement, settlement or other movement of foundations, unless otherwise provided by endorsement added hereto.

With respect to the Exclusions in paragraphs (j) through (m), inclusive, the Insurer shall be liable if an independent and separate Accident not otherwise excluded ensues, but then only for the Property Damage caused by the ensuing Accident.

2. This Policy also does not cover:

(a) accounts, bills, currency, deeds, evidences of debt, money or securities;

(b) (i) records, manuscripts and drawings, for any amount in excess of their value blank plus the cost incurred for actually transcribing or copying them, except as provided in subparagraph III.A.2(b)(ii) below;

(ii) media, data storage devices, and program devices for electronic and electro-mechanical data processing or for electronically controlled equipment, for any amount in excess of the cost of reproducing such media, data storage devices, and program devices from duplicates or from originals of the previous generation of the media, and no liability is assumed

hereunder for the cost of gathering or assembling information or data for such reproduction;

(c) vehicles licensed for highway use, aircraft or watercraft, except when such vehicles, aircraft or watercraft are being used for the servicing of or in connection with the operation of the Insured Property;

(d) any Accidental Property Damage, to the extent of the amount collectible from a contractor, manufacturer or supplier of machinery, equipment or other property under a guaranty or warranty, whether or not such contractor, manufacturer or supplier is included as an Insured under this Policy;

(e) the cost of making good any faulty workmanship, material, construction or design, whether or not due to negligence, inadvertence, misjudgment or any other cause, and regardless of any warranty which may affect such faulty components; provided, however, the Insurer shall be liable if an independent and separate Accident not otherwise excluded ensues, but then only for the Property Damage caused by the ensuing Accident;

(f) more than one opening and closing of a turbine in connection with one Accident; provided, however, that additional openings and closings of a turbine in connection with a single Accident can be covered as expediting expenses subject to the provisions of Section I.E.3; and

(g) any sums which the Insured may be obligated to pay as damages

(i) because of bodily injury or personal injury, or

(ii) because of damage to property not described in the Declarations, or

(iii) for which the Insured is covered or would be entitled to coverage under a nuclear energy liability policy issued by the Nuclear Energy Liability Insurance Association or Mutual Atomic Energy Liability Underwriters or any other third party liability insurer.

B. War Risk Exclusion

1. Subject to paragraph 2 below, the coverage provided under this Policy does not apply to Property Damage caused directly or indirectly by:

(a) hostile or warlike action in time of peace or war, including action in hindering, combating or defending against an actual, impending or expected attack by any government or sovereign power (de jure or de facto), or by any authority maintaining or using military, naval or air forces; or by military, naval or air forces; or by an agent of any such government, power, authority or forces;

(b) any weapon of war employing nuclear fission or fusion whether in time of peace or war; or

(c) insurrection, rebellion, revolution, civil war, usurped power, or action taken by governmental authority in hindering, combating or defending against such an occurrence.

2. This War Risk Exclusion shall only apply to acts which are part of overt military activity.

IV. PREMIUM

1. The Member Insured agrees to pay to the Insurer the Premium under the terms and conditions hereinafter set forth. The Premium shall be paid to the Insurer by wire transfer or other method acceptable to the Insurer on or before the beginning of the policy period specified in Item 3A of the Declarations.

2. The Member Insured agrees to pay to the Insurer as an Additional Premium all Premium Adjustment(s) assessed under Section V.I of the Policy. For each Premium Adjustment, the Additional Premium in the year in which the Premium Adjustment is assessed shall be increased by a pro rata amount.

3. All Additional Premiums computed on the basis of pro rata Premium Adjustments shall be paid to the Insurer by wire transfer or other method acceptable to the Insurer within 40 calendar days after the Notification Date. However, to the extent that there is a request for a variance (as permitted under Section V.I.7), the Additional Premium referred to in this Paragraph need not be paid until 10 calendar days after a decision denying the request for a variance, such payment to be made by wire transfer or other method acceptable to the Insurer.

4. For each year that a Premium Adjustment is in place on the date of the renewal of the Policy, the full amount of each such Premium Adjustment shall be considered Additional Premium and shall be payable with the Premium.

5. Upon the termination of a particular Premium Adjustment in accordance with the terms of Section V.I, the Member Insured shall be entitled to a refund of a pro rata amount of the Additional Premium. The refund shall be paid by wire transfer or other method acceptable to the Member Insured within 40 calendar days after the date the Insurer notifies the Insured of the amount of the refund.

6. As a condition precedent to the Insurer's obligations under this Policy, the Member Insured agrees to notify the Insurer that the Insured Property has been classified Category Number Five by the Institute of Nuclear Power Operations ("INPO"), within seven (7) days of being advised by INPO of such classification being put in place, and to pay such additional Premium due hereunder to the Insurer as a result thereof by wire transfer or other method acceptable to the Insurer within twenty (20) business days after demand.

7. The Member Insured further agrees to pay the Insurer the Retrospective Premium Adjustment under the terms and conditions specified under Section VI.

V. CONDITIONS

A. Abandonment

There shall be no abandonment to the Insurer of any property.

B. Appraisal

In case the Member Insured and the Insurer shall fail to agree as to the amount of Property Damage, then, on the written demand of either, each shall select a competent and disinterested appraiser and notify the other of the appraiser selected within twenty (20) days of such demand. The two (2) appraisers so selected shall first select a competent and disinterested umpire; and failing for fifteen (15) days from the date of selection of the second appraiser to agree upon such umpire, then on request of the Member Insured or the Insurer, such umpire shall be selected by a judge of the United States District Court for the district in which the Insured Property is located. The appraisers shall then appraise the Property Damage, stating separately Replacement Cost and/or the Actual Cash Value of each item; and, failing to agree, shall submit their differences, only, to the umpire. An award in writing, so itemized, of any two when filed with the Insurer shall determine the amount of Property Damage. Each appraiser shall be paid by the party selecting him and the expenses of appraisal and of the umpire shall be paid equally by the Member Insured on the one hand and the Insurer on the other.

C. Assignment

Assignment or transfer of this Policy shall not be valid except with the prior written consent of the Insurer.

D. Choice of Law

1. In view of the diverse locations of the parties hereto and the desirability of unified regulation, the Insureds and Insurer agree that the terms of this Policy shall determine their respective rights and duties and that this Policy shall be construed and enforced in accordance with and governed by the internal law of the State of New York, United States of America.

2. The parties intend that the Insurer conduct its activities so as not to be subject to the insurance regulation of any jurisdiction other than Bermuda and Delaware. Accordingly, the parties expressly recognize and agree that paragraph 1 above does not evidence an intent by the parties to

   (a) give jurisdiction over the Insurer to the insurance regulatory authority of any jurisdiction other than Bermuda and Delaware; or

(b) make applicable to this Policy any of the insurance laws or regulations (including those which specify the terms of the by-laws and contracts of mutual insurance companies) of any jurisdiction, including New York, other than to the extent such laws of Bermuda and Delaware are applicable; or

(c) otherwise have the laws of Bermuda or Delaware apply to the construction or enforcement of this Policy.

E. **Concealment, Fraud**

The Insurer shall have no obligation to make any payment under this Policy if, whether before or after a Loss, any Insured has willfully concealed or misrepresented in writing any material fact or circumstance concerning this insurance or the subject thereof, or the interest of any Insured therein, or in case of any fraud or false swearing by any Insured relating thereto; but the application of this provision shall not affect the Member Insured's obligation to pay the Retrospective Premium Adjustment callable by the Insurer under this Policy, or provide other assurances to the Insurer Pursuant to Section VI.2.

F. **Deductibles**

1. There shall be deducted from the amount of each and every Loss the Deductible stated in Item 8 of the Declarations. In the event that more than one Deductible applies to any one Loss, then only the largest Deductible for that Loss shall be applied.

2. To the extent that the Deductible Adjustment applies in accordance with the provisions of Section V.I, and to the extent that the amount of the Deductible Adjustment is greater than the amount of the Deductible, then the Deductible Adjustment shall be substituted for the Deductible for purposes of Paragraph V.F(1). If there is more than one Deductible Adjustment in place under Section V.I, only the highest Deductible Adjustment will be considered for purposes of this Section V.F.

G. **Dispute Resolution**

1. The Insurer and the Insured mutually acknowledge that the form, terms and conditions of the Policy have been formulated by representatives of the participating utilities in order to provide insurance coverage which is vital to all participants. It was desired that the Insurer serve as a financially stable and reliable entity, responsive to the coverage needs of its participants, and providing coverage fairly and equitably as to each Insured, but taking equally into account fairness and equity as to all insureds as a group. While every effort has been made to define with clarity and precision the scope of coverage and other policy provisions, the Insurer and the Insured mutually acknowledge that situations may arise where the terms of the Policy are disputed. For the foregoing reasons, the Insurer and the Insured agree that the following principles shall govern the interpretation of the Policy:

(a) Even-handedness and fairness to both the Insurer and the Insured;

(b) The intentions of the Insurer and the Insured, including any extrinsic evidence of intent;

(c) The practice of the Insurer and the Insured in interpreting and applying the Policy;

(d) The cooperative rather than adversarial relationship between the Insurer and the Insured; and

(e) The contract construction rule of contra proferentem is not applicable to this insurance policy.

2. The Insurer and Insured agree to endeavor to resolve any dispute between them by means of voluntary proceedings to be agreed upon between them. In the event of a dispute, either the Insurer or the Insured may request the other to participate in an alternative dispute resolution proceeding. The Insurer and the Insured acknowledge, depending upon the circumstances, that an appropriate proceeding may include but is not limited to one or more of the following: early neutral evaluation, mediation, mini-trial, neutral fact finding, or senior peer review. In the absence of the parties agreeing to participate in an alternative dispute resolution process, the Insurer will agree, at the request of the Insured, to submit the dispute to senior peer review, unless otherwise determined by the Insurer's Board of Directors. The Insurer agrees to pay the fees and expenses of any neutral party associated with the procedures. The use of any such or other proceeding is voluntary to both the Insurer and Insured, but each acknowledges that it is in the best interests of the mutual enterprise to resolve disputes by such voluntary means where possible, and without the need for final and binding arbitration between them.

3. The Insured and Insurer agree in good faith to consider, in connection with any dispute, the Statement of Dispute Resolution Principles adopted by the Insurer's Board of Directors and Members, as it may be amended from time to time.

4. Any claim or controversy between the Insured and the Insurer as to any matters arising out of or relating to this Policy, which is not settled between themselves, pursuant to paragraph 2 above or otherwise, shall be submitted at the request of either the Insured or the Insurer to arbitration in New York City unless the parties agree as to another location. Arbitration of a dispute is final and binding. The Insured and the Insurer shall try in good faith to agree on the appointment of a sole arbitrator to settle the dispute. In the event the parties cannot agree on the appointment of a sole arbitrator, they can agree to have a sole arbitrator appointed by the then President of the Association of the Bar of the City of New York or in the absence of agreement to do so, a three-person arbitration panel shall be appointed. In the event that either the Insured or the Insurer determines that the dispute is not appropriate for a sole arbitrator, a three-person arbitration panel shall be appointed. In such instance, the Insured shall appoint one arbitrator and the Insurer another; the two so appointed shall select the third. If the two arbitrators fail to agree on a third arbitrator for a period of sixty calendar days from the date of appointment of the second arbitrator, then on request of the Insured or the Insurer such third arbitrator shall be selected by the then President of the Association of the Bar of the City of New York. The Insured and the Insurer may by

express agreement determine the arbitral procedures to be followed; in the event the parties do not agree, New York law, including the statutory rules on arbitration, shall govern all matters of procedure. The arbitrators shall first determine the liability of the parties as to the dispute, claim or controversy, and then, only if necessary, determine the type and amount of relief to be granted. The arbitrators shall award reasonable attorney's fees and costs to the prevailing party in such amount as they determine appropriate, not to exceed the amount of fees and costs incurred by the non-prevailing party. For this purpose, the fees incurred shall be calculated at reasonable prevailing hourly billing rates and include all reasonable out-of-pocket expenses.

5. To the extent that any dispute, claim or controversy between the Insured and the Insurer hereunder is not subject to arbitration for any reason whatever, the United States District Court for the Southern District of New York shall have exclusive jurisdiction thereof. For such purpose, the Insured agree to accept, without objection to form or manner, service of process to the person identified in Item 11 of the Declarations.

   For such purpose, the Insurer agrees to accept, without objection to form or manner, service of process by registered mail directed to Nuclear Electric Insurance Limited, 1201 Market Street, Suite 1100, Wilmington, Delaware 19801. The foregoing consents to service of process are not intended nor shall they be construed to extend to any dispute, claim, controversy, cause of action, or other matter other than as stated in this paragraph.

H. **Headings**

The headings in this Policy are inserted for convenience only and shall not be deemed to constitute a part hereof.

I. **Evaluations and Compliance with Loss Control Standards**

1. The Insurer shall be permitted, but not obligated, to perform or to have performed on its behalf, evaluations of the Insured Property at any reasonable time. All evaluations and evaluation reports made by or on behalf of the Insurer are made solely for insurance purposes. Evaluation reports are based upon the conditions, practices and property observed and information made available at the time of the evaluation, and shall not be deemed to identify all hazards or to indicate that other hazards do not exist. The Insurer and those performing evaluations on its behalf shall not be responsible for the correction or control of any conditions, practices or property. Notwithstanding any other agreement, express or implied, to the contrary, neither the right to make an evaluation nor the making of an evaluation, nor any advice or report resulting therefrom, shall constitute or be construed as an undertaking on behalf of or for the benefit of the Insureds or others to determine or warrant that the facilities, operations or property are safe or healthful, or are in compliance with any law, rule, regulation, procedure or standard. It shall be the obligation of the Insureds to ensure that the Insurer is accorded the right to conduct an evaluation under this paragraph.

2. Notwithstanding the provisions in Paragraph V.I.5, upon discovery of a dangerous condition (the "Dangerous Condition) with respect to any property, or part thereof, insured under this Policy (the "Affected Property"), whether discovered as a result of an evaluation or otherwise, a representative of the Insurer may

   (a) request that the Affected Property be taken out of service without delay, and/or

   (b) request that actions be taken to remedy the Dangerous Condition.

3. If a request made under Paragraph V.I.2 is not complied with, the Insurer may immediately suspend coverage as to the Affected Property and/or as to Property Damage that could have been avoided or reduced had the Dangerous Condition been remedied, provided, however, that there will be coverage for Property Damage if the Insured can demonstrate that the Property Damage was unrelated to the failure to take the requested action (and there is otherwise coverage under this Policy). Notice of the suspension (which may be made together with either request referred to in Paragraph V.I.2) shall be written and, notwithstanding any other provisions under this Policy, may be sent to the Member Insured by hand delivery, e-mail, fax or courier.

4. It shall be an obligation under this Policy that the Insured comply with the Shall Requirements contained in the Insurer's Loss Control Standards.

5. When the Insurer learns of an Insured's failure to comply with, or to take agreed upon actions to correct a failure to comply with, a Shall Requirement contained in the Insurer's Loss Control Standards, the Insurer may notify the Insured of the non-compliance, and upon or after such notification shall have the right to

   (a) adjust the Insured's premiums ("Premium Adjustments") and/or the Insured's deductible ("Deductible Adjustments"), and/or

   (b) suspend coverage under this policy as to the property that is the subject of the applicable Shall Requirement and/or as to Property Damage that could have been avoided or reduced if not for the Insured's failure to comply with the applicable Shall Requirement, provided, however, that there will be coverage for Property Damage if the Insured can demonstrate that the Property Damage was not related to the noncompliance (and there is otherwise coverage under this Policy).

   The Actions referred to in this Paragraph may be collectively referred to as "Policy Adjustments".

6. Notification to the Insured about a non-compliance with the Shall Requirements contained in the Insurer's Loss Control Standards shall be in writing (the "Notification Letter") and, notwithstanding any other provisions under this Policy, may be sent to the Member Insured by hand delivery, e-mail, fax or courier. The date of the Notification Letter shall be referred to as the "Notification Date". The Notification Letter shall set forth the specific

Premium Adjustments and Deductible Adjustments to be made, which shall be assessed in accordance with the schedules contained in the Insurer's Rating Procedures and Schedules then in effect. Deductible Adjustments shall apply in accordance with the details set forth in the Notification Letter.

7. Unless indicated otherwise in the Notification Letter, all Premium and Deductible Adjustments will take effect on the 31st calendar day after the Notification Date unless the Insured requests a variance (in accordance with the procedures contained in the Loss Control Standards) or requests that the applicable coverage be removed because the Insured has elected not to comply with the relevant Loss Control Standard requirement. The precise scope of any coverage removal will be described in an endorsement to the Policy.

8. Unless indicated otherwise in the Notification Letter, all Premium and Deductible Adjustments will remain in effect until the Insurer endorses the Policy to remove such Policy Adjustments. For purposes of determining whether an Accident took place during a period that there was a Deductible Adjustment, the relevant date is the date on which the Accident actually occurred and not any deemed date that may otherwise be defined in the Policy.

9. Notwithstanding the provisions in Paragraph V.I.6 any suspension of coverage under Paragraphs V.I.3 and V.I.5 shall be in accordance with the scope of coverage suspension set forth in writing and delivered to the Insured.

10. If the Insured requests a variance, no Premium or Deductible Adjustments will be implemented while the variance request is being considered by the Insurer. If the Insurer does not grant the variance, the Premium and Deductible Adjustments shall be applied retroactively to the day the Adjustments would have gone into effect under Paragraph V.I.7, even if the Insured requests a review or otherwise appeals the Insurer's decision. The provisions of this paragraph will apply even in the event that an Accident actually occurs during the time that the variance request is being considered.

11. The Insurer may immediately suspend coverage under this Policy, in whole or in part, with respect to the Insured Property if (i) the NRC suspends or revokes for any reason the operating license issued with respect to any Unit on such Insured Property, or (ii) the NRC issues a shutdown order with respect to such Unit, or (iii) the NRC issues a confirmatory order keeping such Unit shut down. In the event that the Insurer chooses to suspend coverage under this provision, it shall notify the Member Insured in writing of that decision.

12. The coverage suspended in accordance with Paragraphs V.I.3 and V.I.5 above, as well as the coverage removed under Paragraph V.I.7 above, may be reinstated by the Insurer, but only by an endorsement issued to form a part of this Policy. The suspension of the insurance under this Policy will not affect the obligation of the Member Insured to pay the Retrospective Premium Adjustment callable by the Insurer under this Policy, or provide other assurances to the Insurer Pursuant to Section VI.2.

J. **Insurer's Options**

It shall be the option of the Insurer to take all, or any part, of the destroyed or damaged Insured Property at the agreed or appraised value, and also to decontaminate or otherwise repair, or to rebuild or replace such Insured Property destroyed or damaged with other of like kind and quality within a reasonable time, on giving notice of its intention to do so within thirty (30) days after the receipt of the Proof of Loss as herein provided.

K. **Limits**

1. The Insurer shall not be liable for more than the amount shown as limit of liability in the Declarations for any one Accident.

2. The insurance provided by this Policy shall not be reduced by the sum paid for any one Accident.

3. Notwithstanding anything contained herein to the contrary, the Insurer's liability hereunder shall be the amount payable to the Member Insured but for this provision, less any amount owed to the Insurer by the Insureds, including amounts owed to the Insurer by the Insureds under this Policy or any other agreement or policy.

4. The Member Insured's recovery under Section I.A.1 and I.A.2 of this Policy shall not be decreased because the Replacement Cost or Actual Cash Value, whichever is applicable, of the Insured Property is less than the Insurer's limit of liability.

L. **Mortgagee Interests and Obligations**

1. If a Loss hereunder is assigned or made payable, in whole or in part, to a designated mortgagee not named herein as an Insured, such interest in this Policy may be canceled upon sixty (60) days' written notice of cancellation mailed or delivered to such mortgagee.

2. If the Insureds fail to meet the requirements stated herein in the case of Accidental Property Damage, such mortgagee, upon notice, shall render a written estimate of Loss within sixty (60) days and shall render Proof of Loss in the form approved by the Insurer within twelve (12) months thereafter and shall be subject to the provisions hereof relating to appraisal, arbitration and time of payment and of bringing suit. If the Insurer shall claim that no liability exists as to the mortgagor or owner, it shall, to the extent of payment of loss to the mortgagee, be subrogated to all the mortgagee's rights of recovery, but without impairing mortgagee's right to sue; or it may pay off the mortgage debt and require an assignment thereof and of the mortgage. Other provisions relating to the interests and obligations of such mortgagee may be added hereto by endorsement.

M. **Natural Hazards**

1. *Windstorm Loss*

Each Loss by windstorm, tornado or hurricane shall constitute a single Accident; provided, if more than one windstorm, tornado or hurricane should occur within any period of ninety-six (96) hours commencing during the term of this Policy, and such windstorms, tornados or hurricanes have a common origin or are caused by a single atmospheric disturbance, then such windstorms, tornados or hurricanes shall be deemed to be a single windstorm, tornado or hurricane.

2. *Flood Loss*

Each Flood shall be deemed a separate Accident; provided that if more than one Flood should occur within any period of ninety-six (96) hours commencing during the term of this Policy and such Floods have a common origin or are caused by a single Accident, then such Floods shall be deemed to be a single Flood.

3. *Earthquake or Volcanic Eruption Loss*

Each earthquake shock or volcanic eruption shall be deemed a separate Loss; provided that if more than one earthquake shock or volcanic eruption shall occur within any period of ninety-six (96) hours commencing during the term of this Policy and such earthquake shocks or volcanic eruptions have a common origin or are caused by a single incident, then such earthquake shocks or volcanic eruptions shall be deemed to be a single earthquake or volcanic eruption.

N. **Other Insurance**

The Insurer shall not be liable if at the time of the Accident there is any other insurance which would attach if this insurance had not been effected, except that this insurance shall apply only as excess and in no event as contributory insurance, and then only after all other insurance has been exhausted.

O. **Policy Decisions and Notice**

Except as provided in paragraph Q of Section V, all decisions or actions made or taken with respect to this Policy may only be taken or made by the first named Member Insured and all such decisions or actions shall be binding on all Insureds. Such decisions or actions shall include, without limitation, decisions to give or not give notices of losses, to file or not file proofs of loss and to bring or not bring an action under the dispute resolution provision. No
decision or action with respect to this Policy may be made or taken by anyone other than the Insurer and the first named Member Insured. The first named Member Insured shall be that Member Insured whose name is listed first in Item 1 of the Declarations. The Insurer and the Insureds agree that all communications between them as to any matter arising under or relating to this Policy shall be made as follows:

1. If to the Insurer: The communication must be sent by the first named Member Insured and must be sent, by facsimile, mail or courier to the Insurer at the address listed in Item 2 of the Declarations.

2. If to the Insureds: The communication must be sent by the Insurer to the first named Member Insured and must be sent, by facsimile, mail or courier to the address listed in Item 1 of the Declarations or to the address of such Member Insured's Delaware Representative. It shall be the obligation of the first named Member Insured to communicate the contents of any notification from the Insurer to the other Insureds.

The Insured's compliance with the provisions of this paragraph is a condition precedent to the Insurer's obligations under this Policy.

P. **Policy Modifications**

This Policy embodies all agreements between the Member Insured and the Insurer or any of their agents relating to this insurance. There shall be no change in the terms, provisions and stipulations of this Policy except in writing hereon or by endorsement added hereto by the Insurer and the Member Insured.

Q. **Requirements in Case of Loss**

1. It shall be an obligation of the Insureds to give or cause to be given to the Insurer immediate written notice of any Accidental Property Damage and to protect the Insured Property from further damage. The Insureds shall separate or cause to be separated, with reasonable promptness, the damaged and undamaged Insured Property, put it in the best possible order, furnish a complete inventory of the destroyed, damaged and undamaged Insured Property, showing in detail quantities, costs, the Replacement Cost and estimated amount of Property Damage claimed. The Insurer may deny coverage for such Accidental Property Damage if the Insured fails to comply with its obligations to provide immediate written notice thereof, but only if the Insurer demonstrates being prejudiced in its ability to adjust, assess or otherwise investigate the claim as a result of such failure.

2. Within twelve (12) months after the Accidental Property Damage, unless such time is extended in writing by the Insurer, not to be unreasonably withheld, the Insureds shall render to the Insurer a proof of loss ("Proof of Loss"), in the form approved by the Insurer, signed and sworn to by the Member Insured, stating the knowledge and

belief of the Insureds as to the time and origin of the Accidental Property Damage, the interest of the Insureds and all others in the Insured Property, the value of the Insured Property involved in the Accident, the amount of Loss or damage thereto, all other contracts of insurance, whether valid or not, covering any of said Insured Property, and

(a) with respect to Losses covered under Section I.A.1, an attestation by the Member Insured that either no proceeds of this Policy, or no proceeds of this Policy in

excess of the Specified Nuclear Liability Amount, except as provided in a Proof of Loss filed with the Insurer, are needed to discharge the legal obligation or liability of the Insureds under the Act to protect the public health and safety following Accidental Property Damage, and that the payment of policy proceeds for the Property Damage under Section I.A.1 does not violate any regulation or order of the NRC; and

(b) with respect to Losses covered under Section I.A.2, the time and origin of the Accidental Property Damage necessitating such expenses, the amount of expenses incurred in discharging the Insureds' legal obligation or liability under the Act to protect the public health and safety following Accidental Property Damage, and an attestation by the Member Insured as to the Insurer's legal obligation or liability to incur such expenses.

3. The Insureds shall exhibit or cause to be exhibited to any person designated by the Insurer, as often as may be reasonably required, all that remains of any Insured Property and shall submit to examinations under oath by any person named by the Insurer, and shall subscribe the same. The Insureds shall, as often as may be reasonably required, produce for examination all books of accounts, bills, invoices and other vouchers, or certified copies thereof if originals be lost, or other documents needed by the Insurer to determine its liability, at such reasonable time and place as may be designated by the Insurer or its representatives, and shall permit extracts and copies thereof to be made.

R. **State Premium Tax**

The Insureds represent that they have paid or will pay any applicable state premium tax.

S. **Subrogation**

1. Except as provided in paragraph S.3 below, the Insurer may require from the Insureds an assignment of all right of recovery against any party for Accidental Property Damage to the extent that payment therefor is made by the Insurer, and the Insureds shall execute and deliver all necessary instruments and do all things necessary or desirable on behalf of the Insurer to secure such rights. The Insureds shall take no action after the Accident which may prejudice the Insurer's rights under this paragraph; however, prior to an Accident, the Insureds may waive in writing any or all right of recovery against any party for Accidental Property Damage.

2. The Insurer hereby waives any right of subrogation acquired by reason of any payment under this Policy arising out of any Accidental Property Damage against the Insureds and any party furnishing services, materials, parts, or equipment in connection with the planning, construction, maintenance, operation or use of the Insured Property.

3. It is a condition of this Policy that the Insureds shall repay to the Insurer any recoveries made by the Insureds on account of any Accidental Property Damage to the extent that the Insurer would have been entitled to such recoveries had this waiver not been included in

this Policy. The proceeds of any recovery shall be applied first to any uncompensated Property Damage incurred by the Insureds, including reimbursement of any deductible amount under this Policy, and then, to the extent any proceeds of such recovery remain, to reimburse the Insurer for any payments made by it to the Insureds.

T. **Suit**

No suit, action or proceeding on this Policy for the recovery of any claim shall be sustainable in any court of law or equity or any arbitral tribunal unless all the requirements of this Policy shall have been complied with, and unless commenced within eighteen (18) months after the Accident giving rise to such claim; provided, however, an extension of time granted by the Insurer for rendering a Proof of Loss with respect to any Accidental Property Damage shall extend the eighteen-month (18) period for bringing suit with respect to such claim by the period of the extension.

U. **Term and Cancellation**

1. This Policy shall commence on the date specified in Item 3A of the Declarations and shall terminate on the date specified in Item 3A of the Declarations. This Policy shall be automatically renewed for successive one-year terms, however either party may cancel this Policy by providing written notice to the other party by registered mail at least three months prior to any anniversary.

2. This Policy may be canceled at any time by the Insurer, upon approval of its Board of Directors, upon sixty (60) days' written notice of cancellation mailed or delivered to the Member Insured, with or without tender of the excess of paid premium above the pro rata premium for the expired time, which excess, if not tendered, shall be refunded on demand. Notice of cancellation shall state that said excess premium, if not tendered, will be refunded on demand.

3. This Policy shall be automatically canceled if (i) the INPO membership of either the Member Insured or the Operator is suspended or canceled by INPO for any reason and (ii) the Member Insured fails to notify the Insurer within five business days after receipt of notice of such suspension or cancellation of membership in INPO, unless the Insurer is otherwise notified during such five business days.

4. In the event that the Member Insured fails to pay to the Insurer any Retrospective Premium Adjustment due under this Policy, due under any Other Insurance Policy as such Member Insured may have with the Insurer, or referred to in Section VI, this Policy shall terminate provided that the Insurer notifies the Member Insured in writing of this delinquency and the Member Insured fails to make the required payment within 15 days after receiving such notice by registered mail.

5. Neither the cancellation of the Policy on the part of the Member Insured or the Insurer, nor its automatic termination, shall affect the obligation of the Member Insured to pay the

Retrospective Premium Adjustment callable by the Insurer under this Policy, or provide other assurances to the Insurer Pursuant to Section VI.2.

V. Valuation

1. The value of the Insured Property at the time of an Accident shall be the Replacement Cost of such Insured Property, but only if such Insured Property as is damaged or destroyed is replaced within a reasonable time with identical or like kind property on the same premises and intended for the same occupancy and use. In all other cases, the value of the Insured Property at the time of loss shall be the Actual Cash Value of such Insured Property, notwithstanding that the Policy may refer to the Replacement Cost of such Insured Property. The Member Insured may elect first to make claim under this Policy on an Actual Cash Value basis and may make further claim on a Replacement Cost basis, provided the Insurer is notified in writing within one hundred and eighty (180) days after the Accident of the Member Insured's intent to make such further claim and such claim is filed within three hundred and sixty-five (365) days of such notice.

2. The value of Insured Property in transit at the time of an Accident shall be the Replacement Cost of such Insured Property, but not exceeding the amount which it would cost to repair or replace such Insured Property with material of like kind and quality within a reasonable time after such loss, including general average and salvage charges.

3. In the event of Property Damage to Insured Property constituting nuclear fuel, the Insurer's obligation to indemnify the Insureds and their legal representatives under Section I shall be limited as follows:

   (a) Beginning with the date initial criticality is achieved at a Unit, the value of the nuclear fuel in such Unit shall be deemed to be equal to the value of a full fuel core of the fuel then in such unit reduced to reflect the proportion of the usable burn up consumed; and

   (b) Spent nuclear fuel shall have no value and the Insurer shall have no obligation to indemnify the Insureds or their legal representatives for any Property Damage thereto.

W. Waiver Provisions

No provision, stipulation or forfeiture shall be held to be waived by any requirement or proceeding on the part of the Insurer relating to appraisal or to any examination provided for herein.

X. When Loss Payable.

The amount of Loss for which the Insurer may be liable shall be payable as soon as practicable and in any event within sixty (60) days after the Proof of Loss is received by the Insurer and ascertainment of the Loss is made either by agreement between the Member Insured and the Insurer expressed in writing or by the filing with the Insurer of an award as herein provided.

Where only a partial Proof of Loss has been provided to the Insurer and the Insurer's liability for the Property Damage is uncontested, the Insurer may, in its sole discretion, make partial payment to the Insured. Nevertheless, the Insurer shall have no obligation to make such partial payment.

VI. RETROSPECTIVE PREMIUM ADJUSTMENT

The Member Insured agrees to pay to the Insurer the Retrospective Premium Adjustment under the terms and conditions hereinafter set forth.

1. The Insurer may make demand for the Retrospective Premium Adjustment in whole or in one or more parts from time to time, but only to the extent necessary, in the sole discretion of the Board of Directors of the Insurer, to cover Losses incurred by the Insurer under this Policy and all Other Insurance Policies with coverage effective during the Policy Year (specified in Item 3.B of the Declarations).

2. The Insurer, in the sole discretion of the Board of Directors, may require the Member Insured to provide assurance to the Insurer of the Member Insured's ability to satisfy its obligation to pay a Retrospective Premium Adjustment when called. Within twenty (20) business days of receiving notice from the Insurer that such assurance is required, the Member Insured shall notify the Insurer of the option selected to provide the required assurance, which will include, but is not limited to, providing a letter of credit, providing a financial guarantee, purchasing retrospective premium insurance, or paying a Deposit Premium, and implement such option by providing the Insurer with the required documentation or payment, depending on the option selected. The parameters for a letter of credit, a financial guarantee, and the retrospective premium insurance options will be provided to the Member Insured by the Insurer at the time the Insurer requires the Members Insured to take the action. The terms regarding the Deposit Premium are set forth in Paragraph 3 below.

3. If the Member Insured elects to pay a Deposit Premium, the Insurer may require the Deposit Premium to be paid in whole, in part, or in parts. Any Deposit Premium paid to the Insurer will be returned to the Member Insured when, in the sole discretion of the Insurer's Board of Directors, the retention of the Deposit Premium is no longer required. The amount of any Deposit Premium paid shall be a credit against the obligation of the Member Insured to pay a call made for a Retrospective Premium Adjustment and, to the extent thereof, shall be treated as a payment of the Retrospective Premium Adjustment as of the date a call for a Retrospective Premium Adjustment is made. Amounts paid as Deposit Premiums will be held in an interest bearing account and, until such a call is made, interest earned on the Deposit Premium amount will be paid back to the Member Insured on an annual basis, within ninety (90) business days after the end of the applicable calendar year. However, if the Member Insured fails to elect one of the options available pursuant to Paragraph 2 within the time frame required, or at any other time when in the sole discretion of the Insurer's Board of Directors it is in the best interests of the Insurer, the Insurer may make demand upon the Member Insured for a Deposit Premium, whether or not a demand for a Deposit Premium is made upon any other Member Insured(s). If a demand is made by the

Insurer, the Member Insured shall pay the Deposit Premium within twenty (20) business days of demand.

4. That portion of the Retrospective Premium Adjustment demanded by the Insurer shall be paid to the Insurer by wire transfer or other method acceptable to the Insurer within twenty (20) business days after demand. The Insurer may, without first pursuing any rights it may have against any Delinquent Member, make such number of further demands upon the Member Insured, including any Delinquent Member, for further portions of the Retrospective Premium Adjustment, to be payable twenty (20) business days after demand, as may be needed to obtain Retrospective Premium Adjustment from the Member Insureds of the Insurer under this Policy and all Other Insurance Policies with coverage effective during the Policy Year sufficient, in the sole discretion of the Board of Directors of the Insurer, to cover Losses under this Policy and all Other Insurance Policies with coverage effective during the Policy Year. The fact that the Insurer has received sufficient Retrospective Premium Adjustment from such Member Insureds shall not bar the Insurer from pursuing the Insurer's rights against any Delinquent Member.

5. When, for any purpose hereunder, it becomes necessary to calculate the obligation of the Member Insured for the Retrospective Premium Adjustment, it will be calculated as follows:

   (a) The amount of the Retrospective Premium Adjustment shall be equal to the product of (i) the Multiple selected by the Board of Directors of the Insurer as required to meet Losses under this Policy and all Other Insurance Policies with coverage effective during the Policy Year, times (ii) the Premium plus any Additional Premium, or if such is for a period shorter than a calendar year, such Premium and Additional Premium multiplied by a fraction the numerator of which is 365 and the denominator of which is the number of days in the policy period specified in Item 3A of the Declarations.

   (b) The policy year to which any Retrospective Premium Adjustment relates shall be determined by the Board of Directors of the Insurer at the time it makes the call for such Retrospective Premium Adjustment based on the date of the Accident under this Policy or any Other Insurance Policy giving rise to the obligation which such Retrospective Premium Adjustment is designed to satisfy. The aggregate of all Retrospective Premium Adjustments under this Policy shall not exceed the Retrospective Premium Adjustment set forth in Item 5.B of the Declarations.

   (c) Subject to the provisions with respect to calls made in the event of failure to pay by Delinquent Members, the amount of any call for a Retrospective Premium Adjustment hereunder shall bear the same relation to the total Retrospective Premium Adjustment, payable by all Member Insureds of the Insurer under such call as the highest Premium plus Additional Premium determined under subparagraph (a)(ii) above bears to the aggregate Premiums plus Additional

Premiums, used to calculate the total of all such calls, under this Policy and all Other Insurance Policies with coverage effective during the Policy Year.

(d) The obligation of the Member Insured for the Retrospective Premium Adjustment shall be and remain in full force and effect and all the above calculations shall be made without regard to whether or not the Insurer has any obligation to make payments under this Policy or this Policy is canceled or suspended.

6. When, for any purpose hereunder, it becomes necessary to calculate the obligation of the Member Insured for the Deposit Premium, it will be calculated as follows:

(a) The amount of the Deposit Premium, if required, shall be equal to Retrospective Premium Adjustment listed in Item 5.B of the Declarations, unless otherwise indicated.

(b) The aggregate of the Deposit Premium and any Retrospective Premium Adjustments callable under this Policy shall not exceed the Retrospective Premium Adjustment set forth in Item 5.B of the Declarations.

(c) The amount of the Deposit Premium may be adjusted at the anniversary of this Policy.

(d) The obligation of the Member Insured for the Deposit Premium shall be and remain in full force and effect and all the above calculations shall be made without regard to whether or not the Insurer has any obligation to make payments under this Policy or this Policy is canceled or suspended.

7. The Multiple is no higher than the Multiple in any Other Insurance Policy with insurance coverage effective during the Policy Year.

8. The Board of Directors of the Insurer in its sole discretion may adjust downward the Multiple stated in this Policy and any Other Insurance Policy with coverage effective during the Policy Year to a new lower Multiple, and the Retrospective Premium Adjustment callable under this Policy and any such Other Insurance Policy shall be reduced by a like proportionate amount. No downward adjustment in such Multiple and corresponding adjustment in any such Retrospective Premium Adjustment may be made with respect to any Retrospective Premium Adjustment which has been assigned by the Insurer, or in any Other Insurance Policy with coverage effective during the Policy Year, if the Multiple in any such Other Insurance Policy, after adjustment, would be less than the Multiple, after adjustment, in this Policy, unless a similar downward adjustment is made in the Multiple in this Policy, together with a corresponding adjustment in the Retrospective Premium Adjustment.

9. The liability of the Member Insured shall be limited to the Premium, Additional Premium the Retrospective Premium Adjustment or any unpaid portion thereof due to

the Insurer under the terms of this Policy, and any assurance that may be required pursuant to Section VI.2. No Member Insured shall be subject to any contingent liability or be required to pay any dues or assessments in addition to such Premium, Additional Premium, Retrospective Premium, and any assurance under Section VI.2. Adjustment due under this Policy and those due under any Other Insurance Policies as such Member Insured may have with the Insurer. The liability of the Member Insured for the Retrospective Premium Adjustment for the Policy Year shall cease six (6) years after the end of the Policy Year, unless prior demand is made therefor.

10. It is agreed that the obligation of the Member Insured to pay any Retrospective Premium Adjustment due under any Other Insurance Policy between the Insurer and the Member Insured which terminated on or before the inception date of this Policy is an obligation of the Member Insured under this Policy. It is also agreed that the terms and the amount of such obligation shall be determined by reference to the Other Insurance Policy under which such obligation arose, notwithstanding that such Other Insurance Policy may no longer be in effect.

11. The liability of each Member Insured, if there be more than one, for the Retrospective Premium Adjustment, and any assurance that may be required pursuant to Section VI.2, under this Policy shall be several and not joint and in proportion to their respective interests specified in the Declarations.

12. In the event the Insurer has available credit facilities from lenders, the Board of Directors of the Insurer may, in its sole discretion, utilize such facilities to finance Losses incurred by the Insurer under this Policy and all Other Insurance Policies. The Insurer may assign to the lenders the Insurer's interest in the Retrospective Premium Adjustment, in whole or in part, including, in the event the Insurer defaults on its obligations to such lenders, the right to call such interest assigned. Such assignment may be made and shall only be effective with respect to the financing of those Losses for which the Retrospective Premium Adjustment could be called. In the event any assignment is made, the Insurer shall give prompt notice thereof to the Member Insured. Each Member Insured shall, upon the request of the Insurer, give acknowledgment of its liability for the Retrospective Premium Adjustment to each of the lenders involved.

VII. MEMBERSHIP

Each Member Insured becomes a member of the Insurer as part of obtaining insurance from the Insurer, and as such, is entitled to the privileges and benefits, and by entering into this Policy agrees to be subject to and bound by the obligations and duties of membership. These are more fully set forth in the Insurer's Memorandum of Association and in the Bye-Laws and any amendments thereto, each of which is hereby incorporated into and made a part of this Policy. In no event shall any amendment to the Memorandum of Association or the Bye-Laws increase the amount of Premium or Retrospective Premium Adjustment payable or callable hereunder.

VIII. DEFINITIONS

For purposes of this Policy, unless otherwise stated to the contrary, the following capitalized terms shall have the meanings set forth below. Other capitalized terms are included in the Declarations. Unless otherwise stated or required for the meaning of any provision, the singular shall include the plural and the plural, the singular. Whenever a Section or Paragraph number is included in the Policy, it refers to a Policy Section or Paragraph number.

A. "Accident" means a sudden and fortuitous event, an event of the moment, which happens by chance, is unexpected and unforeseeable. Accident does not include any condition which develops, progresses or changes over time, or which is inevitable. The date of the Accident shall be the later of when such Accident occurred or is discovered; provided, however, that no Accident is covered hereunder which occurred while the Insured was not insured by the Insurer under this Policy or a predecessor policy issued by the Insurer.

B. "Accidental" means caused by an Accident.

C. "Accidental Property Damage" means Property Damage which is caused by an Accident.

D. "Actual Cash Value" means the amount determined by taking the Replacement Cost of the Insured Property and reducing it by straight line depreciation at a rate of three percent (3%) per year, subject to a maximum depreciation of fifty percent (50%).

E. "Additional Premium" means the sum of all Premium Adjustment(s), if any, assessed in accordance with Section V.I of the Policy.

F. "Deductible Adjustments" refer to adjustments that may be made under Section V.I of the Policy, as a result of a non-compliance with a SHALL Requirement contained in the Company's Loss Control Standards, the amount of which shall be determined in accordance with the Company's Procedures and Schedules for the Rating of Nuclear Generating Stations and set forth in a Notification Letter to the Insured.

G. "Delinquent Member" means any member insured, including the Member Insured, who fails to pay a retrospective premium adjustment demanded by the Insurer under Policy or any Other Insurance Policy within twenty (20) business days after such demand.

H. "Deposit Premium" means the amount that the Member Insured may be required to pay to the Insurer under this Policy, as detailed in to Section VI of this Policy, as security for future Retrospective Premium Adjustments.

I. "Flood" means a general and temporary overflowing of water on normally dry land areas caused by or resulting from hurricane, tornado, or windstorm; surface water, waves, tidal water, or tidal wave, overflow of streams or other bodies of water, or spray from any of the foregoing, all whether driven by wind or not; water which backs up through sewers or drains; water below the surface of the ground including that which exerts pressure on or flows, seeps or leaks through sidewalks, driveways, foundations, walls, basements or other

floors, or through doors, windows or other openings in such sidewalks, driveways, foundations, walls, basements or other floors, or release of water impounded by a dam.

J. "Insured Property" means the property specified as such in Item 7 of the Declarations and situated at a location specified therein.

K. "Loss" means the costs or expenses covered under Sections I.A, I.D. and I.E.

L. "Loss Control Standards" means the set of procedures and technical requirements adopted by the Insurer that are intended to minimize the risk of loss at Insured Sites.

M. "Member Insureds of the Insurer" means the Member Insureds under this Policy or the Other Insurance Policies.

N. "Operator" means those persons, entities, departments, agencies, or political subdivisions, if any, other than the Member Insured, responsible for operating a Unit covered by the Policy.

O. "Other Insurance Policy" means any Primary Property and Decontamination Liability Insurance Policy or Operating Facility Policy, other than this Policy, issued by the Insurer or any Primary Property and Decontamination Insurance Policy issued by Overseas NEIL Limited.

P. "Other Member Insurance Policy" means any insurance policy, other than this Policy, issued by the Insurer to one or more Member Insureds of the Insurer.

Q. "Premium Adjustment" refer to adjustments that may be made under Section V.I of the Policy, as a result of a non-compliance with a SHALL Requirement contained in the Company's Loss Control Standards, the amount of which shall be determined in accordance with the Company's Procedures and Schedules for the Rating of Nuclear Generating Stations and set forth in a Notification Letter to the Insured.

R. "Property Damage" means direct physical damage to or destruction of the Insured Property.

S. "Rating Procedures and Schedules" means the Procedures and Schedules for the Rating of Nuclear Generating Stations manual utilized by the Insurer to establish premiums during the underwriting process, as may be revised with the approval of the Board.

T. "Replacement Cost" means the cost incurred for the repair or replacement of the Insured Property that sustained Accidental Property Damage. For purposes of determining Actual Cash Value pursuant to Section I hereof, in the event the replacement property is not readily available, then Replacement Cost for such Insured Property shall be the original book value of the damaged component, less any applicable AFUDC, adjusted for inflation using the applicable Handy Whitman Index.

U. "Retrospective Premium Adjustment" means the amount of retrospective premium adjustment called or demanded of the Member Insured under this Policy as calculated pursuant to Section VI of this Policy, but not, in the aggregate, in excess of the Retrospective Premium Adjustment specified in Item 5.B of the Declarations.

V. "SHALL Requirement" means a standard within the Loss Control Standards that sets forth a minimum requirement to be met and maintained for the Insured Property to be insurable, and is identified as such within the Loss Control Standards.

W. "Unit" means a nuclear operating unit.

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

Earth Movement Damage Endorsement

Member Insured: Florida Power Corporation

Site: Crystal River
Endorsement No. 1
Policy Number: P09-081
Effective Date: April 1, 2009

Effective Time of this Endorsement is 12:01 a.m. Standard Time in Hamilton, Bermuda.

1. Subject to the provisions set forth in this Endorsement and to the provisions and stipulations contained in the Policy, paragraph III.A.1.(m) of the Policy is hereby modified and the Policy is extended to insure against Property Damage caused by earthquake and volcanic eruption and subsidence or sinking of land at the Location specified herein. Except as stated above, paragraph III.A.1.(m) remains otherwise unchanged.

2. The Insurer shall not be liable for Property Damage caused by any earthquake shocks, volcanic eruptions or subsidence or sinking of land commencing before the effective date and time of this Endorsement, nor for any Property Damage resulting from earthquake, volcanic eruptions or subsidence or sinking of land after the expiration of the policy period stated in the Declarations. In no event shall this Endorsement render Insurer liable for Property Damage caused by (a) flood, surface water, waves, tidal water, or tidal wave, overflow of streams or other bodies of water, or spray from any of the foregoing; or (b) release of water impounded by a dam; all even though caused by or attributable to earthquake, volcanic eruption or subsidence or sinking of land.

IN WITNESS WHEREOF, the parties hereto have caused this Endorsement to be executed and attested on their behalf.

Wilmington, Delaware

INSURER:
Nuclear Electric Insurance Limited

Date: As of April 1, 2009

By: _____
David B. Ripsom, President

Attest: _____

Wilmington, Delaware

MEMBER INSURED:
Florida Power Corporation

Date: As of April 1, 2009

By: _____
Attorney-in-Fact

Witness: _____

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

Flood Endorsement

Member Insured: Florida Power Corporation

Site: Crystal River
Endorsement No. 2
Policy Number: P09-081
Effective Date: April 1, 2009

Effective Time of this Endorsement is 12:01 a.m. Standard Time in Hamilton, Bermuda.

Subject to the provisions of this Policy not in conflict, Section III, Exclusions, Part A.1.(I) and Section VIII, Definition, Part H are deleted.

This policy is extended to insure against Property Damage caused by Flood as defined below.

Flood is defined as a general and temporary overflowing of water onto normally dry land areas caused by or resulting from hurricane, tornado, or windstorm; surface water, waves, tidal water or tidal waves; overflow of streams or other bodies of water, or spray from any of the foregoing, all whether driven by wind or not, and release of water impounded by a dam at the Location specified herein.

The Insurer shall not be liable for Property Damage caused by Flood commencing before the effective date and time of this Endorsement, or after the expiration of the policy.

No coverage is provided by this Endorsement for Property Damage caused by or resulting from earthquake, volcanic eruption, landslide, subsidence or sinking of land or other earth movement.

No coverage is provided by this Policy for Property Damage caused by or resulting from:

a. Water below the surface of the ground including that which exerts pressure on or flows, seeps or leaks through sidewalks, driveways, foundations, walls, basement or other floors, or through doors, windows or other opening in such sidewalks, driveways, foundations, walls, basements or other floors;
b. Water which backs up through sewers or drains;

In every other respect, the provisions and stipulations of the Policy remain unchanged.

This Endorsement does not increase the amount of insurance provided under the Policy.

IN WITNESS WHEREOF, the parties hereto have caused this Endorsement to be executed and attested on their behalf.

Wilmington, Delaware

Date: As of April 1, 2009

Attest: _____

INSURER:
Nuclear Electric Insurance Limited

By: _____
David B. Ripsom, President

Wilmington, Delaware

Date: As of April 1, 2009

Witness: _____

MEMBER INSURED:
Florida Power Corporation

By: _____
Attorney-in-Fact

NUCLEAR ELECTRIC INSURANCE LIMITED
POLICYHOLDER DISCLOSURE

NUCLEAR POLICY RENEWALS

NOTICE OF TERRORISM INSURANCE COVERAGE
EFFECTIVE DECEMBER 26, 2007

Coverage for acts of terrorism is already included in your current policy. However, under NEIL's Payment for Acts of Terrorism endorsement, your recovery for losses stemming from an act of terrorism could be limited by the terms of the endorsement. However, in accordance with the Terrorism Risk Insurance Program Reauthorization Act of 2007, which took effect December 26, 2007, (TRIPRA), NEIL's Payment for Acts of Terrorism endorsement would not cap the damages for any "certified" acts of terrorism under TRIPRA.

You are hereby notified that under TRIPRA, the definition of act of terrorism has changed. As defined in Section 102(1), the term "act of terrorism" means any act that is certified by the Secretary of the Treasury - in concurrence with other specified federal officials - to be an act of terrorism; to be a violent act or an act that is dangerous to human life, property, or infrastructure; to have resulted in damage within the United States, or outside the United States in the case of certain air carriers or vessels or the premises of a United States mission; and to have been committed by an individual or individuals as part of an effort to coerce the civilian population of the United States or to influence the policy or affect the conduct of the United States Government by coercion.

Under your coverage, any losses resulting from certified acts of terrorism may be partially reimbursed by the United States Government under a formula established in TRIPRA. Your policy may contain other exclusions which might affect your coverage. Under the formula, the United States Government generally reimburses 85% of covered terrorism losses exceeding the statutorily established deductible paid by the insurance company providing the coverage. TRIPRA, contains a $100 billion cap that limits U.S. Government reimbursement as well as insurers' liability for losses resulting from certified acts of terrorism when the amount of such losses exceeds $100 billion in any one calendar year. If the aggregate insured losses for all insurers exceed $100 billion, any insurer that has met its deductible will not be liable to pay for any losses in excess of the $100 billion sustained by its insureds. Thus, if the $100 billion cap is reached, your coverage may be reduced.

NEIL is neither increasing, nor attributing any portion of, the annual premium for terrorism coverage, but a surcharge might be added to the premium if, after a certified act of terrorism, the federal Department of Treasury requires a recoupment of certain amounts paid by the federal government in accordance with the terms of TRIPRA.

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

Payments for Acts of Terrorism Endorsement

Member Insured: Florida Power Corporation

Site: Crystal River
Endorsement No. 3
Policy Number: P09-081
Effective Date: April 1, 2009

Effective Time of this Endorsement is 12:01 a.m. Standard Time in Hamilton, Bermuda.

It is hereby understood and agreed that this Policy is hereby amended as follows:

I. The following Section is hereby added to the Policy:

PAYMENTS FOR ACTS OF TERRORISM

In the event that one or more Acts of Terrorism cause Accidental Property Damage under this Policy and under one or more Nuclear Insurance Policies within twelve months from the date the first Accidental Property Damage occurs:

1. Resources Available

The Insureds' maximum recovery for all such Losses under this Policy and all Nuclear Insurance Policies shall be an aggregate of:

(a) $3.24 billion (U.S. dollars)

plus;

(b) such additional amounts as the Insurer recovers for such Losses from reinsurance, indemnity, and any other source, applicable to such Losses.

2. Allocation of Resources

(a) The amount determined under paragraph 1 above shall first be used to pay for all such Losses payable under all applicable Primary Property and Decontamination Liability Insurance Policies (excluding any Losses payable under all Business Interruption and/or Extra Expense Insurance Policy Endorsements), Primary Property and Decontamination Insurance Policies (excluding any Losses payable under all Business Interruption and/or Extra Expense Insurance Policy Endorsements), Operating Facility Policies, Decontamination Liability, Decommissioning Liability and Excess Property Insurance Policies, Decontamination, Decommissioning

and Excess Property Insurance Policies, Blanket Excess Decontamination Liability, Decommissioning Liability and Excess Property Insurance Policies, and Blanket Excess Decontamination, Decommissioning and Excess Property Insurance Policies (collectively "Property Losses").

(b) If such Property Losses for all Insureds exceed the amount determined under paragraph 1 above, the Insured's maximum recovery shall be the amount determined under paragraph 1 above times a fraction, the numerator of which is the Insured's recovery for the Property Losses resulting from Accidental Property Damage, but for this Section, and the denominator of which is the sum of all Insureds' recovery for Property Losses resulting from Accidental Property Damage under all applicable Nuclear Insurance Policies, including this Policy, but for this Section.

(c) Notwithstanding paragraph 1 and subparagraph 2(b) above, if the payments made pursuant to subparagraph 2(b) exhaust the amount determined under paragraph 1, without paying for all the Insured's Property Losses, the Insured shall recover such additional amounts that the Insurer recovers from reinsurance, indemnity, or other source, for the Insured's Property Losses.

3. Declarations Page

Nothing herein shall be construed to entitle the Insured to recover more than the amount of the Policy Limits stated in Item 6 of the Declarations.

4. Relevant Period

The twelve-month period specified above shall commence on the date of the first Accidental Property Damage caused by an Act of Terrorism. The first Accidental Property Damage caused by an Act of Terrorism that occurs after this or any other twelve-month period shall trigger a new twelve-month period.

5. Definitions

For the purposes of this Section only:

(a) "Act of Terrorism" means any act by a person, group, or organization that appears to be intended to: (i) intimidate or coerce a civilian population, or (ii) disrupt any segment of the economy in the country where the insured plant is located; or (iii) influence the policy of a government by intimidation or coercion; or (iv) affect the conduct of a government by mass destruction; provided, however, that an Act of Terrorism for purposes of this Policy shall not include any act excluded by the War Risk Exclusion.

(b) "Nuclear Insurance Policy" means any Primary Property and Decontamination Liability Insurance Policy, or Primary Property and Decontamination Insurance Policy, or Operating Facility Policy, or any Decontamination Liability, Decommissioning Liability and Excess Property Insurance Policy, or Decontamination, Decommissioning and Excess Property Insurance Policy or any Blanket Excess Decontamination Liability, Decommissioning Liability And Excess Property Insurance Policy, or Blanket Excess Decontamination, Decommissioning And Excess Property Insurance Policy, other than this Policy, issued by the Insurer or by Overseas NEIL Limited.

6. Authorized Changes to this Section

The Insurer's Board of Directors will have the authority to alter or replace the definition of the term "Act of Terrorism" and any other provision of this Section in order to facilitate the availability of resources that may be made available by the Government in the country where the insured plant is located.

IN WITNESS WHEREOF, the parties hereto have caused this Endorsement to be executed and attested on their behalf.

Wilmington, Delaware

Date: As of April 1, 2009

Attest: _____

INSURER:
Nuclear Electric Insurance Limited

By: _____
David B. Ripsom, President

Wilmington, Delaware

Date: As of April 1, 2009

Witness: _____

MEMBER INSURED:
Florida Power Corporation

By: _____
Attorney-in-Fact

NUCLEAR ELECTRIC INSURANCE LIMITED
WILMINGTON, DELAWARE

Class "A" Warehouse and Storage Structures Sublimit Endorsement

Member Insured: Florida Power Corporation

Site: Crystal River
Endorsement No. 4
Policy Number: P09-081
Effective Date: April 1, 2009

Effective Time of this Endorsement is 12:01 a.m. Standard Time in Hamilton, Bermuda.

1. This Endorsement shall be applicable to the following property:

   a) Warehouse And Shops Building

2. It is hereby understood and agreed that each of the properties described in Paragraph 1, including the contents thereof, shall have a coverage sublimit of $25,000,000 of coverage under this Policy for Property Damage caused directly or indirectly by fire, or fire following lightning or explosion, or by any separate and independent Accident which ensues therefrom.

This Endorsement does not increase the amount of insurance provided under this Policy.

IN WITNESS WHEREOF, the parties hereto have caused this Endorsement to be executed and attested on their behalf.

Wilmington, Delaware

Date: As of April 1, 2009

Attest: _____

INSURER:
Nuclear Electric Insurance Limited

By: _____
David B. Ripsom, President

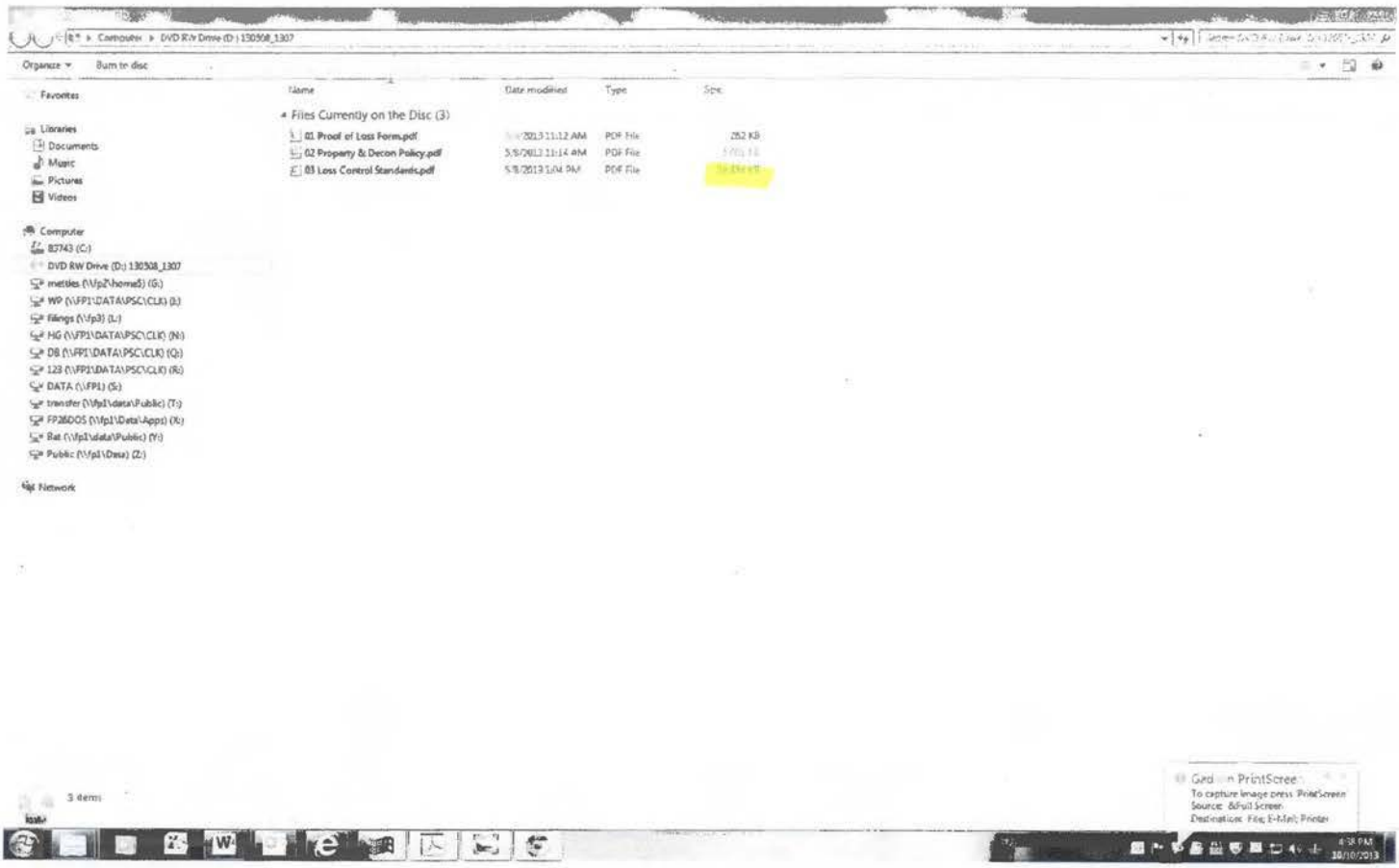
Wilmington, Delaware

Date: As of April 1, 2009

Witness: _____

MEMBER INSURED:
Florida Power Corporation

By: _____
Attorney-in-Fact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PDF File
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02 Property & Decon Policy.pdf
5/9/2013 11:14 AM
PDF File
03 Loss Control Standards.pdf
5/8/2013 1:04 PM
PDF File
3 items
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To capture image press PrintScreen
Source: &Full Screen
Destination: File; E-Mail; Printer
10/10/2013

NUCLEAR ELECTRIC INSURANCE LIMITED

Loss Control Standards

September 2005

CHAPTER 8 LOSS CONTROL PROGRAMS

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CONVENTIONS USED IN THIS MANUAL

***Green Bold Font:** Indicates a hyperlink in the document and clicking on the font style will hyperlink your cursor to that section or area of the standards.*

Red Bold Font: Indicates a change in the Loss Control Standards recently approved by the Board of Directors.

Blue Bold Font: Indicates that the discussion is Interpretative Guidance.

***"?"Green Bold Italic Font with section #:** Indicates a hyperlink to Interpretative Guidance and clicking on the font style will hyperlink your cursor to that Interpretative Guidance.*

Orange Bold Font: Indicates either a Standard that applies to the Primary Property Program only OR the Accidental Outage Program only.

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SECTION 8-1 LOSS CONTROL PROGRAM IMPLEMENTATION

SECTION 8-1A - *INTRODUCTION*
SECTION 8-1B - *DEFINITIONS*
SECTION 8-1C - *LIAISON WITH MEMBERS*
SECTION 8-1D - *LOSS CONTROL ORGANIZATION*
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SECTION 8-1F - *DESIGN REVIEWS*
SECTION 8-1G - *PROCEDURE FOR HANDLING NON-COMPLIANCE WITH Shall RECOMMENDATIONS*
SECTION 8-1H - *ADVERSE CONDITION REPORTING*
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SECTION 8-1J - *LOSS CONTROL BULLETINS*
SECTION 8-1K - *RECORD RETENTION*
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SECTION 8-1N - *CONSTRUCTION PERIOD DOCUMENT LIST*
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SECTION 8-1A - INTRODUCTION

This document provides general guidance and instructions to Members of and parties providing service to Nuclear Electric Insurance Limited (NEIL) in the areas of plant evaluations, reviews of design of insured plants and equipment inspections. This will be accomplished by outlining the responsibilities of the various organizations associated with the application of the NEIL Loss Control Standards.

All information gathered or developed through the Implementation of the NEIL Loss Control Program is intended for the exclusive use of and mutual benefit of NEIL and its Members.

The term Loss Control as used throughout this document means those activities conducted by or on behalf of NEIL to assure compliance with the Standards and associated documents adopted by NEIL. The Standards and documents are intended for use in determining compliance with NEIL requirements only and are not intended to supplant local, state, federal, or other jurisdictional requirements.

The general guidelines and instructions utilize as a basis, the Loss Control Standards, as approved by NEIL.

NEIL Loss Control Standards are developed by the NEIL staff in conjunction with the Engineering Advisory Committee (EAC) and/or the Insurance Advisory Committee (IAC). NEIL also uses some outside agency standards (e.g., American Society of Mechanical Engineers (ASME), National Fire Protection Association (NFPA), etc.) in its evaluation program.

SECTION 8-1B - DEFINITIONS

The following terms, used throughout, apply solely to this document.

A. Evaluation - An assessment of compliance with the NEIL Loss Control Standards carried out by NEIL's Loss Control Representatives.

B. Implementation - Implementation of Nuclear Electric Insurance Limited Loss Control Program.

C. Inspection - Physical observation carried out by Inspection Personnel to satisfy the requirements of the Standards.

D. Inspection Documentation - Written or computerized records or combination thereof that collectively provide the results and evidence that an inspection was performed.

E. Inspection Personnel - Personnel performing the inspections required by the Standards and employed by the NEIL Member or designated by the NEIL Member, and qualified as specified in the Loss Control Standards.

F. Loss Control Representative (LCR) - NEIL Staff members or contracted personnel who perform Boiler and Machinery (B&M) or Property/Fire Protection Evaluations and associated Loss Control functions.

G. Nuclear Service Organization (NSO) - NEIL contracted personnel who perform B&M or Property/Fire Protection Evaluations and associated Loss Control functions.

H. Shall - The Loss Control Standards stated are minimum requirements that must be met and maintained for the plant to be insurable.

I. "should" - The Loss Control Standards stated indicate recommendations. The noncompliance may result in insurance rating penalties.

SECTION 8-1C - LIAISON WITH MEMBERS

NEIL will give its Members and such Advisory Committees as they may create, the opportunity for comment upon the development of the proposed changes in the Loss Control Standards, Implementation of the Loss Control Program and all other related documents. This will be accomplished through distribution of the proposed documents or changes for review and comment by the Members and their Committees prior to the adoption thereof by NEIL. The Engineering Advisory Committee (EAC) is one of the Advisory Committees established by NEIL's members.

The EAC provides technical and engineering advice on behalf of the Members to the Board of Directors of NEIL on practices, which can reduce the likelihood of prolonged outages or extensive property damage at nuclear generating facilities. Specific attention is to be given to evaluating the appropriateness of technical measures to be adopted by the Members of NEIL and assuring the adequacy and uniformity of loss control activities, including any services performed for NEIL by contractors. Methods for evaluating the risk associated with individual plants may be included. Existing industry standards and evaluation reports will be utilized to the maximum practical extent.

The EAC serves in an advisory capacity only and has no power to make decisions binding on NEIL or its Members. However, it is appropriate for the Committee to make technical, engineering, and other recommendations. The EAC will coordinate with the Insurance Advisory Committee of the Members of NEIL on matters of common interest.

SECTION 8-1D - LOSS CONTROL ORGANIZATION

A. The Loss Control Organization is provided by NEIL staff personnel with the assistance of services provided by other organizations as necessary. The responsibilities of NEIL's Loss Control Staff are to:

1. Provide liaison with parties within NEIL concerning matters related to loss control.
2. Provide liaison with Members and their EAC concerning matters related to loss control.
3. Supervise other organizations providing loss control services to NEIL.
4. Audit loss control services to ensure a high standard of performance and uniform application of Loss Control Standards.
5. Provide advisory interpretations of Loss Control Standards as required for existing and prospective Members.
6. Maintain records in accordance with the Record Retention Schedule.

B. The Loss Control Program utilizes Loss Control Representatives (LCR's) for program evaluations, design reviews, and other Loss Control functions as outlined in this document and in the NEIL Loss Control Standards. The responsibilities of the LCR are to:

1. Perform evaluations in accordance with established procedures.
2. Participate in development, review, and implementation of the Standards.

3. Communicate with NEIL Members concerning deviations from the Standards.
4. Provide assessment of deviations from the Standards to NEIL management.
5. Provide risk assessment regarding prospective Members to NEIL management.
6. Witness and/or audit plant testing that involves systems and equipment in accordance with the NEIL Loss Control Standards.
7. Provide design consultation and review for structures, systems and components associated with NEIL Loss Control Standards.
8. Review, comment on, and accept design documents associated with the NEIL Loss Control Standards submitted by Members.
9. Review, comment on, and accept plans and procedures such as fire brigade organization and fire protection system/equipment testing procedures in accordance with the NEIL Loss Control Standards.
10. Provide Loss Control consultation in accordance with the NEIL Loss Control Standards.
11. Maintain records in accordance with Section 8-1K, Record Retention Schedule.

C. NEIL Member - The Member Shall:

1. Submit to evaluations by NEIL to assure plant conditions, Loss Control evaluations, and Loss Control activities are being conducted at least to the minimum degree outlined by the Loss Control Standards.
2. Provide a copy of the most recent edition of the NEIL Loss Control Standards to plant management and plant loss control personnel.
3. Recommendations contained in NEIL Evaluation Reports are provided for the mutual benefit of the Member and NEIL. The Member is responsible for providing NEIL with information concerning the intent for compliance with recommendations and including an implementation schedule within sixty (60) days after receipt of the Report. The Member Shall continue to report on the status of Loss Control recommendations as requested by NEIL until the recommendations are satisfactorily closed or withdrawn by letter from NEIL.

SECTION 8-1E - PLANT EVALUATIONS

The purpose of plant evaluations is to provide the Members with a report of an independent observation on the adequacy of each Member's efforts toward loss control and to provide NEIL a report on loss control activities and compliance with its Standards. The NEIL Loss Control Program utilizes the results of other inspection programs to the maximum extent possible.

A. Evaluations by Outside Agencies. Every effort will be made to utilize plant evaluations conducted by other agencies. In general, plant evaluations conducted by the Institute of Nuclear Power Operations (INPO) and the Nuclear Regulatory Commission (NRC) required fire protection program audits have been found to adequately meet the needs of NEIL. Where necessary, NEIL will review the adequacy of any inspection and/or evaluation programs intended to replace those done by these organizations on a case-by-case basis.

1. Each Member will designate a representative(s) who is responsible for submitting evaluation reports and reports of corrective action to NEIL. If no such representative has been designated, the Members' IAC Representatives will be deemed responsible for submitting reports.

2. If reports are not submitted within the specified time intervals, NEIL will contact the designated representative. Copies of correspondence to the designated representative shall be sent to the Member's EAC and IAC representative. If further action is necessary, NEIL Staff will notify the Board of Directors.
3. Evaluation reports, requested by NEIL "should" be submitted by the Member to NEIL within thirty (30) working days of receipt of the final report.
4. Where deemed necessary, NEIL will request the Member to provide reports of corrective actions taken or initiated in response to the evaluation reports.
5. NEIL will review the evaluation reports and corrective action reports within thirty (30) working days of receipt.
6. NEIL Staff, in conjunction with the EAC, will periodically review the necessity of submitting evaluation and corrective action reports.

B. Evaluation Frequency (Outside Agencies) The evaluation frequency is the maximum interval between plant evaluations and is intended to coincide with the existing evaluation frequency of outside agencies. If the following types of evaluations are conducted by the Members' company, or by an outside agency, then the associated evaluation/inspection reports Shall be submitted to NEIL or, where appropriate, authorization to review such reports Shall be provided:

1. Fire and All Risk Evaluations for Operating Plants (i.e., fire protection). Fire protection and loss control program audits, such as NRC Fire Protection Inspection Reports, Quality Assurance Department Fire Protection Audits and Assessments, and Fire Protection Programmatic Self Assessments are utilized primarily to assess the adequacy of fire protection programs including organization, administrative procedures, and quality assurance.

    a. Fire Protection Reports, listed in Section B.1 above, and a summary listing of fire protection Corrective Action Reports (CAR's) since the last evaluation Shall be provided to NEIL.

2. Overall Plant Operation Evaluations (e.g., INPO Evaluation Reports) conducted in accordance with the frequencies established by INPO or another agency acceptable to NEIL are utilized to assess overall plant operations. Particular emphasis is placed on recurring findings, or findings for which corrective action is not contemplated. (Authorization to review these reports is required by NEIL).

Note: *NEIL may request that Members furnish information on corrective action concerning potential risk conditions identified in INPO Evaluation Reports*

3. NEIL may conduct or contract to have independent evaluations performed as considered necessary to provide better loss control for any plant.

C. Evaluation Requirements by NEIL Loss Control Representatives or Contracted Personnel

1. Plant Evaluation Frequency - The typical evaluation frequency to assess risk exposure is six months; NEIL may modify this frequency as warranted by plant specific conditions and circumstances. The interval between plant evaluations will not normally exceed 12 months. Some of the factors used to determine the interval between evaluations at a plant may include, but will not be limited to:

   Open Recommendations
   Responsiveness to Recommendations
   Special Projects (i.e., major construction projects, steam generator replacements, etc.)
   Scheduled Outages
   Information Developed by Third Parties (i.e., INPO, NRC, ANI, etc.)
   Adverse Conditions
   Fire Protection System Impairments
   Recent Loss History
   Insurance Coverage Provided (i.e., Primary Property, Accidental Outage, etc.)
   Loss Control Representative Input

2. All on-site evaluations will be prearranged with the designated representative of the Member unless NEIL requires that an unannounced evaluation be performed.
3. The Loss Control Representative will confirm his evaluation in writing, setting forth an agenda of items to be reviewed.
4. The Loss Control Representative will be accompanied during the evaluation by a representative designated by the Member.

IF IN THE JUDGEMENT OF THE LOSS CONTROL REPRESENTATIVE, A CONDITION EXISTS IN WHICH EQUIPMENT IS BEING OPERATED IN DISTRESS, EQUIPMENT IS OPERATING WITH A KNOWN DEFECT WHICH SIGNIFICANTLY INCREASES NEIL'S EXPOSURE TO LOSS, OR CONDITIONS ARE OBSERVED THAT REQUIRE IMMEDIATE ACTION, THE LOSS CONTROL REPRESENTATIVE MUST IMMEDIATELY NOTIFY NEIL MANAGEMENT OF THE CONDITIONS OBSERVED.

5. The Loss Control Representative will conduct an exit interview with the appropriate supervisory personnel at the plant and should discuss:

   a. Noncompliance with the Loss Control Standards which were corrected during the evaluation. These will only appear in the "Remarks" section of the Loss Control Report.
   b. Recommendations for the correction of conditions that are not in compliance with Loss Control Standards that will appear in the Loss Control Evaluation Report.

D. Standards Revisions

1. The first evaluation conducted following the issue of a Loss Control Standard Revision will include an audit of the Member's inspection activities to meet the Standard Revision. If the Loss Control Standard Revision is not being met, then the Evaluation Report will note that this will be a follow-up item for the next evaluation.
2. The second evaluation conducted following the issue of a Loss Control Standard Revision will include a follow-up audit of the Member's inspection activities. If the Loss Control Standard Revision has not been met, appropriate Recommendations will be issued addressing the deficiency.

E. Performance of Evaluations specific to the Boiler & Machinery Loss Control Program

1. In general, the Boiler & Machinery Evaluations are comprised of the items outlined in this section. The Loss Control Representative will establish a specific agenda based on the results of previous evaluations and any issues that may have arisen since the last evaluation. Evaluation Agendas will be structured such that all aspects of the NEIL Boiler & Machinery Loss Control Standards are evaluated at least once every two years. Evaluations may include all or a portion of the following:

    a. Entrance and Exit interview with the Station Manager or his designated representative. (Note: *To be done each evaluation.*)
    b. Review of inspection activities completed since the last evaluation. (Note: *To be done each evaluation.*)
    c. Review of the plant's documents for scheduling tests and inspections to meet the requirements outlined in the B&M Loss Control Standards.
    d. Interviews with management, operations, and maintenance personnel who normally are involved in the inspection process to:
        (1) Determine benefits.
        (2) Determine deficiencies.
        (3) Solicit comments on ways to improve the Inspection Program.
    e. Review plant management's method or procedure for responding to findings resulting from inspection activities.
    f. A station tour (not intended to be an in-depth inspection) of accessible plant areas including the Control Room, Turbine Building, Reactor Building, Transformer areas, etc.
    g. A review of Inspection Personnel qualification documents may be conducted at the time of the evaluation.
    h. All Recommendations resulting from the evaluation that will appear in the evaluation report will be discussed at the exit interview. (Note: *To be done each evaluation.*)

2. B&M Loss Control Evaluation Reports

   a. Evaluation Reports will be primarily concerned with B&M Loss Control items as outlined by the NEIL B&M Loss Control Standards.
   b. Log sheets will be maintained to record each Recommendation. The Logs to be maintained are:
      (1) Log of Current Recommendations
      (2) Log of Completed Recommendations
      (3) Log of Withdrawn Recommendations
   c. The logs will be distributed with each Evaluation Report. A brief statement giving the status of a Recommendation will be entered on the log.
   d. NEIL will maintain a Log of all Recommendations that have ever been submitted.
   e. Reports of the Credits assessed for the Primary Property and Accidental Outage Insurance Programs will be distributed with each Evaluation Report.

F. Performance of Evaluations specific to the Property Loss Control Program.

1. In general, Property Evaluations are comprised of the items outlined in this section. The Loss Control Representative will establish a specific agenda based on the results of previous evaluations and any issues that may have arisen since the last evaluation. Evaluation Agendas will be structured such that all aspects of the NEIL Property Loss Control Standards are evaluated at least once every two years. Evaluations may include all or a portion of the following:

   a. Entrance and Exit interview with the Station Manager or his designated representative. (Note: *To be done each evaluation.*)
   b. Review the fire protection organization, fire prevention program, and the implementation of Hot Work and System Impairments processes.
   c. The Property Loss Control Representative will review fire brigade training and witness fire brigade drills in accordance with Section 8-1P.
   d. Testing of Equipment and Systems Associated with Loss Control.
      It Shall be the responsibility of the Member and the Property Loss Control Representative to mutually coordinate the performance of tests where it is necessary for the Property Loss Control Representative to witness these tests. These tests should normally be performed during the routine inspection of the plant. ACCEPTABLE test procedures Shall be utilized for the acceptance and periodic testing programs.
   e. The Property Loss Control Representative should witness and/or review appropriate documentation concerning the acceptance testing of fire protection systems and/or equipment.
   f. The Property Loss Control Representative should witness and/or review appropriate documentation regarding the periodic testing of all systems and/or equipment at a reasonable frequency during regularly scheduled site evaluations.
   g. The Property Loss Control Representative will determine when tests not witnessed during the evaluation will be reviewed based on the effect on the overall loss control program.

h. All Recommendations resulting from the evaluation that will appear in the Evaluation Report will be discussed at the exit interview. (Note: *To be done each evaluation.*)

2. Property Loss Control Evaluation Reports

a. Report Format - Loss Control Evaluation Reports will generally be in one of two formats as follows:

(1) Original Report - This format will be prepared for all plants. For those plants under construction, the report will be generated as the plant is constructed. For those plants already completed, the report will be generated after the original evaluation and revised to reflect major changes in conditions.
(2) Periodic Report - This format will be utilized to record information obtained during subsequent site evaluations. The Periodic Loss Control Evaluation Report will utilize the Original Report as a basic reference.

b. Reports will be primarily concerned with Property Loss Control items as outlined by the NEIL Property Loss Control Standards and should not address any details of security.

c. Log sheets will be maintained to record each Recommendation. The logs to be maintained are:

(1) Log of Current Recommendations
(2) Log of Withdrawn Recommendations
(3) Log of Completed Recommendations
(4) Log (1) will be distributed with each Periodic Report. Log (2) will be distributed with each original report. A brief statement giving the reason for withdrawal of a recommendation will be entered under the "Status" column on the Log of Withdrawn Recommendations. Log (3) will be distributed with each Original Report.

d. NEIL will maintain a log of all Recommendations that have ever been submitted.

G. Action Concerning Loss Control Evaluation Reports

1. After completion of each evaluation, the Loss Control Representative will prepare a report in the applicable format. The draft report will be reviewed in accordance with NEIL Staff procedures, and the published report will be distributed by NEIL to the Member within thirty (30) days of the evaluation.
2. The Recommendations contained in Loss Control Evaluation Reports are provided for the mutual information and benefit of the Member and NEIL. The Member Shall be responsible for providing NEIL with information concerning intent for compliance with Recommendations within sixty (60) days after receipt of the report.

3. Recommendations will only be withdrawn from the Loss Control Evaluation Report only for the following reasons:

   a. Upon appeal by the Member to NEIL with information provided that explains why the Recommendation is not warranted.
   b. Upon receipt of notification that the Recommendation has been complied with or upon re-evaluation it is verified that the condition no longer exists.
   c. Upon receipt of notification from the Member that the Member will accept a rating penalty in lieu of complying with the Recommendation.
   d. Approval of a Professional Judgment Review or Variance for the identified condition.

SECTION 8-1F - DESIGN REVIEWS

The NEIL Loss Control Standards provide that structures, systems and components associated with Loss Control meet specific requirements. In order to ascertain that these requirements are met, it is necessary that NEIL review the design of these systems. This design review also serves to provide the Member (or prospective Member) advice in Loss Control practices.

A. New Construction

This section is intended to describe the process for new plant construction.

To accomplish the necessary design review and provide Loss Control consultation, it is necessary to become involved in the review process at a very early stage in the design of structures, systems and components. The design review may be accomplished in the following steps:

1. Concept review
   a. Initial Meeting:
      (1) Purpose: To explain the NEIL Loss Control philosophy, discuss the general framework of the NEIL Loss Control Standards and the "Implementation of the Nuclear Electric Insurance Limited Loss Control Program," and to establish lines of communication.
      (2) When: Prior to any detailed design of structures, systems and components.
      (3) Suggested Attendees: Members' Risk Manager, key company representatives with project responsibilities, key Architect-Engineer representatives with project responsibilities if applicable, the NEIL Member's Engineering Advisory Committee representative and the NSO Loss Control Representative.
   b. Second Meeting:
      (1) Purpose: To review preliminary design(s), Loss Control Standards, and flow of information.
      (2) When: Following submission of plans and documents to NEIL.
      (3) Suggested Attendees: Same as A.1.a.(3) above.
   c. Other Meetings:
      (1) It is anticipated that additional meetings will need to be scheduled to discuss specific details of design. Either the Member or NEIL should initiate meetings on an as needed basis.

Note: *Copies of the NEIL Loss Control Standards and "Implementation of Nuclear Electric Insurance Limited Loss Control Program* need to *be made available by the Member to those involved in the Loss Control Program prior to the Initial Concept Review Meeting.*

2. Design Review - NEIL will provide ACCEPTANCE and/or consultation during the concept design and construction stages of the project. NEIL must accomplish review of all designs affecting Loss Control as the specifications and plans are generated for the overall system(s) including details of the structures, systems and components.

3. Items to be Reviewed - All designs, specifications, and procedures for all structures, systems and components which affect Loss Control as outlined in the NEIL Loss Control Standards need to be reviewed. This applies to all new plant construction. (See Section 8-1N, Construction Period Document List and Section 8-1O, Completed Plant Document List).

The design review can be accomplished by following the steps outlined in section "C" listed below.

B. Operating Plant Design Review Process

This section is intended to review the process for operating plants involving construction, renovations and additions to existing and new structures, systems and components.

The NSO Loss Control Representative needs to explain the NEIL Loss Control philosophy, discuss the general framework of the NEIL Loss Control Standards and the "Implementation of the Nuclear Electric Insurance Limited Loss Control Program," and to establish lines of communication with the plant

To accomplish the necessary design review and provide Loss Control consultation, it is necessary to become involved in the review process at a very early stage in the design of operating plant construction, additions and renovations.

The design review can be accomplished by following the steps outlined in section "C" listed below.

C. Review Responsibilities and Communications

1. General Responsibility of Member:
   a. Shall have the necessary conceptual and design drawings and specifications submitted to NEIL.
   b. Shall require that all vendor and contractor design specifications affecting NEIL Loss Control be subject to the review and acceptance by NEIL.
2. General Responsibility of the NSO Loss Control Representative
   a. Must assure that all designs submitted are reviewed in a timely manner.
   b. Must provide ACCEPTANCE and/or comments for design consistent with the NEIL Loss Control Standards.
3. Communications
   a. The Member Shall provide a minimum of one copy of each of the Loss Control subject plans, drawings, or specifications to NEIL. NEIL will retain this copy. If the

Member desires that additional copies be stamped and returned, a sufficient number needs to be provided in the original submittal.

b. NEIL will review the design documents supplied and respond within thirty (30) calendar days.
c. NEIL must provide ACCEPTANCE and/or comments in the following form and distribution:

(1) NEIL response will be in the form of a formal letter where the submittal was via formal letter. Where the submittal was via e-mail the response may be by e-mail. The response will address non-compliance with the NEIL Loss Control Standards as follows:

(a) Shall items that are in noncompliance with the NEIL Loss Control Standards. These items will be prefaced: "The following recommendations are listed in accordance with the Nuclear Electric Insurance Limited Loss Control Standards. Compliance Shall be met and maintained for the property to be insurable."

(b) "should" items that are in noncompliance with the NEIL Loss Control Standards. These items will be prefaced: "The following recommendations are listed in accordance with the Nuclear Electric Insurance Limited Loss Control Standards. A noncompliance with "should" recommendations may result in insurance rating penalties."

(c) Items that are not necessarily required by the NEIL Loss Control Standards. These items will be prefaced: "Other Items Not Related to NEIL Loss Control Standards."

(2) Plans, Drawings, and Specifications: When received from the Member, must be reviewed by NEIL, and necessary recommendations for compliance with the NEIL Loss Control Standards clearly indicated in the comment document. If the Member desires returned stamped documents, the documents must be stamped as "reviewed," with the date of the comment document clearly indicated on each page of any drawings and the title page of any specifications along with the reviewer's signature.

(3) Distribution of the Comment Document and ACCEPTANCE documents must be made as follows:

(a) Original of Comment Document with any return requested stamped documents to the party that submitted documents for review.
(b) Copy of Comment Document with one copy of documents to the NEIL Design Review files.
(c) Copies of Comment Document to the Member Insurance Advisory Committee Representative and the Engineering Advisory Committee Representatives and any other person designated by the Member.

When materials cannot be submitted by mail or e-mail due to proprietary or safeguards concerns, a site visit may be necessary for the review.

Guideline for a NEIL Design Review Submittal

If a planned addition, renovation or alteration involves a structure, system or component that is (or will be) insured by NEIL and the change is intended to be permanent (i.e., in place over 180 days), and any of the questions outlined below are answered yes, then the project requires a NEIL Design Review.

Additions, renovations or alterations which change 10% or more of the design criteria of the structure, system or component are subject to a NEIL Design Review.

If there is a question regarding submittals of Design Reviews, contact the NEIL/NSO Loss Control Representative assigned to your plant. The Member is responsible for meeting all requirements of the NEIL Property Loss Control Standards (PLCS).

1. Is this design change a new structure? See PLCS 8-1F, section A.

2. Does the addition, renovation or alteration change the occupancy classification of any part of a NEIL insured structure? See PLCS 8-1F, Section B.

3. Does the design change involve the addition of a new NEIL required fire protection system? See PLCS 8-3, section 3D.

4. Does the change significantly add to, renovate or alter an existing NEIL required fire detection or fire protection system? . For example, this does not include relocation of less than 10% of the fire detectors or suppression heads/nozzles for a single system while still maintaining code compliance. See PLCS 8-3, section 3D.

5. Does the change create an addition to an existing NEIL insured structure? See PLCS 8-1F, Section B.

6. Does the change involve replacement of the roof decking and/or covering such that it would not meet the requirements of the NEIL Property Loss Control Standards, Section 3.C.5 and Appendix 3.C.5?

7. Does the design change affect an interior finish such that it would not meet the requirements of the NEIL Property Loss Control Standards (PLCS), Section 3.C.2.?

8. Does the design change reduce the fire rating of a NEIL required fire rated barrier? See PLCS 8-3, section 3C.

9. Does the design change add to, renovate or alter the fire protection water supply or distribution systems, or, use the fire protection water supply and distribution systems for other than emergency use? See PLCS 8-3, section 3D.

10. Does the design change add to, renovate or alter the cooling tower fill or supports? See PLCS 8-3, section 3D8.

11. Does the design change add oil filled components over 50 gallons oil capacity? See PLCS 8-3, section 3D.
12. Does the change add to, renovate or alter oil collection systems, fire barriers or fire protection systems for oil filled components? See PLCS 8-3, section 3D.

SECTION 8-1G - PROCEDURE FOR HANDLING NONCOMPLIANCE WITH Shall REQUIREMENTS

Evaluations of NEIL Member Plants may periodically identify instances of noncompliance with minimum NEIL requirements (Shall requirements) contained in the NEIL Loss Control Standards. While by definition Shall requirements are intended to be the minimum required for insurability, the identification of such a noncompliance does not automatically result in suspension of coverage. Subject to the provisions of the policy, this procedure is intended to outline the process to be followed when such a noncompliance is identified during plant evaluations.

A. Upon being notified of the noncompliance, NEIL will contact the Member to determine what, if any, corrective action is planned.

B. If the Member agrees to comply, a mutually agreeable course of action and implementation schedule will be established.

C. If the Member determines that the plant will not or cannot comply, a written request for a Variance from the Loss Control Standards Shall be submitted to NEIL within 60 days of the evaluation report, providing details on why the variance is necessary.

    1. Variances will be issued by NEIL only when the intent of a Shall requirement will not be met, but where NEIL has determined specific conditions are such that the risk is not significantly increased. A Variance may be either temporary or permanent.

2. Any request for a Variance to a Shall Standard must be directed from the requesting Member to NEIL for consideration.
3. Each request must include a justification for the Variance, why the Variance is needed, length of time the Variance is needed and information on the time frame in which a decision is needed.

D. NEIL will review the Variance request and respond in one of the following ways:

1. Grant the Variance request.
2. Deny the Variance request and endorse the plant's NEIL Policy as appropriate to limit or exclude coverage for losses resulting from failures involving plant equipment or facilities associated with the non-compliance.
3. Where appropriate, NEIL or the Member Utility may request a review and recommendation from the Executive Committee of the Engineering Advisory Committee. Based on the EAC Executive Committee's recommendation, NEIL may grant the Variance request or may deny the request and endorse the NEIL policy as described in D.2 above.

E. In instances where Variance requests are denied, the Member may request a review and ultimate decision by the NEIL Board of Directors.

F. A record of all decisions on Variances must be maintained by NEIL.

SECTION 8-1H - ADVERSE CONDITION REPORTING

NEIL Members (Primary Property and Accidental Outage Policies) Shall report to Nuclear Service Organization (NSO) any condition, which if allowed to continue uncorrected, could result in a significant property damage incident or loss. Reportable conditions including, but not limited to, the following categories Shall be reported to NSO by telephone (facsimile, e-mail) *when they are identified:*

A. Continued operation of equipment where damage is known or suspected that could result in;

   1. Physical damage in excess of $500,000 to insured property, including consequential damage, OR
   2. An outage longer than ten (10) weeks.

B. At rated speed and stable conditions, vibration levels that enter or exceed the Adverse Condition Alert Range, Rotating Equipment Vibration Guidelines.

C. Test results of transformer insulating oils outside the acceptable limits by 10% or more the values of the Institute of Electrical and Electronic Engineers (IEEE) C57.106-1991 (pg. 20, Table 5), or dissolved gas-in-oil levels exceeding by 10% or more the norms established in IEEE C57.104-1991 (pg. 23, Table 4).

D. Continued operation following discovery of crack indications involving turbine-generator components, the magnitude and growth rate of which may require equipment replacement in five years or less.

E. Continued operation with failed or defeated safety devices (except those undergoing routine maintenance or calibration), which could lead to a turbine water induction incident or turbine overspeed.

NUCLEAR ELECTRIC INSURANCE LIMITED
ADVERSE CONDITION / INCIDENT REPORT

This is a "Suggested Report Format". Nuclear Service Organization (NSO) can be notified in any format, as long as the following information is provided.

Send to NSO by: Phone: 302-888-3000
Facsimile: 302-888-3095
E-Mail to: **nso@nmlneil.com**

Plant: _____ Date: _____

Person to Contact Concerning This Report:

Name: _____ Phone Number: _____

NSO will call to establish a dialogue and obtain additional information as necessary.

Date Adverse Condition Determined / Incident Occurred: _____

Brief Description of Adverse Condition / Incident:

SECTION 8-1I - INCIDENT REPORTING

This section provides guidance regarding the reporting of incidents for documentation, data collecting, and engineering purposes and, *IS IN ADDITION TO THE ALREADY ESTABLISHED CLAIM FILING PROCEDURES.*

A. NEIL Members (Primary Property and Accidental Outage Policies) are to report Incidents in the following categories to NSO by telephone (facsimile, e-mail) *as soon as possible after the occurrence of:*

1. Any fire involving activation or malfunction of a fixed fire extinguishing or detection system.

   OR

2. Any physical damage loss in excess of $100,000.00

B. Reporting of incidents below the limits or conditions stated in A.1 and 2 above, while not required, is nevertheless of value to NEIL, and accordingly, this incident reporting is encouraged.

Suggested Report Format (Contained in Section 8-1H)

SECTION 8-1J - LOSS CONTROL BULLETINS

A. The purpose of a Loss Control Bulletin is to address matters vital to loss control. A bulletin is issued (1) to introduce new loss control subjects or (2) to clarify existing Loss Control Standards or (3) to provide interim guidance or (4) to provide information concerning losses and other significant events.

B. Each bulletin is normally developed and distributed by NEIL. Bulletins are sequentially numbered, by year.

C. Each bulletin will use the same format and include the following topics.

1. Title
2. Background
3. General Discussion
4. Clarification (when applicable)
5. Conclusions
6. Interim Guidance

D. The interim guidance section included in each Loss Control Bulletin may be followed pending cancellation of the Bulletin or appropriate revision of Loss Control Standards.

E. Loss Control Bulletins are in **Section 8-4**.

LOSS CONTROL BULLETIN FORMAT

BULLETIN (NEILYY-SERIAL)

NUCLEAR ELECTRIC INSURANCE LIMITED
BOILER &MACHINERY/PROPERTY LOSS CONTROL BULLETIN

NEIL Loss Control Bulletins deal with matters vital to Loss Control and are (1) issued to introduce new Loss Control Subjects, or (2) for clarification of existing NEIL Loss Control Standards, or (3) to provide interim guidance.

HEADINGS (As Needed)

I. TITLE

II. BACKGROUND

III. GENERAL DISCUSSION

IV. MEMBER ACTIONS

V. CLARIFICATION (Where Applicable)

VI. CONCLUSIONS

VII. INTERIM GUIDANCE

SECTION 8-1K - RECORD RETENTION

NEIL will be responsible for the retention of all records in accordance with this schedule. Files containing such records may be subject to audit.

	Record Type	Retention Interval
A.	Loss Control Representative Qualifications and Training	Individual Employment Duration
B.	Property Original/Periodic Reports B&M Evaluation Reports	Insurance Policy Duration
C.	Logs of Recommendations Issued	Insurance Policy Duration
D.	Members Response to Log in "C"	Insurance Policy Duration
E.	All design review documents including drawings, plans, specifications, NEIL LCR comment letters and Members' Responses	Insurance Policy Duration
F.	Insurance Site Description Maps	Current Edition
G.	General Loss Control Correspondence	10 years
H	EAC Audit Reports of LCR's/Loss Control Program	10 Years
I.	NEIL's Response to Audit Reports	10 years
J.	Incident Reports	10 years
K.	Adverse Condition Reports	10 years
L.	Loss Control Bulletins	10 years

SECTION 8-1L - PROCEDURE FOR HANDLING INFORMATION ON POTENTIAL RISKS

A. GENERAL INFORMATION REVIEW

NEIL receives information with respect to events which may disclose the existence of significant risks of loss to NEIL from a number of sources such as: trade journals, NRC publications, insureds' loss reports, and INPO Significant Event Reports (SER) and Significant Operating Experience Reports (SOER), which it receives directly from INPO. Where information received suggests a significant risk but insufficient data is available, NEIL should develop the necessary data using any available source. The following procedure will be followed:

1. NEIL reviews or distributes information for review as appropriate to consultants with experience in three areas: Nuclear Operations, Boiler and Machinery Loss Control, and Property Loss Control.
2. In cases where no SER or SOER has been issued, NEIL will provide INPO with any information, which it feels, should be considered as the basis of a SER or a SOER. NEIL will also provide INPO with a brief statement outlining the reasons it feels the issuance of a SER or a SOER should be considered, and after review by the EAC and NSO, may suggest recommendations which should be included in a SOER.
3. If INPO does not intend to issue a timely SOER addressing NEIL's concerns, or if recommendations contained in an SOER do not adequately address such concerns, NEIL shall submit a proposed Loss Control Bulletin to the EAC or EAC Subcommittee. After reviewing any comments made by the EAC or EAC Subcommittee concerning the Loss Control Bulletin, NEIL may issue such a Bulletin, as it deems necessary.

B. IMMEDIATE SERIOUS EXPOSURES

If through the above reviews or by other means, NEIL identifies a dangerous condition, or a failure to comply with its Standards with respect to the qualifications of a member insured's personnel or operating and maintenance practices, and such condition or failure presents an immediate serious exposure to NEIL, the following procedure will be followed:

1. NEIL contacts the Member insured to verify the condition and assess the appropriateness of any proposed corrective action. If the situation warrants, NEIL notifies the Chairman of the NEIL EAC and the NEIL IAC of the situation, and requests a recommendation.
2. The Chairman of the EAC considers whether further action is necessary and may submit the matter for consideration to the EAC, the Executive Committee of the EAC, one of the EAC Subcommittees, or an ad hoc group from the EAC, as he deems appropriate. If necessary because of time constraints, he may simply make his own recommendation.
3. The EAC Chairman submits the results of Step 2 to NEIL.
4. If in the opinion of the NEIL Staff, time does not permit the completion of all of the steps set forth in 1 and 2 above, NEIL Staff may make a recommendation to the Board of Directors before these steps are completed.
5. NEIL informs the insured of the desired action, reflecting to the extent appropriate, the recommendation made in Step 4 above.
6. NEIL monitors the plant situation through appropriate contacts at the Member utility.

7. If the insured's response does not adequately address NEIL's concerns, NEIL gives appropriate notice of suspension of coverage, either generally or with respect to a particular plant element, to the insured.
8. Upon notification that the condition has been corrected, NEIL may initiate appropriate action to reinstate coverage, if coverage was suspended.

SECTION 8-1M - DOCUMENT SUBMITTAL LIST FOR PROSPECTIVE NEIL MEMBERS WHICH Shall BE SUBMITTED TO NEIL

A General:

1. Overall layout drawing of the entire site (plot plan) showing all major buildings and equipment.
2. General arrangement drawings of all buildings showing the location of major equipment on each elevation.
3. FSAR/PSAR sections on site related events (Section 2).

B. Fire and All Risk:

1. Fire Hazard analysis
2. Two most recent fire protection/property loss control reports conducted by current insurer and utility responses to those reports.
3. Most recent annual and triennial fire protection audit reports (if applicable) and utility responses to those reports.

C. Boiler and Machinery:

1. Two most recent Boiler and Machinery Evaluation Reports conducted in accordance with frequencies established by current insurance carrier (i.e. Pressure System and Machinery Reports), and utility responses to those reports.
2. List of all outstanding Boiler and Machinery Recommendations.
3. Test result reports for various pieces of machinery (i.e., turbine-generators, diesel generators, etc.) as specifically requested.

D. Operations:

Provide Authorization to review any of the INPO Reports and information listed below:

1. Evaluation Reports (if applicable)
2. Six-Month Status Reports (if applicable)
3. Start-up Assistance Visit Reports (if applicable)
4. Near Term Operating License Reports (if applicable)
5. Responses to above Reports (if applicable)
6. Current status of INPO SOER recommendation compliance (utility perspective)
7. Other relevant INPO Reports or information determined necessary to adequately evaluate NEIL's exposure

E. NRC Reports and Information:

1. ROP Reports (the performance indicator (PI) program, the inspection program, the significance determination process (SDP), and the licensee assessment program) and responses (if applicable)
2. Appendix "R" Inspection Reports and responses (if applicable)
3. Self-Assessment Reports
4. Audit Reports (Quality Assurance)

F. Other relevant reports as determined necessary to adequately evaluate NEIL's exposure.

SECTION 8-1N - CONSTRUCTION PERIOD DOCUMENT LIST

A. Examples of Construction Period Documents / Drawings / Specifications to be submitted for review, ACCEPTANCE, and/or comment by NEIL for the plant under construction and construction associated facilities.

1. Overall layout of entire construction site (plot plan). Identification of all buildings where the buildings and contents' insurable values will exceed $150,000.
2. Construction and occupancy drawings for all buildings, including wind design criteria.
3. Layout of warehouse storage configurations (i.e., details on rack storage arrangements).
4. Details of the construction water supply for use in fire protection during construction (source and pumping) to include hydraulic calculations for the largest fixed water extinguishing system.
5. Working drawings for all fire protection related systems; sprinklers, deluge, CO2, Halon, underground piping, hydrants, control valves, standpipe systems, detection systems, alarm systems, supervisor systems, etc.

B. Written procedures addressing the following are to be submitted to NEIL for review, ACCEPTANCE, and/or comment:

1. Private Fire Brigade program.
2. Property Loss Control Surveillance program.
3. Welding and Cutting (hot work) control program.
4. Impaired Fire Protection System procedure.

C. Information is to be submitted to NEIL for review and acceptance on the following subjects:

1. Use of temporary construction structures, enclosures, trailers inside of permanent buildings. Include information on type of construction materials and fire protection to be provided.
2. Type of scaffolding and form work (i.e., ordinary combustible or fire retardant.) (Review covers only fire potential of scaffolding and form work.)
3. Type of heating devices, including those used on a temporary basis.
4. Fire extinguishers and temporary standpipes.
5. Gas Welding Systems.

SECTION 8-10 - COMPLETED PLANT DOCUMENT LIST

A. Examples for the Completed Plant Documents / Drawings / Specifications to be submitted for review, ACCEPTANCE and/or comment by NEIL for the completed plant.

1. Fire barrier wall delineation drawings to include door schedules and treatment of other penetrations through fire barrier walls and floors.
2. Fire protection systems. This is intended to include all underground piping, hydrants, control valves, fire water supply and/or storage, fire pumps, detection systems, sprinkler systems, other fire suppression systems, and alarm systems, as well as supervisory systems. It is particularly important that the bid specification for fire pumps and accessories be submitted before the contract is awarded.
3. Building construction to include lightning protection, roof deck assemblies, interior and exterior walls, insulation, ceiling materials, and floor coverings.
4. Wind design criteria.
5. Specification drawings and calculations for smoke and heat venting.
6. Drawings showing protection for the oil and hydrogen hazards associated with the turbine-generators and other equipment. Details of oil piping, bearing protection, hydrogen seal oil units, hydrogen piping, and hydrogen storage are included in this classification.
7. Drawings of fire protection systems designed to protect against fire hazards associated with other oil filled equipment. Examples: Large transformers (including any fire barrier walls), feed water pumps, main coolant pumps, hydraulically operated valves, diesel generators, motor generator sets, etc.
8. Cooling tower details to include materials of construction, fire protection systems (if any), and lightning protection.
9. Specifications and fire protection for charcoal filters.
10. Layout of warehouse storage configurations and other concentrations of combustibles.
11. Layout of standpipe and hose systems.
12. Layout of fire extinguishers including size and type of units to be used.
13. Criteria for all cable to include type, fire test results, and cable tray fill.
14. Specifications for bulk storage and handling of combustible liquids, flammable liquids, and flammable gases.
15. Specifications for combustion controls on gas or oil fired equipment.
16. Drawings depicting transformer oil spillage containment and drainage.
17. Details for temporary new fuel storage arrangements.

B. Written procedures addressing the following are to be submitted to NEIL for review, ACCEPTANCE, and/or comment:

1. Private Fire Brigade program.
2. Property Loss Control Surveillance program.
3. Welding and Cutting (hot work) control program.
4. Impaired Fire Protection System Procedure.

SECTION 8-1P - WITNESSED FIRE BRIGADE DRILLS

A. PURPOSE - To evaluate the effectiveness of the Plant Fire Brigade Program implementation.

B. FREQUENCY - A Fire Brigade Drill Shall be arranged by the plant so that it can be witnessed by the Property Loss Control Representative annually.

B.1. If the plant personnel are agreeable, it is recommended that the fire brigade drills be held at each evaluation.

B.2. In either case, this does not relieve plant personnel of the responsibility for conducting Fire Brigade Drills in accordance with the frequency required in the plan prepared in accordance with Section 3.A.1. of the Property Loss Control Standards.

B.3. NEIL, through the discretion of the NSO Property Loss Control Representative may extend the frequency for witnessing fire brigade drills to a maximum of 24 months using the following criteria:

1. Performance of the fire drill would affect plant safety due to an unexpected plant condition.
2. Drill Performance previously witnessed by NSO has been ACCEPTABLE.
3. A review of previous drill critiques and corrective actions taken show management attention to fire brigade performance and improvement.
4. NSO has not identified problems with the content and implementation of the fire brigade program.

C. IMPLEMENTATION - The Property Loss Control Representative must consult with the owner's Senior Representative or his delegate at the site on a Fire Brigade Drill.

Examples:

1. Simulated truck fire in Fuel Unloading Area,
2. Simulated cable tray fire in Cable Spreading Room,
3. Simulated transformer fire, simulated switchgear fires, etc.

If permission is granted by the owner's Senior Representative or his delegate, the drill will be initiated by the use of the plant alarm system.

D. EVALUATION - The Property Loss Control Representative will evaluate the Fire Brigade's response in accordance with Appendix 3.A.1.

E. COMMENTS/RECOMMENDATIONS - The Property Loss Control Representative will submit appropriate comments, and if necessary, Recommendations on his report.

SECTION 8-1Q - NEW OR PROSPECTIVE MEMBERS

Arrangements for the items listed below should be coordinated by NEIL.

A. Prospective Members - NEIL will arrange an initial visit to the prospective Member plant to:

1. Review the prospective Member's related inspection activities using the NEIL Loss Control Standards as a guide.
2. Explain the scope and purpose of the Loss Control Standards to management personnel.
3. Conduct an exit interview with the designated personnel outlining all known deviations from Shall or "should" items contained in the Standards.

B. New Member - The following procedure will be used to assure a smooth transition to compliance with the NEIL Loss Control Standards.

1. A preliminary meeting of the Member's designated management personnel and NEIL will be conducted to:

   a. Explain the Standards.
   b. Determine the proposed degree of involvement of the Inspection Personnel in complying with the NEIL Loss Control Standards.
   c. Establish communication channels between the Member and NEIL.
   d. Resolve concerns about the purpose, scope, and intent of the NEIL Loss Control Standards.
   e. Establish procedures for scheduling evaluation activities.

2. A pre-evaluation meeting at the plant with personnel designated by the Member's management will be conducted to:

   a. Explain the NEIL Loss Control Standards and their intent.
   b. Outline the relationship between the Member and NEIL.
   c. Establish an evaluation schedule and an evaluation notification procedure.

SECTION 8-1R - FIRE PROTECTION SYSTEM IMPAIRMENT NOTIFICATION

The Member Shall establish in writing and enforce an ACCEPTABLE impaired protection procedure for fixed systems. Impairments Shall be as short in duration as possible and every effort made to restore protection to service. The fire brigade chief, or equivalent designee, Shall be notified of each impairment. NEIL "should" be notified of each impairment, when the duration is expected to exceed 48 hours.

NUCLEAR ELECTRIC INSURANCE LIMITED
FIRE PROTECTION SYSTEM IMPAIRMENT NOTIFICATION

This is a "Suggested Report Format". Nuclear Service Organization (NSO) can be notified in any format, as long as the following information is provided.

Send to NSO By: Facsimile: 302-888-3095 E-mail: **nso@nmlneil.com**

Plant: _____ Date: _____

Person to Contact Concerning This Report:
Name: _____ Phone Number: _____

Impairment Number (If Applicable): _____

System Impaired:

☐ Wet Pipe	☐ Dry Pipe	☐ Fire Main, Hydrants, Valves
☐ Deluge	☐ Preaction	☐ CO2
☐ Halon	☐ Fire Pump	☐ Other_____

Description of Impairment (Include Valve / Equipment Tag No.):

_____

_____

Reason for Impairment:

_____

_____

Location of Impairment (Include Area / Equipment Protected):

_____

_____

Compensatory Action Taken:

_____

_____

Date Impairment Occurred: _____
Date Expected Return To Service: _____
Actual Date Returned To Service: _____

Note: *NEIL requires notification of impairments to fire suppression systems, which exceed, or are expected to exceed 48 hours.*

QUESTIONS? Call NSO at: (302) 888-3000

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SECTION 8-2 BOILER & MACHINERY LOSS CONTROL PROGRAM

SECTION 8-2A - B&M LOSS CONTROL STANDARDS
SECTION 8-2B - EQUIPMENT LIST
SECTION 8-2C - TRANSFORMER TESTING FLOWCHART & GUIDELINES
SECTION 8-2D - VIBRATION GUIDELINES
SECTION 8-2E - REFERENCED DOCUMENTS
SECTION 8-2F - PRIMARY PROPERTY PROGRAM B&M CREDITS
SECTION 8-2G - ACCIDENTAL OUTAGE PROGRAM B&M CREDITS

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SECTION 8-2A BOILER & MACHINERY LOSS CONTROL STANDARDS

NOTE: *When there is a green question mark followed by a Section Number (? xxx), Interpretive Guidance exists in* ***Section 14A*** *Starting on* ***Page 359*** *click on the ?xxx to obtain additional information.*

I. Purpose and Scope

II. Definitions

III. Inspection Personnel

IV. Minimum Inspection Program

Standards - Table Format (Table IV.C)
Standards - Narrative Format

Notes

I. PURPOSE AND SCOPE

These Boiler & Machinery (B&M) Loss Control Standards establish minimum inspection requirements for insured equipment and provide assurance that such minimum requirements are met. These B&M Loss Control Standards are applicable to all NEIL Members whose properties are insured by NEIL under the Primary Property Insurance Program and/or the Accidental Outage Insurance Program. The inspection requirements apply to all insured operating plants and to operating equipment in plants awaiting decommissioning or in the decommissioning process.

II. DEFINITIONS

The following is a glossary of terms, applicable only to these B&M Loss Control Standards:

A. ACCEPTABLE - Meets the requirements of NEIL.

B. B&M Loss Control Representatives - NEIL Staff members or contracted personnel who perform the B&M evaluations.

C. Critical Lift - Lifts involving equipment and/or materials which, if failure or personnel errors were to occur, could cause physical or consequential damage in excess of $500,000, an outage longer than ten (10) weeks, or could cause a significant spread of contamination or uncontrolled radioactive release to the environment. Provided that any of the above conditions are met, such lifts include, but are not limited to:

1. Lifts involving the handling of large primary coolant system components; primary containment system components; turbine/generator components; fuel elements; large radiation shielded shipping casks; radioactive/contaminated materials; equipment or supplies handled over spaces in which high value or safety related equipment or systems are located.
2. Load to be lifted exceeds 85% of the rated capacity of the crane configuration, including consideration of load radius and/or rigging equipment where applicable.
3. Load is to be lifted by more than one crane simultaneously.

D. Evaluation - An assessment of compliance with the NEIL B&M Loss Control Standards, carried out by NEIL's B&M Loss Control Representatives.

E. Examinations - Non-destructive examination of components

F. Fuel Cycle - That period between the start of one Refueling Outage and the start of the next Refueling Outage for the same unit. In the case of operating equipment in a plant where fuel has not been loaded, a plant undergoing or awaiting decommissioning, a plant in extended shutdown (greater than 18 months), or a fossil plant, this period is eighteen (18) months. (For plants with Fuel Cycles less than 18 months, 18 calendar months may be substituted for Fuel Cycle.)

G. High Value Equipment - Equipment with a value of $500,000 or more.

H. Implementation - Implementation of the Nuclear Electric Insurance Limited Loss Control Program.

I. Inspection - Physical observation carried out by Inspection Personnel to meet the requirements of these Standards.

J. Inspection Documentation -Written, printed, computer-generated records, or a combination thereof that provide the results of and evidence that an inspection was performed.

K. Inspection Personnel - Personnel performing the inspections required by these Standards and employed by the NEIL Member or designated by the NEIL Member, and qualified in accordance with Section III of the Standards.

L. Observation - The act of verifying that general conditions such as pressures, temperatures, fluid levels, etc. are being maintained (i.e. - operators rounds, system engineer walk-downs).

M. Performance Degradation - Comparison to established reference values show deviations beyond pre-determined limits adopted by the Member.

N. Shall - The Standards stated are minimum requirements that must be met and maintained for the plant/property to be insurable.

O. "should" - The Standards stated indicate recommendations. Noncompliance may result in insurance rating penalties.

P. Surveillance - Operational testing in accordance with established procedures to determine that performance criteria are being met.

III. INSPECTION PERSONNEL

The inspections described in Section IV of these Standards Shall be carried out by Inspection Personnel as designated by the Members.

A. Supervisory personnel involved in providing or reviewing Boiler & Machinery inspections are to:

1. Have attained a Bachelor of Science Degree in Engineering from an accredited institution plus four years experience in the design, construction, operation or repair of nuclear steam supply system components, high pressure boilers, or turbine-generators, or;
2. Have attained the equivalent of a High School Education plus ten years experience in the design, construction, operation, or repair of nuclear steam supply system components, high pressure boilers, or turbine-generators.

B. Personnel performing Boiler & Machinery inspections are to:

1. Have a minimum of five years experience in the design, construction, operation, maintenance, or inspection of nuclear steam supply systems, high pressure boilers, turbine-generators and related equipment, or;
2. Have an adequate knowledge of the inspection requirements of these NEIL B&M Loss Control Standards.

C. Supervisory personnel involved in providing or reviewing cranes, rigging, or fuel and material handling equipment inspections are to:

1. Have attained a Bachelor of Science Degree in Engineering from an accredited institution plus four years experience in the design, operation, or repair of cranes, rigging, or fuel and material handling equipment, or;
2. Have attained the equivalent of a High School Education plus ten years experience in the design, operation, or repair of cranes, rigging, or fuel and material handling equipment.

D. Personnel performing crane, rigging, and fuel and material handling equipment inspections are to:

1. Have a minimum of five years experience in the design, operation, repair, or maintenance of cranes, rigging, or fuel and material handling equipment, or;
2. Have an adequate knowledge of the inspection requirements of these B&M Loss Control Standards.

IV. MINIMUM INSPECTION PROGRAM

A. Member Requirements

1. The Member Shall develop inspection, maintenance and operating documents pertaining to the equipment covered by the NEIL B&M Loss Control Standards for each plant insured by NEIL. The documents describing and governing these activities Shall be made available to NEIL.
2. If a Member does not plan to comply with the minimum requirements outlined in these NEIL B&M Loss Control Standards, then the Member Shall submit to NEIL, for review and approval, a proposal addressing alternate actions which will be performed in lieu of those in the NEIL B&M Loss Control Standards. (See **Section 8-1G** for procedures to request a Variance).
3. In order to satisfy the minimum requirements of NEIL, the Member Shall provide verification of all examination and testing required under the established ASME Code, Section XI, Inservice Inspection and Testing Program.

4. Components and systems listed in Table IV.C, which fall within the scope of the ASME Code, Section XI, Shall be inspected in accordance with that Code, in lieu of these B&M Loss Control Standards.
5. Components and systems listed in Table IV.C, not within the scope of the ASME Code, Section XI, are to be inspected in accordance with these B&M Loss Control Standards.

B. Applicable Standards based on Policy Coverage - In June 1999, the Loss Control Programs for Primary Property and Accidental Outage Policies were consolidated. The objective of the consolidation was to impose no new requirements on Members who do not have both Primary Property and Accidental Outage Coverage. This objective is met by:

1. The NSO Loss Control Representatives (LCR's) will perform plant evaluations, using the consolidated Standards.

2. If the Member has Accidental Outage Coverage Only:

   a. "should" recommendations will not be issued against any Standard, however deviations will be recorded as comments.
   b. Shall recommendations will not be issued against the following Standards, however deviations will be recorded as comments:

Standard 4.2, 4.3, 4.4, 4.5, 5B, 5C, 6, 7, 8, 9, 13, 15, 16, 17.3 and 17.4, 3B (Except 3B.8 and 3B.10)
4.1, 4.6, 4.7, & 4.8 (Transformers > 100 MVA, other than Main, Auxiliary & Startup), 10 (Turbines other than Emergency Core Cooling Systems (ECCS)), 11 (Motors other than ECCS), 12 (Pumps other than ECCS)

3. If the Member has Primary Property Coverage Only:

   Shall and "should" recommendations will not be issued against the following Standard, however the deviations will be recorded as comments:

   Standard 5A

4. By writing comments, the Member will be made aware of the Standard requirements, in the event that Primary Property or Accidental Outage Policy Coverage is requested. Comments will impose no additional requirements, as no response from the Member will be required.

5. Any additional deviations from the Standards will be resolved per Member request on a case-by-case basis.

C. Inspection Schedule

1. The inspection frequencies shown for Standards 1 through 17, are those desired by NEIL to mitigate or otherwise reduce B&M losses. The inspection frequencies apply to all operating plants and to operating equipment in plants awaiting decommissioning or in the decommissioning process, except as modified by IV.B above.

? 2. Inspections and tests may be arranged so there will be no interference with power production.

3. No specific containment or drywell entries are necessary to meet the requirements of these Standards.

? 4. Items "should" be observed, inspected, or tested once within the desired inspection frequencies and Shall be observed, inspected, or tested once within the insurability frequencies.

Table IV.C

Components

Boilers
Circuit Breakers, Low and Medium Voltage
Combustion Turbines
Cranes, Rigging, Fuel and Material Handling Equipment
Deaerators
Diesel Generators
Electric Motors
Inspection Documentation
Mechanical Drive Turbines
Moisture Separator/Reheaters
Other Prime Movers and/or Driven Equipment
Pumps
Reactor Vessel
Spent Fuel Pool Chemistry
Steam Generator
Switchyard Equipment
Transformers
Turbine-Generator/Exciter

Standard Notes

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TABLE IV.C

When an item is highlighted in ***green****, click on it to obtain additional information.*

STANDARD 1 REACTOR VESSEL

Standard	Observation /Test/Inspection/Surveillance	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
1	Reactor Vessel/Internals Inspected	N/A	N/A	10 Years

STANDARD 2 STEAM GENERATOR

Standard	*Observation /Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
2	Steam Generator Inspection Program	N/A	N/A	As Required

STANDARD 3 TURBINE-GENERATOR / EXCITER

Standard 3A Turbine-Generator / Exciter - Observations

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
3A.1	Steam Pressure, Temperature	Weekly	5	3 Months
3A.2	Bearing Oil Pressure	Weekly	10	3 Months
3A.3	Bearing Vibration	Weekly	80	3 Months
3A.4	Leakage of Steam, Oil, Water	Weekly	10	3 Months
3A.5	Steam Purity	Weekly	25	3 Months
3A.6	Power Factor, Voltage, Current	Weekly	10	3 Months
3A.7	Winding Temperature/Hydrogen Usage	Weekly	50	3 Months
3A.8	Iso-Phase Bus Duct Condition	Weekly	20	3 Months
3A.9	Availability of ELOP and ESOP	Weekly	50	3 Months

Standard 3B Turbine-Generator / Exciter - Operating Tests

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
3B.1	**Simulated Overspeed Trip Test**	3 Months	150	N/A
3B.2	**Integrity of Electrical Circuits/Heaters**	N/A	N/A	1 Fuel Cycle
3B.3	**Integrity of Electrical Circuits/Valves**	N/A	N/A	1 Fuel Cycle
3B.4	**Extraction Line Check Valves**	N/A	N/A	1 Fuel Cycle
3B.5	**Extraction Line Stop/Check Valves**	1 Fuel Cycle	110	2 Fuel Cycles
3B.6	**Simulated Pressure Decay**	1 Fuel Cycle	100	2 Fuel Cycles
3B.7	**Oil Pumps Provide Adequate Pressure**	1 Fuel Cycle	100	2 Fuel Cycles
3B.8	**Solenoid Valves**	N/A	N/A	1 Fuel Cycle
3B.9	**Pressure Switches**	N/A	N/A	1 Fuel Cycle
3B.10	**Torsional Vibration Response**	N/A	N/A	As required

STANDARD 3 TURBINE-GENERATOR / EXCITER (Cont)

Standard 3C Turbine-Generator / Exciter - Dismantled Inspections (See Note 1)

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
3C.1 *	Results of NDE	72 Months	50	96 Months
3C.2 *	Review of Manufacturer's Procedures	72 Months	50	96 Months
3C.3 *	Reference to Previous Inspections	72 Months	50	96 Months
3C.4 *	Casing	72 Months	50	96 Months
3C.5 *	Bearings and Journals	72 Months	10	96 Months
3C.6 *	Packing and Glands	72 Months	70	96 Months
3C.7 *	Rotor Misalignment	72 Months	100	96 Months
3C.8 *	Nozzles, Wheels, Diaphragms, etc.	72 Months	100	96 Months
3C.9 *	Blades, Buckets	72 Months	50	96 Months
3C.10 *	Couplings, Bolting	72 Months	50	96 Months
3C.11	Control, Stop Valves	96 Months	50	120 Months
3C.12	Governor Control System	72 Months	20	96 Months
3C.13 **	Lubricating Oil **System, Primary** Pumps	72 Months	30	96 Months
3C.14	Relief, Non-Return Valves	72 Months	20	96 Months
3C.15	Field, Stator **(see Note 2)**	72 Months	50	96 Months
3C.16	Hydrogen Coolers, Windings	72 Months	50	96 Months
3C.17	Generator Enclosure	72 Months	50	96 Months
3C.18	Hydrogen Seals	72 Months	50	96 Months
3C.19	Exciter, Collector Rings	72 Months	50	96 Months
3C.20	Seal Oil System	72 Months	50	96 Months
3C.21	Rotor Retaining Rings	72 Months	100	96 Months
3C.22	Bushings	72 Months	30	96 Months
3C.23	Electrical Testing	72 Months	95	96 Months
3C.24	Iso-Phase Bus Supports, Duct Condition			
3C.24.a	**Electrical Testing**	**2 Fuel Cycles**	**50**	**N/A**
3C.24.b	**Visual Inspection**	**N/A**	**N/A**	**4 Fuel Cycles**
3C.25	Extraction Check Valves	96 Months	100	120 Months
3C.26	Drip Pots, Traps, Orifices **(See Note 3)**	1 Fuel Cycle	30	2 Fuel Cycles
3C.27	**Solenoid Valves**	24 Months	100	72 Months
*	HP Turbine & Mono-block, or Welded Rotor LP Turbines	96 Months		120 Months
**	HP Turbine Shaft-Driven LO Pumps	96 Months		120 Months

Standard 3D Turbine-Generator / Exciter - Dismantled Tests

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
3D.1	Actual Overspeed Trip Test	N/A	N/A	Maintenance on Front Standard
3D.2	Actual Overspeed Trip Test	N/A	N/A	1 Fuel Cycle
3D.3	Exciter / PMG Tests	N/A	N/A	As Required

STANDARD 4 TRANSFORMERS

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
4.1	**Observations of General Conditions**	Weekly	30	3 Months
4.2	**Top Oil, Winding Temperatures**	Weekly	30	3 Months
4.3	Protective Relay Operation	Weekly	10	3 Months
4.4	Hours Above Nameplate Rating	Weekly	10	3 Months
4.5	**Power Factor Testing**	6 Years	75	8 years
4.6	**Insulating Oil Testing**	12 Months	150	18 Months
4.7	**Dissolved Gas-in-Oil Testing**	6 Months	150	9 Months
4.8	**Additional Testing**	As Required	200	N/A
4.9	Adverse Condition Reporting	N/A	N/A	As Required
4.10	Load Tap Changer Preventive Maintenance	N/A	N/A	As Required
4.11	Load Tap Changer Internal Inspection **(See Note 6)**	15,000 Operations	100	30,000 Operations

STANDARD 5 DIESEL GENERATORS
Standard 5A Diesel Generators (Class 1E)
Standard 5A1 Operating Inspections

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
5A1.1	Testing Program	N/A	N/A	As Required
5A1.2	Load Rejection Testing	N/A	N/A	1 Fuel Cycle

Standard 5A2 Dismantled Inspections

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
5A2	Preventative Maintenance Program	N/A	N/A	As Required

Standard 5B Diesel Generators Installed As An Alternate AC Power Source/Standby Diesel Generator (1000 HP And Over)
Standard 5B1 Operating Inspections

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
5B1	Testing Program	Per NUMARC 87-00	25	2 X "should"

Standard 5B2 Dismantled Inspections

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
5B2	Preventative Maintenance Program	N/A	N/A	As Required

STANDARD 5 DIESEL GENERATORS (Cont)
Standard 5C Diesel Generators Not Class 1E/Not Installed As An Alternate AC Power Source/Standby Diesel Generator (1000 HP And Over)
Standard 5C1 Operating Inspections

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
5C1	Testing Program	Per NUMARC 87-00	25	As Required

Standard 5C2 Dismantled Inspections

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
5C2	Preventative Maintenance Program	N/A	N/A	As Required

STANDARD 6 BOILERS(See Note 4)
Standard 6A Auxiliary Boilers

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
6A.1	**Internal Inspections**	18 Months	25	36 Months
6A.2	**External Inspections**	1 Months	25	12 Months
6A.3	**Safety Valves**	12 Months	25	18 Months

Standard 6B Power Boilers/Piping

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
6B.1	**Internal Inspections**	12 Months	25	18Months
6B.2	**External Inspections**	6 Months	25	12 Months
6B.3	**Safety Valves**	12 Months	25	18Months
6B.4	**High Temperature Piping Inspection**	N/A	N/A	As Required

STANDARD 7 MOISTURE SEPARATOR/REHEATERS

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
7.1	**Internal Inspections**	2 Fuel Cycles	25	72 Months
7.2	**Operability of Pressure Devices**	72 Months	25	96 Months
7.3	**External Inspections**	6 Months	25	N/A
7.4	**Wear Areas of Casing, Shell**	2 Fuel Cycles	25	72 Months

STANDARD 8 DEAERATORS

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
8.1	**Internal Inspections**	2 Fuel Cycles	25	72 Months
8.2	**Operability of Pressure Devices**	72 Months	25	96 Months
8.3	**External Inspections**	6 Months	25	N/A
8.4	**Wear Areas of Casing, Shell**	2 Fuel Cycles	25	72 Months

STANDARD 9 COMBUSTION TURBINES

Standard 9A Combustion Turbines - Observations

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
9A.1	Vibration Trends	Weekly	5	6 Months
9A.2	Gas Temperature Trends	Weekly	5	6 Months
9A.3	Condition of Lubricating Oil	Weekly	5	6 Months
9A.4	Accumulation of Hours	Weekly	5	6 Months
9A.5	Generator Power Factor, Voltage, Current	Weekly	5	6 Months
9A.6	Generator Winding Temperature/Hydrogen Consumption	Weekly	5	6 Months
9A.7	Iso-Phase Bus Duct Condition	Weekly	5	6 Months
9A.8	Availability of Emergency LO Pumps	Weekly	5	6 Months

Standard 9B Combustion Turbines - Tests

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
9B.1	**Tests of Protective Devices**	Weekly	10	6 Months
9B.2	**Simulated Overspeed Trip Tests**	N/A	N/A	6 Months
9B.3	**Actual Overspeed Trip Test**	N/A	N/A	Annually or Maintenance on Front Standard

Standard 9C Combustion Turbines - Dismantled Inspections

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
9C.1	Partial Dismantled Inspections	1500 Hours	45	2300 Hours
9C.2	Dismantled Inspection of Turbines	6000 Hours	45	9000 Hours
9C.3	Dismantled Inspection of Generator	6000 Hours	45	9000 Hours

STANDARD 10 MECHANICAL DRIVE TURBINES

Standard 10A Mechanical Drive Turbines - Observations

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
10A.1	Turbine Pressure, Temperature	Weekly	5	3 Months
10A.2	Vacuum, Backpressure	Weekly	5	3 Months
10A.3	Bearing oil Pressure, Temperature	Weekly	5	3 Months
10A.4	Turbine Speed	Weekly	5	3 Months
10A.5	Bearing, Casing Vibration	Weekly	30	3 Months
10A.6	Leakage of Steam, Oil, Water	Weekly	10	3 Months
10A.7	Pedestal Cracking, Deterioration	Weekly	10	3 Months
10A.8	Availability of Emergency L. O. Pumps	Weekly	30	3 Months
10A.9	Bearing Oil Cooling System	Weekly	10	3 Months
10A.10	Movement of Control Mechanisms	Weekly	20	3 Months

STANDARD 10 MECHANICAL DRIVE TURBINES (Cont)

Standard 10B Mechanical Drive Turbines - Dismantled Inspections (See Note 5)

Standard	Observation/Test/Inspection/Surveillance	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
10B.1	Results of NDE	96 Months	40	120 Months
10B.2	Procedure Review	96 Months	20	120 Months
10B.3	Valve Evidence of Leakage	96 Months	10	120 Months
10B.4	Casing Evidence of Leakage	96 Months	10	120 Months
10B.5	Bearing Distress	96 Months	10	120 Months
10B.6	Packing, Gland Excessive Wear	96 Months	10	120 Months
10B.7	Rotor Misalignment	96 Months	10	120 Months
10B-8	Nozzles, Wheels for Cracking	96 Months	10	120 Months
10B.9	Blades, Buckets for Cracking	96 Months	10	120 Months
10B.10	Couplings, Bolting for Distress	96 Months	10	120 Months
10B.11	Governor, Control System Components	96 Months	25	120 Months
10B.12	Control Lines, Linkages	96 Months	10	120 Months
10B.13	Lubricating Oil Pumps, Lines, Coolers	96 Months	25	120 Months
10B.14	Relief and Non-Return Valves	96 Months	5	120 Months

Standard 10C Mechanical Drive Turbines - Dismantled Tests

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
10C	Actual Overspeed Trip Test	Following Dismantle	150	120 Months

STANDARD 11 ELECTRIC MOTORS

Standard 11A Electric Motors - Observations

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
11A.1	Voltage	Weekly	10	3 Months
11A.2	Current	Weekly	10	3 Months
11A.3	Vibration	Weekly	75	3 Months
11A.4	Foundation, Grounding	Weekly	10	3 Months
11A.5	Cooling Vents	Weekly	10	3 Months
11A.6	Bearing Oil Temperature, Pressure	Weekly	10	3 Months
11A.7	Evidence of Leakage of Oil, Water	Weekly	5	3 Months

Standard 11B Electric Motors - Dismantled Inspections

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
11B.1	Results of Electrical Testing	As Indicated	50	N/A
11B.2	Rotor, Stator - Loose Blocking	As Indicated	25	N/A
11B.3	Evidence of Oil, Water, etc.	As Indicated	10	N/A
11B.4	Bearing Distress	As Indicated	25	N/A
11B.5	Coupling, Bolting Distress	As Indicated	25	N/A
11B.6	Motor Grounding System	As Indicated	10	N/A

STANDARD 12 PUMPS

Standard 12A Pumps - Observations

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
12A.1	Suction, Discharge Pressure	Weekly	10	3 Months
12A.2	Excessive Vibration	Weekly	50	3 Months
12A.3	Bearing Metal Temperature	Weekly	25	3 Months
12A.4	Bearing Oil Temperature, Pressure	Weekly	20	3 Months
12A.5	Shaft Seal Leakage	Weekly	20	3 Months
12A.6	Foundation Deterioration	Weekly	20	3 Months

Standard 12B Pumps - Dismantled Inspections

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
12B.1	Impeller for Wear	As Indicated	20	N/A
12B.2	Casing for Erosion	As Indicated	10	N/A
12B.3	Bearings, Shaft for Distress	As Indicated	20	N/A
12B.4	Seal, Journal for Wear	As Indicated	20	N/A
12B.5	Visual Observations Evaluated	As Indicated	50	N/A

STANDARD 13 OTHER PRIME MOVERS AND/OR DRIVEN EQUIPMENT (1000 HP AND OVER)

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
13	Maintenance, Testing, Inspection	N/A	N/A	As Required

STANDARD 14 SWITCHYARD EQUIPMENT

Standard 14A Breakers

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
14A.1	Observation	Weekly	50	Monthly
14A.2	Breaker Actuation Observation	N/A	N/A	Each Occurrence
14A.3	External Inspection	N/A	N/A	2 Fuel Cycles
14A.4	Insulating Medium Moisture Test	1 Fuel Cycle	20	2 Fuel Cycles
14A.5	Internal Inspection	N/A	N/A	As Required

Standard 14B Relays

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
14B.1	Operational, Functional Test	N/A	N/A	2 Fuel Cycles
14B.2	Calibration of Relays	N/A	N/A	2 Fuel Cycles

Standard 14C Batteries

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
14C.1	Observation	Weekly	20	Monthly
14C.2	Testing	Monthly	30	Quarterly
14C.3	Performance Testing	N/A	N/A	As Specified

STANDARD 15 CRANES, RIGGING, FUEL AND MATERIAL HANDLING FOR CRITICAL LIFTS

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
15.1	**Members' Senior Representative**	N/A	N/A	As Required
15.2.a	Assigned Supervisors	N/A	N/A	As Required
15.2.b	Qualified Operators, Riggers	N/A	N/A	As Required
15.2.c	Operations, Maintenance	N/A	N/A	As Required
15.2.d	Contractor Personnel, Equipment	N/A	N/A	As Required
15.3.a	Equipment Operator Training	As Required	10	N/A
15.3.b	Rigger/Signaler Training	As Required	10	N/A
15.3.c	Non Qualified Personnel	N/A	N/A	As Required
15.3.d	Severe Weather Procedures	As Required	10	N/A
15.4.a	Preventative Maintenance Program	N/A	N/A	As Required
15.4.b	Welding Repairs	N/A	N/A	As Required
15.4.c	Repairs Meeting Design Requirements	N/A	N/A	As Required
15.5	**Equipment Design, Installation**	N/A	N/A	As Required
15.6.a	Written Operational Procedures	As Required	10	N/A
15.6.b	Written Procedures, Review	As Required	10	N/A
15.6.c.(1)	Limitations on Wind Velocity	As Required	10	N/A
15.6.c.(2)	Extreme Temperatures / Ice Build-Up	As Required	10	N/A
15.6.d.(1)	Determination of Total Working Load	As Required	20	N/A
15.6.d.(2)	Capacity of Load Bearing Components	As Required	20	N/A
15.6.d.(3)	Measure/Determine Lift Radius/Load Path	As Required	20	N/A
15.6.d.(4)	Weather Reviews	As Required	20	N/A
15.6.d.(5)	Underwater Lifts	As Required	20	N/A
15.6.e	Initial, Periodic, Maintenance Inspections	As Required	10	N/A
15.6.f	Contractor Documentation	As Required	10	N/A
15.6.g.(1)	Daily Visual	Daily	15	N/A
15.6.g.(2)	Quarterly Inspection Quarterly	Quarterly	15	N/A
15.6.g.(3)	Infrequently Used Equipment	As Required	10	N/A
15.6.h.(1)	General/Visual Inspection	As Required	50	N/A
15.6.h.(2)	Inspection of Slings	As Required	10	N/A
15.6.h.(3)	Inspection of Hooks	As Required	10	N/A
15.6.h.(4)	Inspection of Shackles	As Required	10	N/A
15.6.h.(5)	Inspection of Eyebolts	As Required	10	N/A
15.6.h.(6)	Inspection of Chain Hoists	As Required	10	N/A
15.6.h.(7)	Inspection of Turnbuckles	As Required	10	N/A
15.6.h.(8)	Inspection of Spreaders, Equalizers	As Required	10	N/A

STANDARD 16 SPENT FUEL POOL CHEMISTRY

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
16	Program of Chemical Analysis	N/A	N/A	As Required

STANDARD 17 INSPECTION DOCUMENTATION

Standard	*Observation/Test/Inspection/Surveillance*	*"should" Frequency*	*Penalty Points*	*Shall Frequency*
17.1	**Inspection Activities**	N/A	N/A	As Required
17.2	Documentation	As Required	50	N/A
17.3	Listing of Cranes, Hoists, etc	N/A	N/A	As Required
17.4	Cranes Documentation (Maintained)	As Required	N/A	N/A
17.5	Cranes Documentation (Available)	N/A	N/A	As Required
17.6.a	Adverse Condition Reporting	N/A	N/A	As Required
17.6.b	Evaluation Report Responses	N/A	N/A	As Required

STANDARD 18 **CIRCUIT BREAKERS, LOW AND MEDIUM VOLTAGE**

Standard	Observation/Test/Inspection/Surveillance	"should" Frequency	Penalty Points	Shall Frequency
18.1	Preventive Maintenance Program	N/A	N/A	As required
18.2	Inspection Program for new and refurbished breakers	N/A	N/A	As required
18.3	Molded Case Circuit Breakers Inspection Program	N/A	N/A	As required

Total Penalty Points 5010

NOTES

Note 1: The dismantled inspection frequency is intended to be calendar months, but may be extended at the discretion of Nuclear Electric Insurance Limited.

Conditions for consideration of such extension include the following:

?1 Turbine

a. Full spectrum vibration analysis;
b. Complete lubricating oil and control oil analysis;
c. Turbine admission steam purity, measured directly or indirectly within Manufacturer's recommendations;
d. Performance studies and evaluation;
e. "Crawl-through" visual inspection of accessible Low Pressure blading.

?2 Generator

a. On-line diagnostic system, OR
b. Continuous hydrogen gas monitoring for incipient generator faults, AND
c. Radio Frequency (RF) monitor, AND
d. Generator end turn vibration monitoring, AND
e. Resistance Temperature Detectors (RTD's) or thermocouples embedded in gas passages (or an installed Pyrolysate Collection System.)

(See Loss Control Bulletin NEIL 95-01B, Section 8-4O)

Note 2: A rotor-out inspection or complete robotic inspection that is ACCEPTABLE to NEIL will meet this requirement.

Note 3: As a minimum, critical drip pots, traps, and orifices includes:

main stop valves;
steam chest;
before and after intercept valves;
turbine casing drains.

Note 4: Inspections are to include a determination that water purity is controlled by water chemistry specifications and that procedures are implemented to investigate and correct departures from these chemistry specifications.

Note 5: Turbines driving High Pressure Coolant Injection (HPCI), Reactor Core Isolation Cooling (RCIC), or Auxiliary Feedwater Pumps regardless of horsepower rating, and the associated valves, Shall be subject to dismantled inspection on a 12 year frequency or 1000 hours of operation, whichever comes first. Degraded performance Shall be cause for dismantled inspection.

Note 6: IEEE accepted industry terminology for "Load Tap Changer" as used in Standard 4.11 is Tap Changer Under Load (TCUL).

Minimum Inspection Requirements

Unless otherwise noted, the following Standards are applicable to all insured properties.

Note: *Numbers in { } indicate Penalty Points in the Primary Property Insurance Program for non-compliance with "should" Items.*

STANDARDS - Narrative Format

Components

Boilers
Circuit Breakers, Low and Medium Voltage
Combustion Turbines
Cranes, Rigging, Fuel and Material Handling Equipment
Deaerators
Diesel Generators
Electric Motors
Inspection Documentation
Mechanical Drive Turbines
Moisture Separator/Reheaters
Other Prime Movers and/or Driven Equipment
Pumps
Reactor Vessel
Spent Fuel Pool Chemistry
Steam Generator
Switchyard Equipment
Transformers
Turbine-Generator/Exciter

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STANDARD 1 REACTOR VESSEL

? 1. Reactor Vessel and Internals inspected or examined - Every Ten Year Interval.

"should" - N/A, Shall - Every Ten Year Interval

STANDARD 2 STEAM GENERATOR

? 1. A Steam Generator inspection program is to be implemented in accordance with NEI 97-06, *Steam Generator Program Guidelines.*

"should" - N/A, Shall - As Required

STANDARD 3 TURBINE-GENERATOR/EXCITER

? Standard 3A Turbine-Generator/Exciter - Observations

Observations of Turbine-Generators are to be conducted. Determination of acceptable operating conditions is to be made in advance for comparison with those noted at the time of observation. In all cases, where possible, remote and local indications are to be compared for consistency.

Observations of the following are to be made and documented:

1. Turbine steam pressures and temperatures (at admission, extraction points, etc.)

   "should" - Weekly{ 5 }, Shall - 3 months

2. Bearing oil temperatures and pressures.

   "should" - Weekly{ 10 }, Shall - 3 months

3. Vibration levels.

   "should" - Weekly{ 80 }, Shall - 3 months

4. Any evidence of leakage of steam, oil or water at glands, casing joints, or connections.

   "should" - Weekly{ 10 }, Shall - 3 months

5. Turbine steam purity, whether measured directly or indirectly, is to be reviewed to assure that it is within the limits of the plant's approved water chemistry specifications. As a minimum, the following items are to be reviewed and evidence of adverse trends thoroughly investigated:

   - cation conductivity
   - concentrations of dissolved oxygen
   - sodium
   - chlorides
   - silica

   "should" - Weekly{ 25 }, Shall - 3 months

6. Generator power factor, voltages, and currents.

   "should" - Weekly{ 10 }, Shall - 3 months

7. Generator winding temperatures and hydrogen consumption.
"should" - Weekly{ 50 }, Shall - 3 months

8. Iso-phase bus duct conditions.
"should" - Weekly{ 20 }, Shall - 3 months

9. Availability of emergency lubricating oil pumps and emergency seal oil pumps.
"should" - Weekly{ 50 }, Shall - 3 months

Standard 3B Turbine-Generator/Exciter - Operating Tests

For Members in the Accidental Outage Program Only, the following Standards apply: Standard 3B.8 and 3B.10. See **Section 8-2A, IV.B**

Operation and testing is to be conducted in accordance with the following:

? 1. Simulated overspeed trip tests **of mechanical systems or monitoring self-diagnostics of electronic systems**.
"should" - 3 months{ 150 }, Shall - N/A

? 2. Integrity of electrical circuitry and power supply for heater extreme high level alarms, controls, switches and interlocks by testing.
"should" - N/A, Shall - 1 Fuel Cycle

? 3. Integrity of electrical circuitry and power supply of all remote operated heater drain and bypass valves by testing.
"should" - N/A, Shall - 1 Fuel Cycle

? 4. Actual observation of the mechanical freedom of all extraction line check valves. (Where ALARA concepts preclude actual observation, this may be accomplished by monitoring remote valve position indicators).
"should" - N/A, Shall - 1 Fuel Cycle

? 5. Mechanical operation, interlocks and controls of all extraction line check and stop valves are tested to full closure. Verify seat/disc contact of extraction check valves.
"should" - 1 Fuel Cycle{ 110 }, Shall - 2 Fuel Cycles

? 6. By simulating pressure decay, test the availability of emergency lubricating oil and emergency hydrogen seal oil pumps.
"should" - 1 Fuel Cycle{ 100 }, Shall - 2 Fuel Cycles

? 7. Test the ability of the emergency lubricating oil and emergency hydrogen seal oil pumps to provide adequate pressure to the turbine/generator centerline within the manufacturer's specified time frame.
"should" - 1 Fuel Cycle{ 100 }, Shall - 2 Fuel Cycles

? 8. Test operate each trip solenoid valve in the turbine trip system to ensure freedom of movement. If any solenoid fails to operate, then all trip solenoids in the turbine trip system will be removed, replaced or rebuilt and then tested per manufacturer's instructions.

"should" - N/A, Shall - 1 Fuel Cycle

? 9. Verify the set pressure on all pressure switches used for turbine trips.

"should" - N/A, Shall - 1 Fuel Cycle

? 10. Determine the Natural Resonant Frequencies due to Torsional Vibration response by testing or analysis. If the natural resonant frequency is within the critical range of 118 to 122 Hz (for a 60 Hz electric system) or 98 to 102 Hz (for a 50 Hz electrical system), action is to be taken to separate natural frequencies from this critical frequency range, or the Member is to provide the technical justification to NEIL why such action is not necessary. Testing or analysis is to be performed whenever a rotating element of the turbine-generator is replaced. Replacement of a "like kind"-rotating rotating element does not require testing or analysis.

"should" - N/A, Shall - As Required

? Standard 3C Turbine - Generator/Exciter - Dismantled Inspections (see Note 1)

Note: *For High Pressure (HP) Turbines and Low Pressure Turbines with mono-block or welded rotors, the more restrictive Dismantled Inspection interval of these Standards or OEM recommendations will apply.*

The scope of work to be performed during the inspection outage is to include owner-approved manufacturer's bulletins, required maintenance, and nondestructive examinations.

1. In addition to visual examinations of the items below, inspection personnel should thoroughly review all nondestructive examination results.

"should" - 72 Months{ 50 }, Shall - 96 Months

HP & mono-block or welded rotor LP Turbine - "should" - 96 Months{ 50 }, Shall - 120 Months

2. A review should be performed on the procedures and results of inspections and maintenance performed by manufacturer's representatives, or others.

"should" - 72 Months{ 50 }, Shall - 96 Months

HP & mono-block or welded rotor LP Turbine - "should" - 96 Months{ 50 }, Shall - 120 Months

3. Reference should be made to previous examinations of the same component to determine the progress, if any, of deterioration, wear and tear, erosion, or corrosion.

"should" - 72 Months{ 50 }, Shall - 96 Months

HP & mono-block or welded rotor LP Turbine - "should" - 96 Months{ 50 }, Shall - 120 Months

Inspections are to be made of the following:

4. Casings for evidence of cracking and casing joints for evidence of leakage.

"should" - 72 Months{ 50 }, Shall - 96 Months

HP & mono-block or welded rotor LP Turbine - "should" - 96 Months{ 50 }, Shall - 120 Months

5. All bearings for any evidence of distress, and shaft journals for scoring.
"should" - 72 Months{ 10 }, Shall - 96 Months
HP & mono-block or welded rotor LP Turbine - "should" - 96 Months{ 10 }, Shall - 120 Months

6. All packing or glands for evidence of excessive wear.
"should" - 72 Months{ 70 }, Shall - 96 Months
HP & mono-block or welded rotor LP Turbine - "should" - 96 Months{ 70 }, Shall - 120 Months

7. Rotor for evidence of the effects of misalignment (rubbing, etc.).
"should" - 72 Months{ 100 }, Shall - 96 Months
HP & mono-block or welded rotor LP Turbine - "should" - 96 Months{ 100 }, Shall - 120 Months

8. All nozzles, wheels, blade rings, rotors, and diaphragms for evidence of cracking, erosion, or corrosion.
"should" - 72 Months{ 100 }, Shall - 96 Months
HP & mono-block or welded rotor LP Turbine - "should" - 96 Months{ 100 }, Shall - 120 Months

9. All buckets or blades for cracks, looseness, corrosion or erosion; and broken, cracked, or missing shroud bands or lashing wire.
"should" - 72 Months{ 50 }, Shall - 96 Months
HP & mono-block or welded rotor LP Turbine - "should" - 96 Months{ 50 }, Shall - 120 Months

10. All couplings and bolting for any sign of distress.
"should" - 72 Months{ 50 }, Shall - 96 Months
HP & mono-block or welded rotor LP Turbine - "should" - 96 Months{ 50 }, Shall - 120 Months

11. Control (governor), stop (throttle), reheat stop, intercept and bypass valves for evidence of leakage, steam cutting, cracks, excessive erosion, binding, etc.
"should" - 96 *Months,* or as Indicated by Valve Testing *{ 50 }, Shall* - 120 *Months*

12. All governor control system components, including pumps, lines, orifices and coolers.
"should" - 72 Months { 20 }, Shall - 96 Months

13. Lubricating oil system, including lines, orifices, coolers**, and primary oil pumps.**
"should" - 72 Months { 30 }, Shall - 96 Months
HP Turbine Shaft-Driven LO Pumps - "should" - 96 Months { 30 }, Shall - 120 Months

14. Relief and non-return valves.
"should" - 72 Months { 20 }, Shall - 96 Months

15. Field and stator for evidence of loose blocking or ties and for evidence of electrical discharge (corona) or overheating. **(See Note 2)**
"should" - 72 Months { 50 }, Shall - 96 Months

16. Hydrogen coolers and water-cooled windings for evidence of leakage.
"should" - 72 Months { 50 }, Shall - 96 Months

17. Generator enclosure for evidence of any distress.
"should" - 72 Months { 50 }, Shall - 96 Months

18. Hydrogen seals for evidence of excessive wear or misalignment.
"should" - 72 Months { 50 }, Shall - 96 Months

19. On brush type exciters, collector rings for excessive or uneven wear.
"should" - 72 Months { 50 }, Shall - 96 Months

20. Hydrogen seal oil system for evidence of distress.
"should" - 72 Months { 50 }, Shall - 96 Months

21. Appropriate examination of the generator field retaining rings.
"should" - 72 Months { 100 }, Shall - 96 Months

22. Generator bushings for evidence of distress.
"should" - 72 Months { 30 }, Shall - 96 Months

23. Electrical testing to determine insulation integrity and generator ground system integrity.
"should" - 72 Months{ 95 }, Shall - 96 Months

24. **The condition of** accessible iso-phase bus supports and bus ducts **is to be determined by:**

a. **Appropriate electrical testing, which may include megger, high potential, power factor, or other methods.**
"should" - 2 Fuel Cycles { 50 }, Shall - N/A

b. **Visual inspection of all accessible iso-phase bus supports and bus ducts.**
"should" – N/A, Shall – 4 Fuel Cycles

25. Internal dismantled inspection of all extraction check valves to determine seat condition, wear on hinge or pivot pins, freedom of operation, and tightness of locking devices.
"should" - 96 Months { 100 }, Shall - 120 Months

26. Inspection of all critical drip pots, traps, and orifices. **(See Note 3)**
"should" - 1 Fuel Cycle { 30 }, Shall - 2 Fuel Cycles

? 27. Remove, replace or rebuild and then test each solenoid valve in the turbine trip system per manufacturer's instructions.
"should" - 24 Months { 100 }, Shall - 72 Months

Standard 3D Turbine - Generator/Exciter - Dismantled Tests

? 1. Every Fuel Cycle plus anytime maintenance work is performed on the front standard, an actual trip test (at or above normal running speed) Shall be conducted to verify that the overspeed trip used for primary protection operates in accordance with plant specifications.
"should" - N/A, Shall - Maintenance On Front Standard, and 1 Fuel Cycle

? 2. When the exciter or permanent magnet generator is dismantled, appropriate tests Shall be performed to ensure adequate insulation of exciter bearings and associated electrical equipment.

"should" - N/A, Shall - As Required

STANDARD 4 TRANSFORMERS

(See Equipment List for Applicable Transformers)

For Members in the Accidental Outage Program Only, the following Standards apply:

Standard 4.1, 4.6, 4.7 & 4.9. See **Section 8-2A ,Section IV.B**

A preventive maintenance program, which includes periodic general observations, detailed inspections, and electrical testing of Transformers in accordance with industry practices is to be implemented. The frequencies shall be consistent with industry practices or as deemed necessary by performance degradation.

Observations/Inspections and tests of Transformers are to determine the following:

? 1. Observe the general condition of the transformers, to include, as applicable:

Oil Level in Tank	Oil Level in Bushings
Nitrogen Pressure in Storage Bottle	Nitrogen Blanket Pressure
Gas Accumulator Relay Operational	Oil Leaks
Alarm(s) Operational	Operation of Control System(s)
Proper Number of Fans / Coolers in Operation	Desiccant

Record general condition inspections; record and investigate any off-normal conditions.

"should" - Weekly { 30 }, Shall - 3 Months

? 2. Record/Correlate Readings of the Top Oil/Winding Temperature Indication.

"should" - Weekly { 30 }, Shall - 3 Months

3. Incidence of protective relay operation.

"should" - Weekly { 10 }, Shall - 3 Months

4. Number of hours each Transformer was operated at a load above the nameplate rating.

"should" - Weekly { 10 }, Shall - 3 Months

? 5. Perform Power Factor Testing of Transformer Windings, Bushings and lightning arresters.

"should" - 6 Years { 75 }, Shall - 8 Years

? 6. Insulating Oil Tests of the Transformers are made in accordance with IEEE C57.106-1991 and the results and interpretations reviewed by Inspection Personnel. Test results are to include a measure of oil temperature at the time of sample collection in order to determine relative saturation of the insulating oil. For Insulating Oil test results evaluation, refer to the NEIL Transformer Testing Guidelines, **Section 8.2C**.

"should" - 12 Months { 150 }, Shall - 18 Months

Note: *For a given PPM Moisture, the Relative Saturation increases as temperature decreases.*

? 7. Dissolved Gas Analysis Tests of the transformers are made in accordance with IEEE C57.104-1991

and the results and interpretations reviewed by Inspection Personnel. For Dissolved Gas Analysis test results evaluation, refer to the NEIL Transformer Testing Guidelines, **Section 8.2C**.

"should" - 6 Months { 150 }, Shall - 9 Months

? 8. Test results from 4.6 and 4.7, outside acceptable limits given in **Section 8.2C**, by more than 10%, "should" require further testing, investigation, and diagnosis.

"should" - As Required { 200 }, Shall - N/A

9. Insulating oil test results or dissolved gas-in-oil levels outside acceptable limits or norms by more than 10% Shall be reported to NSO in accordance with **Section 8-1H**.

"should" - N/A, Shall -As Required

10. Preventive maintenance including oil analysis and thermography Shall be performed on load tap changers.

"should" - N/A, Shall - As Required

11. Load tap changers "should" be internally inspected.

"should" - 15,000 Operations { 100 }, Shall - 30,000 Operations

STANDARD 5 DIESEL GENERATORS

The following Standards apply to Members in the Primary Property Program only. See Section 8-2A, IV.B

Standard 5B & 5C

The following standard applies to Members in the Accidental Outage Program only. See Section 8-2A, IV.B

Standard 5A Diesel Generators (Class 1E)

Standard 5A.1 Operating Inspections

1. An inspection and surveillance testing program Shall be established based on industry practices and the requirements of applicable portions of ANSI/IEEE 387-1977. Observation, inspection, and surveillance testing Shall be performed on Emergency Diesel Generators.

"should" - N/A, Shall - As Required

2. The load rejection testing in the referenced standard (ANSI/IEEE 387-1977) Shall be performed and may be satisfied by using the largest single load available, while the generator is loaded to near rated capacity.

"should" - N/A, Shall - 1 Fuel Cycle

Standard 5A.2 Dismantled Inspections

1. A preventive maintenance program, including dismantled inspections of Emergency Diesel Generators, Shall be performed in accordance with industry practices, at a frequency consistent with industry practice, or as determined necessary by performance degradation.

"should" - N/A, Shall -As Required

Standard 5B Diesel Generators installed as Alternate AC power source/Standby Diesel Generators (1000 HP and Over)

Standard 5B.1 Operating Inspections

1. Periodic testing is to be performed, and witnessed by Inspection Personnel, as specified in Appendix B of NUMARC 87-00.

"should" - Per NUMARC 87-00 { 25 }, Shall - 2 X "should"

Standard 5B.2 Dismantled Inspections

1. A Preventive Maintenance (PM) Program, including dismantled inspections, is be performed in accordance with industry practices, at a frequency consistent with industry practice, or as determined necessary by performance degradation. The PM Program is to include a schedule for disassembly, inspection, parts replacement and procedures for the nondestructive examination of parts.

"should" - N/A, Shall - As Required

Standard 5C Diesel Generators - Non Class 1E/Not Installed As Alternate AC Power Source/Standby Diesel Generators. (1000 HP And Over)

Standard 5C.1 Operating Inspections

1. Periodic testing is to be performed, at a frequency consistent with industry practice, and witnessed by Inspection Personnel.

"should" - Per NUMARC 87-00 { 25 }, Shall - 2 X "should"

Standard 5C.2 Dismantled Inspections

1. A Preventive Maintenance (PM) Program, including dismantled inspections, is be performed in accordance with industry practices, at a frequency consistent with industry practice, or as determined necessary by performance degradation. The PM Program is to include a schedule for disassembly, inspection, parts replacement and procedures for the nondestructive examination of parts.

"should" - N/A, Shall - As Required

STANDARD 6 BOILERS (See Note 4)

Standard 6 applies to the Primary Property Program only. See Section 8-2A, IV.B

? Standard 6A **Auxiliary Boilers**

? 1. Internal inspections of Auxiliary Boilers are to include a thorough visual inspection of both sides of the pressure boundary, where accessible, with attention directed at corrosion extent and rate, evidence of cracking or other distress, adequate weld reinforcement, and scale accumulation. Internal surfaces of low water fuel cut-off controls are to be inspected for sludge accumulation and mechanism operability.

"should" - 18 Months { 25 }, Shall - 36 Months

? 2. External inspections of Auxiliary Boilers are to be made while the boiler is operating and include visual inspection of accessible pressure boundary areas. Safety features such as low water fuel cut-off controls and flame failure protective devices are to be tested for operability.

"should" - 1 Month { 25 }, Shall - 12 Months

? 3. Safety valves are to be exercised.

"should" - 12 Months { 25 }, Shall - 18 Months

Standard 6B Power Boilers/Piping

? 1. Internal inspection of Power Boilers used as steam generators for main Turbine-Generators are to include a thorough visual inspection of both sides of the pressure boundary, where accessible, with attention directed at corrosion extent and rate, evidence of cracking or other distress, adequate weld reinforcement, and scale accumulation. Internal surfaces of low water fuel cut-off controls are to be inspected for sludge accumulation and mechanism operability. Additional attention is to be directed at condition of reheaters and superheater tube erosion, wall wastage, soot blower impingement, and refractory condition.

"should" - 12 Months { 25 }, Shall - 18 Months

? 2. External inspections of Power Boilers used as steam generators for main Turbine-Generators are to be made while the boiler is operating and include visual inspection of accessible pressure boundary areas. Safety features such as low water fuel cut-off controls and flame failure protective devices are to be tested for operability. Operating logs are to be reviewed to discover unusual operating conditions or transients.

"should" - 6 Months { 25 }, Shall - 12 Months

? 3. Safety valves are to be tested.

"should" - 12 Months { 25 }, Shall - 18 Months

? 4. A programmatic inspection of steam piping such as main steam or hot reheat piping which operates in the creep range (steam temperature > 800° F) is to be conducted. Attention is directed at seam welds, butt welds, attachment points or other higher stress areas where creep-stress rupture would be expected to occur.

Baseline inspection: "should" - N/A, Shall - Establish Acceptable Program

Where a baseline inspection has been performed (such as described in Interpretative Guidance), then the inspection results Shall dictate the appropriate re-inspection interval.

STANDARD 7 MOISTURE SEPARATOR/REHEATERS

Standard 7 applies to the Primary Property Program only. See Section 8-2A, IV.B

Note: *This Standard applies to Moisture Separators with or without reheat capability.*

? 1. Internal inspections of Moisture Separator/Reheaters (MS/R's) are to include a thorough visual inspection of both sides of the pressure boundary, where accessible. Attention is to be directed at corrosion extent and rate, evidence of cracking or other distress, adequate weld reinforcement and sludge/scale accumulation.

"should" - 2 Fuel Cycles{ 25 }, Shall - 72 Months

? 2. Verify the operability of pressure relieving devices of MS/R's

"should" - 72 Months{ 25 }, Shall - 96 Months

? 3. External inspection of MS/R's is to include verification of pressure boundary integrity, foundation, or support degradation.

"should" - 6 Months{ 25 }, Shall - N/A

? 4. Wear areas of casings or shells of moisture separator/reheaters are to be examined to verify integrity and acceptable wall thickness.

"should" - 2 Fuel Cycles{ 25 }, Shall - 72 Months

STANDARD 8 DEAERATORS

Standard 8 applies to the Primary Property Program only. See Section 8-2A, IV.B

? 1. Internal inspections of Deaerators are to include a thorough visual inspection of both sides of the pressure boundary, where accessible. Attention is to be directed at corrosion extent and rate, evidence of cracking or other distress, adequate weld reinforcement and sludge/scale accumulation.

"should" - 2 Fuel Cycles{ 25 }, Shall - 72 Months

? 2. Verify the operability of pressure relieving devices of Deaerators.

"should" - 72 Months{ 25 }, Shall - 96 Months

? 3. External inspections of Deaerators are to include verification of pressure boundary integrity, foundation, or support degradation.

"should" - 6 Months{ 25 }, Shall - N/A

? 4. Wear areas of casings or shells of deaerators are to be examined to verify integrity and acceptable wall thickness.

"should" - 2 Fuel Cycles{ 25 }, Shall - 72 Months

? STANDARD 9 COMBUSTION TURBINES

Standard 9 applies to the Primary Property Program only. See Section 8-2A, IV.B

? Standard 9A Combustion Turbines - Observations

Observations of Combustion Turbines are to be conducted. Determination of acceptable operating conditions is to be made in advance for comparison with those noted at the time of the observation. In all cases, where possible, remote and local indications are to be compared for consistency.

1. Trends and sudden changes in recorded vibration readings.
   "should" - Weekly { 5 }, Shall - 6 Months

2. Trends and sudden changes in recorded gas temperatures.
   "should" - Weekly { 5 }, Shall - 6 Months

3. Condition of lubricating oil.
   "should" - Weekly { 5 }, Shall - 6 Months

4. Accumulated operating hours.
   "should" - Weekly { 5 }, Shall - 6 Months

5. Generator power factor, voltages, and currents.
   "should" - Weekly { 5 }, Shall - 6 Months

6. Generator winding temperatures and hydrogen consumption.
   "should" - Weekly { 5 }, Shall - 6 Months

7. Iso-phase bus duct conditions.
   "should" - Weekly { 5 }, Shall - 6 Months

8. Availability of emergency lubricating oil pumps.
   "should" - Weekly { 5 }, Shall - 6 Months

Standard 9B Combustion Turbines - Tests

Inspection Personnel are to review test results on the following items.

? 1. Results of tests on installed protective devices.
"should" - Weekly { 10 }, Shall - 6 Months

? 2. Results of simulated overspeed trip tests.
"should" - N/A, Shall - 6 Months

? 3. Results of actual overspeed trip tests. Tests are to be performed following maintenance on the front standard or the overspeed trip mechanism.
"should" - N/A, Shall – Annually, OR Maintenance on Front Standard

? Standard 9C Combustion Turbines - Dismantled Inspections

A review should be performed on the procedures and results of inspections and maintenance performed by manufacturer's representatives, or others. Reference should be made to previous examinations of the same component to determine the progress, if any, of deterioration, wear and tear, erosion, or corrosion. Inspections are to be made of the following:

1. A partial dismantled inspection is being performed to include:

    a. Fuel nozzles.
    "should" - 1500 Operating Hours { 45 }, Shall - 2300 Operating Hours

    b. Combustion chambers and transition ducts for cracks and burning.
    "should" - 1500 Operating Hours { 45 }, Shall - 2300 Operating Hours

    c. Turbine blades, discs, and vanes for evidence of sulfidation, cracking, etc.
    "should" - 1500 Operating Hours { 45 }, Shall - 2300 Operating Hours

    d. Compressor inlet duct, blades, discs and vanes for evidence of cracking, erosion, corrosion, and foreign object damage or sulfidation.
    "should" - 1500 Operating Hours { 45 }, Shall - 2300 Operating Hours

Note: *Maximum of 45 Points Total for Standard 9C.1*

2. Complete dismantle of combustion turbines for inspection, including extensive nondestructive examination of all rotating and stationary components.
    "should" - 6000 Operating Hours { 45 }, Shall - 9000 Operating Hours

3. Generators driven by combustion turbines are to be inspected for:

    a. All governor control system components, including pumps, lines, orifices and coolers.
    b. Lubricating oil system, including pumps, lines, orifices and coolers.
    c. Relief and non-return valves.
    d. Field and stator for evidence of loose blocking or ties and for evidence of electrical discharge (corona) or overheating.
    e. Hydrogen coolers and water-cooled windings for evidence of leakage.
    f. Generator enclosure for evidence of any distress.
    g. Hydrogen seals for evidence of excessive wear or misalignment.
    h. On brush type exciters, collector rings for excessive or uneven wear.
    "should" - 6000 Operating Hours { 45 }, Shall - 9000 Operating Hours

STANDARD 10 MECHANICAL DRIVE TURBINES

In the Primary Property Program, Standard 10 applies to Turbines 1000 HP and over.
In the Accidental Outage Program, Standard 10 applies to Emergency Core Cooling System (ECCS) Turbines. See **Section 8-2A, IV.B.** See **Equipment List** for Mechanical Drive Turbines subject to the Standard.

? Standard 10A Mechanical Drive Turbines - Observations

Observations of mechanical drive turbines are to be conducted. Determination of acceptable operating conditions is to be made in advance for comparison with those noted at the time of the observation. In all cases, where possible, remote and local indicators are to be compared for consistency. Observations of the following are to be made and documented:

1. Turbine steam pressure and temperature at admission.
   "should" - Weekly { 5 }, Shall - 3 Months

2. Vacuum or backpressure.
   "should" - Weekly { 5 }, Shall - 3 Months

3. Bearing oil temperature and pressure.
   "should" - Weekly { 5 }, Shall - 3 Months

4. Turbine speed.
   "should - Weekly { 5 }, Shall - 3 Months

5. Bearing and casing vibration.
   "should" - Weekly { 30 }, Shall - 3 Months

6. Any evidence of leakage of steam, oil, or water at glands, casing joints, or connections.
   "should" - Weekly { 10 }, Shall - 3 Months

7. Any evidence of turbine support pedestal cracking or deterioration.
   "should" - Weekly { 10 }, Shall - 3 Months

8. Availability of emergency lubricating oil pumps.
   "should" - Weekly { 30 }, Shall - 3 Months

9. Bearing oil-cooling system for evidence of deterioration or leakage.
   "should" - Weekly { 10 }, Shall - 3 Months

10. Any evidence of lack of freedom or smoothness of control mechanisms.
    "should" - Weekly { 20 }, Shall - 3 Months

? Standard 10B Mechanical Drive Turbines - Dismantled Inspections

Note: *Turbines driving High Pressure Coolant Injection (HPCI), Reactor Core Isolation Cooling (RCIC), or Auxiliary Feedwater Pumps* regardless of horsepower rating, and the associated valves, *Shall be subject to dismantled inspection on a* 12 *year frequency or 1000 hours of operation, whichever comes first. Degraded performance Shall be cause for dismantled inspection.*

As determined by Performance Degradation, mechanical drive turbines are to be dismantled to the extent that the following observations can be made by Inspection Personnel.

Reference is to be made to previous examinations of the same item to determine the progress, if any, of deterioration, wear and tear, erosion, or corrosion.

1. The scope of work to be performed during the inspection outage is to include owner-approved manufacturers' bulletins, required maintenance and nondestructive examination. In addition to visual examinations of the items below, Inspection Personnel "should" thoroughly review all other nondestructive examination results.

   "should" - 96 *Months { 40 }, Shall* - 120 *Months*

2. A review "should" be performed on the procedures and results of inspections and maintenance performed by manufacturers' representatives or others.

   "should" - 96 *Months { 20 }, Shall* - 120 *Months*

Inspections of the following are to be made and documented:

3. Control (governor), stop (throttle), and bypass valves for evidence of leakage, steam cutting, cracks, excessive erosion, corrosion, binding, etc.

   "should" - 96 *Months { 10 }, Shall* - 120 *Months*

4. Casings for evidence of cracking and casing joints for evidence of leakage.

   "should" - 96 *Months { 10 }, Shall* - 120 *Months*

5. All bearings for evidence of distress and shaft journals for scoring.

   "should" - 96 *Months { 10 }, Shall* - 120 *Months*

6. All packing or glands for evidence of excessive wear.

   "should" - 96 *Months { 10 }, Shall* - 120 *Months*

7. Rotor for any evidence of effects of misalignment, rubbing, etc.

   "should" - 96 *Months { 10 }, Shall* - 120 *Months*

8. All nozzles, wheels, diaphragms, rotors, and blade rings for evidence of cracking, erosion, or corrosion.

   "should" - 96 *Months { 10 }, Shall* - 120 *Months*

9. All buckets or blades for cracks, looseness, corrosion or erosion; and broken, cracked, or missing shroud band or lashing wire.

   "should" - 96 *Months { 10 }, Shall* - 120 *Months*

10. All couplings and bolting for any sign of distress.

"should" - 96 *Months { 10 }*, *Shall* - 120 *Months*

11. All governor control systems components.

"should" - 96 *Months { 25 }*, *Shall* - 120 *Months*

12. All control lines and linkage.

"should" - 96 *Months { 10 }*, *Shall* - 120 *Months*

13. All lubricating oil pumps, lines, and coolers.

"should" - 96 *Months { 25 }*, *Shall* - 120 *Months*

14. Relief and non-return valves.

"should" - 96 *Months { 5 }*, *Shall* - 120 *Months*

? Standard 10C Mechanical Drive Turbines - Dismantled Tests

1. Following dismantled inspection, an actual overspeed trip test **at or above normal running speed** is to be performed to determine that the overspeed trip **used for primary overspeed protection** functions **in accordance with plant specifications.**

"should" - Following Dismantle { 150 }, *Shall* - 120 *Months*

Note: *The Shall Requirement for turbines driving High Pressure Coolant Injection (HPCI), Reactor Core Isolation Cooling (RCIC) or Auxiliary Feedwater (AF) Pumps is 120 Months.*

STANDARD 11 ELECTRIC MOTORS

In the Primary Property Program, Standard 11 applies to Motors 1000 HP and over. In the Accidental Outage Program, Standard 11 applies to ECCS Motors & Reactor Recirculation Pump Motor/Generator Sets. See **Section 8-2A, IV.B.** See **Equipment List** for Electric Motors subject to this Standard

? Standard 11A Electric Motors - Observations

Determination of acceptable operating conditions is to be made in advance for comparison with those noted at the time of the observation. Observations of the following are to be made:

1. Motor voltage.

"should" - Weekly { 10 }, *Shall - 3 Months*

2. Current.

"should" - Weekly { 10 }, *Shall - 3 Months*

3. Excessive vibration.

"should" - Weekly { 75 }, *Shall - 3 Months*

4. Motor foundation for evidence of loose foundation bolts, grounding straps or deterioration of the foundation.

"should" - Weekly { 10 }, Shall - 3 Months

5. Motor cooling vents for evidence of accumulation of dirt or debris.

"should" - Weekly { 10 }, Shall - 3 Months

6. Bearing oil temperature and pressure.

"should" - Weekly { 10 }, Shall - 3 Months

7. Any evidence of leakage of oil or water.

"should" - Weekly { 5 }, Shall - 3 Months

? Standard 11B Electric Motors - Dismantled Inspections

As determined by Performance Degradation, electric motors Shall be dismantled to the extent that the following inspections can be made by Inspection Personnel.

1. In addition to visual examination, Inspection Personnel "should" thoroughly review the results of electrical testing to determine insulation integrity. In all cases, reference is to be made to previous examination of the same component to determine the progress, if any, of deterioration or wear and tear.

"should" - As Indicated { 50 }, Shall - N/A

Inspections of the following are to be made:

2. Rotor and stator end turns for evidence of loose blocking and ties, for evidence of electric discharge (corona), or overheating.

"should" - As Indicated { 25 }, Shall - N/A

3. Motor for evidence of oil film, moisture, or chemical compounds.

"should" - As Indicated { 10 }, Shall - N/A

4. All bearings for evidence of distress and shaft journals for scoring.

"should" - As Indicated { 25 }, Shall - N/A

5. Couplings and bolting for evidence of distress.

"should" - As Indicated { 25 }, Shall - N/A

6. Motor grounding system for integrity.

"should" - As Indicated { 10 }, Shall – N/A

STANDARD 12 DRIVEN PUMPS

In the Primary Property Program, Standard 12 applies to Pumps with Drivers 1000 HP and over. In the Accidental Outage Program, Standard 12 applies to ECCS Pumps. See **Section 8-2A, IV.B.** See **Equipment List** for Driven Pumps subject to this Standard

? Standard 12A Driven Pumps - Observations

Observations of driven pumps are to be conducted. Determination of acceptable operating conditions is to be made in advance for comparison with those noted at the time of the observations.

Observations of the following are to be made:

1. Suction and discharge pressure.

   "should" - Weekly { 10 }, Shall - 3 Months

2. Excessive vibration.

   "should" - Weekly { 50 }, Shall - 3 Months

3. Bearing metal temperature.

   "should" - Weekly { 25 }, Shall - 3 Months

4. Bearing oil temperature and pressure.

   "should" - Weekly { 20 }, Shall - 3 Months

5. Shaft seal for evidence of excessive leakage.

   "should" - Weekly { 20 }, Shall - 3 Months

6. Pump foundation for evidence of looseness or deterioration.

   "should" - Weekly { 20 }, Shall - 3 Months

? Standard 12B Driven Pumps, Dismantled Inspections

As determined by Performance Degradation, driven pumps Shall be dismantled to the extent that the following inspections can be made by Inspection Personnel.

In all cases, reference is to be made to previous examinations of the same component to determine the progress, if any, of deterioration or wear and tear.

Inspections of the following are to be made:

1. Pump impeller for evidence of excessive wear, erosion, corrosion, cracking, or the effects of cavitation.

   "should" - As Indicated { 20 }, Shall - N/A

2. Pump internal casing for evidence of erosion, corrosion, debris build-up, or cracking.

   "should" - As Indicated { 10 }, Shall - N/A

3. All bearings and shaft for evidence of distress.

"should" - As Indicated { 20 }, Shall - N/A

4. Seal and shaft journals for evidence of excessive wear, misalignment, or journal scoring.

"should" - As Indicated { 20 }, Shall - N/A

5. Visual observations indicating cracking or distress of any component "should" be further evaluated.

"should" - As Indicated { 50 }, Shall - N/A

? STANDARD 13 OTHER PRIME MOVERS AND/OR DRIVEN EQUIPMENT (1000 HP AND OVER)

Standard 13 applies to the Primary Property Program only. See Section 8-2A, IV.B

1. A preventive maintenance, inspection, and testing program are to be established based on manufacturer's recommendations. The program is to include a schedule for disassembly, inspection, parts replacement and procedures for nondestructive examination of parts, as recommended by the manufacturer/industry practice.

"should" - N/A, Shall - As Required

STANDARD 14 SWITCHYARD EQUIPMENT

Standard 14A Breakers (High Voltage Power Circuit Breakers that connect the insured power plant to the grid)

Note: *This Standard is applicable to all plants insured by NEIL. The Standard applies even though NEIL may not insure the Switchyard. The Standard also applies even if the Switchyard equipment is maintained by another organization or company, other than the Member.*

For Switchyards insured by NEIL, all breakers and associated relays and batteries are subject to the requirements of this Standard. For Switchyards not insured by NEIL, the Breakers referenced are:

For Main Step-Up or GSU Transformers - the first Breaker out from the transformer to the Switchyard.

For Auxiliary and Start-Up Transformers - the last Breaker to the transformer from the Switchyard.

The referenced Disconnects are those between the Breakers listed above and the Transformers.

1. Perform a visual inspection, to include as applicable, cleanliness, leaks, pressures/temperatures, compressor run time, relay flags, oil levels in tanks and bushings, heaters.

"should" - Weekly{ 50 }, Shall - Monthly

2. Perform actions in 1. above upon relay actuated circuit breaker operation.
"should" - N/A, Shall - Each Occurrence

3. External inspection, to include as applicable, testing of gas and/or air system low pressure alarms and trips, gas and/or air reservoir moisture blow down.
"should" - N/A, Shall - 2 Fuel Cycles

? 4. Insulating Medium Moisture Test.
"should" - 1 Fuel Cycle{ 20 }, Shall - 2 Fuel Cycles

5. Based on performance monitoring, perform a complete internal inspection as defined by the OEM, including diagnostic tests, timing, contact resistance, resistor, capacitor and power factor tests.
"should" - N/A, Shall - As Required
(Not to exceed 10 years for Oil CB or 15 Years for Gas CB)

Standard 14B Relays (Those relays associated with the Breakers in Standard 14A)

1. Perform an Operational/Functional test of the relay schemes.
"should" - N/A, Shall - 2 Fuel Cycles

2. Perform a calibration of the relays.
"should" - N/A, Shall - 2 Fuel Cycles

Standard 14C Batteries (Those batteries which supply power to the Relays in Standard 14B and/or tripping power the Breakers in Standard 14A)

1. Perform a visual inspection of the switchyard batteries for abnormal/unusual conditions. Inspection will include Ambient Temperature, General Cell/Rack Inspection and Ventilation Equipment Check.
"should" - Weekly { 20 }, Shall - Monthly

2. Perform the following testing for the specified battery type.

Vented Lead-Acid Battery Cells (IEEE 450-1995)
Battery Float Voltage, Pilot Cell Voltage and Specific Gravity, Electrolyte Level, Charger Output Current/Voltage and Unintentional Grounds.

Valve Regulated Lead-Acid Battery Cells (IEEE 1188-1996)
Battery Float Voltage, Pilot Cell Voltage and Temperature, Charger Output Current/Voltage, Unintentional Grounds and Excessive Jar/Cover Bulging.

Vented Nickel-Cadmium Cells (IEEE 1106-1995)
Battery Float Voltage, Pilot Cell Voltage and Temperature, Electrolyte Level, Charger Output Current/Voltage and Unintentional Grounds.
"should" - Monthly { 30 }, Shall - Quarterly

3. Perform the following Performance Testing for the specified battery type.

Vented Lead-Acid Battery

Initially within the first two years of installation, then every five years until 85% of service life or signs of degradation (See IEEE 450-1995) occur, then annually. Replace battery if capacity is less than 80% of manufacturer's nameplate. Replacement Shall be made within one year.

Valve Regulated Lead-Acid Battery

Every year until 85% of service life or signs of degradation (See IEEE 1188-1996) occur, then every six months. Replace battery if capacity is less than 80% of manufacturer's nameplate. Replacement Shall be made in accordance with IEEE 1188-1996; however, the replacement time Shall not exceed one year.

Vented Nickel-Cadmium Battery

Initially within the first two years of installation, then every five years until there are indications of excessive capacity loss (See IEEE 1106-1995), then annually. Replace battery following recommendations of IEEE 1106-1995. Replacement Shall occur within one year.

"should" - N/A, Shall - As Specified

? STANDARD 15 CRANES, RIGGING, FUEL AND MATERIAL HANDLING FOR CRITICAL LIFTS

Standard 15 applies to the Primary Property Program only. See Section 8-2A, IV.B

? 1. Responsibility - A Member's Senior Representative at each site Shall be appointed the responsibility for the overall operations, inspections, equipment maintenance, and personnel training associated with Cranes, Rigging, and Fuel and Material Handling operations involving Critical Lifts.

"should" - N/A, Shall - As Required

? 2. The Member's Senior Representative Shall:

a. Assure that Supervisors are assigned responsibility for crane, rigging, and fuel and material handling operations.

"should" - N/A, Shall - As Required

b. Assure that qualified crane operators/riggers are assigned to perform all critical lifts.

"should" - N/A, Shall - As Required

c. Assure the proper operation and maintenance of all cranes, rigging, and fuel and material handling equipment.

"should" - N/A, Shall - As Required

d. Assure that contractor personnel and equipment comply with the applicable portions of these Standards when working on the insured plant site.

"should" - N/A, Shall - As Required

? 3. Training

a. Crane, fuel, and material handling equipment operators "should" demonstrate their ability to operate the crane, fuel, or material handling equipment to which they will be assigned by passing a performance test.

"should" - As Required { 10 }, Shall - N/A

b. Riggers and signalers "should" demonstrate their ability to perform the functions of their task by passing a practical test.

"should" - As Required { 10 }, Shall - N/A

c. Non-qualified personnel Shall not be permitted to operate cranes, or fuel and material handling equipment unless under the close supervision and direction of qualified personnel.

"should" - N/A, Shall - As Required

d. Severe weather procedures "should" be included in the initial and ongoing training program for all crane operators who operate outdoor cranes.

"should" - As Required { 10 }, Shall - N/A

? 4. Maintenance

a. A preventive maintenance program Shall be established for cranes, rigging, and fuel and material handling equipment, which as a minimum, addresses the manufacturer's recommendations or other applicable specifications.

"should" - N/A, Shall - As Required

b. All welding associated with crane repairs Shall be performed in accordance with procedures that meet applicable American Society of Mechanical Engineers or American Welding Society Standards, or according to manufacturer's directions. All repairs Shall be inspected by qualified inspection personnel.

"should" - N/A, Shall - As Required

c. Repairs Shall meet or exceed the design requirements and manufacturer's specifications or generally accepted industry practice.

"should" - N/A, Shall - As Required

? 5. Equipment Design And Installation - All cranes, both fixed and mobile, and fuel and material handling equipment design, placement, assembly and/or installation Shall be done in accordance with applicable ANSI, OSHA, or manufacturer's specifications.

"should" - N/A, Shall - As Required

? 6. Equipment Operation And Inspections

Supervisors "should":

a. Assure that operational procedures pertaining to all crane, fuel and material handling, and rigging operations associated with critical lifts are written.

"should" - As Required { 10 }, Shall - N/A

b. Prior to use, perform a review of crane, fuel and material handling and rigging procedures and operations.

"should" - As Required { 10 }, Shall - N/A

c. Assure that operational procedures pertaining to all outdoor critical lift operations are written addressing:

(1) Limitations based on wind velocity in accordance with manufacturer's recommendations to include action levels for derating, termination of lifting activities, anchoring, and lowering of booms.

"should" - As Required { 10 }, Shall - N/A

(2) Derating or termination of lifting activities in accordance with manufacturer's recommendations based on extreme temperatures or when ice build-up exists on lifting equipment.

"should" - As Required { 10 }, Shall - N/A

? d. Monitor each critical lift with authority to shutdown that operation (to a safe condition) when acceptable standards are not being followed. The following specific requirements apply to all Critical Lifts. Critical Lifts are to be preplanned through:

(1) Determination of the total working load weight (including the weight of rigging, etc.).

"should" - As Required { 20 }, Shall - N/A

(2) Calculating the capacity of the load bearing components of the lift.

"should" - As Required { 20 }, Shall - N/A

(3) Measuring/determining the lift radius, load path and interference, where applicable.

"should" - As Required { 20 }, Shall - N/A

(4) Before outdoor lifts, weather reviews are to be conducted before performing a critical lift. Maximum allowable wind velocities are to be predetermined in case the wind velocity increases during the lift.

"should" - As Required { 20 }, Shall - N/A

(5) Before performing underwater lifts, consider visibility.

"should" - As Required { 20 }, Shall - N/A

? e. Assure that initial, periodic, and post maintenance inspections, and full-capacity lift tests using the overload factors for all lifting devices are performed in accordance with applicable ANSI and OSHA Standards and documented.

"should" - As Required { 10 }, Shall - N/A

? f. Assure that each contractor provides documented evidence of inspections and maintenance on its equipment.

"should" - As Required { 10 }, Shall - N/A

g. Assure periodic documented inspections of all cranes, fuel and material handling equipment as follows:

? (1) Daily (Frequent Inspection as defined by OSHA/ASME) - visual inspection by qualified operators, during periods of use, documented by a checklist.

"should" - As Required { 15 }, Shall - N/A

? (2) Quarterly (Periodic Inspection as defined by OSHA/ASME) - detailed inspection by qualified inspection personnel during periods of use.

"should" - As Required { 15 }, Shall - N/A

? (3) For cranes, fuel or material handling equipment used infrequently (i.e., inactive for more than one quarter), a detailed inspection by qualified maintenance personnel prior to use.

"should" - As Required { 10 }, Shall - N/A

? h. Assure that rigging equipment and accessories meet the requirements outlined below and that periodic inspections of such equipment are conducted. Inspections are to be performed in accordance with applicable ANSI/ASME, OSHA or manufacturer's specifications.

(1) General:

All rigging equipment is to be visually inspected prior to each use.

Only equipment rated for the load is to be used for lifting. Equipment is to be identified by tags, vibro-etching, stamps, or by another means of identifying safe working loads.

Rigging equipment and slings used for critical lifts are to be reserved for that use.

Equipment is to be stored in a location protected from physical damage (i.e. away from heat, radiation (as practical), chemicals, etc.) and the detrimental effects of weather.

"should" - As Required { 50 }, Shall - N/A

(2) Slings (Including Alloy Steel Chain, Wire Rope, Metal Mesh, Natural or Synthetic Fiber and Synthetic Web) are to be inspected visually before each use, as well as during each preventive maintenance inspection, as referenced in ASME B30.9a.

"should" - As Required { 10 }, Shall - N/A

(3) Hooks:

Hoisting hooks are to be equipped with safety latches or moused where practical.

Hoisting hooks and blocks are to be inspected visually before each use, as well as during each preventive maintenance inspection. Any hook found to be cracked, or showing evidence of excessive wear (a decrease of 10% or greater of the original thickness), or open at the throat more than 15% in excess of its original opening, or twisted more than 10 degrees from the plane of the unbent hook is to be destroyed to prevent inadvertent use.

"should" - As Required { 10 }, Shall - N/A

(4) Shackles:

Replacement shackle pins are to be of the same size, material, and configuration as the original shackle pins.

Cotter pins are to be used with all round pin shackles. Screw pin shackles may be used where the shackle is positioned such that the pin tightens under load.

Shackles are to be destroyed if worn more than 10% of the original diameter in the crown or pin, or if the pins are bent, or the distance between the shackle eyes has increased due to distortion and exceeds the dimensions specified by manufacturer's recommendations.

"should" - As Required { 10 }, Shall - N/A

(5) Eyebolts:

Only eyebolts with shoulders or collars are to be used.

Tapped holes for eyebolts are to have a minimum depth of one and one-half times the bolt diameter (and eye bolts engaged to the full depth of the hole) with the collar engaged to the object being lifted. Spacers can be used to maintain alignment, if necessary, provided minimum engagement is not violated.

Manufacturer's or standard rigging tables are to be followed relative to the selection, location, and application of eyebolts.

Eyebolt efficiency factors, as shown in the following table, are to be applied, and eyebolt loading thereby calculated. (Eyebolt efficiency factors, supplied by the eyebolt manufacturer may be used in lieu of the values listed).

Eyebolt Efficiency Factors	
Direction of Loading	Percent of Rated Capacity
In plane of eye and:	
Along axis of eyebolt shank	100%
15° from axis of eyebolt shank	65%
30° from axis of eyebolt shank	30%
45° from axis of eyebolt shank	20%

"should" - As Required { 10 }, Shall - N/A

(6) Chain Hoists:

Chain falls used in a four-point lift are to be of sufficient rated capacity to bear 50% of the total vectored load.

Chain falls used in lifting operations are to be designed with safety factors equal to those of cranes or their capacities are to be reduced to permit the same safety factors.

Chain hoists are not to have load-bearing parts constructed of cast iron or other brittle material.

Chain links are to be closed by welding and the chain certified for the lifting capacity intended.

Chain hoists are to be of self-locking design.

Chains are to be inspected annually and discarded when links are worn or stretched to a gage length exceeding the manufacturers specifications, or in the tables given in OSHA 1910.184 (Slings, July 1, 1992). Chains with repaired sections are not to be used, unless repaired in accordance with manufacturer's specifications.

"should" - As Required { 10 }, Shall - N/A

(7) Turnbuckles:

All turnbuckles used in hoisting or rigging operations are to be of weldless construction and forged low alloy steel.

When turnbuckles are supplied with hook end fittings, safety latches are to be provided, or the hooks are to be moused.

Turnbuckles are to be inspected before each use for cracks in the end fittings, (especially at the neck of the shank). Deformed end fittings, deformed and bent rods and bodies, cracks and bends around the internally threaded portion, and signs of thread damage are reasons for removal from service.

"should" - As Required { 10 }, Shall - N/A

(8) Spreader and Equalizer Beams:

Spreader and equalizer beams are to be designed to suit the specific application and in accordance with the specifications within the AISC "*ASD - Manual of Steel Construction.*" The maximum safe working load is not to exceed either:

- 20% of the ultimate strength of the base material, OR
- a minimum design factor of three, based on the yield strength of the base material.

All associated hardware is to meet the requirements stated under (1) through (7) above.

The distance between attachment points is not to exceed the design specifications in relation to the load.

"should" - As Required { 10 }, Shall - N/A

STANDARD 16 SPENT FUEL POOL CHEMISTRY

Standard 16 applies to the Primary Property Program Only. See Section 8-2A, IV.B

? 1. A program of periodic chemistry analysis is to be established based on fuel manufacturer's recommendations or industry practice.

"should" - N/A, Shall - As Required

STANDARD 17 INSPECTION DOCUMENTATION

? 1. The Member is to require from Inspection Personnel, timely, detailed documentation of inspection activities.

"should" - N/A, Shall - As Required

2. The Member is to demonstrate compliance to these Standards by making documentation showing such compliance available to the NEIL Loss Control Representative during evaluations. Documentation is to include:

   a. Specific dates of activities
   b. Name and title of persons making the inspection
   c. A description of items observed
   d. Results of the inspections, examinations, and testing with reference to the objects listed in the Standard
   e. Identification of specific corrective action to alleviate any adverse conditions

"should" - As Required { 50 }, Shall - N/A

3. Cranes, Rigging, Fuel and Materials Handling Related Items

? a. The Member Shall develop and provide to NEIL, a list of cranes, hoists, and other fuel and material handling equipment that is used in conjunction with critical lifts. As a minimum, this list "should" include the Reactor Building and Turbine Building Cranes, New Fuel, Spent Fuel, and Cask Handling Cranes, Bridges, and Hoists. Rigging equipment designed for use in handling specific components (e.g. spreader beams and slings used to lift turbine casings) is to be included in the list. General hardware used for Critical Lifts need not be included in the list. However, this equipment "should" be maintained as specified in the applicable portions of these Standards.

b. Equipment is to be listed by nomenclature, specific use and identifying serial numbers (if applicable).

c. The Member is to maintain the list current with changes submitted to NEIL as necessary.

"should" - N/A, Shall - As Required

? 4. The following documentation "should" be available for review during plant evaluations:

a. Signed and dated detailed inspection reports for cranes, fuel and material handling equipment and rigging. (Maintain for the life of equipment).

b. Signed and dated maintenance reports for cranes, fuel handling equipment and rigging. (Maintain for the life of the equipment).

c. Reports of investigations of crane and rigging related incidents (Maintain for five (5) years).

d. Qualification records of operators involved in critical lifts. (Maintain for five (5) years).

e. Periodic review of crane, fuel handling and rigging procedures and operations.

f. Procedures used for pre-planning critical lifts.

"should" - As Required, Shall - N/A

5. Inspection documents Shall be made available to the B&M Loss Control Representative during the NEIL Boiler & Machinery evaluations.

"should" - N/A, Shall - As Required

6. Reports

a. Adverse Condition Reporting

Adverse Conditions are defined as conditions which, if allowed to continue uncorrected, could cause physical damage in excess of $500,000, including consequential damage, or an outage longer than ten (10) weeks When such Adverse Conditions are identified, the Member Shall report the circumstances to NEIL by telephone, fax or e-mail. See **Section 8-1H**.

"should" - N/A, Shall - As Required

b. Evaluation Report Responses

The Recommendations contained in the evaluation reports are provided for the mutual benefit of the Member and NEIL. The Member Shall be responsible for providing NEIL with information concerning the intent for compliance with Recommendations and include an implementation schedule within sixty (60) days after receipt of the report.

The Member Shall continue to report on the status of Loss Control Recommendations as requested by NEIL, until the Recommendations are satisfactorily closed or withdrawn by letter from NEIL. Recommendations are closed only during plant evaluations.

"should" - N/A, Shall - As Required

STANDARD 18 CIRCUIT BREAKERS (Low and Medium Voltage)

This Standard applies to non-Class 1E, low (600 Volts and below) **and medium (15 KV and below) voltage Circuit Breakers** for **important plant** equipment (equipment necessary for protection of the Turbine-Generator and Feedwater Pumps). This equipment includes Turbine-Generator Normal, Standby, and Emergency Lube Oil Pumps; Normal, Standby, and Emergency Seal Oil Pumps; Feedwater Pump Lube Oil Pumps; and the Bus Feeder Breakers for this equipment. **The Programs for** Circuit Breakers **are to include** Normal and Emergency Power Bus Feeders, and the breakers for **important plant** equipment based upon the plant's breaker coordination study. Preventive Maintenance, Overhaul, and Testing Programs should include **reference to** industry guidelines and/or manufacturers' recommendations.

?1. Establish a Preventive Maintenance and Overhaul Program for Circuit Breakers.

"should" - N/A { N/A }, Shall - As required

?2. Establish an Inspection Program for new and refurbished Circuit Breakers to include functional testing prior to placing in service.

"should" - N/A { N/A }, Shall - As required, prior to placing in service

?3. Establish an Inspection Program for Molded Case Circuit Breakers to verify breakers are fully functional and trip at the set amperage prior to placing in service.

"should" - N/A { N/A }, Shall - As required, prior to placing in service

SECTION 8-2B EQUIPMENT LIST FOR THE B&M LOSS CONTROL STANDARDS

Note: *This Equipment List is generic. Components, which perform the same, or a similar function as the listed equipment, are subject to the requirements of B&M Loss Control Standards.*

Common Objects:

- Reactor Vessel and Internals
- High Pressure Turbine
- Low Pressure Turbine
- Main Generator/Exciter
- Main (Generator) Step-Up Transformer
- Auxiliary Transformer
- Start-Up Transformer
- **Other Transformers, 100 MVA and Higher (Applies to the Primary Property Program only)**
- Mechanical Drive Turbines, 1000 HP and Over
- Combustion Turbines
- Diesel Generators, Class 1E, OR, 1000 HP and Over
- Emergency Core Cooling Systems (ECCS)
  - Residual Heat/Decay Heat Removal Pump & Motor/Turbine
  - Containment Spray Pump & Motor
  - Reactor Building Component Cooling Water Pump & Motor
- Motors, 1000 HP and Over
- **Turbine-Generator Standby (Auxiliary) and Emergency Lubricating Oil Pump Motors**
- Pumps, with Drivers 1000 HP and Over
- **Turbine-Generator Standby (Auxiliary) and Emergency Lubricating Oil Pumps**
- Spent Fuel Pool
- Cranes, Rigging, Fuel and Material Handling Equipment

Pressurized Water Reactors:

- Reactor Coolant Pump & Motor
- Steam Generator
- ECCS
  - High Pressure Safety Injection Pump & Motor
  - Low Pressure Safety Injection Pump & Motor
- Auxiliary Feed Pump & Motor/Turbine

Boiling Water Reactors:

- Reactor Recirculating Pump & Motor
- Reactor Recirculating Pump Motor Generator Set
- ECCS
  - Reactor Core Isolation Cooling Pump & Motor/Turbine
  - High Pressure Coolant Injection Pump & Motor/Turbine
  - Low Pressure Coolant Injection Pump & Motor/Turbine
  - High Pressure Core Spray Pump & Motor
  - Low Pressure Core Spray Pump & Motor

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SECTION 8-2C TRANSFORMER TESTING FLOWCHART & GUIDELINES

Dissolved Gas-in-Oil Sampling Flowchart

Step 1	Collect and Analyze Sample – Generate Gas Data
	Go To Step 2

Step 2	Compare Test Results to Norms and/or Previous Data
	Go To Step 3

Step 3	Are All Gas Levels < Adverse Condition Trigger Levels? **(See Figure 1A)**
	If YES, Go to Step 4
	If NO, Go to Step 5

Step 4	Go to Step 1 - Return to Normal Sample Interval

Step 5	Resample as Soon as Possible to Confirm Results
	Are All Gas Levels < Adverse Condition Trigger Levels? **(See Figure 1A)**
	If YES, Go to Step 4
	If NO, Go to Step 6

Step 6	Notify NEIL Per Adverse Condition Reporting (See **Section 8-1H**)
	Classify Condition and Initiate Additional Testing to Determine Gassing Rate **(See Figure 2)**
	Go to Step 7

Step 7	Establish Test Interval and Operating Procedure (See **Figure 3 for TDCG** or **Figure 4 for TCG**)
	Submit Test Results to Nuclear Electric Insurance Limited
	Consult with NEIL Concerning Continued Testing and Impact of Adverse Condition on Insurance Coverage of the Transformer
	Go to Step 8

Step 8	Continue Sampling Per Sampling / Test Intervals and Operating Procedures Test Intervals (See **Figure 3 for TDCG** or **Figure 4 for TCG**) Until Transformer Gas Data is Within Norms.

FIGURE 1A

DISSOLVED GAS-IN-OIL

	Hydrogen H2	Methane CH4	Ethylene C2H4	Ethane C2H6	Acetylene C2H2	Carbon Monoxide CO	TDCG
IEEE NORMS in ppm	100	120	50	65	35	350	720
NEIL Adverse Condition Trigger Levels	(110)	(132)	(55)	(72)	(39)	(385)	(792)

Triggers for NEIL Adverse Condition ≥ 110% of IEEE Norms, in ( )

Identification of any gas exceeding the IEEE Norms by greater than 10% requires increased testing in accordance with **Figure 2**, to determine the Combustible Gas Generation Rate.

FIGURE 1B

INSULATING OIL

IEEE Values NEIL Adverse Condition Triggers in ( )		69 kV and Below	Above 69 through 288 kV	325 kV and Above
DIELECTRIC BREAKDOWN VOLTAGE	ASTM D-877 kV, minimum	26 (23)	26 (23)	26 (23)
	OR			
	ASTM D-1816-.08" kV, minimum	34 (30)	45 (40)	45 (40)
	OR			
	ASTM D-1816-.04" kV, minimum	23 (20)	26 (23)	26 (23)
NEUTRALIZATION NUMBER Mg KOH/gm oil, maximum		0.2 (0.22)	0.2 (0.22)	0.1 (0.11)
INTERFACIAL TENSION MN/m, minimum		24 (21)	26 (23)	30 (27)
MOISTURE ppm, maximum		35 (39)	25 (28)	20 (22)
RELATIVE SATURATION %		---	---	---

Triggers for NEIL Adverse Condition ≥ 110% of IEEE values, in ( )

The identification of any insulating oil property exceeding the IEEE values by greater than 10% would trigger increased testing to verify condition and corrective actions.

FIGURE 2

MINIMUM SAMPLING / TEST FREQUENCY TO DETERMINE GASSING RATE

	TDCG (ppm)	Note: *A minimum of 3 tests required. If more tests are performed, proceed to* ***Figure 3*** *or* ***Figure 4*** *immediately following the fourth test.*
Condition I Some Deterioration	Less Than 792	Monthly
Condition II More Than Normal Deterioration	792 to 1920	Weekly
Condition III High Level of Deterioration	1921 to 4630	Every Three Days
Condition IV Excessive Deterioration	Greater Than 4630	Daily

TDCG = Total Dissolved Combustible Gas

Once the gassing rate has been determined through sampling conducted in accordance with ***Figure 2***, future sampling/testing frequencies and operating procedures are determined from ***Figure 3*** or ***Figure 4***.

FIGURE 3

SAMPLING / TEST INTERVALS AND OPERATING PROCEDURES

SAMPLING INTERVALS FOR TDCG

Note: *This figure applies to total dissolved combustible gas in the oil.*

TDCG LEVEL (ppm)	TDCG RATE (ppm/day)	INTERVAL	PROCEDURE
Condition I (< 792)	< 10	Normal Frequency	1
	10 to 30	Quarterly	1
	> 30	Monthly	2
Condition II (792 to 1920)	< 10	Quarterly	2
	10 to 30	Monthly	2
	> 30	Monthly	2
Condition III (1921 to 4630)	< 10	Monthly	3
	10 to 30	Weekly	3
	> 30	Weekly	3
Condition IV (> 4630)	< 10	Weekly	3
	10 to 30	Daily	3
	> 30	Daily	4

TDCG = Total Dissolved Combustible Gas

FIGURE 3

OPERATING PROCEDURES

PROCEDURE	DESCRIPTION
1	- Continue normal surveillance, unless TDCG has increased by > 10% since previous sample.
2	Exercise Caution - Use all available analytical procedures and on-line diagnostic techniques to identify cause of gassing. - Consult transformer manufacturer. - Determine load dependence.
3	Exercise Extreme Caution - Complete all items in Procedure 2. - Reduce MVA load, plan an outage if rate constant or increasing - Monitor using continuous gas-in-oil analyzer - Conduct thermographic surveys
4	NEIL Will Review Continued Insurance Coverage - Complete all items in Procedure 3. - Reduce MVA load. - Remove unit from service as soon as possible.

FIGURE 4

SAMPLING / TEST INTERVALS AND OPERATING PROCEDURES

SAMPLING / TEST INTERVALS FOR TCG

Note: *This figure applies to total combustibles in the gas space. Bladder type oil preservation systems do not have a gas space.*

TCG LEVEL (ppm)	TCG RATE (ppm/day)	INTERVAL	PROCEDURE
Condition I (≤ 0.5)	< 0.01	Normal Frequency	1
	.01 to .03	Quarterly	1
	> .03	Monthly	2
Condition II (> 0.5 to 2.0)	< 0.01	Quarterly	2
	.01 to .03	Monthly	2
	> .03	Monthly	2
Condition III (> 2.0 to 5.0)	< 0.01	Monthly	3
	.01 to .03	Weekly	3
	> .03	Weekly	3
Condition IV (> 5.0)	< 0.01	Weekly	3
	.01 to .03	Daily	3
	> .03	Daily	4

TCG = Total Combustible Gas

FIGURE 4

OPERATING PROCEDURES

PROCEDURE	DESCRIPTION
1	- Continue normal surveillance, unless TCG has increased by > 10% since previous sample.
2	Exercise Caution - Use all available analytical procedures and on-line diagnostic techniques to identify cause of gassing. - Consult transformer manufacturer. - Determine load dependence.
3	Exercise Extreme Caution - Complete all items in Procedure 2. - Reduce MVA load, plan an outage if rate constant or increasing - Monitor using continuous gas-in-oil analyzer - Conduct thermographic surveys
4	NEIL Will Review Continued Insurance Coverage - Complete all items in Procedure 3. - Reduce MVA load. - Remove unit from service as soon as possible.

Insulating Oil Sampling Flowchart

Step 1	Collect and Analyze Sample
	Go To Step 2

Step 2	Compare to IEEE Values and/or Previous Data (See **Figure 1B**)
	Go To Step 3

Step 3	Are All Insulating Oil Values < Adverse Condition Trigger Levels? (See **Figure 1B**)
	If YES, Go to Step 4
	If NO, Go to Step 5

Step 4	Go to Step 1 – Return to Normal Sample Interval

Step 5	Resample as Soon as Possible to Confirm Results
	Are All Insulating Oil Values < Adverse Condition Trigger Levels? (See **Figure 1B**)
	If YES, Go to Step 4
	If NO, Go to Step 6

Step 6	Notify NEIL Per Adverse Condition Reporting (See **Section 8-1H**)
	Perform Additional Testing, as Necessary
	Go to Step 7

Step 7	Submit Test Results to Nuclear Electric Insurance Limited
	Consult with NEIL Concerning Continued Testing and Impact of Adverse Condition on Insurance Coverage of the Transformer
	Go to Step 8

Step 8	Continue Sampling as Discussed with NEIL, Determine and Correct Cause of Abnormal Test Results. When Insulating Oil Test Results are Within IEEE Norms, Notify NEIL and return to Step 1.

SECTION 8-2D ROTATING EQUIPMENT VIBRATION GUIDELINES

Based on rotating equipment vibration problems, which have arisen from time to time at NEIL Member plants, the NEIL EAC recognized that it would be beneficial to both NEIL and its Members to establish a consistent method for addressing such conditions. The EAC had earlier determined that NEIL should be made aware of conditions, which could potentially increase its exposure to loss, and implemented an Adverse Condition Reporting requirement (**Section 8-1H**) for notification to NEIL when certain conditions were identified. However, no specific guidance was provided for the NEIL Staff or Members on how such conditions should be handled.

The NEIL Rotating Equipment Vibration Guidelines were developed by the EAC's B&M Subcommittee based on generally accepted Industry Standards along with input from NEIL Member companies. The guidelines were intentionally structured to be general in nature to encompass all rotating equipment, which, if failure were to occur, could result in a NEIL loss. It was recognized that specific pieces of equipment may have normal operating characteristics or manufacturer allowances which exceed one or more of the action levels contained in the guidelines. Such situations, however, are considered on a case-by-case basis by NEIL. In general, the guidelines were felt to be appropriate for the various equipment classes and speeds listed.

Several important points should be noted:

1. The guidelines apply only to rotating equipment (excluding Emergency Diesel Generators) addressed by the NEIL B&M Loss Control Standards and specified on the **EQUIPMENT LIST FOR THE B&M LOSS CONTROL STANDARDS**.

2. The method of vibration monitoring or measurement is intentionally not specified. The intent is to apply the guidelines to results obtained utilizing the plant's normal monitoring and measurement methods. Where appropriate, measurements should be taken in accordance with the requirements and instructions outlined in the ASME ISTB (OM-6) document.

3. The guidelines are intended to apply to steady state conditions and not transient conditions such as start-up, which normally result in conditions at or near the action levels for short periods.

4. Identification of an Adverse Condition as defined by the guidelines does not necessarily mean that a significant problem exists or that NEIL will initiate some underwriting action. The intent is for NEIL to be made aware of conditions once a certain trigger point is reached so that a dialogue can be established between NEIL Staff and the Member to determine what, if any, additional risk the condition presents.

ROTATING EQUIPMENT VIBRATION GUIDELINES

English Table	Vibration Levels (Mils - Shaft)				
Equipment	Speed (RPM)	Normal Procedure 1	Adverse Condition Alert Procedure 2	Increased Risk Procedure 3	Coverage Procedure 4
Main Turbine Generator	1800	≤ 6	> 6 to ≤ 10	> 10 to ≤ 12	> 12
	3600	≤ 3	> 3 to ≤ 5	> 5 to ≤ 6	> 6
Mechanical Drive Turbines	> 3000	≤ 2	> 2 to ≤ 4	> 4 to ≤ 5	> 5
Pumps	< 600	≤ 10.5	> 10.5 to ≤ 16	> 16 to ≤ 22	> 22
Velocity Levels (in/sec - Bearing Housing)					
Pumps	≥ 600 to 2000	≤ 0.325	> 0.325 to ≤ 0.5	> 0.5 to ≤ 0.7	> 0.7
Pumps	> 2000	≤ 0.4	> 0.4 to ≤ 0.6	> 0.6 to ≤ 0.8	> 0.8

Motors	Acceptable National Standards Have Not Been Developed For Motors. The Member May Use The Values Established For Pumps As Guidance For Motors. Motor Vibration Levels Exceeding Pump Vibration Levels DO NOT Constitute An Adverse Condition.

Alternate Methods For Vibration Measurements And Corresponding Reporting Levels Whose Equivalence Can Be Demonstrated To NEIL, Will Be Acceptable.

ROTATING EQUIPMENT VIBRATION GUIDELINES

Note: *A conversion and rounding off were used to obtain the Metric Table Values.*

Metric Table	Vibration Levels (Microns - Shaft)				
Equipment	Speed (RPM)	Normal Procedure 1	Adverse Condition Alert Procedure 2	Increased Risk Procedure 3	Coverage Procedure 4
Main Turbine Generator	1500	≤ 200	> 200 to ≤ 300	> 300 to ≤ 400	> 400
	3000	≤ 100	> 100 to ≤ 150	> 150 to ≤ 200	> 200
Mechanical Drive Turbines	> 3000	≤ 50	> 50 to ≤ 100	> 100 to ≤ 130	> 130
Pumps	< 600	≤ 270	> 270 to ≤ 400	> 400 to ≤ 550	> 550
Velocity Levels (mm/sec - Bearing Housing)					
Pumps	≥ 600 to 2000	≤ 8.3	> 8.3 to ≤ 12.7	> 12.7 to ≤ 17.8	> 17.8
Pumps	> 2000	≤ 10.2	> 10.2 to ≤ 15.2	> 15.2 to ≤ 20.3	> 20.3

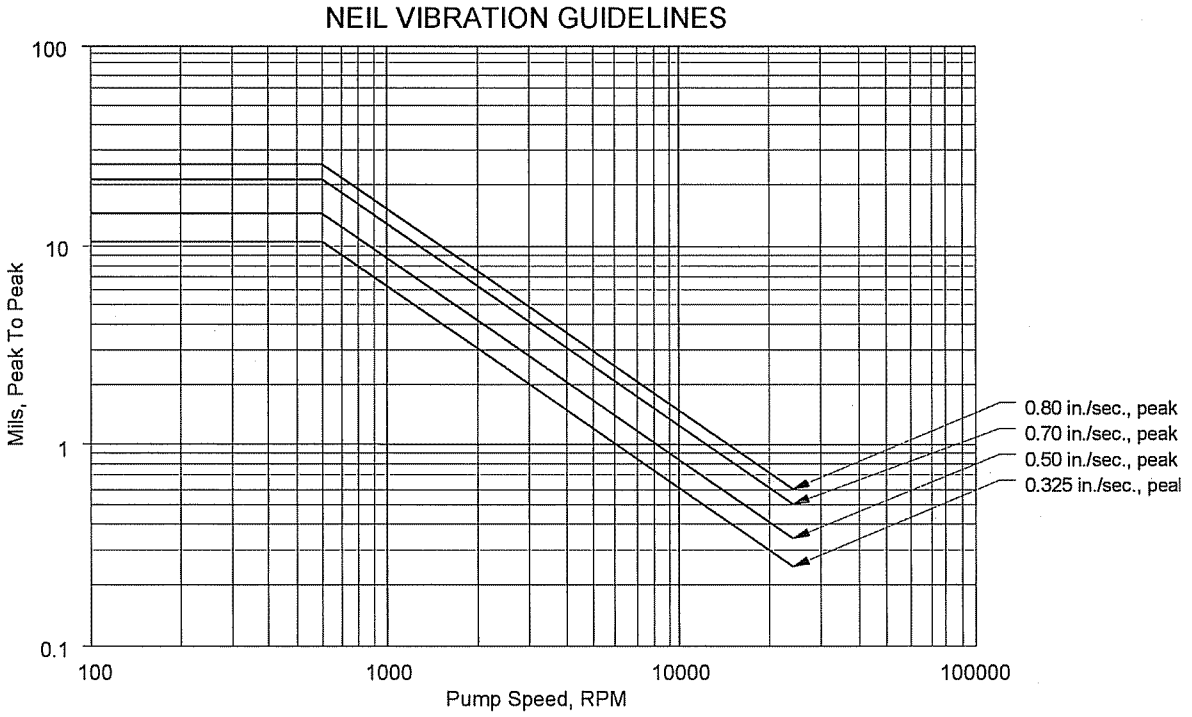
Motors	Acceptable National Standards Have Not Been Developed For Motors. The Member May Use The Values Established For Pumps As Guidance For Motors. Motor Vibration Levels Exceeding Pump Vibration Levels DO NOT Constitute An Adverse Condition.

Alternate Methods For Vibration Measurements And Corresponding Reporting Levels Whose Equivalence Can Be Demonstrated To NEIL, Will Be Acceptable.

ROTATING EQUIPMENT VIBRATION GUIDELINES PROCEDURES

PROCEDURE	DESCRIPTION
1	- Continue normal operation and surveillance.
2	Exercise Caution - File Adverse Condition Report To NEIL - Use all available analytical procedures and diagnostic techniques to identify cause of the vibration. - Perform full spectral analysis. - Contact equipment manufacturer or consultants, if appropriate. - Perform corrective action at earliest opportunity.
3	Exercise Extreme Caution - Complete all items in Procedure 2. - Plan an outage to correct cause of vibration. - Provide NEIL with technical justification for continued operation.
4	NEIL Will Review Continued Insurance Coverage - Contact NEIL immediately - Complete all items in Procedure 3. - Remove unit from service as soon as possible.

Alternate Methods For Vibration Measurements And Corresponding Reporting Levels Whose Equivalence Can Be Demonstrated To NEIL Will Be Acceptable.



SECTION 8-2E REFERENCED DOCUMENTS

REFERENCE DOCUMENTS*

AISC	ASD-Manual of Steel Construction
ANSI/ASME XI	Rules for Inservice Inspection of Nuclear Power Plant Components
ASME TWDPS1	Recommended Practices for the Prevention of Water Damage Part 2 to Steam Turbines Used for Electric Power Generation
ASME OM Code Subsection ISTB	Code for Operation and Maintenance of Nuclear Power Plants
IEEE 387-1984	IEEE Standard Criteria for Diesel-Generator Units Applied as Standby Power Supplies for Nuclear Power Generating Stations
IEEE 450-1995	IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications
IEEE 505-1977	IEEE Standard Nomenclature for Generating Station Electric Power Systems
IEEE 1106-1995	IEEE Recommended Practice for Installation, Maintenance, Testing and Replacement of Vented Nickel-Cadmium Batteries for Stationary Applications
IEEE 1188-1996	IEEE Recommended Practice for Installation, Maintenance, Testing and Replacement of Valve-Regulated Lead-Acid (VRLA) Batteries for Stationary Applications
IEEE C57.104-1991	IEEE Guide for the Interpretation of Gases Generated in Oil-Immersed Transformers
IEEE C57.106-1991	IEEE Guide for Acceptance and Maintenance of Insulating Oil in Equipment
ASME B30.2a-1991	Overhead and Gantry Cranes
ASME B30.9a-1991	Slings
ASME/ANSI B30.10b-1991	Hooks
NUMARC 87-00	Guidelines and Technical Bases for NUMARC Initiatives Addressing Station Blackout at Light Water Reactors

SECTION 8-2E	*REFERENCED DOCUMENTS* (Cont)
OSHA 29 CFR Ch XVII 1910.179, 7/1/92	Overhead and Gantry Cranes
OSHA 29 CFR Ch XVII 1910.184, 7/1/92	Slings
SNT-TC-1A	American Society of Non-Destructive Testing; a Recommended Practice to Establish the General Framework for a Qualification and Certification Program
NEI 97-06	Steam Generator Program Guidelines

*Other ACCEPTABLE Documents may be used.

? SECTION 8-2F - PRIMARY PROPERTY PROGRAM B&M CREDITS

Primary Property Program B&M Credits

Table Format

Narrative Format

Equipment List

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Primary Property Program B&M Credits - Table Format

SECTION I Protective Devices and Hardware

A. Turbine

Credit	*Observation/Test/Inspection/Surveillance*	*Frequency*	*Partial Credit*	*Credit*
A.1	**Water Induction System**	N/A	100	200
A.2	**Bearing Metal Temperature**	N/A	40	60
A.3	Bearing High Vibration Trip	N/A	0	200
A.4	**On-Line Vibration Analysis**	Continuous	0	200
A.5	**Independent Overspeed Trip Protection**	Fuel Cycle	0	100

B. Generator

Credit	*Observation/Test/Inspection/Surveillance*	*Frequency*	*Partial Credit*	*Credit*
B.1	Shorted Turn Monitoring on Rotor	N/A	0	100
B.2	**On-Line Diagnostic System**	Continuous	0	100
B.3	Radio Frequency (RF) Monitor	Continuous	0	100
B.4	Resistance Temperature Detectors (RTD's)	N/A	0	100
B.5	End Turn Vibration Monitoring	N/A	0	100
B.6	**Pyrolysate System**	N/A	0	100

Note: *Maximum of 500 Credits for items B.1 to B.6*

Credit	*Observation/Test/Inspection/Surveillance*	*Frequency*	*Partial Credit*	*Credit*
B.7	Generator Protective Relays	N/A	0	150
B.7.a	Differential	N/A	10	0
B.7.b	Ground	N/A	15	0
B.7.c	Overcurrent	N/A	10	0
B.7.d	Loss of Excitation	N/A	20	0
B.7.e	Reverse Current	N/A	15	0
B.7.f	Field Ground	N/A	15	0
B.7.g	Phase Balance	N/A	15	0
B.7.h	Volts / Hertz	N/A	50	0
B.8	Hydrogen Monitoring	Continuous	0	100
B.9	Retaining Rings	N/A	0	200

C. Condensate / Feedwater Systems

Credit	*Observation/Test/Inspection/Surveillance*	*Frequency*	*Partial Credit*	*Credit*
C.1	**High Integrity Tubing**	N/A	0	200
	Feedwater Systems	N/A	75	0
	FW Heaters - MS/R's	N/A	125	0
C.2	Continuous System Monitoring	Continuous	0	260
	Feedwater System	Continuous	110	0
	Condensate System	Continuous	150	0

D. NSSS

Credit	*Observation/Test/Inspection/Surveillance*	*Frequency*	*Partial Credit*	*Credit*
D	Loose Parts Monitoring	N/A	0	215

E. Transformers

Credit	*Observation/Test/Inspection/Surveillance*	*Frequency*	*Partial Credit*	*Credit*
E.1	Sudden Fault Relay & Trip	N/A	0	100
	Alarm Only	N/A	50	0
E.2	Continuous Monitors			
E.2.a	On-Line Gas Analyzer (Gas-In-Oil)	Continuous	0	300
E.2.b	Partial Discharge Monitor	Continuous	0	100
E.2.c	Moisture Content Analyzer	Continuous	0	100
E.3	Additional Testing			200
	a. Frequency Response Analysis	6 Years	100	
	b. Partial Discharge Test	6 Years	100	
	c. Furan Analysis	2 Years	100	
	d. Static Electrification Detection	6 Years	100	
	e. Geomagnetically Induced Current (GIC) Testing	6 Years	100	

Note: Maximum of 200 Credit Points available for Additional Testing.

SECTION II Loss Control Programs and Procedures

A. Vibration Analysis Programs

Credit	*Observation/Test/Inspection/Surveillance*	*Frequency*	*Partial Credit*	*Credit*
A.1	**Turbine-Generator**	Monthly	50	100
	Rotating Equipment	Monthly	100	200
A.2	**Reactor Coolant / Recirculation Pumps**	Continuous	0	100

B. **Full Spectrum Lubricating Oil/Control Fluid Analysis**

Credit	*Observation/Test/Inspection/Surveillance*	*Frequency*	*Partial Credit*	*Credit*
B	Testing of Oil Samples	Quarterly	0	125

C. Major Pressure Vessels, Safety Valve Testing

Credit	*Observation/Test/Inspection/Surveillance*	*Frequency*	*Partial Credit*	*Credit*
C	Safety Valve Testing Program	6 Years	0	100

D. Thickness Testing of Balance of Plant Piping Systems

Credit	*Observation/Test/Inspection/Surveillance*	*Frequency*	*Partial Credit*	*Credit*
D	Main Steam Piping	N/A	0	55
	Extraction Steam Piping	N/A	0	50
	Condensate and Feedwater	N/A	0	100

E. Preventative Maintenance Program

Credit	Observation/Test/Inspection/Surveillance	*Frequency*	*Partial Credit*	*Credit*
E.1	Formal Maintenance Program	N/A	0	250
E.2	Predictive Maintenance Program - Current Signature Analysis	Once Per Fuel Cycle	0	25
E.3	Predictive Maintenance Program - Partial Discharge Analysis	Once Per Fuel Cycle	10	25

F. Thermographic Surveys

Credit	*Observation/Test/Inspection/Surveillance*	*Frequency*	*Partial Credit*	*Credit*
F.1	**Transformers**	Annual	75	150
	Motors, Bus Ducts	Annual	75	150
	Pumps Bearings, Gears and Couplings	Annual	25	50
F.2	**Switchyard Breakers and Disconnects**	Semi-Annual	100	200

SECTION III Administration

III. **Personnel Training**

Credit	*Observation/Test/Inspection/Surveillance*	*Frequency*	*Partial Credit*	*Credit*
III	**Accredited Personnel Training**	N/A	0	250
A	Mechanical Maintenance	N/A	40	0
B	Electrical Maintenance	N/A	40	0
C	Non-Licensed Operator	N/A	40	0
D	Control Room Operators	N/A	40	0
E	Senior Control Room Operator or Shift Supervisor	N/A	25	0
F	Instrument and Control Technician	N/A	40	0
G	Technical Staff Managers	N/A	25	0

Total Credits 5115

Primary Property Program B&M Credits - Narrative Format

? Credit for Shutdown Plants

Section I Protective Devices and Hardware

A. Turbine

? 1. Water Induction System - Turbine system designed in accordance with ASME TWDPS1 - Part 2. Partial credit is given for significant upgrading of turbines not designed to the ASME Standard.

Designed to ASME TWDPS1 - Part 2 - Credit - 200
Significant Upgrades, Not Designed to ASME - Partial Credit - 100

? 2. Bearing Metal Temperature - All Turbine-Generator bearings provided with bearing metal temperature detection. Partial credit is given for thrust bearings only.

All Turbine-Generator Bearings - Credit - 60
Thrust Bearings Only - Partial Credit - 40

3. Bearing High Vibration Trip - Bearing high vibration trip provided and armed except in closely controlled circumstances such as start-up.

Credit - 200

? 4. On-line Vibration Analysis - Continuous on-line vibration monitoring hardware with continuous trending and analysis.

Credit - 200

? 5. Independent Overspeed Protection - An independent system beyond the normal systems to provide additional assurance against excessive overspeed. The correct operation of this system should be verified each Fuel Cycle.

Credit - 100

B. Generator

Note: *Maximum of 500 Full Credits for items I.B.1. - I.B.6.*

1. Shorted Turn Monitoring on Rotor - On-line techniques to monitor shorted turns in the rotor causing thermal sensitivity.

Partial Credit - 100

? 2. Generator On-line Diagnostic System - Credit is given for a complete, installed diagnostic system, which is continuously monitored for trends in the generator internal conditions.

Partial Credit - 100

3. Radio Frequency (RF) Monitor - Continuous monitoring of signal emissions from within the generator fields.

Partial Credit – 100

4. Resistance Temperature Detectors (RTD) - Resistance Temperature Detectors or Thermo-couples embedded in the generator gas passages to signal increasing internal temperatures.

Partial Credit -100

5. Generator End Turn Vibration Monitoring - Installed vibration monitoring system using fiber-optic technology. Provides advance warning of end turn cracking, loose wedges, etc.

Partial Credit -100

? 6. Pyrolysate System - An installed system for continuous collection of cooling gasses to detect the presence of particulates from sacrificial chemical compounds to readily detect location of overheating.

Partial Credit - 100

7. Generator Protective Relays - Credit is provided for the installation of relays to protect the Generator from electrical damage. Partial credit is available for each relay (differential, ground, over current, loss of excitation, reverse current, field ground, phase balance, and volts/hertz.)

Credit - 150
Differential, Partial Credit - 10
Ground, Partial Credit - 15
Over current, Partial Credit - 10
Loss of Excitation, Partial Credit - 20
Reverse Current, Partial Credit - 15
Field Ground, Partial Credit - 15
Phase Balance, Partial Credit - 15
Volts/Hertz, Partial Credit - 50

8. Hydrogen Monitoring - Credit is available for continuous hydrogen monitoring for purity and incipient Generator faults.

Credit - 100

9. Retaining Rings - Installed retaining rings of 18Mn/18Cr material or equivalent.

Credit - 200

C. Condensate/Feedwater Systems

? 1. High Integrity Tubing - Condensers, Feedwater (FW) Heaters, and Moisture Separator/Reheaters (MS/R's) having non copper-bearing materials. Partial credit is applied for all condensers or all FW Heaters, including MS/R's.

Credit - 200
Condensers, Partial Credit - 75
FW Heaters - MS/R's, Partial Credit - 125

2. Continuous System Monitoring - Continuous monitoring of Feedwater and Condensate systems for chemistry imbalances or excursions and for contaminants, with alarm functions for values outside plant specifications.

Credit - 260
Feedwater System, Partial Credit - 110
Condensate System, Partial Credit - 150

D. NSSS - Loose parts monitoring for Reactors/Steam Generators.

Credit - 215

E. Transformers

1. The installation of sudden/fault pressure relays on all transformers referenced in the NEIL B&M Standards, to include alarm and trip features. Partial credit is available for transformers equipped with sudden/fault pressure relays arranged to provide alarm only.

Alarm and Trip, Credit - 100
Alarm Only, Partial Credit - 50

2. The installation of continuous monitors on the Main Generator Step-up Transformer(s):

a. On-Line Gas Analyzers (Dissolved Gas-in-Oil)

Credit - 300

b. Partial Discharge Monitor

Credit - 100

c. Moisture Content Analyzer

Credit – 100

3. Credit is provided for performing Additional Testing of transformers as follows:

a. Frequency Response Analysis every 6 Years.

Partial Credit - 100

b. Partial Discharge Test every 6 Years.

Partial Credit - 100

c. Furan Analysis every 2 Years.

Partial Credit - 100

d. Static Electrification Detection every 6 Years.

Partial Credit - 100

e. Geomagnetically Induced Current Testing every 6 Years.

Partial Credit - 100

Note: Maximum Credit for E.3, Additional Testing, is 200 Points.

Section II Loss Control Programs and Procedures

A. Vibration Analysis Programs

? 1. Credit is provided for a monthly vibration analysis program which measures, records, and trends vibration spectrum signatures. Credit is available for Turbine-Generator only, or rotating equipment as noted in the NEIL Primary Insurance Program only. Credit is applied if the person performing and the person reviewing vibration analysis results are certified to

SNT-TC-1A, Level I and Level II, respectively. Partial credit is applied if either the person performing or person reviewing is not certified to SNT-TC-1A.

Turbine-Generator, Credit - 100, Partial Credit - 50
Rotating Equipment, Credit - 200, Partial Credit – 100

? 2. Credit is provided for the continuous operation of a vibration monitoring system installed on Reactor Coolant Pumps/Reactor Recirculation Pumps that has the capabilities of detecting shaft cracking and bearing degradation.

Credit - 100

? B. Full Spectrum Lubricating Oil/Control Fluid Analysis - Credit is provided for quarterly testing of oil samples by applying methods of quantitative and qualitative analysis to determine the presence of wear metals or contaminants.

Credit - 125

C. Major Pressure Vessels, Safety Valve Testing - The implementation of a six (6) year safety valve testing program, to include pressure vessels not within the scope of the ASME Section XI Inservice Testing program. The program would typically include safety valves on Feedwater Heaters, Heater Drain Tanks, and Coolers.

Credit - 100

D. Thickness Testing of Balance of Plant Piping Systems - A regularly scheduled inspection program to provide for thickness testing of Main Steam Piping, Extraction Steam Piping, Feedwater, and Condensate Piping.

Main Steam Piping - Credit - 55
Extraction Steam Piping - Credit - 50
Condensate and Feedwater - Credit - 100

E. Preventative Maintenance Program

1. The provision of a fully implemented formal maintenance program, which ensures planned and systematic activities with documented results on objects described in the NEIL B&M Loss Control Standards.

Credit - 250

2. A predictive maintenance program which includes the performance of motor current or flux analysis, and motor winding analysis every Fuel Cycle.

Credit - 25

3. A predictive maintenance program which includes Partial Discharge Analysis of 1000 HP and over electric motors at least once every Fuel Cycle. Partial Credit is applied for implementation of a Partial Discharge Analysis Program; full Credit is applied if all 1000 HP and over motors are included in the program.

Credit - 25; Partial Credit - 10

F. Thermographic Surveys

? 1. Annual infrared surveys of major equipment including transformers, motors, motor control centers, and associated bus ducts, and pumps, including bearings, couplings and gears.

Transformers, Credit - 150, Partial Credit - 75
Motors, Bus Ducts, Credit - 150, Partial Credit - 75
Pumps, Bearings, Gears and Couplings, Credit - 50, Partial Credit – 25

? 2. Semiannual infrared surveys of switchyard breakers and disconnects.

Switchyard Breakers, Disconnects, Credit - 200, Partial Credit - 100

Credit is applied if the person performing and the person reviewing thermographic results are certified to SNT-TC-1A, Level I and Level II, respectively. Partial credit is applied if either the person performing or person reviewing is not certified to SNT-TC-1A.

Section III Administration

? III. Personnel Training - Credit is provided for the implementation of training programs for personnel whose activities concern the Turbine-Generator. Those training programs accredited by an industry-recognized authority in the following disciplines are considered; partial credits apply.

Credit - 250

A. Mechanical Maintenance

Partial Credit - 40

B. Electrical Maintenance

Partial Credit - 40

C. Non-licensed Operator

Partial Credit - 40

D. Control Room Operator

Partial Credit - 40

E. Senior Control Room Operator or Shift Supervisor

Partial Credit - 25

F. Instrument and Control Technician

Partial Credit - 40

G. Technical Staff Managers

Partial Credit – 25

Primary Property Program B&M Credits - Equipment List

Main Turbine-Generator/Exciter
Motors (1000 HP and Over)
Pumps with Driver (1000 HP and Over)
Mechanical Drive Turbines (1000 HP and Over)
Main Step-Up Transformers
Auxiliary Transformers
Start-Up Transformers
Other Transformers (100 MVA and Over)

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SECTION 8-2G ACCIDENTAL OUTAGE PROGRAM B&M CREDITS

Accidental Outage Program B&M Credits

Table Format

Narrative Format

Equipment Object List

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Accidental Outage Program B&M Credits - Table Format

Assessed Credits will be determined by normalizing to 1000, by the following:

A = (1000/Available) x Applied

Where:

A = Assessed Credits

Available = Available credit points (based on design characteristics determined by the EAC)

Applied = Points applied during the evaluation.

SECTION I Pressure Vessels

A. ***Reactor Pressure Vessel Internals***

Credit	*Observation/Test/Inspection/Surveillance*	*Frequency*	*Partial Credit*	*Credit*
A	Reactor Vessel Internal Inspection	Fuel Cycle	0	150

B. Pressurized Water Reactors

Credit	*Observation/Test/Inspection/Surveillance*	*Frequency*	*Partial Credit*	*Credit*
B.1	**Steam Generator - Tube Bundle Conditions**	Fuel Cycle	12.5*	25
B.2	**Steam Generator - Tube Sheets & Shell**	Fuel Cycle	12.5*	25
B.3	Water Chemistry		0	25
B.4	Sludge Removal Program	Fuel Cycle	12.5*	25
B.5	**Thermal Shield Inspection**	Fuel Cycle	25*	150
B.6	Reactor Coolant Pumps and Motors Vibration & Lubricating Oil Analysis	Fuel Cycle	0	50

* Partial Credit available if inspections performed every two Fuel Cycles.

C. Boiling Water Reactors

Credit	*Observation/Test/Inspection/Surveillance*	*Frequency*	*Partial Credit*	*Credit*
C.1	**Hydrogen Injection System**	N/A	0	75
C.2	Reactor Recirculation Pumps and Motors Vibration & Lubricating Oil Analysis	Fuel Cycle	0	75

SECTION II Turbine-Generator/Exciter

A. Observations

Credit	*Observation/Test/Inspection/Surveillance*	*Frequency*	*Partial Credit*	*Credit*
A.1	Control and Stop Valves	Weekly	0	15
A.2	Extraction Check Valves	Weekly	0	10
A.3	Feedwater Heaters	Weekly	0	10
A.4	Emergency Lubricating Oil Pumps	Weekly	0	10
A.5	Feedwater Chemistry	Weekly	0	10
A.6	Hydrogen Purity	Weekly	0	10
A.7	Iso-phase Bus Duct Condition	Weekly	0	10

B. Observations

Credit	*Observation/Test/Inspection/Surveillance*	*Frequency*	*Partial Credit*	*Credit*
B	Conditions Observed and Recorded		-	75
	1. Valves, Full Stroke Exercise	Fuel Cycle	0	
	2. Float Type Devices, Test	Fuel Cycle	0	
	3. Accessible LP Blading, Condition	Fuel Cycle	0	
	4. Generator Components, Condition	Fuel Cycle	0	
	5. Vibration & LO Analysis, Evaluate	Fuel Cycle	0	
	6. Hydrogen Seal Systems, Integrity	Fuel Cycle	0	
	7. Pressure Switches, Verify Set Pressure	Fuel Cycle	0	

C. Observations

Credit	*Observation/Test/Inspection/Surveillance*	*Frequency*	*Partial Credit*	*Credit*
C	Extraction Check Valves	Fuel Cycle	25*	50

* Partial Credit available if inspections performed every two Fuel Cycles.

SECTION III Dismantled Inspection of Turbine-Generator/Associated Equipment

Credit	*Observation/Test/Inspection/Surveillance*	*Frequency*	*Partial Credit*	*Credit*
A	Turbine Dismantled Inspection	8 Years	0	50
B	Generator Dismantled Inspection	8 Years	0	50
C.1	Turbine Protective Devices			
	a. Designed/Installed to TWDPS-1, Part 2	N/A	0	10
	b. Bearing Metal Detection	N/A	0	10
	c. Bearing High Vibration Trip	N/A	0	10
	d. On-line Vibration Hardware	N/A	0	10
C.2	Generator/Exciter Protective Devices			
	a. Shorted Rotor Turns	N/A	0	10
	b. Pyrolysate Collection System	N/A	0	10
	c. Radio Frequency Monitor	N/A	0	10
	d. End-Turn Vibration	N/A	0	15
	e. Retaining Rings	N/A	0	15

SECTION IV Transformers

Credit	*Observation/Test/Inspection/Surveillance*	*Frequency*	*Partial Credit*	*Credit*
A	Transformer Insulating Oil	*	0	50
B	Dissolved Gas-in-Oil	*	0	50
C	Thermographic Surveys	6 months	0	50
D	Online Dissolved Gas-In-Oil Analyzers			
	Main Step-Up Transformers	Continuous	0	40
	Auxiliary Transformers	Continuous	0	10

* Frequency - Within "should" Sample Periodicity, Results Within IEEE Norms.

SECTION V Mechanical Drive Turbines - Operational Inspections

Credit	*Observation/Test/Inspection/Surveillance*	*Frequency*	*Partial Credit*	*Credit*
V	Operational Inspections	As Required	0	25

SECTION VI Mechanical Drive Turbines - Operational Tests

Credit	*Observation/Test/Inspection/Surveillance*	*Frequency*	*Partial Credit*	*Credit*
VI	Operational Tests	As Required	0	25

SECTION VII Electric Motors, Motor-Generator Sets, and Pumps - Vibration Analysis

Credit	*Observation/Test/Inspection/Surveillance*	*Frequency*	*Partial Credit*	*Credit*
VII	Motors, Motor-Generator Sets, and Pumps Operating continuously Operate only during surveillance testing	 Quarterly Annual	0	30

SECTION VIII Electric Motors, Motor-Generator Sets, and Pumps - Oil Analysis

Credit	*Observation/Test/Inspection/Surveillance*	*Frequency*	*Partial Credit*	*Credit*
VIII	Motors, Motor-Generator Sets, and Pumps Operating continuously Operate only during surveillance testing	 Quarterly Fuel Cycle	0	30

SECTION IX Electric Motors and Motor-Generator Sets - Monitoring Program

A. Thermographic Surveys

Credit	*Observation/Test/Inspection/Surveillance*	*Frequency*	*Partial Credit*	*Credit*
A	Motors, Motor-Generator Sets, & Motor Control Centers Operating continuously Operate only during surveillance testing	 6 Months **Fuel Cycle**	0	15

B. Performance Monitoring

Credit	*Observation/Test/Inspection/Surveillance*	*Frequency*	*Partial Credit*	*Credit*
B	Motors, Motor-Generator Sets, & Motor Control Centers - Operating Characteristics Operating continuously Operate only during surveillance testing - Electrical Testing	 6 Months Annual Fuel Cycle	0	25

Accidental Outage Program B&M Credits - Narrative Format

The Assessed Credits will be determined by normalizing to 1000, by the following:

A = (1000/Available) x Applied

Where:

A = Assessed Credits
Available = Available credit points (based on design characteristics determined by the EAC)
Applied = Points Applied during the evaluation.

Section I Pressure Vessels

? A. Reactor Pressure Vessel Internals

Observations should be made each Fuel Outage of the general condition, structural weld conditions, debris, and condition of bolting and other fasteners and any associated lifting devices. These observations should identify any cracking or galling of Reactor Vessel Internals and associated equipment. Results of such inspections should be recorded. A complete core off-load is not required, however, observations are to be equivalent to those performed as if the core were completely off-loaded.

Fuel Cycle - Credit - 150

B. Pressurized Water Reactors - Observations should be made each Fuel Outage and results recorded on the following:

? 1. Steam Generator- Tube bundle conditions to include:
Eddy-current examination results, hot and cold legs, in all unplugged tubes
Tube cracking
Tube thinning
Tube denting
Tube supports

Fuel Cycle - Credit - 25
2 Fuel Cycles - Partial Credit - 12.5

? 2. Steam Generator - Tube sheets and shell internal conditions, including foreign object inspection.

Fuel Cycle - Credit - 25
2 Fuel Cycles - Partial Credit - 12.5

3. Water chemistry controlled within plant/manufacturer's guidelines.

Credit - 25

4. Sludge removal program.

Fuel Cycle - Credit - 25
2 Fuel Cycles - Partial Credit - 12.5

? 5. Thermal Shields (where installed) - Observations of all accessible areas using VT-3 methods to include:
- General conditions;
- Condition of support bolting, pins, welds, and/or surfaces.

Fuel Cycle - Credit - 150
2 Fuel Cycles - Partial Credit - 25

6. Reactor Coolant Pumps and Motors:
- Full spectrum vibration analysis.
- Lubricating oil analysis for sludge, particulates, wear metals, acidity and moisture content.

Fuel Cycle - Credit - 50

C. Boiling Water Reactors

? 1. A Hydrogen Injection System should be installed with adequate provisions to ensure its continued operation except under controlled conditions.

Credit – 75

2. Reactor Recirculation Pumps and Motors:
- Full spectrum vibration analysis.
- Lubricating oil analysis for sludge, particulates, wear metals acidity and moisture content.

Fuel Cycle - Credit – 75

Section II Turbine-Generator/Exciter

A. Observation should be made and results recorded of the following:

1. Freedom of movement of all Control and Stop Valves;

Weekly - Credit - 15

2. Freedom of movement of all Extraction Check Valves;

Weekly - Credit - 10

3. Operability of all Feedwater Heater extreme high level alarms, controls, switches and interlocks;

Weekly - Credit - 10

4. Operational availability of Emergency Lubricating Oil Pumps;

Weekly - Credit - 10

5. Feedwater chemistry controlled within plant/manufacturer's recommendations;

Weekly - Credit - 10

6. Hydrogen purity maintained above 96%;

Weekly - Credit - 10

7. Operability of Iso-phase Bus Duct Cooling System.

Weekly - Credit - 10

B. The following should be observed and recorded, and the consistency between remote and local indications should be verified:

1. The mechanical freedom of all Extraction Stop and Check Valves should be verified by a full stroke exercise.
2. Float type level indicating or alarm devices should be tested by actual operation of the float.
3. The condition of accessible low-pressure blading.
4. The condition of accessible portions of the generator components.
5. The results of lubricating and control oil analysis and vibration analysis should be evaluated for possible remedial actions.
6. The integrity of the hydrogen seal systems.
7. Verify the correct set pressure of all pressure switches used for turbine trips.

Fuel Cycle - Credit - 75

C. Observations should be made at each fuel cycle and the conditions recorded of the functional condition of all extraction check valve hinge pins, seats and locking devices.

Fuel Cycle - Credit - 50
2 Fuel Cycles - Partial Credit - 25

Section III Dismantled Inspection of Turbine-Generator and Associated Equipment

Dismantled inspections of Turbine-Generator units in accordance with manufacturer's recommendations should include visual examinations of the following components. In all cases, reference should be made to previous examinations of the same items to determine the progress, if any, of deterioration, wear and tear, erosion or corrosion.

In addition to visual examinations of the items listed, all nondestructive examination results should be reviewed and dispositioned.

A. Turbine

Note: *The entire machine need not be dismantled at one time. It is necessary only to complete the dismantled inspection of each part once within the eight (8) calendar year period.*

- Control (governor), stop (throttle), reheat stop, intercept and bypass valves for evidence of leakage, steam cutting, cracks, excessive erosion, etc.;
- Casings for evidence of cracking and casing joints for evidence of leakage;
- All bearings for any evidence of distress and shaft journals for scoring;
- All packing and glands for evidence of excessive wear;
- Rotor for any evidence of effects of misalignment (rubbing, etc.);
- All nozzles, wheels, blade rings and diaphragms for evidence of cracking, erosion, or corrosion;
- All buckets or blades for cracks, looseness, corrosion or erosion; and broken, cracked, or missing shroud bands or lashing wire;
- All couplings and bolting for any sign of distress;
- All governor control system components;
- All control lines and linkages;

- All lubricating oil pumps, lines, orifices and coolers;
- Relief and non-return valves;
- Internal inspection of all extraction line check and stop valves to determine seat condition, excessive wear on hinge or pivot points, freedom of operation and tightness of locking devices.
- All critical drip pots, traps and orifices (see note below) should be cleaned at the first refueling, prior to return to service after an extended outage of greater than 6 months and every 8 years thereafter. If debris is found in such quantity that would impair the effectiveness of a drip pot, trap or orifice, all such devices within the affected system Shall be inspected and cleaned prior to returning the unit to service.

Note: *Critical drip pots, traps and orifices are: Before and after main stop valves, control valves, steam chests, intercept, reheat valves and turbine casing drains.*

8 Calendar Years - Credit - 50

B. Generator/Exciter

Note: *The entire machine need not be dismantled at one time. It is necessary only to complete the dismantled inspection of each part once within the eight (8) calendar year period.*

Dismantled inspection of the Generator/Exciter in accordance with manufacturer's recommendations should be carried out with the field removed.

Inspections should be made of the following components:

- Field and Stator for evidence of loose blocking or ties, for evidence of electrical discharge (corona) or overheating;
- Hydrogen coolers and water-cooled windings for evidence of leakage;
- Generator enclosure for evidence of any distress;
- All bearings for evidence of any adverse conditions, and shaft journals for scoring;
- All hydrogen seals for evidence of excessive wear or misalignment;
- The Seal Oil System and components for evidence of distress;
- All couplings and bolting for any signs of distress;
- On brush type exciters, collector rings for excessive or uneven wear;
- Generator bushings.

In addition to the visual inspections above, the following should be completed:

- Nondestructive examination of the field retaining rings constructed of materials other than 18Mn/18Cr, or equivalent;
- Electrical testing to determine insulation integrity, generator ground system integrity and electrical balance.

8 Calendar Years - Credit - 50

C. Additional Credits for Protective Devices and Hardware

1. Turbine
   a. Design and installation in accordance with the ASME TWDPS-1, Part 2

      Credit - 10

   b. All bearings provided with bearing metal temperature detection

      Credit - 10

   c. Bearing high vibration trip provided and armed at all times except under closely controlled circumstances, such as start-up

      Credit - 10

   d. On-line vibration hardware with continuous trending and diagnostic analysis

      Credit - 10

2. Generator/Exciter
   a. On-line monitoring hardware for shorted rotor turns

      Credit - 10

   b. Pyrolysate Collection System to detect the presence of particulates from sacrificial chemical compounds to readily detect location of overheating

      Credit - 10

   c. Radio Frequency Monitor to continuously monitor signal emission from within the generator fields

      Credit - 10

   d. End-turn Vibration Monitoring, using fiber-optics technology, to provide advance warning of end turn cracking, loose wedges etc.

      Credit - 15

   e. Retaining rings of 18Mn/18Cr or equivalent material

      Credit - 15

Section IV Transformers

Inspections of transformers should include the following:

A. Transformer Insulating Oil Test results maintained within the norms listed in **Section 8-2C, Figure 1B**.

Within Limits, Within Sample Periodicity - Credit - 50

B. Transformer Dissolved Gas-In-Oil Test results maintained within the norms listed in **Section 8-2C Figure 1A.**

Within Limits, Within Sample Periodicity - Credit - 50

C. Thermographic surveys of transformers, bushings, disconnect switchgear, and associated bus ducts.

6 Months - Credit - 50

D. Installation of Continuous Online Dissolved Gas-in-Oil Analyzers.

Main Step-Up Transformers, Credit - 40
Auxiliary Transformers, Credit - 10

Section V Mechanical Drive Turbine - Operational Inspection

As determined by system design, observations of the following should be made and results recorded during periods when the turbine is in operation:

- Turbine steam pressure and temperature at admission.
- Vacuum or backpressure.
- Bearing oil temperature and pressure.
- Turbine speed.
- Any evidence of leakage of steam, oil or water at glands, casing joints or connections.
- Any evidence of turbine support pedestal cracking or deterioration.
- Emergency Bearing Lubricating Oil Pumps and applicable power supply for availability.
- Bearing Oil Cooling System for evidence of deterioration or leakage.

Credit - 25

Section VI Mechanical Drive Turbine - Operational Tests

The plant program should include a schedule for performing the following tests and recording the results:

- As determined by system design, a Simulated Overspeed Trip Test to be conducted annually or an actual overspeed trip test each fuel cycle.
- The Emergency Lubricating Oil Pumps operationally tested, by simulating loss of oil pressure, annually.
- Full Spectrum Vibration Analysis of all bearings, annually.
- Lubricating Oil Analysis for sludge, particulates, wear metals, acidity and moisture content annually.
- Actual overspeed trip test following each dismantled inspection or any work done on the front standard. Results to be within the plant acceptance criteria.

Credit - 25

Section VII Electric Motor, Motor-Generator Sets and Pumps - Vibration Analysis

Note: *This Standard applies to those Motors, Motor-Generator Sets, and Pumps listed on the **Accidental Outage Program B&M Credits - Equipment List.** Reactor Coolant / Reactor Recirculation Pumps and Motors are exempt from this Standard. See **AO Credit Section B.6** and **AO Credit Section C.2.***

Full Spectrum Vibration Analysis should be performed:

Quarterly - on electric motors, motor-generator sets, and pumps which operate continuously.

Annually - on electric motors, motor-generator sets and pumps that normally are subject to operation only during surveillance testing.

Credit - 30

Section VIII Electric Motor, Motor-Generator Sets and Pumps - Oil Analysis

Note: *This Standard applies to those Motors, Motor-Generator Sets, and Pumps listed on the* ***Accidental Outage Program B&M Credits - Equipment List.*** *Reactor Coolant / Reactor Recirculation Pumps and Motors are exempt from this Standard. See* ***AO Credit Section B.6*** *and AO* ***Credit Section C.2.***

Lubricating Oil Analysis for sludge, particulates, wear metals, acidity and moisture content should be performed:

Quarterly - on electric motors, motor-generator sets, and pumps that operate continuously.

Each Fuel Cycle - on electric motors, motor-generator sets and pumps that normally are subject to operation only during surveillance testing.

Credit - 30

Section IX Electric Motors and Motor-Generator Sets - Monitoring Program

Note: *This Standard applies to those Motors and Motor-Generator Sets listed on the* ***Accidental Outage Program B&M Credits - Equipment List.*** *Reactor Coolant / Reactor Recirculation Pumps and Motors are exempt from this Standard. See* ***AO Credit Section B.6*** *and AO* ***Credit Section C.2.***

A. Thermographic surveys of Motors, Motor-Generator Sets and associated Motor Control Centers and Busses should be conducted at steady state operating conditions:

6 Months - on equipment that operates continuously

Each Fuel Cycle - on equipment that is normally operated only for surveillance testing

Credit - 15

B. Performance monitoring of Motors and Motor-Generator sets, which records and trends motor operating characteristics, including:
- winding temperature
- bearing temperature
- current signature analysis per phase
- versus load (i.e., flow)

"should" be performed:

6 Months - on equipment that operates continuously

Annually - on equipment that is normally operated only for surveillance testing

Each Fuel Cycle - Electrical testing, which performs and trends electrical test data, including megger, winding resistance, and step voltage testing

Credit - 25

ACCIDENTAL OUTAGE PROGRAM B&M CREDITS - EQUIPMENT LIST

Common

- Reactor Vessel and Internals
- Main Turbine-Generator/Exciter
- Main Step-up Transformer
- Auxiliary Transformer
- Startup Transformer
- Residual Heat/Decay Heat Removal Pump & Motor/Turbine
- Containment Spray Pump & Motor
- Reactor Building Component Cooling Water Pump & Motor

Pressurized Water Reactors

- Reactor Coolant Pump & Motor
- Steam Generator
- High Pressure Safety Injection Pump & Motor
- Low Pressure Safety Injection Pump & Motor
- Auxiliary Feed Pump & Motor/Turbine

Boiling Water Reactors

- Reactor Recirculating Pump & Motor
- Reactor Recirculating Pump Motor-Generator Set
- Reactor Core Isolation Cooling Pump & Motor/Turbine
- High Pressure Coolant Injection Pump & Motor/Turbine
- Low Pressure Coolant Injection Pump & Motor/Turbine
- High Pressure Core Spray Pump & Motor
- Low Pressure Core Spray Pump & Motor

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SECTION 8-3 PROPERTY/FIRE PROTECTION LOSS CONTROL PROGRAM

SECTION 8-3A - *PROPERTY/FIRE PROTECTION LOSS CONTROL STANDARDS*

SECTION 8-3B - *APPENDIX 3.A.1*
OPERATING PLANT FIRE BRIGADES

SECTION 8-3D - *APPENDIX 3.A.6*
FIRE PROTECTION SYSTEMS TESTING

SECTION 8-3E - *APPENDIX 3.B.2*
HIGH VALUED WAREHOUSES

SECTION 8-3F - *APPENDIX 3.C.1.c*
FOAM PLASTIC BUILDING MATERIALS

SECTION 8-3G - *APPENDIX 3.C.3*
PROTECTION OF FIRE BARRIER PENETRATIONS

SECTION 8-3H - *APPENDIX 3.C.5*
ROOF ASSEMBLIES

SECTION 8-3I - *APPENDIX 3.C.7.e*
SMOKE AND HEAT VENTING

SECTION 8-3J - *APPENDIX 3.C.7.f*
CHARCOAL FILTERS

SECTION 8-3K - *APPENDIX 3.D.3.c*
HYDRANTS AND HOSE EQUIPMENT STATIONS

SECTION 8-3L - *APPENDIX 3.D.4.g*
FIRE PROTECTION FOR HAZARDS ASSOCIATED WITH TURBINE GENERATORS

SECTION 8-3M - *APPENDIX 3.D.5.b*
HOSE STREAM DEMAND WHEN SUPPLIED BY SPRINKLER SYSTEMS

SECTION 8-3N - *APPENDIX 3.D.8*
COOLING TOWERS

SECTION 8-3O - *APPENDIX 3.D.10*
TEMPORARY NEW FUEL STORAGE

SECTION 8-3P - *APPENDIX 3.F.2.b.(1)*
FABRICS (TARPAULINS)

SECTION 8-3Q - APPENDIX 3.F.2.e
TEMPORARY SERVICES

SECTION 8-3A PROPERTY/FIRE PROTECTION LOSS CONTROL STANDARDS

I. PREAMBLE
II. GLOSSARY
III. PROPERTY/FIRE PROTECTION LOSS CONTROL STANDARDS

I. PREAMBLE

A. Purpose

The Property Loss Control Standards provide a framework for protecting property insured by Nuclear Electric Insurance Limited (NEIL).

B. Scope

The Standards apply to all insured property belonging to NEIL Members and located within the site description of the policy.

C. Compliance Criteria

All Member insureds are expected to abide by the requirements set forth herein, subject to the following criteria:

Shall The word Shall in the Standards is used to indicate minimum requirements that must be met and maintained for the property to be insurable.

"should" The word "should" in the Standards is used to indicate recommendations. Although noncompliance does not affect insurability, it may result in insurance rating penalties.

D. Referenced Standards

Where the standards of other organizations are incorporated by reference, it is intended that the current edition apply.

D.1 For existing insured systems, structures or components, the standards in effect at the time of design will apply.

D.2 For existing systems, structures or components under evaluation for insurance coverage by NEIL, the current standards will be used as a basis to evaluate insurability.

D.3 For changes to existing insured systems, structures or components, NEIL will evaluate the impact of the changes on insurability and determine the applicable standards that apply.

D4. Documents listed under the title "References" in the Property Loss Control Appendices are intended to serve the user as a list of supplemental documents where one may go to obtain additional information and are not part of the requirements. References listed in the body of the Property Loss Control Standards and/or

Appendices are considered part of the requirements of the section in which they are contained.

E. Alternate Compliance

While some of the requirements of these standards are prescriptive, others are performance based. ACCEPTABLE means of complying with certain requirements appear as an appendix. However, other methods, based on proper engineering principles, will be considered for ACCEPTABILITY on an individual basis.

F. Responsibilities

The Property Protection Subcommittee of the NEIL Engineering Advisory Committee is delegated responsibility for maintaining the Property Loss Control Standards. Member insureds are responsible for complying with these Standards. Where the Member proposes an alternate compliance solution, the Member is responsible for submitting all appropriate justifying data in support of the proposal. Proposals for revisions or alternate compliance methods to these Standards are to be directed to Nuclear Electric Insurance Limited.

II. GLOSSARY OF TERMS

Nuclear Electric Insurance Limited has adopted the following definitions for use in the Standards:

A. ACCEPTABLE - satisfactorily meets the requirements of Nuclear Electric Insurance Limited. In general, materials or equipment that are UL Listed or FM Approved will satisfactorily meet the requirements of NEIL.

B. Bulk Combustible Liquid Storage - storage quantities exceeding 120 gallons.

C. Bulk Flammable Liquid Storage - storage quantities exceeding 60 gallons.

D. Bulk Hydrogen and Flammable Gas - storage area where the total volume of gaseous hydrogen or flammable gas is equal to or exceeds 400 standard cubic feet (scf) including unconnected reserves, or liquefied hydrogen equal to or exceeding 40 gallons.

E. Combustible - not meeting the definition of noncombustible or limited combustible.

F. Combustible Liquid - a liquid having a flash point at or above 100F (37.8C).

Combustible Liquids are subdivided as follows:

Class II liquids include those having flash points at or above 100F (37.8C) and below 140F (60C).

Class IIIA liquids include those having flash points at or above 140F (60C) and below 200F (93.4C).

Class IIIB liquids include those having flash points at or above 200F (93.4C).

Refer to NFPA No. 30 "Flammable and Combustible Liquid Code" Section II, Definitions.

G. Critical Building - any permanent station building, structure, or component that meets one of the following criteria:

Is necessary for power production

Contains installed safety-related equipment or cables

Contains a radioactive process or storage of radioactive material

H. Critical Radiant Flux - the level of radiant heat energy incident on the floor covering system at the most distant flameout point. It is reported as watts/cm2 (Btu/ft2 Sec.).

NFPA No. 253 "Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Energy Source" and ASTM E-648 are the test methods used to determine the Critical Radiant Flux.

I. FM - Factory Mutual Engineering & Research Corporation.

J. Fire Area - portion of a building that is separated from other areas by boundary fire barriers (walls, floors, or floor/ceiling assemblies), with any openings or penetrations protected with seals, closures, or other ACCEPTABLE tested configurations having a fire resistance rating equal to or greater than that of the barrier.

K. Fire Barriers - a partition, wall, floor, or ceiling assembly that is used to prevent the spread of fire. The fire resistance of the fire barrier is expressed in terms of the number of hours that barrier assemblies will resist fire exposure as determined by tests conducted by Underwriters Laboratories, Inc., or other nationally recognized testing laboratories. Refer to the current edition of Underwriters Laboratories, Inc., "Fire Resistance Directory".

L. Fire Brigade Drills - a simulated emergency exercise involving a credible emergency and requiring the fire brigade to perform planned emergency operations for evaluating the effectiveness of the training and education program and the competence of fire brigade members in performing required duties and functions.

Announced - A fire brigade drill that is announced to the Senior Shift Representative in advance of the initiation of the fire brigade drill. The fire brigade and other personnel may be alerted that a fire brigade drill will occur.

Unannounced - A fire brigade drill that may be announced to the Senior Shift Representative in advance of the initiation of the fire brigade drill. The fire brigade and other personnel may not be alerted that a fire brigade drill will occur.

M. Fire Prevention - measures directed towards avoiding the inception of fire.

N. Fire Protection - methods of providing for fire control or fire extinguishment.

O. Fire Retardant Pressure-Impregnated Wood - wood that has been pressure impregnated with fire retardant chemicals and results in a listed flame spread rating of 25 or less when tested by a nationally recognized testing laboratory in accordance with ASTM E-84. Pressure-impregnated wood that is to be used in areas exposed to the weather must also pass the ASTM D-2898 (Rain test).

NOTE: Fire retardant paint is not ACCEPTABLE for use on ordinary combustible material to achieve a flame spread rating of 25 or less.

P. First Aid - (Portable fire extinguishes or standpipe hose systems) those extinguishers and/or hose systems that will be utilized by plant personnel as the first manual means of extinguishing a fire.

Q. Flame Propagation Index - the flame propagation index provides a measure for classifying horizontal floor covering materials and assemblies (i.e., carpets and underlayment, etc.) when exposed to a flaming ignition source and is stated as a numerical rating.

R. Flame Spread Rating - refers to ratings obtained according to the "Method of Test of Surface Burning Characteristics of Building Materials" NFPA No. 255 and ASTM No. E-84.

The object of this test is to subject a 20-inch-wide-by-25-foot-long sample forming the roof of a rectangular furnace to a fire of controlled severity. The flame spread of a sample, which will not spread fire, is zero. A standard red oak deck will spread fire to the end of the test sample in 5 minutes; this value is selected as 100 on the scale. Depending on the distance that the flame spreads on other materials, or the time in which flame spreads the entire distance, comparative flame spread ratings are developed.

Smoke-developed ratings are also recorded during this test and are compared with a noncombustible and a red oak sample, which have smoke-developed rating of 0 and 100, respectively.

S. Flammable Liquids - any liquid having a flash point below 100F and having a vapor pressure not exceeding 40 pounds per square inch absolute at 100F.

Refer to NFPA No. 30, "Flammable & Combustible Liquids Code", Section II, Definitions.

T. For Trial Use - NEIL Loss Control Document Status Designation. The designation may be applied to newly developed documents or revisions for a period as recommended by the NEIL Engineering Advisory Committee. The trial period is intended to allow time for assessment of the ramifications of their use. During the trial period, the newly developed documents or their revisions are in full force and effect except that rating penalties and insurability restrictions are not applied until the period ends.

U. High Value Equipment - equipment that has a value of $500,000 or more.

V. Interior Finish - interior finish is generally considered to consist of those materials or combination of materials that form the exposed interior surface of floors, walls, and ceilings. Wall and ceiling coverings less than 1/28-inch (0.91mm) in thickness are not considered a finish material. Interior floor finishes are considered to mean the exposed floor surfaces of the building including floor coverings such as carpets and floor tile.

W. Less Flammable Fluid - dielectric liquid having a flash point of 572F (300C) or more when tested in accordance with ASTM D-92.

X. Limited Combustible Construction - any building built of any limited combustible material as defined in II.X.

Y. Limited Combustible Materials - a material that is not defined as noncombustible which, in the form in which it is used, has a potential heat value not exceeding 3500 Btu/lb. (8141 Kj/Kg), and complies with one of the following paragraphs. Materials subject to increase in combustibility or flame spread rating beyond the limits herein established due to the effects of age, moisture, or other atmospheric condition Shall be considered combustible.

Materials having a structural base of noncombustible material, with a surfacing not exceeding a thickness of 1/8 inch (3.2 mm) which have a flame spread rating not greater than 50.

Materials, in the form and thickness used, other than as described in above, having neither a flame spread rating greater than 25 nor evidence of continued progressive combustion and of such composition that surfaces exposed by cutting through the material on any plane would have neither a flame spread rating greater than 25 or evidence of continued progressive combustion.

NOTE: Fire retardant pressure-impregnated wood is not viewed as meeting the definition of Limited Combustible Material.

Z. Mineral Oil - a combustible dielectric liquid, having an approximate flash point of 320F (160C) or less.

AA. NFPA - National Fire Protection Association.

BB. Noncombustible Construction - any building built of noncombustible material as defined in II.BB

CC. Noncombustible Materials - materials, no part of which will ignite and burn when subjected to fire.

The following assemblies or material is ACCEPTABLE for use in place of noncombustible material. Other assemblies will be considered on an individual basis.

Metal deck roofs - UL "fire classified" or FM Class 1 (See Section 8-3H, Appendix 3.C.5).
Gypsum board (flame spread less than or equal to 25).
UL Listed or FM Approved suspended ceiling.
Fiberglass insulation (flame spread less than or equal to 25).
Fiberglass reinforced materials (flame spread less than or equal to 25).

DD. Noncombustible Occupancy - commodities that will not burn or liberate flammable gases when heated to a temperature of 1380F (750C) for five minutes.

EE. Non-critical Building - any permanent station building, structure, or component that does not meet any of the criteria for a critical building.

FF. Private Protection - all fire protection systems, equipment (fixed or portable), and facilities or methods owned by or made available through the electric generating station. (The private fire brigade and watchman's service would be examples of private protection.)

GG. Public Protection - fire fighting aid and/or assistance which is available from nearby governmental installations or municipalities (fire district, city, town, etc.) and would include manpower, fire department pumper trucks, fire hose, water supply, pumping facilities, etc.

HH. Radwaste Container - the outermost receptacle for Radwaste Storage, capable of being moved, transported or lifted by a forklift, crane or truck.

II. Radwaste Storage - radioactive waste, excluding spent fuel, packaged for interim retention on-site.

JJ. Shall - the Standards stated are minimum requirements that must be met and maintained for the property to be insurable.

KK. "should" - the Standards stated indicate recommendations. Noncompliance may result in insurance rating penalties.

LL. Temporary - a period of time not exceeding 180 days during which non-permanent conditions may apply.

MM. UL - Underwriters Laboratories, Inc.

NN. Vault/Cell - a compartment or enclosure within the primary structure whose walls, floor and cover are constructed of non-combustible materials, without unprotected penetrations or ignition sources when closed.

III. PROPERTY LOSS CONTROL STANDARDS

3.A. Property Loss Control Administration
3.A.1. Fire Brigade
3.A.2. Fire Incident Reporting
3.A.3. Property Loss Control Surveillance
3.A.4. Control of Ignition Sources
3.A.5. General Housekeeping
3.A.6. Protection System Operability
3.A.7. Adverse Labor Conditions

3.B. General Building Arrangement
3.B.1. Permanent Site Structures
3.B.2. Warehouses and Storage Buildings

3.C. Building Construction
3.C.1. Materials of Construction
3.C.2. Interior Finish
3.C.3. Fire Barriers and Penetration Requirements
3.C.4. Wind Design
3.C.5. Roof Decking Assemblies
3.C.6. Containment and Drainage
3.C.7. HVAC System(s)
3.C.8. Duct and Pipe Insulation
3.C.9. Cable Installations
3.C.10. Lightning Protection
3.C.11. Electrical Services

3.D. Site Fire Protection
3.D.1. Minimum Water Supplies
3.D.2. Fire Pumps, Alarms & Controllers
3.D.3. Fire Mains and Hydrants
3.D.4. Automatic Fixed Extinguishing Systems
3.D.5. Extinguishers and Standpipe Systems
3.D.6. General Alarm and Communication System(s)
3.D.7. Automatic Fire Detection and Alarm System(s)
3.D.8. Cooling Towers
3.D.9. Boilers and Other Fired Equipment
3.D.10. Temporary New Fuel Storage
3.D.11. Transformers
3.D.12. Radwaste Processes

3.E. Hydrogen, Flammable Gas, and Flammable and Combustible Liquids Storage

3.F. Construction / Modification and Outage Support
3.F.1. Modification / Outages
3.F.2. Facilities and Services
3.F.3. Construction

Primary Property Loss Control Standards

These Standards apply to all NEIL Primary Property insured sites. Insured areas are described in the Primary Property Insurance Policy. Structures or equipment excluded from the fire peril is listed in the Fire Damage Exclusion Endorsement and structures or equipment excluded from all coverage is noted in the Description of the Property of the policy. Recommendations applicable to these Standards are initially listed in the Periodic Property Loss Control Reports then resolved to the Log of Completed or Withdrawn Recommendations.

Accidental Outage Property Loss Control Standards

These Standards apply to all NEIL Accidental Outage insured sites. Buildings, areas, or equipment necessary for power production or which contain installed safety related equipment or cables are structures and equipment governed by these Standards. Each unit insured by the Accidental Outage Policy is rated in accordance with these Standards on the Fire Rating Schedule. Credits reflect protection in excess of these Standards. Credit reductions or rate penalties reflect deviations from these Standards. Third party reports may be reviewed to develop credit rating changes.

Unless specifically identified as being applicable only to the Primary Property Program or Accidental Outage Program, these Standards apply to both insurance programs.

3.A. Property Loss Control Administration - A written administrative plan detailing property loss control administration for the site Shall be developed.

3.A.1. Fire Brigade - An ACCEPTABLE written Fire Brigade administrative plan Shall be developed. The plan Shall:

3.A.1.a. Establish the organization and duties of its members and procedures to carry out the performance of these duties.

3.A.1.b. Provide an ACCEPTABLE initial qualification and periodic training program for the Brigade including periodic drills.

? 3.A.1.c. Establish fire pre-plans to all NEIL insured structures/areas of the site.

3.A.1.d. Track to resolution any inadequacies identified during live fire training, quarterly training, meetings or drills.

See Section 8-3B, Appendix 3.A.1.

3.A.2. Fire Incident Reporting - A program Shall be established to provide a separate record of all site fires. This includes investigation of all site fires.

See Section 8-1I - Incident Reporting.

3.A.3. Property Loss Control Surveillance - ACCEPTABLE property loss control surveillance Shall be provided.

3.A.3.a. This surveillance "should" consist of recorded rounds, at least daily.

3.A.3.b. Personnel performing these functions Shall be properly supervised and trained.

3.A.4. Control of Ignition Sources - Administrative controls and procedures Shall be established to protect against losses resulting from ignition sources such as welding, cutting, grinding, smoking, temporary heaters, or other ignition sources. ACCEPTABLE welding and cutting and other hot work safety procedures Shall be established utilizing NFPA No. 51B and NFPA No. 241 as a guide.

3.A.4.a. Hot Work Safety Procedures

3.A.4.a.(1) ACCEPTABLE hot work safety procedures Shall be established. The following is an ACCEPTABLE method of satisfying this Standard; however, other methods of satisfying this Standard will be considered on an individual basis.

3.A.4.a.(2) A program Shall be established in writing and enforced by detailing definite assignments and fire prevention procedures to be followed in areas where welding, cutting or other hot work operations are in progress.

3.A.4.b. Permit System - A permit system Shall be provided to positively control all hot work in site areas other than "designated" welding areas. The permit system Shall be such that no welding would be allowed unless approved by appropriate supervisory personnel.

3.A.4.c. Area Preparation

3.A.4.c.(1) Areas where hot work is in progress Shall be kept clean. All accumulations of trash, rags, etc., Shall be removed.

3.A.4.c.(1)(a) Consideration "should" be given to the distance that sparks or slag can travel.

3.A.4.c.(2) All machinery, equipment, cable in trays, or other items subject to damage or possible ignition by spark from hot work operations Shall be covered with suitable noncombustible material.

3.A.4.c.(2)(a) Special attention "should" be directed toward welding gas hoses.

3.A.4.c.(3) When hot work operations are performed above grating, decks and/or near floor or wall openings, the deck and/or openings Shall be covered with suitable noncombustible material. Care Shall be taken not to direct the slag stream from cutting operation through nearby openings. Particular care Shall be taken that large pieces of hot slag are not allowed to remain on surfaces long enough to cause combustion or damage.

3.A.4.c.(4) First aid fire extinguishers of the appropriate variety Shall be readily accessible when hot work operations are performed.

3.A.4.c.(5) Fire extinguisher(s) credited for a hot work activity, the extinguisher(s) Shall be referenced on the Hot Work Permit. The fire extinguisher(s) Shall be observed so as to confirm it is in operational condition prior to starting the hot work activity.

3.A.4.d. Environmental Preparation - Special care Shall be taken to ensure that the hot work environment is considered and controlled to protect against injury and damage.

3.A.4.d.(1) All hollow spaces, cavities, tanks, or other containers "should" be vented, purged, and tested for the presence of explosive and/or otherwise hazardous atmospheres prior to initiating hot work activities.

3.A.4.e. Hot Work Fire Watch

3.A.4.e.(1) One or more individuals in each hot work area Shall be designated and dedicated to watch for potential fires or smoldering sparks.

3.A.4.e.(1)(a) – These individuals **Shall** be trained **annually** in **the proper use of portable fire extinguishers, hazards involved with incipient stage fire fighting and be familiar with the requirements of 3.A.4.a., Hot Work Safety Procedures. These individuals "should" receive hands-on, live fire extinguishment training annually.**

3.A.4.e.(1)(b) They Shall be familiar with the facilities for sounding an alarm in the event of a fire. The individuals Shall call hazards to the appropriate supervisor's attention for correction. Upon completion of hot work operations in an area, an inspection Shall be made to confirm that safe conditions exist.

3.A.4.e.(1)(c) A follow-up inspection of the work area "should" be performed at an appropriate interval by designated individuals to check for unsatisfactory conditions. The results of this inspection "should" be reported to the appropriate supervisor.

3.A.4.e.(2) The above requirements may be modified in properly designed fixed hot workstations.

3.A.4.f. Fixed Hot Work Stations - Where there is a need for frequent hot work activities, fixed hot workstations may be established. The following precautions □should□ be established for fixed hot work stations:

3.A.4.f.(1) Locate in noncombustible building.
3.A.4.f.(2) Remove all nonessential combustibles from within the station.
3.A.4.f.(3) Secure openings in floors and walls within the station with noncombustible covers.
3.A.4.f.(4) Provide fire extinguishers within the station.
3.A.4.f.(5) Separate the fixed hot workstation from combustibles by 35 feet of open space or provide noncombustible enclosures to isolate from other combustibles.
3.A.4.f.(6) Dedicated hot work fire watches are not required in fixed hot work stations meeting the above requirements.

3.A.4.g. References

For additional information, see the following standards:

NFPA 50 - 1996	Bulk Oxygen Systems at Consumer Sites
NFPA 51 - 2002	Standard for the Design and Installation of Oxygen-Fuel Gas Systems for Welding, Cutting and Allied Processes
NFPA 51B - 2003	Standard for Fire Prevention During Welding, Cutting and Other Hot Work
NFPA 58 - 2004	Liquefied Petroleum Gas Code
NFPA 241 - 2000	Standard for Safeguarding Construction, Alteration, and Demolition Operations
ANSI Z49.1	Safety in Welding and Cutting

3.A.5. General Housekeeping - Management Shall be responsible for maintaining housekeeping at the site in such a manner to minimize the probability of a loss.

3.A.5.a. ACCEPTABLE procedures "should" address the control of transient combustibles.

3.A.6. Protection Systems Operability

3.A.6.a. Where installation of fire protection systems is a Shall requirement, such as fire hydrants, fire water tanks, fire pumps and suppression systems for high value warehouses / limited combustible and combustible structures, procedures ACCEPTABLE to NEIL for the care, maintenance, and testing of all fire protection systems and equipment Shall be established and implemented. Records Shall be available for review by NEIL.

See Section 8-3D, Appendix 3.A.6.

3.A.6.b. Where installation of fire protection systems is a "should" requirement, procedures ACCEPTABLE to NEIL for the care, maintenance, and testing of all fire protection systems and equipment "should" be established and implemented. Records "should" be available for review by NEIL.

See Section 8-3D, Appendix 3.A.6.

3.A.6.c. An ACCEPTABLE impaired protection procedure for fixed systems Shall be established in writing and enforced. Impairments Shall be as short as possible and every effort made to restore protection to service. The fire brigade chief or equivalent designee Shall be notified of each impairment.

3.A.6.c.(1) NEIL "should" be notified of each impairment, where the duration is expected to exceed 48 hours.

See Section 8-1R

3.A.6.d. Fire protection equipment subjected to maintenance and/or repair activities "should" be post maintenance tested appropriate to the maintenance or repair activity to ensure that the equipment will perform its design function.

3.A.7. Adverse Labor Conditions

3.A.7.a. During a strike, work stoppage, lockout, or job action, which may reduce the fire protection readiness, Plant Management Shall take appropriate action to ensure continuity of loss control practices, features, and services.

3.A.7.b. These practices, features, and services "should" include, but not be limited to, fire detection systems, fire suppression systems, administrative controls to prevent losses (e.g., permit systems), watchmen services, and fire brigade and offsite fire departments.

3.A.7.c. NEIL "should" be advised of such existing or impending conditions and the Member "should" discuss the actions being taken to maintain good loss control practices.

3.B. General Building Arrangements

3.B.1. Permanent Site Structures - Shall be adequately separated from each other by a clear space or engineered physical fire barrier as dictated by design, construction, occupancy, and the degree of fire protection.

3.B.1.a. NFPA Recommended Practice 80A "should" be utilized as a guide to determine minimum building separation. In all specific cases, reference "should" be made to the appropriate NFPA Standards.

3.B.1.b. Three-hour rated fire barriers or an ACCEPTABLE clear space as determined by NFPA No. 80A "should" be provided to separate the following buildings/areas:

3.B.1.b.(1) Reactor Building
3.B.1.b.(2) Control Building/Areas
3.B.1.b.(3) Turbine Generator Building
3.B.1.b.(4) Turbine Generator Areas by Unit on all levels beneath the turbine-operating floor
3.B.1.b.(5) Auxiliary Building/Auxiliary Equipment Areas
3.B.1.b.(6) Emergency Diesel Generator Building/Areas
3.B.1.b.(7) Storeroom Areas
3.B.1.b.(8) Circulating Water Pump Building/Area
3.B.1.b.(9) Service/Administration Buildings

Section 3.B.2 is applicable to sites in the Primary Property Program.

3.B.2. Warehouses and Storage Buildings

3.B.2.a. Noncombustible Construction

3.B.2.a.(1) Warehouse buildings constructed of noncombustible materials with combined building and contents values of less than $45 million "should" be separated from other structures in accordance with NFPA No. 80A.

3.B.2.a.(2) Warehouse buildings constructed of noncombustible materials with combined building and contents values equal to or greater than $45 million Shall be separated from other structures by a minimum distance of 30 feet;

AND

All requirements contained in Appendix 3.B.2 Shall be met.

3.B.2.b. Limited Combustible or Combustible Construction

3.B.2.b.(1) Warehouse buildings constructed of limited combustible or combustible materials with combined building and contents values less than $15 million Shall be separated from other structures in accordance with Section 3.C.1.d.

3.B.2.b.(2) The following requirements apply to warehouse buildings constructed of limited combustible or combustible materials where the combined building and contents values are equal to or greater than $15 million:

3.B.2.b.(2)(a) Separation distance between the warehouse and any exposing structure Shall be a minimum of 30 feet, or a minimum three-hour rated fire barrier Shall be provided.

3.B.2.b.(2)(b) A minimum three-hour rated fire barrier Shall be provided to limit fire areas to a maximum insurable value of $15 million apiece. The maximum overall size of any such warehouse Shall be limited to two fire areas.

3.C. Building Construction

3.C.1. Materials of Construction

3.C.1.a. Noncombustible materials Shall be utilized for construction of critical buildings.

Standard 3.C.1.b. is applicable to the Accidental Outage Program only.

?3.C.1.b. Superior construction (bearing walls and principal supporting members have a minimum fire resistance rating of three hours) "should" be utilized for all buildings and structures housing equipment required for power production.

3.C.1.c. Permanent trailers and/or structures constructed of limited combustible or combustible construction materials are ACCEPTABLE on the Turbine Deck if all the following conditions are met:

See Section 8-3F, Appendix 3.C.1.c.

3.C.1.c.(1) All limited combustible or combustible structures Shall be protected internally by an ACCEPTABLE automatic fire suppression system.

3.C.1.c.(2) The limited combustible or combustible structure(s) Shall be limited in size so that all limited combustible or combustible structures do not exceed 1,500 sq. ft. of total floor area and are not more than two stories in height.

3.C.1.c.(3) The limited combustible or combustible structure(s) Shall be located a minimum of 30 feet from the Turbine Generator.

3.C.1.c.(4) The limited combustible or combustible structure(s) Shall be located on a concrete or other ACCEPTABLE noncombustible deck, which extends at least three feet beyond the perimeter of the structure(s) on all sides, and not be located near equipment or floor openings unless an ACCEPTABLE automatic fire suppression system is provided throughout the elevation below the turbine operating deck.

3.C.1.c.(5) Services, including electrical, to the limited combustible or combustible structures(s) Shall be permanent and installed to meet all applicable codes and standards.

3.C.1.d. External structures, those not located within any structure, constructed of limited combustible or combustible materials are ACCEPTABLE provided that all the following conditions are met:

3.C.1.d.(1) All limited combustible or combustible structure(s) Shall be protected internally by an ACCEPTABLE automatic fire suppression system.

3.C.1.d.(2) The limited combustible or combustible structure(s) Shall be separated from other permanent site structure(s) by a minimum distance of 30 feet.

EXCEPTION: When all portions of the exposed building (i.e. walls, roof, etc.)

within 30 feet of the exposure constitute a rated fire barrier, minimum separation distance may be reduced in accordance with the following table.

TABLE 3.C.1
BUILDING SEPARATION

Exposed Building Fire Barrier Rating	Exposing Building Has Automatic Sprinklers
> 3 Hours	0 Feet
2 Hours	10 Feet
1 Hour	20 Feet
< 1 Hour	30 Feet

3.C.1.d.(3) The limited combustible or combustible structure(s) Shall meet all other existing Standard requirements, including wind and lightning design requirements

3.C.1.d.(4) Services, including electrical, to the limited combustible or combustible structure(s) Shall be permanent and installed to meet all applicable codes and standards.

3.C.1.e. Internal structure(s), located within a larger primary structure, constructed of limited combustible or combustible construction materials are ACCEPTABLE if all the following conditions are met:

3.C.1.e.(1) The primary structure Shall be protected throughout by an automatic fire suppression system.

3.C.1.e.(2) The internal limited combustible or combustible structure(s) Shall be protected internally by an ACCEPTABLE automatic fire suppression system.

3.C.1.e.(3) The internal limited combustible or combustible structure(s) Shall not be permitted in critical structures, with the exception of trailers/structures on the turbine deck meeting the applicable conditions.

3.C.1.e.(4) The internal limited combustible or combustible structure(s) located within High Value Warehouses Shall not exceed 1,500 sq. ft. of total floor area and not be more than two stories high.

3.C.1.e.(5) Services, including electrical, to the limited combustible or combustible structure(s) Shall be permanent and installed to meet all applicable codes and standards.

3.C.2. Interior Finish

3.C.2.a. Interior finish material Shall comply with Table 3.C.2.

3.C.2.b. If wall and ceiling coverings are greater than or equal to 1/28-inch (0.91mm) thickness, they Shall be applied over a noncombustible base for critical buildings.

3.C.2.c. Carpet Shall only be used as a floor covering.

TABLE 3.C.2.
INTERIOR FINISH REQUIREMENTS

SURFACE REQUIREMENT	BUILDING	FLAMMABILITY	SMOKE DEVELOPMENT RATING	STANDARD REQUIREMENT
WALL/CEILING COVERINGS	CRITICAL	<= 25 FSR	<= 450	Shall
WALL/CEILING COVERINGS	NONCRITICAL	<= 200 FSR	NO REQUIREMENT	Shall
FLOOR* COVERINGS	ALL	>= 0.45 CRF	<= 450	Shall
SUSPENDED CEILINGS	ALL	<= 25 FSR	NO REQUIREMENT	Shall

CRF = CRITICAL RADIANT FLUX FSR = FLAME SPREAD RATING

Flame Spread Ratings are based on ASTM E-84. Critical Radiance Flux testing is based on ASTM E-648 or NFPA 253. The smoke development rating of floor coverings is based upon the flaming and non-flaming test modes in accordance with ASTM E-662. The smoke development rating of other wall and ceiling coverings is based upon ASTM E-84 or NFPA 255.

*These requirements apply to floor coverings installed after July 1, 1993.

3.C.3. Fire Barriers and Penetration Requirements

?3.C.3.a. Critical and non-critical structures / areas "should" be separated from other areas by fire barriers with the appropriate fire resistance rating.

3.C.3.a.(1) Three-hour rated fire barriers "should" be provided to separate the following buildings or areas. Spatial separation meeting NFPA 80A requirements may be provided as an ACCEPTABLE alternative to fire barriers for building separation.

3.C.3.a.(1)(a) Control Building/Area
3.C.3.a.(1)(b) Control Room
3.C.3.a.(1)(c) Primary Cable Spreading Room(s)
3.C.3.a.(1)(d) High value Electronic Equipment Rooms (where the high value electronic equipment is safety related or required for continued operation)
3.C.3.a.(1)(e) Relay Rooms
3.C.3.a.(1)(f) Safety Related Battery Rooms
3.C.3.a.(1)(g) Safety Related Switchgear Rooms
3.C.3.a.(1)(h) Emergency Diesel Generator Building/Area
3.C.3.a.(1)(i) Auxiliary Building/Areas
3.C.3.a.(1)(j) Reactor Building
3.C.3.a.(1)(k) Turbine Generator Building
3.C.3.a.(1)(l) Between units on all levels beneath the turbine operating floor
3.C.3.a.(1)(m) Fuel Handling Buildings/Areas
3.C.3.a.(1)(n) Service Water Building/Area

3.C.3.a.(1)(o) Circulating Water Pump Building/Area
?3.C.3.a.(1)(p) Between redundant fire pumps
3.C.3.a.(1)(q) Radwaste Building/Area
3.C.3.a.(1)(r) Turbine generator lube oil storage tanks, lube oil reservoirs, etc.
3.C.3.a.(1)(s) Motor generator sets that contain 100 gallons or more of combustible fluids

Standard 3.C.3.a.(2) is applicable to the Accidental Outage Program only.

?3.C.3.a.(2) Three-hour rated fire barriers "should" be provided to separate redundant divisions of safety related equipment and electrical cable from the opposite division and from potential fires in non-safety related areas.

3.C.3.a.(3) Two-hour rated fire barriers "should" be provided to separate non-safety related or balance-of-site cable spreading rooms.

Standard 3.C.3.a.(4) is applicable to the Accidental Outage Program only.

3.C.3.a.(4) One-hour fire barriers "should" be provided to separate Peripheral Control Room areas. For example: offices, meeting rooms, break areas, unless protected by a fixed automatic fire extinguishing system.

Standard 3.C.3.a.(5) is applicable to the Primary Property Program only.

3.C.3.a.(5) One-hour rated fire barriers "should" be provided where electrical switchgear concentrations could be externally exposed to fire.

?3.C.3.a.(6) Fire barriers "should" be provided to separate attached fired Auxiliary Boiler Area(s) by one of the following methods:

3.C.3.a.(6)(a) Two-hour rated fire barrier.

3.C.3.a.(6)(b) One-hour rated fire barriers with an ACCEPTABLE fixed automatic extinguishing system within the boiler area.

Exception: Spatial separation meeting the requirements of NFPA 80A is ACCEPTABLE in lieu of rated fire barriers.

3.C.3.a.(7) Fire barriers "should" be provided to isolate high value electronic equipment rooms (not safety related or required for power production) by one of the following methods:

3.C.3.a.(7)(a) Two-hour rated fire barriers.

3.C.3.a.(7)(b) One-hour rated fire barriers where ACCEPTABLE fixed automatic protection is provided on both sides of the barrier.

Standard 3.C.3.a.(8) is applicable to the Primary Property Program only.

3.C.3.a.(8) Fire barriers "should" be provided to isolate simulators together with their associated high value electronic equipment by one of the following methods:

3.C.3.a.(8)(a) Two-hour rated fire barriers,

3.C.3.a.(8)(b) One-hour rated fire barriers where ACCEPTABLE fixed automatic protection is provided on both sides of the barrier.

3.C.3.b. All openings (e.g., doors, piping, cable) through the fire barriers "should" be protected consistent with the rating of the fire barrier.

3.C.3.b.(1) Fire door openings:

3.C.3.b.(1)(a) UL Listed or FM approved automatic-closing fire doors and frames "should" be provided in doorways; fire door assemblies "should" have fire resistance ratings consistent with the fire barrier rating.

3.C.3.b.(1)(b) Refer to NFPA 80 for additional information on fire doors and fire barrier openings.

3.C.3.b.(2) HVAC Openings:

3.C.3.b.(2)(a) UL Listed or FM Approved automatic closing fire damper assemblies "should" be provided to protect interior HVAC duct openings in accordance with NFPA 90A.

3.C.3.b.(3) Other fire barrier penetrations:

3.C.3.b.(3)(a) Other fire barrier penetrations such as those openings made to accommodate passage of piping, cable, cable tray, HVAC ductwork, etc., "should" be protected with ACCEPTABLE devices such as fire barrier penetration seals and/or fire stopping material.

3.C.3.b.(3)(b) Fire barrier openings "should" be kept to an absolute minimum.

See Section 8-3G, Appendix 3.C.3

? 3.C.3.c. Fire Barrier Openings Inspection and Maintenance:

3.C.3.c.(1) Fire barrier opening protection devices (i.e. doors, dampers, seals, etc.) in walls required by NEIL as a Shall requirement, Shall be inspected and maintained in a condition which would allow the devices to perform their design function.

3.C.3.c.(2) Fire barrier opening protection devices (i.e. doors, dampers, seals, etc.) in walls required by NEIL as a "should" requirement "should" be inspected and maintained in a condition which would allow the devices to perform their design function.

3.C.4. Wind Design - As a minimum, selection of the basic wind velocity for buildings and other structures Shall be based on the current edition of ASCE 7.
References: ASCE Standard No. 7.

3.C.5. Roof Decking Assemblies

3.C.5.a. Roof decking assemblies Shall be ACCEPTABLE.

See Section 8-3H, Appendix 3.C.5.

3.C.6. Containment and Drainage

3.C.6.a. Areas with equipment containing combustible oil or less flammable (high fire point) dielectric fluid "should" be arranged to contain the combustible oil or high fire point dielectric liquid in the immediate area of the equipment, or drainage "should" be provided to an ACCEPTABLE location.

3.C.6.b. The concrete floors of sprinklered areas "should" be pitched to minimize the spread of water, oil or other fluids to other areas of the plant.

3.C.6.c. Where provided, catch tanks, oil/water separator systems or other interim storage arrangements "should" be sized to accommodate the expected amount of oil and the expected amount of water from water spray systems, rain, floor drains, etc.

3.C.6.d. Where provided, diking and containment "should" be sized to include 100% of the tank volume and a minimum 10-minute discharge of the water spray system.

3.C.6.e Containment pits and diking "should" be inspected and maintained in a condition which would allow the pit to meet the containment requirements in section 3.C.6.d.

3.C.7. HVAC System(s)

?3.C.7.a. Heating, ventilation and air conditioning systems "should" be designed and installed in accordance with NFPA 90A.

3.C.7.b. Ventilation for battery rooms "should" be designed and maintained to limit the concentration of hydrogen to 1 percent by volume. Refer to ANSI/IEEE 484 "Recommended Practice for Design and Installation of Large Lead Storage Batteries for Generating Stations and Substations".

Standard 3.C.7.c is applicable to the Accidental Outage Program only.

3.C.7.c. The Control Room HVAC system "should" be designed to assure that Control Room habitability can be maintained.

3.C.7.d. Smoke and heat venting "should" be provided for the following structures:

3.C.7.d.(1) Turbine Buildings, a minimum ratio of 1 square foot of venting area to 100 square feet of floor area "should" be provided.

Standard 3.C.7.d.(2) is applicable to the Primary Property Program only.

3.C.7.d.(2) Warehouse/Storage structures, one story in height, with no automatic fire suppression system.

3.C.7.e. Design and installation of smoke and heat venting systems "should" use NFPA No. 204M as a guide.

See Section 8-3I, Appendix 3.C.7.e

3.C.7.f. HVAC System Filters

3.C.7.f.(1) Critical Buildings - Charcoal filters "should" be protected.

See Section 8-3J, Appendix 3.C.7.f

All other HEPA and HVAC system filters "should" have a flame spread of 25 or less or be UL Listed or FM Approved as "Class 1 filters" or "HEPA Filter Units" or ACCEPTABLE equivalent.

3.C.7.f.(2) Non-Critical Buildings - Filters may be either UL Class 1 or Class 2 or ACCEPTABLE equivalent.

3.C.8. Duct and Pipe Insulation - Insulation for pipes and ducts, including adhesives, "should" have a flame spread of 25 or less and be impervious to oil in areas subject to oil contamination. The smoke development rating "should" be no higher than 50.

3.C.9. Cable Installations - Cable installations "should" include:

3.C.9.a. Cable Construction - Cable insulation and protective jacket materials "should" be in accordance with (1) or (2) below:

? 3.C.9.a.(1) Flame retardant cables - ACCEPTABLE if the cables have passed the fire and/or flame test as described in IEEE Standard 383 - 1974 and/or 1202 - 1991 or ACCEPTABLE equivalent.

3.C.9.a.(2) Nonflame retardant cables - cables that do not meet the IEEE 383 - 1974 and/or 1202 - 1991 requirements are ACCEPTABLE if a coating of UL Listed or FM Approved fire retardant materials or ACCEPTABLE equivalent has been applied in accordance with the fire retardant material's manufacturer's instructions.

Note: Coatings are referred to by Factory Mutual (FM) as fire-protective coatings for grouped electrical conductors.

3.C.9.b. Fire Breaks - Vertical sections of all cable trays "should" have an ACCEPTABLE firebreak installed every 30 feet, even if a floor was not penetrated.

3.C.9.c. Damage Protection - ACCEPTABLE cable and cable tray damage protection "should" be provided. Where appropriate, cables and cable trays "should" be protected from mechanical damage.

3.C.10. Lightning Protection

3.C.10.a. All permanent site buildings and structures Shall be properly protected against lightning in accordance with NFPA 780 or other ACCEPTABLE method.

? 3.C.10.b Lightning protection systems Shall be inspected and maintained in a condition, which would allow the system to function as designed.

3.C.11. Electrical Services - Electrical services and wiring for permanent, structures and equipment "should" be installed in accordance with applicable standards.

3.D. Site Fire Protection

3.D.1. Minimum Water Supplies

3.D.1.a. The permanent fire protection water supply Shall be capable of delivering the maximum demand of the largest single automatic fixed water extinguishing system plus 500 gpm. The pressure to the system Shall be in accordance with NFPA No. 13, NFPA No. 14, NFPA No. 15, NFPA No. 16, and other applicable NFPA codes, or 65 psig residual at the highest standpipe outlet location, whichever is greater.

NOTE : If a hose stream allowance of at least 500 gpm is included in the largest system demand, an additional hose stream allowance is not required.

3.D.1.b. The water supply "should" consist of a minimum of two hours at the maximum rate and may usually be provided by one of the following:

3.D.1.b.(1) Multiple water storage tanks.

3.D.1.b.(1)(a) The tanks "should" be heated where freezing may occur.

3.D.1.b.(1)(b) One tank Shall be capable of being filled to the maximum level in eight hours.

3.D.1.b.(1)(c) The minimum supply "should" be satisfied with the largest tank out of service.

3.D.1.b.(2) A lake, river water, or any source of water properly treated may be used as a source of supply. There "should" be no contribution of salt water due to sea tidal flow to the source of supply.

3.D.1.c No connection "should" be permitted from the fire protection system other than for emergency use.

?3.D.2. Fire Pumps, Alarms, and Controllers

3.D.2.a. UL Listed or FM Approved fire pumps or ACCEPTABLE pumps Shall be provided in sufficient number such that the required water supply is available with the highest flow capacity pump out of service. The suction and discharge piping arrangements, to and from the fire water pumping systems, Shall be arranged such that, no single impairment will result in the inability of the fire pumping system to deliver the required water supply to the site fire protection systems.

3.D.2.a.(1) Pump installations "should" be in accordance with NFPA No. 20 or ACCEPTABLE equivalent.

3.D.2.a.(2) All pumps "should" be ACCEPTABLE for the specific service.

3.D.2.a.(3) Piping arrangements "should" be such that any or all pumps can take suction from any and/or all ACCEPTABLE suction sources and discharge to the main loop with any other pump(s) out of service.

3.D.2.a.(4) Each pump's installation "should" include an ACCEPTABLE outside hose header (with necessary testing equipment) and/or a flow meter or some other ACCEPTABLE means of conducting fire pump capacity.

3.D.2.a.(5) An ACCEPTABLE pressure maintenance system "should" be utilized to maintain the entire system pressure to prevent cycling of the fire pump.

3.D.2.a.(6) All pumps "should" start automatically and be driven by ACCEPTABLE pump drivers.

3.D.2.b. Automatic control room alarms Shall be provided as a minimum for the following fire pump conditions:

3.D.2.b.(1) Power failure
3.D.2.b.(2) Pump running
3.D.2.b.(3) Failure to start
3.D.2.b.(4) Other appropriate alarms (e.g., diesel trouble) "should" be provided.

3.D.2.c. UL Listed or FM Approved controllers or other ACCEPTABLE controllers Shall be provided.

3.D.3. Fire Mains and Hydrants - Fire mains, hydrants, and valving "should" be designed and installed in accordance with NFPA No. 24 or ACCEPTABLE equivalent.

3.D.3.a. Underground and Interior Mains

?3.D.3.a.(1) Looped fire mains Shall be designed and installed to meet the systems' flow requirements with the hydraulically least demanding portion of any one loop main out of service.

3.D.3.a.(2) Pipe material, fittings, and linings Shall be ACCEPTABLE.

3.D.3.a.(3) UL Listed or FM Approved indicating valves "should" be installed to provide ACCEPTABLE sectional control of the fire main loop to minimize site protection impairments.

3.D.3.a.(4) All post indicator valves and gate valves, with the exception of hydrant curb box valves, that control the underground main "should" be electrically supervised; or sealed or locked in the normal position and inspected on a frequency stated in Section 8-3D, Appendix 3.A.6, Section O.

3.D.3.a.(4)(1) Valves normally physically accessible to the public "should" be electrically supervised or locked and inspected on a frequency stated in Section 8-3D, Appendix 3.A.6, Section O.

Standard 3.D.3.a.(5) is applicable to the Primary Property Program only.

3.D.3.a.(5) Where fire mains extend beyond the NEIL insured site boundaries into non-NEIL insured site areas, an engineering analysis Shall be conducted to demonstrate that

the minimum water supplies per Section 3.D.1 can be maintained on the NEIL insured site at all time; OR

An ACCEPTABLE administrative procedure Shall be implemented to isolate water to the non-NEIL insured areas in the event of a fire on the NEIL insured site.

3.D.3.a.(6) If interior fire main headers are utilized, they "should" be routed so exposure to severe fire or explosion hazards is eliminated.

?3.D.3.b. Hydrants - UL Listed, FM Approved, or other ACCEPTABLE hydrants Shall be provided per applicable NFPA standards.

?3.D.3.b.(1) The maximum intervals "should" be 250 feet on the yard main.

3.D.3.c. Hose Equipment Station - ACCEPTABLE hose and equipment "should" be provided. The hose and equipment "should" be located in houses, hose cabinets, mobile hose carts, and/ or trucks.

See Section 8-3K, Appendix 3.D.3.c.

3.D.4. Automatic Fixed Extinguishing Systems

?3.D.4.a. Automatic fixed fire extinguishing systems, if provided, "should" be designed and installed in accordance with appropriate NFPA Standards.

3.D.4.b. Individual system control valves, including post indicator or other underground valves, which could isolate individual systems, "should" be electronically supervised, sealed, or locked in the normal position.

3.D.4.c. Alarms for all systems "should" be indicated in the Control Room or other constantly attended location. System valve position supervision, if provided, "should" be indicated in the Control Room or other constantly attended location.

3.D.4.d. Automatic fixed water extinguishing systems "should" be provided for:

?3.D.4.d.(1) Under the turbine operating floor to properly protect against all known hazards.

See Section 8-3L, Appendix 3.D.4.g

?3.D.4.d.(2) Turbine generator lube oil conditioning or system room.

3.D.4.d.(3) Turbine generator lube oil storage tank room.

3.D.4.d.(4) Oil or gas fired auxiliary boiler room.

3.D.4.d.(5) Any building room or area where combustibles are stored or used.

3.D.4.d.(6) Hydrogen seal oil conditioning unit.

3.D.4.d.(7) Equipment containing 50 gallons or more of combustible oil regardless of pressurization.

Standard 3.D.4.e is applicable to the Accidental Outage Program only.

3.D.4.e. Suppression "should" be provided for reactor coolant pumps (PWR) or recirculation pumps (BWR) unless provided with a seismically qualified oil collection system ACCEPTABLE to NEIL.

(Note: Fixed extinguishing systems are NOT required if the pumps are located in an area that is normally inerted during normal operation.)

Standard 3.D.4.f is applicable to the Accidental Outage Program only.

3.D.4.f. Suppression "should" be provided for diesel fire pumps.

?3.D.4.g. Automatic fixed water, gas, or chemical extinguishing systems "should" be provided for:

3.D.4.g.(1) Hydraulic control systems (where combustible fluids are used).

See Section 8-3L, Appendix 3.D.4.g

?3.D.4.g.(2) All oil hazards associated with the turbine generators, turbines and exciters, providing particular attention to large bearings, hydrogen oil seals at generators, guarded and unguarded pressurized oil piping and oil storage systems including oil transfer, filtering and conditioning systems.

See Section 8-3L, Appendix 3.D.4.g

3.D.4.g.(3) Emergency diesel generators rated at 500 kW or more.

? 3.D.4.g.(4) Cable spreading rooms and other areas of high cable concentration.

3.D.4.g.(5) High Value Electronic Equipment Rooms, such as computer rooms, telephone equipment room, etc., not constantly attended.

For sites in the Accidental Outage Program, this only includes high value electronic equipment rooms containing safety related equipment or equipment required for plant operation.

Standard 3.D.4.g(6) is applicable to the Primary Property Program only.

3.D.4.g.(6) Simulators and their associated high value electronic equipment.

Standard 3.D.4.h is applicable to the Primary Property Program only.

3.D.4.h. Automatic fixed water-extinguishing systems designed and installed in accordance with applicable NFPA standards "should" be provided for normally open truck or railroad bays where transient combustibles are located.

3.D.4.i. Separate hydraulically designed automatic deluge systems in accordance with applicable NFPA standards "should" be provided for combustible (mineral) oil-filled transformers including:

3.D.4.i.(1) Main
3.D.4.i.(2) Station Service
3.D.4.i.(3) Auxiliary
3.D.4.i.(4) Electrically Connected Reserve

Standard 3.D.4.i.(5) is applicable to the Primary Property Program only.

3.D.4.i.(5) Transformers in the switchyard/substation that do not meet the separation criteria.

3.D.4.j. Special hazards fire protection "should" be operational prior to the introduction of the hazard, such as energizing a transformer or placing oil in tanks.

3.D.4.k. Automatic fixed fire extinguishing systems Shall be installed throughout all buildings constructed of limited combustible or combustible materials in accordance with the applicable NFPA Standards.

3.D.5. Extinguishers and Standpipe Systems

3.D.5.a Portable fire extinguishers Shall be provided.

3.D.5.a.(1) Portable fire extinguishers "should" be installed in accordance with NFPA 10.

3.D.5.a.(2) Portable fire extinguishers "should" be inspected and maintained.
See Section 8-3D, Appendix 3.A.6, Section P

3.D.5.b. Inside standpipe hose systems "should" be provided for structures four stories (or equivalent) or more in height and for structures where any portion of a structure is more than 400 feet from the nearest point of fire department vehicle access. When required, standpipe systems "should" be designed and installed in accordance with NFPA No. 14 and Section 8-3M, Appendix 3.D.5.b

3.D.6. General Alarm and Communication System(s)

3.D.6.a. ACCEPTABLE general alarm system(s) Shall be provided.

3.D.6.a.(1) The alarm system(s) "should" be such that personnel on the site will be alerted.

3.D.6.b. A communications system independent of the normal communications system "should" be provided for emergency use. Fixed repeaters "should" be installed where necessary for portable radio communication.

3.D.7. Automatic Fire Detection and Alarm System(s)

3.D.7.a. ACCEPTABLE automatic fire detection systems, designed and installed in accordance with NFPA 72 and other applicable NFPA Standards, with alarms to the control room or other constantly attended location "should" be installed in locations such as:

3.D.7.a.(1) Major Motor Control Centers.

3.D.7.a.(2) Switchgear Rooms.

3.D.7.a.(3) Control Rooms.
?3.D.7.a.(4) Cable Areas in Containment.

3.D.7.a.(5) Cable Spreading Rooms.

3.D.7.a.(6) Turbine-generator bearings provided with fixed manually controlled extinguishing systems.

3.D.7.a.(7) High Value Electronic Equipment Rooms.

Standard 3.D.7.a.(8) is applicable to the Primary Property Program only.

3.D.7.a.(8) Simulators and their associated high value electronic equipment.

Standard 3.D.7.a.(9) is applicable to the Primary Property Program only.

3.D.7.a.(9) Switchyard/Substation Control House.

Standard 3.D.7.a.(10) is applicable to the Primary Property Program only.

3.D.7.a.(10) Unsprinklered buildings with a primary office occupancy and a building and contents value of $500,000 or more.

?3.D.8. Cooling Towers

3.D.8.a. Cooling towers Shall utilize either noncombustible or ACCEPTABLE material, or be protected by ACCEPTABLE hydraulically designed automatic deluge system(s).

Exception: For sites in the Accidental Outage Program, if two combustible towers are redundant for a Unit and are separated by 500 feet of clear space, then suppression is not required.

3.D.8.b. ACCEPTABLE fire barriers Shall be utilized to divide each cooling tower into an appropriate number of fire areas, unless constructed of noncombustible material or ACCEPTABLE system components throughout.

See Section 8-3N, Appendix 3.D.8.

3.D.8.c. Cooling towers "should" be assessed for structural integrity.

3.D.9. Boilers and Other Fired Equipment - ACCEPTABLE combustion safeguards Shall be provided on gas or oil-fired boilers and other fired equipment in accordance with applicable NFPA Standards or ACCEPTABLE equivalent.

Standard 3.D.10 is applicable to the Primary Property Program only.

3.D.10. Temporary New Fuel Storage - All temporary storage of new fuel Shall be ACCEPTABLE. **See Section 8-3O, Appendix 3.D.10.**

?3.D.11. Transformers

? 3.D.11.a Outdoor separation from adjacent structures

3.D.11.a. (1) Oil insulated transformers with a capacity of 500 gallons or more "should" be separated from adjacent structures by a two-hour rated fire barrier.

3.D.11.a.(1)(a) Separation is ACCEPTABLE if the exposed wall is both one-hour fire rated and protected by an approved automatic water spray system.

3.D.11.a.(1)(b) The fire barrier "should" extend in the vertical and horizontal direction such that the nearest point of the transformer is a minimum of 50 feet from any point on the wall not protected by the two hour fire barrier.

3.D.11.a.(1)(c) Where a two-hour rated fire barrier is not provided, separation from adjacent structures "should" be a minimum of 25 feet for oil capacities of 500 to 5,000 gallons and 50 feet for oil capacities over 5,000 gallons.

3.D.11.a.(1)(d) For oil insulated transformers with less than 500 gallons capacity, an ACCEPTABLE analysis "should" be performed which considers type and quantity of oil, size of postulated spill, type of construction of adjacent structures, and fire suppression systems provided.

? 3.D.11.b. Outdoor separation from adjacent transformers

3.D.11.b.(1) Oil filled transformers containing up to 5,000 gallons capacity "should" be separated from each other by a minimum clear space of 25 feet or a minimum one-hour rated fire barrier.

3.D.11.b.(2) Oil filled transformers over 5,000 gallons capacity "should" be separated from each other by a minimum clear space of 50 feet or a minimum one-hour rated fire barrier.

3.D.11.c. Outdoor transformers using less flammable fluid - For transformers containing less flammable (high fire point) fluid, an ACCEPTABLE analysis which considers the quantity of oil, size of postulated spill, type of construction of adjacent structures, power rating of the transformers, and fire suppression systems provided "should" be performed to determine the proper separation requirement.

3.D.11.d. Indoor separation

3.D.11.d.(1) Oil insulated transformers of 100 gallons or more capacity "should" be separated from adjacent areas by three-hour rated fire barriers.

3.D.11.d.(2) Indoor transformers using less flammable fluid and rated greater than 35 KV "should" be separated from adjacent areas by three-hour rated fire barriers.

3.D.11.d.(3) Where indoor transformers are protected by an automatic fire suppression system, the fire barrier rating may be reduced to one hour.

?3.D.11.e. PCB filled transformers

3.D.11.e.(1) PCB filled transformers "should" not be used.

3.D.11.e.(2) If PCB filled (greater than 500 ppm) transformers are used, a clear zone of 15 feet surrounding the transformer "should" be maintained free of transient and installed combustibles.

3.D.11.e.(3) PCB filled transformers Shall be identified in the fire or emergency response plan.

3.D.11.e.(3)(a)The plan "should" specify that rapid de-energization is advised in case of fire or explosion in or adjacent to the transformer.

3.D.11.e.(4) If interior PCB transformers are retro-filled or replaced, a FM approved less flammable fluid Shall be used.

3.D.11.e.(4)(a)Protection "should" be provided in accordance with Section 3.D.11.d.

Standard 3.D.12 is applicable to the Primary Property Program only

3.D.12. Radwaste Processes

3.D.12.a. Asphalt Solidification/Volume Reduction Process

3.D.12.a.(1) The process "should" be located in a noncombustible building isolated from adjacent buildings or structures by three-hour rated fire barriers.

3.D.12.a.(2) An automatic water extinguishing system "should" be provided to protect hazards such as asphalt pipelines, gearbox lube oil, and drum-filling operation. Fixed extinguishing systems utilizing water or foam-water extinguishing agents "should" be designed and installed in accordance with the appropriate NFPA Standards.

3.D.12.a.(3) The Control Center room "should" be isolated by a two-hour rated fire barrier.

3.D.12.a.(4) Adequate containment and drainage facilities "should" be provided for appreciable quantities of combustible liquids such as the extruder/evaporator area and drum filling area. Dikes or retaining walls "should" be designed to contain the largest spill plus concurrent flow from the water extinguishing system for a period of 10 minutes.

3.D.12.a.(5) Electrical equipment "should" be in accordance with NFPA No. 70, National Electrical Code.

3.D.12.a.(6) ACCEPTABLE building ventilation "should" be provided.

3.D.12.a.(7) The following protection features "should" be incorporated into the design of the bulk asphalt storage tank.

3.D.12.a.(7)(a) If located indoors, the tank "should" be isolated from the remainder of the facility by three-hour rated fire barriers and provided with diking or curbing to contain the entire tank contents.

3.D.12.a.(7)(b) If located outdoors, the tank "should" be detached a minimum of 30 feet from any building or structure, and a dike or retaining wall "should" be provided around the tank to contain 110% of tank capacity.

3.D.12.a.(7)(c) The asphalt liquid level and temperature "should" be monitored to maintain the asphalt level and temperature within safe limits.

3.D.12.a.(7)(d) Tank isolation (if provided) "should" be noncombustible.

3.D.12.a.(8) The general design features for asphalt storage and handling "should" be in accordance with NFPA No. 30, Flammable and Combustible Liquids Code.

3.D.12.b. Polymer Solidification Process

3.D.12.b.(1) The process "should" be located in a noncombustible building isolated from adjacent buildings or structures by three-hour rated fire barriers.

3.D.12.b.(2) Bulk binder storage (indoors) in a single storage tank or individual drum storage, whichever provided, "should" be isolated by three-hour fire barriers. Outdoor bulk binder storage "should" be detached a minimum of 50 feet from any building or structure or buried underground. Adequate containment and drainage facilities "should" be provided with diking or retaining walls designed to contain the entire binder storage contents plus concurrent flow from the fixed water extinguishing system for a period of 10 minutes, if provided.

3.D.12.b.(3) The Binder/Resin Mixing Area "should" be isolated from the remainder of the facility by three-hour rated fire barriers. Catalyst and promoter storage "should" be isolated in separated ACCEPTABLE storage cabinets or isolated by two-hour rated fire barriers if catalyst or promoter quantities exceed cabinet capacities.

3.D.12.b.(4) A fixed automatic extinguishing system "should" be provided for the following areas utilizing water or foam-water extinguishing agents designed and installed in accordance with the appropriate NFPA Standards:

3.D.12.b.(4)(a) Bulk binder storage (if indoors)
3.D.12.b.(4)(b) Binder/Resin Mixing area
3.D.12.b.(4)(c) Catalyst storage area
3.D.12.b.(4)(d) Promoter storage area

3.D.12.b.(5) The Control Center room "should" be isolated by a two-hour rated fire barrier.

3.D.12.b.(6) A lower explosive limit (LEL) vapor detection system "should" be considered in the Binder/Resin Mixing area.

3.D.12.b.(7) Electrical equipment "should" be in accordance with NFPA No. 70, National Electrical Code.

3.D.12.b.(8) ACCEPTABLE building ventilation "should" be provided.

3.D.12.b.(9) The general design features for binder and promoter storage and handling "should" be in accordance with NFPA No. 30, Flammable and Combustible Liquids Code.

3.D.12.b.(10) The storage and handling of benzol peroxide, Class I oxidizer, in the polymer solidification process area "should" be in accordance with NFPA No. 430, "Storage of Liquid and Solid Oxidizing Materials".

3.D.12.c. Radwaste Storage

3.D.12.c.(1) Inside Storage

3.D.12.c.(1)(a) Inside storage facilities for radioactive waste Shall be constructed of non-combustible materials.

3.D.12.c.(1)(b) Radioactive waste "should" be stored in noncombustible radwaste containers.

3.D.12.c.(1)(c) If radwaste is stored in combustible containers or if combustible pallets are used, an automatic fire suppression system "should" be installed to protect the storage area unless the containers are stored in a vault/cell.

3.D.12.c.(2) Outside Storage

3.D.12.c.(2)(a) Outside storage facilities for radioactive waste Shall be provided with containment and drainage to an ACCEPTABLE location.

3.D.12.c.(2)(b) Radioactive waste Shall be stored in non-combustible radwaste containers if located outside.

3.D.12.c.(2)(c) Outside storage Shall meet the wind design criteria set forth in Section 3.C.4.

3.D.12.c.(2)(d) Lightning protection Shall be provided for the storage area per NFPA 780 or other ACCEPTABLE method.

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3.E. Hydrogen, Flammable Gas, and Flammable and Combustible Liquids Storage

3.E.1. Bulk Flammable Gas Storage

3.E.1.a. Bulk hydrogen and flammable gas storage facilities "should" be separated from site buildings or structures as follows:

3.E.1.a.(1) Rated fire barriers in accordance with applicable NFPA Standards.

OR

3.E.1.a.(2) Spatial separation in accordance with applicable NFPA Standards; however, not less than 30 feet.

3.E.2. Exterior Storage of Bulk Flammable and Combustible Liquids

3.E.2.a. Exterior bulk flammable and combustible liquid storage, in a separate structure or area, "should" be separated from site buildings or structures as follows:

3.E.2.a.(1) Rated fire barriers in accordance with applicable NFPA Standards.

OR

3.E.2.a.(2) Spatial separation in accordance with applicable NFPA Standards; however, not less than 30 feet.

3.E.2.b ACCEPTABLE Containment or drainage "should" be provided for areas containing bulk flammable and combustible liquids storage in accordance with NFPA 30.

3.E.3. Indoor Storage of Bulk Flammable and Combustible Liquids

3.E.3.a. Permanent indoor bulk storage of flammable and combustible liquids "should" be as follows:

3.E.3.a.(1) In a storage room designed in accordance with applicable NFPA Standards,

OR

3.E.3.a.(2) In storage cabinets in accordance with applicable NFPA Standards.

3.E.3.b. ACCEPTABLE Containment or drainage "should" be provided for areas containing bulk flammable and combustible liquids storage in accordance with NFPA 30.

3.E.4. Staging of Combustible Liquids

3.E.4.a. Where activities necessitate the staging of bulk combustible liquids inside of buildings, but outside of normal bulk storage areas, such staging "should" be located in an area provided with an automatic fire suppression system, "should" not exceed ten days duration, and "should" be provided with ACCEPTABLE containment and/or drainage.

3.E.5. General Purpose Warehouses

3.E.5.a. Flammable and combustible liquids storage in General Purpose Warehouses, "should" follow NFPA 30.

3.E.6. Handling of Flammable and Combustible Liquids

3.E.6.a. Handling of flammable, combustible liquids, compressed gases and other hazardous materials Shall be in accordance with applicable NFPA Standards. UL Listed or FM Approved containers Shall be used whenever possible for the handling of flammable liquids. Liquids with special handling requirements (alcohol, paint, chemicals, etc.) may be kept and handled in their original containers. However, when not in use, these containers Shall be stored in UL Listed or FM Approved cabinets.

?3.E.7. Combustible Oil Storage Tanks

Standard 3.E.7.a. is applicable to the Accidental Outage Program only.

3.E.7.a. Combustible oil storage tanks and other hazardous material tanks of more than 30,000 gallon capacity or multiple tanks having a combined capacity in excess of 60,000 gallons, ACCEPTABLE diking "should" be provided, and "should" be located a minimum of 100 feet from buildings and equipment. If approved automatic protection and diking are provided, 50 feet or more of clear space is ACCEPTABLE.

3.F. Construction / Modification and Outage Support

This section pertains to facilities and services incidental to construction and modification projects and outage support where work activities could impact on the operation of an insured unit, and outage related activities which could impact on the restart of a unit. Situations not addressed below Shall comply with the applicable requirements contained in other sections of the Property Loss Control Standards.

3.F.1. Modification / Outages

Administrative procedures and controls Shall be reviewed and modified to address the possibility of an exposure to an operational unit from modifications and/or outage activities. These controls are particularly important in buildings, which are shared by the operating unit and the unit undergoing modifications and/or an outage.

As a minimum, the procedures "should" address:

3.F.1.a Fire Brigades
3.F.1.b Fire Prevention Surveillance
3.F.1.c General Housekeeping
3.F.1.d Control of Ignition Sources
3.F.1.e Fire Protection System Testing
3.F.1.f Fire Protection Impairments
3.F.1.g Temporary Buildings and Enclosures
3.F.1.h Temporary Services (i.e., electrical, heating, etc.)

In general, procedures and controls incorporating the requirements outlined in previous sections of the Loss Control Standards would be ACCEPTABLE.

3.F.2. Facilities and Services

3.F.2.a. Exterior Temporary Buildings

3.F.2.a.(1) All exterior buildings, where the combined value of the building and contents is greater than $500,000 Shall be protected by an ACCEPTABLE automatic sprinkler system designed and installed in accordance with applicable NFPA Standards unless the building is constructed of noncombustible material and the contents of the building are noncombustible.

NOTE: Grouped noncombustible buildings or trailers with separation between individual units less than that specified by NFPA No. 80A, or grouped combustible or limited combustible buildings or trailers with separation between individual units less than 30 feet Shall be considered as a single building.

3.F.2.a.(2) Temporary buildings, whether individual or grouped cluster, constructed of noncombustible material "should" be separated from other structures in accordance with NFPA No. 80A.

3.F.2.a.(3) Temporary buildings, whether individual or grouped cluster, constructed of combustible or limited combustible material Shall be separated from other structures by a minimum distance of 30 feet.

3.F.2.a.(4) Temporary buildings, trailers, or other structures constructed of combustible or limited combustible material Shall be separated from permanent site buildings or equipment by a minimum of 30 feet.

EXCEPTION: When all portions of the exposed building (i.e. walls, roof, etc.) within 30 feet of the exposure constitute a rated fire barrier, minimum separation distance may be reduced in accordance with the following table.

TABLE 3.F.2.a.(4)
TEMPORARY BUILDING SEPARATION

EXPOSED BUILDING FIRE BARRIER RATING	EXPOSING BUILDING WITHOUT PROTECTION	EXPOSING BUILDING HAS AUTOMATIC SPRINKLERS
>= 3 Hours	5 Feet	0 Feet
2 Hours	10 Feet	5 Feet
1 Hour	20 Feet	10 Feet
< 1	30 Feet	15 Feet

3.F.2.a.(5) For all exterior buildings, the appropriate type and size of portable fire extinguishers along with ACCEPTABLE watchman service Shall be provided.

3.F.2.b. Exterior Temporary Coverings

Where coverings are utilized for protecting the outdoor storage of materials and/or equipment the following apply:

3.F.2.b.(1) Only UL Listed or FM Approved fire retardant fabrics or other ACCEPTABLE materials "should" be used.

See Section 8-3P, Appendix 3.F.2.b.(1)

3.F.2.b.(2) All framing material used to support such coverings "should" be either noncombustible or fire retardant pressure-impregnated wood.

3.F.2.b.(3) The covered storage "should" not be located within 30 feet of any building. All storage "should" be protected from damage by vehicular traffic, either by adequate distance from roadways or by physical barriers.

3.F.2.c. Interior Temporary Facilities

3.F.2.c.(1) Interior temporary buildings Shall be in accordance with Table 3.F.2.c.1.

3.F.2.c.(2) The use of interior temporary coverings "should" be limited to special conditions.

3.F.2.c.(2)(a) If interior temporary coverings are necessary, they Shall be constructed of UL Listed or FM Approved fire retardant tarpaulins.

3.F.2.c.(3) If framing is required, it Shall be noncombustible, limited combustible, or fire retardant pressure-impregnated wood.

3.F.2.c.(3)(a) Only noncombustible or ACCEPTABLE fire retardant material "should" be used for any scaffolds or forms both inside and outside permanent buildings.

3.F.2.c.(4) Permanent buildings Shall not be occupied for storage except where advance approval has been obtained as to the storage plan and proper protection requirements.

3.F.2.c.(5) For all interior temporary buildings, the appropriate type and size of portable fire extinguishers along with ACCEPTABLE watchman service Shall be provided.

TABLE 3.F.2.c.(1)
INTERIOR TEMPORARY BUILDINGS

TEMPORARY BUILDING CONSTRUCTION	CONTENTS	SPRINKLER REQUIREMENTS	SIZE/RESTRICTIONS PER FIRE AREA
Noncombustible	Combustible	Shall	800 Sq. Ft. Max
Noncombustible	Noncombustible	None	No Restrictions
Cargo Van	Combustible	"should"	2 Vans Together; 4 Total per Fire Area; 30 Ft Separation Between Groups Of Vans
Cargo Van	Noncombustible	None	No Restrictions
Limited Combustible	Combustible	Shall	400 Sq. Ft per Fire Area - 200 Sq. Ft. per Temporary Building; 30 Ft. Separation Between Buildings
Limited Combustible	Noncombustible	"should"	400 Sq. Ft per Fire Area: No Restrictions On Separation
Combustible Office, Trailer or Structure	Combustible	Shall	200 Sq. Ft per Trailer; Max of 2 Trailers Separated by 50 Ft. per Fire Area
Combustible Office, Trailer or Structure	Noncombustible	"should"	200 Sq. Ft per Trailer; Max of 2 Trailers Separated by 50 Ft. per Fire Area

NOTE: Any combination of temporary building construction and contents from Table 3.F.2.c.(1) may be used provided that:

1. The maximum square footage for all temporary buildings Shall not exceed 800 Sq. Ft. per Fire Area.

2. Of the 800 Sq. Ft. maximum, the total allowed for limited combustible and/or combustible office trailers Shall not exceed 400 Sq. Ft. per Fire Area.

EXCEPTION: No size or separation restrictions apply to temporary noncombustible buildings or cargo vans with noncombustible contents.

3.F.2.d. Flammable and Combustible Liquids - Flammable liquids, combustible liquids, gases, or other hazardous materials Shall be stored and handled in accordance with the requirements of Section 3.E

3.F.2.e. Temporary Services - ACCEPTABLE procedures addressing the installation of temporary services, (i.e., cables, hoses, heating devices, etc.) "should" be established and implemented.

3.F.2.e.(1) Electrical wiring and equipment "should" be installed in accordance with NFPA No. 70, National Electrical Code. The electrical supply for each temporary structure "should" be capable of being de-energized from outside the structure by a single switch. Temporary services to these structures "should" be shut off when it is not in use.

3.F.2.e.(2) Only safely installed UL Listed or FM Approved heating devices and their fuel supply systems Shall be utilized inside or within 30 feet of temporary and permanent buildings.

3.F.2.e.(3) Non-permanent electrical circuits required for temporary power and lighting installations "should" not be placed in cable trays with permanent circuits unless they meet the same requirements as permanent circuits.

See Section 8-3Q, Appendix 3.F.2.e

3.F.2.f. Site Lay-Down Areas - Minimum water supply and applicable fire protection equipment as described in 3.D Shall be provided unless:

3.F.2.f.(1) The material and/or equipment stored in the area is noncombustible and/or ACCEPTABLE.

OR

3.F.2.f.(2) Stacks of material and/or equipment in the Lay-Down Area are separated by a minimum clear space of 30 feet and the value of each stack is limited to $500,000.00

3.F.3. Construction

3.F.3.a. During construction, fire barriers and fire doors "should" be given priority for construction and installation to reduce the potential for spread of fire.

3.F.3.b. ACCEPTABLE lightning protection Shall be provided for temporary construction buildings exceeding $500,000 in value.

3.F.3.c. A minimum water supply Shall be available prior to insured values on site and capable of furnishing 750 gpm -OR- the largest fixed water-extinguishing system including 500 gpm for hose streams for at least a two-hour duration.

3.F.3.d. Hydrants Shall be provided with a maximum distance between any two hydrants of 500 feet; hose and hydrant equipment provided Shall assure adequate overlap of protection.

3.F.3.e. During construction, adequate first aid water standpipe systems (2-inch minimum pipe size) Shall be in service in any permanent building that has as much as two-floor-equivalent wall heights erected. Additional standpipe hose connections Shall be added to each floor level as soon as sufficient landings are available to fight fires from that level.

3.F.3.e.(1) Freeze protection "should" be provided where necessary.

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SECTION 8-3B APPENDIX 3.A.I

OPERATING PLANT FIRE BRIGADES

A. An ACCEPTABLE fire brigade written administrative plan Shall be developed. The following is an ACCEPTABLE method of satisfying this Standard.

A.1. FIRE BRIGADE MEMBERS AND DUTIES - The written administrative plan Shall designate the assignment of personnel to the fire brigade and the establishment of their duties.

A.1.a. Fire Loss Control Management - The written administrative plan "should" detail the following:

A.1.a.1 Establishing the size and structure of the fire brigade(s).

A.1.a.2 Providing equipment and supplies for the fire brigade(s).

A.1.a.2.a. An ACCEPTABLE program for the care and maintenance of the equipment provided for use by the fire brigade. This includes restoration of all affected fire protection systems and equipment after use in a drill or actual emergency.

A.1.a.3. Supervising the training and staffing of the brigade(s).

A.1.a.4. Establishing appropriate lines of communication with local and state agencies.

A.1.a.5. Investigation of all plant fires and the maintenance of a record of pertinent information on each fire. See Section 8-1I "Incident Reporting."

A.1.a.6. A method for the fire brigade to be aware of the status of fire protection systems and plant conditions that can affect fire brigade operations.

B. TRAINING - An ACCEPTABLE written fire brigade training and fire brigade drill program Shall be established to provide both initial and periodic training and drills.

B.1. Training Program - The training program "should" include Job Performance Requirements for initial Fire Brigade Member (FBM), and Fire Brigade Leader (FBL). For Continuing Education and Training (CET), all Job Performance Requirements "should" be accomplished over a two-year period.

B.1.a. Fire Brigade Member Requirements:

Fire brigade members "should" meet the educational requirements established by the management of the Fire Brigade and the medical and job-related physical requirements based on NFPA 600, Standard on Industrial Fire Brigades or equivalent.

B.1.a.1. Fire Brigade Member – Interior Structural/Advanced Exterior Level (Initial and CET):

Prior to being qualified or certified as Fire Brigade Member level, individuals "should" be able to meet the applicable job performance requirements listed below:

a. Understand the different alarm detection systems within the facility; difference between alarm, trouble, and supervisory alarms; hazards protected by the detection systems; hazards associated with each type of alarm condition; knowledge of emergency response plan; and communication procedures.

b. Understand the sources of water supply for the fire protection system, and site-specific water supply components (fire pumps, jockey pumps, hydrants, etc).

c. Understand mutual aid procedures, resources and equipment available, and the structure of the mutual aid organization, site Standard Operating Procedures (SOPs), and the incident management system.

d. Have the ability to recognize conditions that require personal protection, uses and limitations of thermal protective clothing, components of thermal protective clothing ensemble, and donning and doffing procedures.

e. Have the ability to recognize conditions requiring use, limitations of SCBA and PASS, components of SCBA and PASS, donning procedures, breathing techniques, emergency procedures and physical requirements for use.

f. Maintain a good knowledge of available tools and equipment, their storage locations, and their correct use in accordance with recognized practices and selection of tools and equipment given different conditions.

g. Have the ability to recognize site-specific hazards, such as access to areas restricted by fences, scaffolding, and walls; understand procedures associated with special hazard areas, such as electrical substation, radiation hazard areas and others specific to the site.

h. Understand the classification of fires, risks of each class, operating methods and limitations of portable fire extinguishers.

i. Understand types of fixed extinguishing systems, hazards associated with system operation, how system operates, system overrides and manual intervention procedures and shutdown procedures.

j. Understand types of hose lines, precautions when advancing hose lines, dangerous building conditions, and principles of exposure protection.

k. Understand principles of fire streams: types, design, operation, nozzle pressure effects, flow capability of nozzles; observable results that fire streams are correctly applied; dangerous conditions created by fire; potential long term consequences of exposure to products of combustion; physical states of matter in which fuels are found; the application of each size and type of attack line; the role of backup team in fire attack situations, attack and control techniques, and exposing hidden fires.

l. Understand methods by which foam prevents or controls a hazard, principles by which foam is generated, causes of poor foam generation and corrective measures; differences between hydrocarbon and polar solvent fuels and concentrates that work on each; the characteristics, uses, and limitations of fire fighting foams; the advantages and disadvantages of using fog nozzles verses foam nozzles for foam application; foam stream application techniques; hazards associated with foam usage; and methods to reduce and avoid hazards.

m. Understand the characteristics of flammable gases, components of flammable gas systems, effects of heat and pressure on closed containers, BLEVE signs and effects, methods for identifying contents, water stream usage and demands for pressurized gas fires, what to do if the fire is prematurely extinguished, re-ignition is prevented, and team protection is maintained.

n. Have confidence of the methods by which a Class C agent prevents or controls a hazard; methods by which Class C fires are de-energized; causes of injuries from Class C fire fighting on live Class C fires with Class A agents and the Class C agents; the extinguishing agents characteristics, uses and limitations; the advantages and disadvantages of de-energizing equipment.

o. Have the ability to apply the principles of conducting initial fire size-up upon arrival at the scene.

p. Understand the methods by which special agents such as dry chemical, dry powder, carbon dioxide, Halon, etc prevent or control a hazard; the characteristics, uses, limitations of fire-fighting special agents; the advantages and disadvantages of using special agents; special agent application techniques; hazards associated with special agents usage; and methods to reduce and avoid hazards.

q. Understand the principles, advantages, limitations and effects of horizontal and vertical ventilation; safety considerations when venting a structure; the methods of heat transfer; principles of thermal layering within a structure on fire; fire behavior in a structure; the signs, causes, effects and prevention of backdrafts; the relationship of oxygen concentration to life safety and fire growth.

r. Have the ability to recognize effects of operating in obscured conditions and ways to manage them, methods to determine if an area is tenable, primary and secondary search techniques, team members' roles and goals, methods to use an indicators of finding victims, victim removal methods, and considerations related to respiratory protection.

s. Understand the different types of fire attack lines and water application devices most effective for overhaul, water application methods for extinguishment that limit water damage, types of tools and methods used to expose hidden fires, dangers associated with overhaul, obvious signs of area of origin or sign of arson, and reasons to protect the fire scene.

t. Understand the methods used to protect property, methods used to reduce damage to property, types and use of salvage covers and operations at protected properties.

B.1.a.2. Fire Brigade Leader (Initial and CET):

Prior to being qualified or certified as Fire Brigade Leader level, in addition to being certified as a fire brigade member, individuals "should" meet the job performance requirements listed below:

a. Have the ability to perform verbal communications during emergencies, techniques used to make assignments under stressful situations, and methods of confirming the members' understanding of assigned tasks.

b. Have the ability to understand SOP's, resources available, basic fire control procedures, an incident management system, personnel accountability system, and common causes of injury during fire brigade activities, safety policies and procedures, and basic fire brigade member safety.

c. Understand the organizational policy and procedures, common causes of fire and their prevention, and the integration of mutual aid.

d. Have the ability to carryout the elements of size-up, SOP's for emergency operations, and understanding fire behavior.

e. Understand the basic fire scene investigation, salvage, and preliminary collection for fire report generation.

B.1.a.3. (Sites that utilize mobile fire apparatus) Fire Brigade Apparatus Driver/Operator (Initial and CET)

Prior to being qualified or certified as Fire Brigade Apparatus Driver/Operator, individuals "should" meet the job performance requirements established by the management of the Fire Brigade and defined by NFPA 1002, Standard on Fire Apparatus Driver/Operator Professional Qualifications or equivalent and the applicable site-specific requirements as defined by the management of the Fire Brigade. It is recognized that some Job Performance Requirements listed in NFPA 1002 do not apply to Nuclear Power Facilities.

B.1.b. Training records "should" be maintained for each member showing training sessions attended.

B.2. Fire Brigade Drills

B.2.a. ACCEPTABLE fire brigade drills "should" be provided using realistic plant conditions to maintain fire brigade proficiency. Fire brigade drills "should" include the following:

B.2.a.1. Fire brigade drills "should" be a simulated emergency exercise involving a credible emergency and requiring the fire brigade to perform planned emergency operations for the purpose of evaluating the effectiveness of the training and education program and the competence of fire brigade members in performing required duties and functions. Fire brigade drills may be either announced or unannounced.

B.2.a.1.(a) Fire Brigade Drills "should" be assessed in accordance with B.2.b.

B.2.a.1.(b) Generally, fire brigade drills are not considered training evolutions. However, announced drills may incorporate a degree of training while performing an evaluation of the fire brigade. Announced fire brigade drills may vary in types of response, speed of response, and use of equipment, if a true test of the brigades' knowledge to use the fire fighting equipment and skills can be achieved. Unannounced fire brigade drills are to be used specifically to evaluate the fire fighting readiness of the fire brigade, fire brigade leader, and fire protection systems and equipment.

B.2.a.2. At least annually, each shift fire brigade "should" participate in an unannounced fire brigade drill. Unannounced fire brigade drills "should" be performed in a realistic manner, using real-time evolutions, full personal protective equipment (PPE) including air usage from self-contained breathing apparatus (SCBA) and where appropriate, using charged hose lines.

B.2.a.3. The fire drills "should" be monitored by an adequate number of drill controllers **and evaluators** to meet the objectives that are planned.

B.2.a.3(a) Fire brigade drill controllers "should" have knowledge and training, such as prior fire brigade qualification, on the type of fires which may be encountered.

B.2.a.3(b) Fire brigade drill evaluators "should" be familiar with the fire brigade drill objectives they are to evaluate.

B.2.a.4 At least one fire brigade drill per year "should" focus on NEIL insured areas and structures located outside the power block within the scope of the station full fire brigade response.

B.2.b. Assessment of the fire drill "should" include the following:

B.2.b.1. Fire Alarm effectiveness and timeliness.

B.2.b.2. Control Room interface with the fire attack.

B.2.b.3. Timeliness of the assembly of the entire brigade at the fire scene.

B.2.b.4. Timeliness of the start of fire attack.

B.2.b.5. The brigade members' knowledge and ability to properly deploy and use fire fighting equipment in an effective attempt to extinguish the simulated fire.

B.2.b.6. The brigade members' knowledge of their role in the fire fighting strategy.

B.2.b.6(a) The brigade members' ability to confine the fire, while protecting exposures.

B.2.b.6(b) The brigade members' knowledge of fixed and manual ventilation.

B.2.b.6(c) The brigade members' tactical knowledge of salvage and overhaul.

B.2.b.7. The brigade members' ability to don and use PPE including the use of air with the SCBA.

B.2.b.8. The brigade members' ability to effectively communicate while having the SCBA face piece donned.

B.2.b.9. The brigade leaders ability to perform a size up of the fire.

B.2.b.10. The brigade leaders use of the fire pre-plan.

B.2.b.11. The brigade leaders effective implementation of command and control including use of onsite personnel.

B.2.b.12. The brigade leaders ability to recognize hazards to the plant from the fire or fire attack.

B.2.b.13 The brigade leaders ability to coordinate additional manpower from the offsite fire department.

B.2.b.14 A critique of the drill is performed by the participants.

B.3. When a NEIL Property Loss Control Representative (LCR) requests to witness a fire brigade drill, with prior notification to senior plant management, an unannounced drill "should" be performed. At the discretion of the LCR, the requirement to witness an unannounced drill may be changed to an announced drill.

B.4 Drill Records "should" be maintained showing each members participation in the drills.

C. UTILIZING OFF-SITE FIRE SUPPRESSION ORGANIZATIONS

A fire response plan is required for all buildings, equipment, and areas included within the NEIL insurance site description.

The station may elect to have another recognized fire suppression organization respond to emergencies as the primary responder. This is ACCEPTABLE to NEIL if ACCEPTABLE response plans are written and implemented. As a minimum, fire response plans utilizing organizations other than the recognized plant fire brigade Shall include the following:

C.1. When there is an indication of a fire (e.g. report of smoke or fire, fire suppression system activation, multiple fire detection alarms, etc), the off-site fire suppression organization Shall be notified immediately.

C.2. Name of the outside organization to be called in the event of a fire, such as the local municipal fire department.

C.3. Verification through periodic response drills that the responding organization will arrive at the site within an ACCEPTABLE period from the time the alarm is received at the central alarm station.

C.4. Verification that the responding organization will respond in full turnout gear with at least five (5) qualified members within the ACCEPTABLE response period.

C.5. Verification that the responding organization will respond to the site with at least the equipment specified in Appendix 3.D.3.c, Sections B and C, and that their equipment is compatible with plant fire protection equipment.

C.6. A written fire pre-plan Shall be made available to the responding organization for each NEIL insured building, structure, or area they are responsible for.

C.7. A fire drill Shall be conducted at least annually involving the organization responsible for fire response to NEIL insured buildings, equipment, and areas. The fire drill may be witnessed by NEIL during regularly scheduled plant evaluations.

D. Corrective Action Plan. Deficiencies identified during Training and Fire Drills Shall be documented within the Stations Corrective Action Program or equivalent and be available for review during the NEIL Primary Property Loss Control periodic evaluations.

E. REFERENCES

OSHA - Occupational Safety & Health Act, 1970
Title 10, Code of Federal Regulations, Energy, Part 50.48
Title 29, Code of Federal Regulations, Part 1910.038, Emergency Plan
Title 29, Code of Federal Regulations, Part 1910.134, Respiratory Protection Standard
Title 29, Code of Federal Regulations, Part 1910.156, Subpart L
NFPA - Fire Protection Handbook - 18th Edition
NFPA 600 - 2000 - Standard on Industrial Fire Brigades
NFPA 805 - 2001 - Standard for Fire Protection for Advanced Light Water Reactor Electrical Generating Plants
NFPA 1001 - 2002 - Standard for Fire Fighter Professional Qualifications
NFPA 1002 - 2003 - Standard on Fire Apparatus Driver/Operator Professional Qualifications
NFPA 1081 - 2001 - Standard for Industrial Fire Brigade Member Professional Qualifications
NFPA 1403 - 2002 - Standard on Live Fire Training Evolutions
NFPA 1404 - 2002 - Standard for Fire Service Respiratory Protection Training
NFPA 1500 - 2002 - Standard on Fire Department Occupational Safety And Health Program
NFPA 1561 - 2002 - Standard on Emergency Services Incident Management System
NFPA 1582 - 2003 - Standard on Comprehensive Occupational Medical Program for Fire Departments

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SECTION 8-3D APPENDIX 3.A.6

FIRE PROTECTION SYSTEMS TESTING

This Appendix outlines the NEIL ACCEPTABLE testing for the common types of fire protection systems found at Nuclear Power Facilities. When new technology for fire suppression or detection is ACCEPTED for a NEIL installed fire system, the ACCEPTABLE inspection, maintenance and testing program will be documented in the system Design Review and will normally follow NFPA and manufacturer requirements. The following constitutes an ACCEPTABLE method for meeting the requirements for the inspection / testing / maintenance of fire protection systems as outlined in Standard 3.A.6.a and 3.A.6.b Inspection, testing and maintenance is required for fire protection systems installed to meet NEIL standards or credited as protecting a structure or equipment in a Variance or Professional Judgment. **For plants in the Accidental Outage Program, this appendix is used to evaluate the assignment of credits / penalties for those fire protection systems associated with power production.**

A. This Appendix provides the inspection, test and maintenance requirements that are ACCEPTABLE to NEIL. Generally, NEIL requirements for inspection, test and maintenance of fire protection systems/equipment are based on NFPA requirements. This Appendix lists the ACCEPTABLE inspection, test and maintenance activities with the NEILACCEPTABLE frequency. This Appendix also provides alternate/additional methods for complying with this Standard. The ACCEPTABLE frequencies may differ from the frequencies listed in NFPA documents, but in no case is the NEIL frequency more restrictive than the NFPA frequency. This was done in recognition of the unique nature of Nuclear Power Plants and the impracticality of performing some inspection, testing and maintenance at the prescribed NFPA frequency. This Appendix provides the testing requirements for traditional fire protection systems. When a new type of system, such as water mist or alternative gaseous systems are installed to meet NEIL Standards, NFPA testing requirements and frequencies need to be used until experience with the reliability of the system is gained. It is recognized that unique situations may arise at some plants, and those will be considered on an individual basis.

   Where a particular type of system/equipment is not installed or is not in service, that section of the Appendix requirements does not apply.

B. It is recognized that many plants are investigating, or are in the process of implementing a performance-based approach to fire protection system inspection, testing and maintenance intervals. NEIL will review the results of a performance-based analysis and, if found ACCEPTABLE, will allow use of the performance-based inspection, testing and/or maintenance intervals in lieu of the intervals stated in this Appendix. Frequencies may be initially extended as discussed in B.1 through B.5. Each progressive extension from monthly or less up to refueling outage must be accompanied with the required years of new data for an extension to that frequency as provided in D.2.

   B.1. **60 days** or less performance intervals may be extended to Quarterly.

   B.2. Quarterly performance intervals may be extended to Semi-Annual.

   B.3. Semi-Annual intervals may be extended to Annual.

   B.4. Annual performance intervals may be extended consistent with the station's fuel cycle (e.g. 18 or 24 months).

B.5. Refuel frequency or greater intervals may **be extended to the greater of two times the refueling interval or twice the stated NEIL ACCEPTABLE frequency**.

C. Where an inspection, test or maintenance activity indicates that the system/equipment failure rate is higher than ACCEPTABLE to NEIL, the interval of the inspection, test or maintenance SHALL be reduced to the NEIL ACCEPTABLE Interval until ACCEPTABLE performance can be demonstrated as outlined in sections B and D.

D. Each performance-based analysis must be plant specific. Where inspection, testing and maintenance intervals exceed those listed in this Appendix, those intervals, with supporting documentation, "should" be submitted to NEIL for review and comment. As a minimum, the submittal "should" include:

D.1. A list of all equipment/systems whose proposed testing interval will exceed those listed in this Appendix, with the appropriate performance-based analysis for the equipment/systems.

D.2. The performance-based analysis must include a technical justification, including plant specific historical failure rate data on the equipment/system. Minimum time intervals for historical failure rate data are:

D.2.a. **60 days** or less testing / inspection extended to Quarterly - 2 years of data at the monthly frequency
D.2.b. Quarterly testing / inspection extended to Semi-annual - 3 years of data at the quarterly frequency.
D.2.c. Semi-annual testing / inspection extended to annual - 3 years of data at the Semi annual frequency.
D.2.d. Annual testing / inspection extended consistent with the station's fuel cycle (e.g. 18 or 24 months) - 5 years of data at the annual frequency.
D.2.e. Refueling or greater testing/inspection - **5 years of data at the current frequency.**

D.3. The criteria and method for shortening the testing interval if higher than expected failure rates or other unexpected poor performance is found.

?D.4. A frequency developed due to an ACCEPTABLE performance- based analysis may supersede the ACCEPTABLE NEIL frequency in this Appendix as long as the performance-based analysis remains valid.

E. Activities that present an operational hazard to the plant and/or a personnel hazard to those performing the inspection, test and maintenance activities may be extended beyond the indicated frequency at an interval ACCEPTABLE to NEIL. Frequencies identified as 18 months are intended to be fuel cycle outage related. Where a plant is on a 24 month fuel cycle outage schedule, performance of testing at 24 months on those systems and components not normally accessible during unit operation, will meet the intent of an 18 month frequency.

F. A rotating two-year review **frequency** will be utilized to determine compliance with this Appendix.

The review process does not require that all systems be reviewed during **the two-year review frequency**. A random sample of several systems will be used to determine compliance with Appendix 3.A.6. The

random sample will generally consist of power block systems and non-power block systems to provide for a representative sample. Selected systems/equipment may be reviewed in detail to determine if the inspection, testing and maintenance are being properly completed.

G. DEFINITIONS

G.1. Inspection - A visual examination of the fire protection system or portion thereof to verify that it appears to be in operating condition and is free of physical damage.

G.2. Maintenance - Work performed to keep equipment operable or to make repairs.

G.3. Testing - Conducting periodic physical checks of the fire protection system and/or its components. This test may include physical checks by calibration, which would test instrumentation and circuitry.

G.4. Trip Test - Trip tests (full flow trip, partial trip, functional trip) require each automatic initiating circuit and all manual mechanical initiating devices to be tested.

G. REFERENCES

NFPA 10	Standard for Portable Fire Extinguishers – 2002
NFPA 11	Standard for Low, Medium and High Expansion Foams - 2002
NFPA 12	Carbon Dioxide Extinguishing Systems – 2000
NFPA 12A	Halon Fire Extinguishing Systems – 2004
NFPA 17	Standard for Dry Chemical Extinguishing Systems – 2002
NFPA 17A	Standard for Wet Chemical Extinguishing Systems – 2002
NFPA 25	Inspection, Testing and Maintenance of Water Based Fire Protection Systems – 2002
NFPA 72	National Fire Alarm Code – 2002
NFPA 1962	Standard for the Inspection, Care, and Use of Fire Hose, Couplings and Nozzles and the Service Testing of Fire Hose – 2003
NFPA 2001	Clean Agent Fire Extinguishing Systems - 2004
ASTM D-975	Specifications for Diesel Fuel Oil – 2004
ASTM D-4057	Manual Sampling of Petroleum Products – 2000
ASTM D-4177	Automatic Sampling of Petroleum Products – 2000
EPRI TR 1006756	Fire Protection Equipment Surveillance Optimization and Maintenance Guide – 2003

I. TABLES

A. - FIRE MAINS / HYDRANTS / PIVs
B. - WATER STORAGE TANKS
C. - FIRE PUMPS
D. - WET PIPE SPRINKLER
E. - DELUGE
F. - PRE-ACTION
G. - DRY PIPE SPRINKLER
H. - FOAM WATER
I. - STANDPIPE AND HOSE
J. - CARBON DIOXIDE
K. - CLEAN AGENT AND HALON
L. - DRY / WET CHEMICAL
M. - ALARM SIGNALING SYSTEMS
N. - AUTOMATIC FIRE DETECTORS
O. - VALVES
P. - PORTABLE EXTINGUISHERS

A. FIRE MAINS/HYDRANTS

Testing based on: NFPA 25 – 2002 Chapter 7; NFPA 1962 – 2003 Chapter 4; NFPA 1962 – 2003 Chapter 7

	Component	Activity	ACCEPTABLE NEIL Frequency
A.1	Hydrants	Inspect	Annual
A.2	Hydrants	Maintain	Annual
A.3	Hydrants	Test Flow	Annual
A.4	Hose / Hydrant House	Inspect	Annual
A.5	Hose / Hydrant House	Maintain	Annual
A.6	Main Line Strainers	Maintain-Clean	Annual
A.7	Underground Mains	Flow Test	5 Years
A.8	Hose - Outside	Test-Hydro	Annual

A.1 Hydrants need to be inspected annually and after each operation and the necessary corrective actions taken for the items described below:

Accessibility of the Hydrant
Leaks in outlets or top of the hydrant
Damage to the hydrant barrel
Worn threads or operating nut
Availability of hydrant wrench
For Dry Barrel Hydrants determine proper barrel drainage by checking for water in the barrel prior to freezing weather

A.2 Hydrants need to be lubricated annually to ensure that all stems, caps, plugs, and threads are in proper operating condition.

A.3 Hydrants need to be tested annually to ensure proper functioning. Each hydrant needs to be opened fully and water flowed until all foreign material has cleared. Flow needs to be maintained for not less than one minute.

After operation, dry barrel and wall hydrants need to be observed for proper drainage from the barrel. Full drainage normally does not take longer than 60 minutes. Where soil conditions or other factors are such that the hydrant barrel does not drain within 60 minutes or where the groundwater level is above the hydrant drain, the hydrant drain is usually plugged and the water in the barrel is pumped out. Dry barrel hydrants located in areas subject to freezing weather and that have plugged drains need to be clearly identified as needing to be pumped out after operation.

A.4 Hose houses need to be inspected Annually. Houses need to be inspected, and the necessary corrective action for the following items:

Accessibility of the hose / hydrant house
Operation of the doors
Physical damage
Ensure the required equipment inventory

A.5 Hose houses shall be maintained annually in a condition to ensure that all fire hose and required components are in a usable condition.

A.6 Mainline strainers need to be cleaned annually and verified ACCEPTABLE for continued operation through inspection or differential pressure after each operation through greater than a two-inch orifice.

A.7 Underground and exposed piping need to be flow tested to determine the internal condition of the piping at minimum five-year intervals. Flow tests need to be performed at flows representative of those expected during a fire for the purpose of comparing friction loss characteristics of the pipe with that expected for the particular type of pipe involved, with due consideration given to the age of the pipe and to the results of previous flow tests. Any flow test results that indicate deterioration of available water flow and pressure need to be fully investigated to ensure that adequate flow and pressure are available for fire protection.

A.8 Outside Hose need to be treated as attack/ supply hose with an inspection and service-test or manufacturers test performed prior to being placed in service for the first time and annually thereafter.

B. - WATER STORAGE TANKS
Testing based on: NFPA 25 – 2002 Chapter 9

	Component	Activity	ACCEPTABLE NEIL Frequency
B.1	Tank Exterior	Inspect	Annual
B.2	Tank Interior	Inspect	5 Years
B.3	Heating System	Inspect	Weekly - Seasonal $< 40^{o}$ F
B.4	Water Level	Inspect	Monthly
B.5	Water Level Indicators	Test	5 Years
B.6	High / Low Level Alarms	Test	18 Months
B.7	Pressure Tanks / Air Pressure	Inspect	Monthly
B.8	Low Water Temperature Alarms	Test	Monthly - Seasonal

B.1 The exterior of the tank, supporting structure, vents, foundation, condition of the water in the tank, and catwalks or ladders, where provided, need to be inspected annually instead of the NFPA recommended quarterly for signs of obvious damage or weakening.

?B.2 The interior of tank needs to be inspected every five years. Regardless of Corrosion protection or pressurization as discussed in the exceptions in the NFPA Standard. NEIL may ACCEPT a 10-year frequency when an impressed current cathodic protection system is present and maintained.

B.3 The heating system, where provided, needs to be inspected weekly during the heating season

B.4 The water level and the condition of the water in the tank shall be inspected monthly. A quarterly inspection is allowed when the low level alarms are monitored in a constantly attended location.

B.5 Level indicators need to be tested every 5 years for accuracy and freedom of movement.

B.6 High and low water level alarms need to be tested once every 18 months instead of the semiannual test recommended by NFPA.

B.7 The air pressure in pressure tanks need to be inspected monthly when the pressure is not supervised, or quarterly when tank pressure supervision is provided.

B.8 Low water temperature alarms, where provided, need to be tested monthly during cold weather periods.

C. - FIRE PUMPS
Testing based on: NFPA 25 – 2002 Chapter 8; NFPA 25 – 2002 Chapter 12

	Component	Activity	ACCEPTABLE NEIL Frequency
C.1	Pump House	Inspect	Monthly
C.2	Gauges	Inspect	Monthly
C.3	Gauges	Test Calibrate	5 years
C.4	Controller Auto On	Inspect	Monthly
C.5	Diesel Driver, Oil Cooler, etc	Inspect	Monthly
C.6	Batteries	Inspect	**Quarterly**
C.7	Electric Motor	Run-10 Minutes	**60 Days**
C.8	Diesel Engine	Run-30 Minutes	Monthly
C.9	Full Flow Discharge	Test	18 Months
C.10	Relief/Recirc Valve Operator	Test	18 Months
C.11	Day Fuel Tank Quantity	Inspect	Monthly
C.12	Remote Alarms	Test	18 Months
C.13	Diesel Fuel	Stored Fuel Quality	Quarterly
C.14	Discharge Check Valves	Inspect-Internal	5 Years
C.15	**Fire Pump / Driver**	**Maintain**	**Manufacturer's Recommendation**

C.1 The pertinent visual observations listed in the following checklist needs to be performed monthly instead of the NFPA recommended weekly performance.

MONTHLY INSPECTION /OBSERVATIONS:

Pump House Conditions

Heat adequate, not less than 40° F (4.4° C) - (70° F (21° C) for pump room with diesel pumps without engine heaters)
Ventilating louvers free to operate

Pump System Conditions

Piping is free of leaks
Suction reservoir full

Electric System Conditions

Transfer switch normal pilot light illuminated
Isolating switch closed - standby (emergency) source
Reverse phase alarm pilot light off, or normal phase rotation pilot light on
Oil level in vertical motor sight glass normal

Diesel Engine System Conditions

All alarm pilot lights off

Steam System Conditions

Steam pressure gauge reading normal

C.2 On a monthly basis verify, where appropriate, pump suction pressure and fire system pressure are in their expected bands.

C.3 The accuracy of pressure gauges and sensors used to verify that a fire pump can meet its design requirements needs to be checked every 5 years for NEIL.

NFPA suggests that a preventative maintenance program be established on all components of the pump assembly in accordance with the manufacturer's recommendations. Records need to be maintained on all work performed on the pump, driver, controller, and auxiliary equipment.

In the absence of manufacturer's recommendations for preventive maintenance, NFPA 25 Table 5-5.1 provides alternative requirements, NEIL has adopted item A.3 of this table to ensure that where installed instruments are used to verify pump performance, accurate readings are obtained.

C.4 Verify on a monthly basis that the controller pilot light (power on) is illuminated and the controller selector switch is in the AUTO position.

C.5 Visual inspection of the diesel fire pump driver to verify the engine run time meter is reading, oil level in right angle drive is normal, crankcase oil level is normal, cooling water level is normal, electrolyte level in batteries is normal, water jacket heater is operating. These inspections need to be performed on a monthly basis for NEIL instead of the NFPA's suggested weekly frequency.

C.6 The diesel fire pump batteries need to be inspected for normal voltage reading, charging current readings in the normal range, and the battery pilot light are on or battery failure lights are off. NEIL requires this inspection to be performed on a **quarterly** basis instead of the NFPA's suggested weekly frequency. **The procedure needs to contain guidance for a once per cycle material condition inspection. EPRI 1006756, Fire Protection Surveillance Optimization and Maintenance Guide contains an ACCEPTABLE method on meeting these requirements.**

C.7 Electric motor-driven pump assemblies need to be tested without flowing water. This test needs to be conducted by automatic starting the pump for a minimum of a 10 minutes run **once every 60 days** instead of NFPA's suggested weekly frequency. A valve installed, to open, as a safety feature is permitted to discharge water.

C.8 Diesel engine driven pump assemblies need to be tested without flowing water. This test needs to be conducted by automatic starting the pump for a minimum of a 30 minutes run on a monthly basis instead of NFPA's suggested weekly frequency. A valve installed, to open, as a safety feature may be permitted to discharge water.

?C.9 A flow test of each pump assembly needs to be conducted under minimum, rated, and peak flows for the fire pump. The test may be performed using the fire pump test header through playpipes or through a flow meter with discharge to a drain or water supply. NEIL requires that this test be conducted every eighteen months instead of the NFPA recommended annual frequency. NEIL

does NOT require the water supply to be dumped to a drain on a three-year frequency when a bypass meter discharging back to the supply tank is used.

C.10 During the fire pump flow test required in C.9 the relief valve, relief and re-closure settings need to be verified to be correct. This verification needs to be performed at an 18-month frequency to meet NEIL Standards.

C.11 The Diesel fuel tank needs to be verified to be at least 2/3 full on a monthly basis to meet NEIL Standards.

C.12 Verify for proper operation and confirm proper identification under a fault condition for fire pump alarms reporting to the control room every 18 months to meet NEIL Standards.

C.13 Long-term storage for diesel fuel is defined as storage of fuel for longer than 12 months after it is received by the user. A successful program to maintain fuel quality includes monitoring bulk fuel during prolonged storage and replacement of aged fuel with fresh product at established intervals.

Stored fuel should be periodically sampled and its quality assessed. ASTM D-4057 provides guidance for sampling. Since fuel contaminants and degradation products will usually settle to the bottom of a quiescent tank, a "Bottom" or "Clearance" should be included in the evaluation.

Fuels that have undergone mild-to-moderate degradation can be consumed per manufacturer's instructions. Fuels containing very large quantities of fuel degradation products require special attention.

C.14 Check valves need to be inspected internally every five years to verify that all components operate properly, move freely, and are in good condition.

C.15 Preventive maintenance needs to be conducted in accordance with applicable manufacturer's recommendations. It is anticipated that the maintenance will include items such as changing of lubrication oil, checking of hose on engines, changing coolant on engines, and packing the pump. EPRI 1006756, Fire Protection Surveillance Optimization and Maintenance Guide contains an ACCEPTABLE method on meeting these requirements.

D. - WET PIPE SPRINKLER
Testing based on: NFPA 25 – 2002 Chapter 5; NFPA 25 – 2002 Chapter 10; NFPA 25 – 2002 Chapter 12

	Component	Activity	ACCEPTABLE NEIL Frequency
D.1	Sprinklers	Inspect-Visual	18 Months
D.2	Piping	Inspect-Visual	18 Months
D.3	Hanger/Seismic Bracing	Inspect-Visual	18 Months
D.4	Fire Dept. Connection	Inspect	18 Months
D.5	Water Flow Alarm	Test	18 Months
D.6	System Main Drain	Test	18 Months
D.7	Strainers	Inspect	18 Months

D.1 Sprinklers need to be inspected from the floor level every 18 months. Sprinklers need to be free of corrosion, foreign materials, paint, and physical damage and be installed in the proper orientation (e.g., upright, pendant, or sidewall). Any sprinkler that is painted, corroded, damaged, loaded, or in the improper orientation needs to be replaced. Sprinklers installed in concealed spaces are not required to be inspected. Sprinklers that become accessible due to maintenance or shutdown need to be inspected. Conditions identified as NOT meeting installation requirement or as listed above need to be documented and repaired.

D.2 Sprinkler pipe and fittings need to be inspected from the floor level every 18 months. Pipe and fittings need to be in good condition and free of mechanical damage, leakage, corrosion, and misalignment. Sprinkler piping is not to be subjected to external loads by materials either resting on the pipe or hung from the pipe. Pipe and fittings installed in concealed spaces are not required to be inspected. Pipe and fittings that become accessible due to maintenance or shutdown need to be inspected. Conditions identified as NOT meeting installation requirement or as listed above need to be documented and repaired.

D.3 Sprinkler pipe hangers and seismic braces needs to be inspected from the floor level every 18 months. Hangers and seismic braces need to be verified to not be damaged or loose. Hangers and seismic braces that are damaged or loose need to be replaced or refastened. Hangers and seismic braces installed in concealed spaces are not required to be inspected. Hangers and seismic braces that become accessible due to maintenance or shutdown need to be inspected. Conditions identified as NOT meeting installation requirement or as listed above need to be documented and repaired

D.4 Fire Department connections need to be inspected once every 18 months to meet NEIL Standards instead of NFPA's suggested quarterly. The inspection needs to verify the following:

(a) The fire Department connections are visible and accessible.
(b) Couplings or swivels are not damaged and rotate smoothly.
(c) Plugs or caps are in place and not damaged.
(d) Gaskets are in place and in good condition.
(e) Identification signs are in place.
(f) The check valve is not leaking.
(g) The automatic drain valve is in place and operating properly.

D.5 Testing of the water flow alarm on wet pipe systems needs to be completed by opening the inspector's test connection on an 18-month frequency. This simulates activation of one sprinkler. Where freezing weather conditions or other circumstances prohibit using the inspector's test connection, the bypass test connection may be considered ACCEPTABLE.

?D.6 A main drain test needs to be conducted on an 18 month frequency at each water-based fire protection system riser to determine if there has been a change in the condition of the water supply piping and control valves.

D.7 Strainers are required for sprinkler head/ spray nozzle with an orifice less than 0.375 inches. When provided the strainers need to be inspected and cleaned after each use and in accordance with the manufacturer's instructions. The frequency will usually coincide with the system testing requirements.

E. – DELUGE
Testing based on: NFPA 25 – 2002 Chapter 10; NFPA 25 – 2002 Chapter 12; NFPA 72 – 2002 Chapter 10

	Component	Activity	ACCEPTABLE NEIL Frequency
E.1	Nozzles	Inspect	18 Months
E.2	Piping	Inspect	18 Months
E.3	Hanger/Seismic Bracing	Inspect	18 Months
E.4	Remote Alarms	Test	18 Months
E.5	System Main Drain	Test	18 Months
E.6	Detectors	Test	18 Months
E.7	Manual Trip Devices	Test	18 Months
E.8	Strainers	Inspect	18 Months
E.9	Full Flow Trip	Test	18 Months
E.10	Supervisory Devices	Test	18 Months

Note: Deluge Spray Systems - Full Flow Trip Test may be performed during scheduled outages. Outdoor system nozzles need to be examined for insect buildup.

E.1 Water spray nozzles need to be inspected and maintained to ensure that they are in place, are aimed or pointed in the direction intended in the system design, and are free from external loading and corrosion. Where caps or plugs are required, the inspection needs to confirm they are in place and free to operate as intended. Misaligned water spray nozzles need to be adjusted (aimed) by visual means, and the discharge patterns checked at the next scheduled flow test.

E.2 System piping and fittings need to be inspected for the following:

(a) Mechanical damage (e.g., broken piping or cracked fittings)
(b) External conditions (e.g., missing or damaged paint or coatings, rust, and corrosion)
(c) Misalignment or trapped sections
(d) Low point drains (automatic or manual)
(e) Location of rubber-gasketed fittings

E.3 Hangers and supports need to be inspected for the following and repaired as necessary.

(a) Condition (e.g., missing or damaged paint or coating, rust, and corrosion)
(b) Secure attachment to structural supports and piping
(c) Damaged or missing hangers

E.4 Remote annunciators need to be tested to verify proper operation and identification under a fault condition every eighteen months.

?E.5 A main drain test needs to be conducted on an 18 month frequency at each water-based fire protection system riser to determine if there has been a change in the condition of the water supply piping and control valves.

E.6 Automatic detection equipment need to be inspected, tested, and maintained to ensure that the detectors are in-place, securely fastened, and protected from corrosion, weather, and mechanical damage and that the communication wiring, control panels, or pneumatic tubing system is functional.

E.7 Manual actuation devices need to be operated on an eighteen-month frequency instead of NFPA's suggested annually.

E.8 Strainers are required for sprinkler head/ spray nozzle with an orifice less than 0.375 inches. When provided the strainers need to be inspected and cleaned after each use and in accordance with the manufacturer's instructions. The frequency will usually coincide with the system testing requirements.

E.9 Each deluge or preaction valve needs to be trip tested on an eighteen-month frequency, at full flow in warm weather and in accordance with the manufacturer's instructions. When testing deluge systems, care needs to be taken to prevent water damage by verifying that there is adequate drainage. Protection needs to be provided for any devices or equipment subject to damage by system discharge during tests. Testing for equipment such as transformers, that are only accessible on extended frequencies need to be tested during the shortest scheduled preventative maintenance frequency for the protected component. Alternate methods for performing trip tests for indoor systems need to be developed and agreed to by NEIL.

E.10 Supervisory devices need to be tested every eighteen months.

a. Control Valve Switch - Test per Appendix 3.A.6 Section O.6.
b. Room Temperature Switch - Operate switch and verify receipt of signal to indicate the decrease in room temperature to 40°F (4.4°C) and its restoration to above 40°F (4.4°C).
c. Water Level Switch - Operate switch and verify the receipt of signal indicating the water level raised or lowered 3 in. (76.2 mm) from the required level within a pressure tank, or 12 in. (305 mm) from the required level of a non-pressure tank, and its restoration to required level.
d. Water Temperature Switch - Operate switch and verify receipt of signal to indicate the decrease in water temperature to 40°F (4.4°C) and its restoration to above 40°F (4.4°C).

F. – PREACTION
Testing based on: NFPA 25 – 2002 Chapter 10; NFPA 25 – 2002 Chapter 12; NFPA 72 – 2002 Chapter 10

	Component	Activity	ACCEPTABLE NEIL Frequency
F.1	Sprinklers	Inspect-Visual	18 Months
F.2	Piping	Inspect-Visual	18 Months
F.3	Hanger/Seismic Bracing	Inspect-Visual	18 Months
F.4	Supervisory Air Alarm	Test	18 Months
F.5	Remote Alarms	Test	18 Months
F.6	System Main Drain	Test	18 Months
F.7	Functional Trip	Test	18 Months
F.8	Detectors	Test	18 Months
F.9	Low Point Drains	Inspect	Annual-Fall
F.10	Strainers	Inspect	18 Months

F.1 Sprinklers need to be inspected from the floor level every 18 months. Sprinklers need to be free of corrosion, foreign materials, paint, and physical damage and be installed in the proper orientation (e.g., upright, pendant, or sidewall). Any sprinkler that is painted, corroded, damaged, loaded, or in the improper orientation needs to be replaced. Sprinklers installed in concealed spaces are not required to be inspected. Sprinklers that become accessible due to maintenance or shutdown need to be inspected. Conditions identified as NOT meeting installation requirement or as listed above need to be documented and repaired.

F.2 Sprinkler pipe and fittings need to be inspected from the floor level every 18 months. Pipe and fittings need to be in good condition and free of mechanical damage, leakage, corrosion, and misalignment. Sprinkler piping is not to be subjected to external loads by materials either resting on the pipe or hung from the pipe. Pipe and fittings installed in concealed spaces are not required to be inspected. Pipe and fittings that become accessible due to maintenance or shutdown need to be inspected. Conditions identified as NOT meeting installation requirement or as listed above need to be documented and repaired.

F.3 Sprinkler pipe hangers and seismic braces needs to be inspected from the floor level every 18 months. Hangers and seismic braces need to be verified to not be damaged or loose. Hangers and seismic braces that are damaged or loose need to be replaced or refastened. Hangers and seismic braces installed in concealed spaces are not required to be inspected. Hangers and seismic braces that become accessible due to maintenance or shutdown need to be inspected. Conditions identified as NOT meeting installation requirement or as listed above need to be documented and repaired

F.4 Low air pressure alarms, if provided, need to be tested every eighteen months in accordance with the manufacturer's instructions.

F.5 Remote annunciators need to be tested to verify proper operation and identification under a fault condition every eighteen months.

?F.6 A main drain test needs to be conducted on an 18 month frequency at each water-based fire protection system riser to determine if there has been a change in the condition of the water supply piping and control valves.

F.7 Each deluge or preaction valve needs to be trip tested on an eighteen-month frequency, at full flow in warm weather and in accordance with the manufacturer's instructions. When testing deluge systems, care needs to be taken to prevent water damage by verifying that there is adequate drainage. Protection needs to be provided for any devices or equipment subject to damage by system discharge during tests. Testing for equipment such as transformers, that are only accessible on extended frequencies need to be tested during the shortest scheduled preventative maintenance frequency for the protected component. Alternate methods for performing trip tests for indoor systems need to be developed and agreed to by NEIL.

F.8 Automatic detection equipment need to be inspected, tested, and maintained to ensure that the detectors are in-place, securely fastened, and protected from corrosion, weather, and mechanical damage and that the communication wiring, control panels, or pneumatic tubing system is functional.

F.9 Low points in preaction or deluge systems need to be drained after each operation and before the onset of freezing weather conditions when subject to temperatures below 40° F.

F.10 Strainers are required for sprinkler head/ spray nozzle with an orifice less than 0.375 inches. When provided the strainers need to be inspected and cleaned after each use and in accordance with the manufacturer's instructions. The frequency will usually coincide with the system testing requirements.

G. - DRY PIPE SPRINKLER
Testing based on: NFPA 25 – 2002 Chapter 5; NFPA 25 – 2002 Chapter 10; NFPA 25 – 2002 Chapter 12; NFPA 72 –2002 Chapter 10

	Component	Activity	Acceptable NEIL Frequency
G.1	Sprinklers	Inspect-Visual	18 Months
G.2	Piping	Inspect-Visual	18 Months
G.3	Hanger/Seismic Bracing	Inspect-Visual	18 Months
G.4	Low Air Alarm	Test	Annual
G.5	Quick Opening Valves	Test	18 Months
G.6	Partial Trip	Test	18 Months
G.7	Full Trip	Test	3 Years
G.8	Low Point Drains	Inspect	Annual-Fall
G.9	System Main Drain	Test	18 Months
G.10	Remote Alarms	Test	18 Months
G.11	Strainers	Inspect	18 Months

G.1 Sprinklers need to be inspected from the floor level every 18 months. Sprinklers need to be free of corrosion, foreign materials, paint, and physical damage and be installed in the proper orientation (e.g., upright, pendant, or sidewall). Any sprinkler that is painted, corroded, damaged, loaded, or in the improper orientation needs to be replaced. Sprinklers installed in concealed spaces are not required to be inspected. Sprinklers that become accessible due to maintenance or shutdown need to be inspected. Conditions identified as NOT meeting installation requirement or as listed above need to be documented and repaired.

G.2 Sprinkler pipe and fittings need to be inspected from the floor level every 18 months. Pipe and fittings need to be in good condition and free of mechanical damage, leakage, corrosion, and misalignment. Sprinkler piping is not to be subjected to external loads by materials either resting on the pipe or hung from the pipe. Pipe and fittings installed in concealed spaces are not required to be inspected. Pipe and fittings that become accessible due to maintenance or shutdown need to be inspected. Conditions identified as NOT meeting installation requirement or as listed above need to be documented and repaired.

G.3 Sprinkler pipe hangers and seismic braces needs to be inspected from the floor level every 18 months. Hangers and seismic braces need to be verified to not be damaged or loose. Hangers and seismic braces that are damaged or loose need to be replaced or refastened. Hangers and seismic braces installed in concealed spaces are not required to be inspected. Hangers and seismic braces that become accessible due to maintenance or shutdown need to be inspected. Conditions identified as NOT meeting installation requirement or as listed above need to be documented and repaired

G.4 Low air pressure alarms, if provided, need to be tested annually in accordance with the manufacturer's instructions.

G.5 Quick-opening devices, if provided, need to be tested once per eighteen months instead of the NFPA recommended quarterly.

G.6 During those years when full flow testing is not required, each dry pipe valve needs to be trip tested with the control valve partially open.

G.7 Every 3 years and whenever the system is altered, the dry pipe valve needs to be trip tested with the control valve fully open and the quick-opening device, if provided, in service.

G.8 Low points in dry pipe sprinkler systems need to be drained after each operation and before the onset of freezing weather conditions.

?G.9 A main drain test needs to be conducted on an 18 month frequency at each water-based fire protection system riser to determine if there has been a change in the condition of the water supply piping and control valves.

G.10 Remote annunciators need to be tested to verify proper operation and identification under a fault condition every eighteen months.

G.11 Strainers are required for sprinkler head/ spray nozzle with an orifice less than 0.375 inches. When provided the strainers need to be inspected and cleaned after each use and in accordance with the manufacturer's instructions. The frequency will usually coincide with the system testing requirements.

H. - FOAM WATER
Testing based on: NFPA 25 – 2002 Chapter 11; NFPA 11 – 2002 Chapter 10 and 11; NFPA 72 – 2002 Chapter 10

	Component	Activity	ACCEPTABLE NEIL Frequency
H.1	Discharge Device	Inspect	18 Months
H.2	Piping	Inspect-Visual	18 Months
H.3	Hanger/Supports	Inspect-Visual	18 Months
H.4	Foam Concentrate Strainer	Inspect	18 Months
H.5	Proportioning System	Test	18 Months
H.6	Proportioning System	Maintain	5/10 Years
H.7	Discharge Flow	Test	18 Months
H.8	Foam Quality	Maintain	Annual
H.9	Remote Alarms	Test	18 Months
H.10	Detectors	Test	18 Months

Foam water systems are being divided into two categories; foam water sprinklers design in accordance with NFPA 16 and low expansions foam systems detailed in NFPA 11.

H.1 Foam systems Installed in accordance with NFPA 16 or NFPA 16A (25/8-2.5): Foam-water discharge devices need to be inspected visually and maintained to ensure that they are in place, continue to be aimed or pointed in the direction intended in the system design, and are free from external loading and corrosion. Where caps or plugs are required, the inspection needs to confirm they are in place and free to operate as intended. The inspection needs to be performed on an eighteen-month frequency.

Foam systems installed in accordance with NFPA 11 (11/8-1): An eighteen-month inspection needs to be performed to verify that the foam maker will operate properly. The inspection needs to include an inspection for obstruction to the air intake of the foam maker and suitable means to perform maintenance and inspection of the vapor seal.

H.2 Foam systems Installed in accordance with NFPA 16 or NFPA 16A (25/8-2.3): System piping and fittings need to be inspected, on an eighteen month frequency instead of the NFPA recommended quarterly, for the following:

(a) Mechanical damage (e.g., broken piping or cracked fittings);
(b) External conditions (e.g., missing or damaged paint or coatings, rust, and corrosion);
(c) Misalignment or trapped sections;
(d) Low point drains (automatic or manual);
(e) Location and condition of rubber-gasket fittings.

Foam systems installed in accordance with NFPA 11 (11/8-1.2): Piping needs to be inspected to determine its condition and to verify that proper drainage pitch is maintained.

H.3 Foam systems Installed in accordance with NFPA 16 or NFPA 16A (25/8-2.4): Hangers and supports need to be inspected, on an eighteen month frequency, for the following and repaired as necessary:

(a) Condition (e.g., missing or damaged paint or coating, rust, and corrosion);
(b) Secure attachment to structural supports and piping;
(c) Damaged or missing hangers.

Foam systems installed in accordance with NFPA 11 (11/8-1.2): Hangers and supports need to be addressed during the periodic inspection to verify the system is in an operational condition.

H.4 Foam systems Installed in accordance with NFPA 16 or NFPA 16A (25/8-2.9.2): Foam concentrate strainers need to be inspected visually, once every eighteen months, to ensure the blow-down valve is closed and plugged. Baskets or screens need to be removed and inspected after each operation or flow test.

Foam systems installed in accordance with NFPA 11 (11/8-1.3): Strainers need to be inspected once every eighteen month and cleaned after each use or flow test.

H.5 Foam systems Installed in accordance with NFPA 16 or NFPA 16A (25/8-2.9.2): Operational tests need to be conducted every eighteen months to ensure that the foam-water system(s) responds as designed, both automatically and manually. Wherever possible, the test procedures needs to simulate anticipated emergency events so the response of the foam-water system(s) can be evaluated.

Foam systems installed in accordance with NFPA 11 (11/8-1.1): Proportioning devices, their accessory equipment, and foam makers need to be inspected every eighteen months to verify their operational status.

H.6 Foam systems Installed in accordance with NFPA 16 or NFPA 16A (25/8-2.9.2): Maintenance of foam-water systems needs to be in accordance with the following requirements:

Standard Pressure Proportioner.

(a) The ball drip (automatic type) drain valves need to be disassembled, cleaned, and reassembled.
(b) The foam liquid storage tank needs to be drained of foam liquid and flushed. (Foam liquid may be permitted to be salvaged and reused.)
(c) The foam liquid tank needs to be inspected for internal and external corrosion and hydrostatically tested to the specified working pressure.

Bladder Tank Proportioner.

(a) Sight glass, where provided, needs to be removed and cleaned.
(b) The foam concentrate tank needs to be hydrostatically tested to the specified working pressure.

Line Proportioner.

(a) The foam concentrate tank needs to be inspected for internal corrosion. Pickup pipes inside the tank need to be inspected for corrosion, separation, or plugging. (Table 8-2 - 10 Years)
(c) The foam concentrate tank needs to be drained and flushed. (Foam concentrate may be salvaged and reused.) (Table 8-2 - 10 Years)

Standard Balanced Pressure Proportioner.

(a) The foam concentrate pump needs to be operated. Foam concentrate will be circulated back to the tank.
(b) Foam pumps, drive train, and drivers need to be serviced in accordance with the manufacturer's instructions and frequency, but not at intervals of more than 5 years.
(c) The diaphragm-balancing valve needs to be flushed through the diaphragm section with water or foam concentrate until fluid appears clear or new.
(d) The foam concentrate tank needs to be inspected internally for corrosion and sediment. Excessive sediment will require draining and flushing of the tank.

In-Line Balanced Pressure Proportioner.

(a) The foam concentrate pump needs to be operated. Foam concentrate will be circulated back to the tank.
(b) Foam pumps, drive train, and drivers need to be serviced in accordance with the manufacturer's instructions and frequency, but not at intervals of more than 5 years.
(c) The diaphragm-balancing valve needs to be flushed through the diaphragm section with water or foam concentrate until fluid appears clear or new.
(d) The foam concentrate tank needs to be inspected internally for corrosion and sediment. Excessive sediment will require draining and flushing of the tank.

Foam systems installed in accordance with NFPA 11 (8-1.1): Proportioning devices, their accessory equipment, and foam makers need be inspected to determine the ability to perform their intended function.

H.7 Operational tests need to be conducted to ensure that the foam-water systems respond as designed, both automatically and manually. Wherever possible, the test procedures need to simulate anticipated emergency events so the response of the foam-water systems can be evaluated. Where discharge from the system discharge devices would create a hazardous condition or conflict with local requirements, an approved alternate method to achieve full flow conditions will be permitted.

H.8 Samples need to be submitted in accordance with the manufacturer's recommended sampling procedures.

H.9 Remote annunciators need to be tested to verify proper operation and identification under a fault condition every eighteen months.

H.10 Automatic detection equipment needs to be inspected, tested, and maintained to ensure that the detectors are in-place, securely fastened, and protected from corrosion, weather, and mechanical

damage and that the communication wiring, control panels, or pneumatic tubing system is functional.

I. - STANDPIPE & HOSE
Testing based on: NFPA 25 – 2002 Chapter 6; NFPA 1962 – 2003 Chapter 4; NFPA 1962 – 2003 Chapter 7

	Component	Activity	ACCEPTABLE NEIL Frequency
I.1	Hose Stations	Inspect	Quarterly
I.2	Flow	Test	5 Years
I.3	Pressure Regulating Valves	Test	5 Years
I.4	Pressure Regulating Valves	Inspect	Quarterly
I.5	Piping	Inspect-Visual	18 Months
I.6	Hangers/Supports	Inspect-Visual	18 Months
I.7	Hose-Inside	Test-Hydro	3 Years

I.1 Components of standpipe and hose systems needs to be visually inspected quarterly

I.2 A flow test needs to be conducted at the hydraulically most remote hose connection of each zone of a standpipe system to verify the water supply still adequately provides the design pressure at the required flow. Where a flow test of the hydraulically most remote outlet(s) is not practical, NSO/NEIL needs to be consulted while determining the appropriate location for the test.

A flow test needs to be conducted every 5 years.

I.3 Standpipes, sprinkler connections to standpipes, or hose stations equipped with pressure reducing valves or pressure regulating valves need to have a full flow test conducted on each valve at 5-year intervals and compared to previous test results. If adjustments are necessary, they need to be made in accordance with the manufacturer's instructions.

I.4 Standpipes, sprinkler connections to standpipes, or hose stations equipped with pressure reducing valves or pressure-regulating valves need to have these valves inspected quarterly. The inspection needs to verify the following:

(a) The handwheel is not missing or broken.
(b) There are no leaks.

I.5 Components of standpipe and hose systems need to be visually inspected every 18 months

I.6 Components of standpipe and hose systems need to be visually inspected every 18 months

I.7 New hose hydrostatically tested by the manufacturer does not need to be inspected and service-tested prior to being placed in service. Hydrostatic testing of new hose after its fifth year of service is ACCEPTABLE to NEIL.

Existing hose in service needs to be hydrostatically tested every three years instead of the NFPA Annual requirement for attack hose

J. - CARBON DIOXIDE
Testing based on: NFPA 12 – 2000 Chapter 1; NFPA 72 – 2002 Chapter 10

	Component	Activity	ACCEPTABLE NEIL Frequency
J.1	System	Inspect	18 Months
J.2	System	Test	18 Months
J.3	Cylinders	Weigh	18 Months
J.4	Tanks	Inspect - Level/Pressure	Monthly
J.5	Alarm Devices	Test	18 Months
J.6	Detectors	Test	18 Months
J.7	Flexible Hoses	Test-Hydro	5 Years

J.1 At least every eighteen months verify that there have been no changes to the size, type, and configuration of the hazard and system, using procedures developed from systems drawings, calculations and manuals.

J.2 At least eighteen months, all carbon dioxide systems need to be thoroughly tested for proper operation.

J.3 High-pressure cylinders need to be weighed and the date of the last hydrostatic test noted. Hydrostatic tests need to be performed in accordance with applicable national standards. If, at any time, a container shows a loss in net content of more than 10 percent, it needs to be refilled or replaced.

J.4 The liquid level gauges of low-pressure containers need to be observed. If at any time a container shows a loss of more than 10 percent, it needs to be refilled, unless the minimum gas requirements are still provided.

J.5 Fire extinguishing system or suppression system alarm Switches need to be operated mechanically or electrically to verify receipt of the signal by the control panel.

J.6 Automatic detection equipment need to be inspected, tested, and maintained to ensure that the detectors are in-place, securely fastened, and protected from corrosion, weather, and mechanical damage and that the communication wiring, control panels, or pneumatic tubing system is functional.

J.7 All system hose, including those used as flexible connectors or hand lines, need to be tested at 2500 psi (17,239 kPa) for high-pressure systems, and at 900 psi (6205 kPa) for low-pressure systems. Hose needs to be tested as follows:

a. The hose needs to be removed from any attachment.
b. Hose for hand lines need to be checked for electrical continuity between couplings.
c. The hose assembly will then be placed in a protective enclosure designed to permit visual observation of the test.
d. The hose needs to be completely filled with water before testing.

e. Pressure needs to then be applied at a rate-of-pressure rise to reach the test pressure within one minute. The test pressure will be maintained for one full minute. Observations then need to be made to note any distortion or leakage.
f. If the test pressure has not dropped and if the couplings have not moved, the pressure will be released. The hose assembly will then be considered to have passed the hydrostatic test if no permanent distortion has taken place.
g. Hose assembly passing the test need to be completely dried internally. If heat is used for drying, the temperature may not exceed 150°F (66°C).
h. Hose assemblies failing this test need to be marked and destroyed. They need to be replaced with new assemblies.
i. Hose assemblies passing this test need to be suitably marked with the date of the test on the hose.

K. – CLEAN AGENT AND HALON
Testing based on: NFPA 12A – 2004 Chapter 6; NFPA 72 – 2002 Chapter 10; NFPA 2001 Chapter 6

	Component	Activity	ACCEPTABLE NEIL Frequency
K.1	System	Inspect	18 Months
K.2	System	Test	18 Months
K.3	Agent Quantity	Inspect	18 Months
K.4	Pressure	Inspect	Semi-Annual
K.5	Detectors	Test	18 Months
K.6	Remote Alarms	Test	18 Months
K.7	Flexible Hoses	Test-Hydro	5 Years

K.1 All systems need to be thoroughly inspected and documented for proper operation by trained personnel.

K.2 All systems need to be thoroughly tested and documented for proper operation by trained personnel.

K.3 The agent quantity of refillable containers needs to be checked. If a container shows a loss in net weight of more than 5 percent, it needs to be refilled or replaced.

For inert gas clean agents that are not liquefied, pressure is an indication of agent quantity. If an inert gas clean agent container shows a loss in pressure (adjusted for temperature) of more than 5 percent, it shall be refilled or replaced. Where container pressure gauges are used for this purpose, they shall be compared to a separate calibrated device at least annually.

K.4 The pressure of refillable containers needs to be checked. If a container shows a loss in pressure (adjusted for temperature) of more than 10 percent, it needs to be refilled or replaced.

For inert gas clean agents see item K.3.

K.5 Automatic detection equipment need to be inspected, tested, and maintained to ensure that the detectors are in-place, securely fastened, and protected from corrosion, weather, and mechanical damage and that the communication wiring, control panels, or pneumatic tubing system is functional.

K.6 Remote annunciators need to be tested to verify proper operation and identification under a fault condition every eighteen months.

K.7 All hoses need to be tested at 1500 psi (10342 kPa) for 600-psi (4137-kPa) charging pressure systems, and at 900 psi (6205 kPa) for 360-psi (2482-kPa) charging pressure systems.

For Clean Agent systems the test needs to be performed at 1 ½ times the maximum operating pressure at 130° F. (54.4° C)

The test needs to be performed as follows:
a. Remove the hose from any attachment.

b. The hose assembly is then to be placed in a protective enclosure designed to permit visual observation of the test.
c. The hose must be completely filled with water before testing.
d. Pressure then is applied at a rate-of-pressure rise to reach the test pressure within a minimum of one minute. The test pressure is to be maintained for one full minute. Observations are then made to note any distortion or leakage.
e. If the test pressure has not dropped or if the couplings have not moved, the pressure is released. The hose assembly is then considered to have passed the hydrostatic test if no permanent distortion has taken place.
f. Hose assembly passing the test must be completely dried internally. If heat is used for drying, the temperature must not exceed 150°F (66°C).
g. Hose assemblies failing a hydrostatic test must be destroyed. They will be replaced with new assemblies.
h. Each hose assembly passing the hydrostatic test needs to be marked to show the date of test.

L. - DRY / WET CHEMICAL
Testing based on: NFPA 17 – 2002 Chapter 11; NFPA 17A – 2002 Chapter 7; NFPA 72 – 2002 Chapter 10

	Component	Activity	ACCEPTABLE NEIL Frequency
L.1	System	Inspect	Annual
L.2	System	Maintain	Annual
L.3	Fixed temperature Sensing	Replaced	Annual
L.4	Alarm Devices	Test	Annual

L.1 On an annual basis, an inspection needs to be conducted in accordance with the manufacturer's listed installation and maintenance manual or owner's manual. As a minimum, this "quick check" or inspection needs to include verification of the following:

The extinguishing system is properly aimed at the hazard.

The manual actuators are unobstructed.

The tamper indicators and seals are intact.

The maintenance tag or certificate is in place.

The system shows no physical damage or condition that might prevent operation.

The pressure gauge(s), if provided, is in operable range.

The nozzle blow-off caps, where provided, are intact and undamaged.

Neither the protected equipment nor the hazard has been replaced, modified, or relocated.

L.2 At least annually, maintenance needs to be conducted in accordance with the manufacturer's listed installation and maintenance manual. As a minimum, such maintenance needs to include the following:

A check to see that the hazard has not changed.

An examination of all detectors, expellant gas container(s), agent container(s), releasing devices, piping, hose assemblies, nozzles, signals, and all auxiliary equipment.

Verification that the agent distribution piping is not obstructed.

Examine the dry chemical (if there is evidence of caking, the dry chemical needs to be discarded and the system needs to be recharged in accordance with the manufacturer's instructions).

Exception: Dry chemical in stored pressure systems do not require annual examination but may be examined at least every 6 years.

When annual maintenance of any dry / wet chemical containers or system components reveals

conditions such as, but not limited to, corrosion or pitting in excess of the manufacturer's limits, structural damage or fire damage, or repairs by soldering, welding, or brazing, the affected part(s) needs to be replaced or hydrostatically tested in accordance with the recommendations of the manufacturer or the listing agency.

All dry / wet chemical systems need to be tested, to include the operation of the detection system, signals, and releasing devices, including manual stations and other associated equipment. A discharge of the dry / wet chemical normally is not part of this test.

When the maintenance of the system(s) reveals defective parts that could cause an impairment or failure of proper operation of the system(s), the affected parts need to be replaced or repaired in accordance with the manufacturer's recommendations.

The maintenance report, including any recommendations, needs to be filed with the owner or with the designated party responsible for the system.

L.3 Fixed temperature sensing elements of the fusible metal alloy type need to be replaced at least annually from the date of installation. They need to be destroyed when removed.

L.4 The ability of the extinguishing system to transmit a local and remote alarm needs to be testing annually

M. - ALARM SIGNALING SYSTEMS
Testing based on NFPA 72 – 2002 Chapter 10

	Component	Activity	ACCEPTABLE NEIL Frequency
M.1	Indicating Devices	Test	18 month
M.2	Annunciators	Test	18 month
M.3	Control Panels	Test	18 month
M.4	Supervisory Devices	Test	18 month

M.1 At least every 18 months fire alarm systems components monitored for alarm, supervisory, and trouble signals such as: fuses, interfaced equipment, lamp / LEDs, primary (main) power supply, and need to be tested to verify the following:

At a minimum, control equipment needs to be tested to verify correct receipt of alarm, supervisory, and trouble signals (inputs), operation of evacuation signals and auxiliary functions (outputs), circuit supervision including detection of open circuits and ground faults, and power supply supervision for detection of loss of ac power and disconnection of secondary batteries.

The rating and supervision fuses need to be verified.

Integrity of single or multiple circuits providing interface between two or more control panels need to be verified. Interfaced equipment connections needs to be tested by operating or simulating operation of the equipment being supervised. Signals required to be transmitted need to be verified at the control panel.

Lamps / LEDs need to be illuminated.

All secondary (standby) power needs to be disconnected and tested under maximum load, including all alarm appliances requiring simultaneous operation. All secondary (standby) power needs to be reconnected at end of test. For redundant power supplies, each needs to be tested separately.

The correct operation and identification of annunciators needs to be verified. If provided, the correct operation of annunciator under a fault condition needs to be verified.

Supervising Station Fire Alarm Systems - Transmission Equipment testing NFPA 72 Table 7.2.2 item 10 was removed due to duplication.

It is recognized that this testing may be performed in conjunction with other testing.

M.2 At least every 18 months, the correct operation and identification of annunciators is to be verified. If provided, the correct operation of annunciator under a fault condition will also be verified. It is recognized that this testing may be performed in conjunction with other testing.

M.3 The control panel testing is functionally performed during the initiating device testing.

M.4 At least every 18 months, room temperature switches need to be operated. Receipt of signal to indicate the decrease in room temperature to 40°F (4.4°C) and its restoration to above 40°F (4.4°C) needs to be verified.

Testing requirements of NFPA 72 Table 7.2.2 item h, which are duplicated in other sections of the appendix, were not restated. These includes valve supervisory, low air pressure, tank level, water temperature and water flow devices.

N. - AUTOMATIC FIRE DETECTORS
Testing based on NFPA 72 – 2002 Chapter 10

	Component	Activity	ACCEPTABLE NEIL Frequency
N.1	Non-restorable Spot Heat	Test	18 month
N.2	Restorable Heat	Test	18 month
N.3	Pneumatic Line Type	Test	18 month
N.4	Non-restorable Line Type	Test Alarm Function	18 month
N.5	Smoke	Test	18 month
N.6	Smoke	Test-Sensitivity	Per Code of Record At Construction
N.7	Duct Smoke	Test	18 month
N.8	Flame	Test	18 month

N.1 Heat tests are not to be performed. Functionality is tested mechanically and electrically. After 15 years of service from initial installation, all devices are to be replaced or two detectors per 100 laboratory tested. The two detectors are to be replaced with new devices. If a failure occurs on any of the detectors removed, additional detectors need to be removed and tested to determine either a general problem involving faulty detectors or a localized problem involving one or two defective detectors. If detectors are tested instead of replaced, tests need to be repeated at intervals of 5 years.

N.2 Heat test need to be performed with a heat source per the manufacturer's recommendations for response within one minute. A test method needs to be used that is recommended by the manufacturer or other method that will not damage the nonrestorable fixed-temperature element of a combination rate-of-rise/fixed-temperature element.

N.3 Heat tests need to be performed (where test chambers are in circuit) or a test with pressure pump needs to be conducted.

N.4 Heat test are not to be performed. Functionality is tested mechanically and electrically. Loop resistance needs to be measured and recorded. Changes from acceptance testing needs to be investigated.

?N.5 Ionization and photoelectric detectors need to be tested in place to ensure smoke entry into the sensing chamber and an alarm response. Testing with smoke or listed aerosol approved by the manufacturer will be permitted as ACCEPTABLE test methods. Other methods approved by the manufacturer that ensure smoke entry into the sensing chamber will be permitted.

Projected beam detectors need to be tested by introducing smoke, other aerosol, or an optical filter into the beam path.

Tests of Smoke detectors with control output functions need to verified that the control capability remain operable even if all of the initiating devices connected to the same initiating device circuit or signaling line circuit are in an alarm state.

Air sampling detectors are tested per manufacturer's recommended test methods, detector alarm response will be verified through the end sampling port on each pipe run; airflow through all other ports needs to be verified as well.

N.6 When required by the stations code of record, any of the following tests may be performed to ensure that each smoke detector is within it's listed and marked sensitivity range:

(a) Calibrated test method
(b) Manufacturer's calibrated sensitivity test instrument
(c) Listed control equipment arranged for the purpose
(d) Smoke detector/control unit arrangement whereby the detector causes a signal at the control unit when its sensitivity is outside its listed sensitivity range
(e) Other calibrated sensitivity test method ACCEPTED by NEIL

N.7 Air duct detectors need to be tested or inspected to ensure that the device will sample the air stream. The test may be made in accordance with the manufacturer's instructions.

N.8 Flame detectors and spark/ember detectors need to be tested in accordance with the manufacturer's instructions to determine that each detector is operative. Flame detector and spark/ember detector sensitivity needs to be determined using any of the following:

(a) Calibrated test method
(b) Manufacturer's calibrated sensitivity test instrument
(c) Listed control unit arranged for the purpose
(d) Other approved calibrated sensitivity test method that is directly proportional to the input signal from a fire, consistent with the detector listing or approval

O. – VALVES
Testing based on: NFPA 25 – 2002 Chapter 8; NFPA 25 – 2002 Chapter 12; NFPA 72 – 2002 Chapter 10

	Component	Activity	ACCEPTABLE NEIL Frequency
O.1	Valves - Fire Pump	Inspect	Monthly
O.2	Control Valves - No Supervision/ Sealed	Inspect	Monthly
O.3	Control Valves - Electrically Supervised/Locked	Inspect	Quarterly
O.4	Control Valves - OS&Y	Maintain	Annual
O.5	Control Valves	Operate	Annual
O.6	alve Tamper Devices	Test	18 Months

Note: Where valves are the primary isolation of a water based fire suppression system, such that the valve isolates only one suppression system and is located directly adjacent to the suppression system operational components, that valve can be cycled and maintained at the same frequency as the associated system's functional test.

O.1 Fire pump valves such as the suction and discharge, bypass and other valves that can affect pump operability need to be verified to be fully open on a monthly basis.

O.2 Inspection of valves without supervision need to be verify, on a monthly basis, that the valves are in the following condition:

(a) In the normal open or closed position
(b) Properly sealed
(c) Accessible
(d) Provided with appropriate wrenches
(e) Free from external leaks
(f) Provided with appropriate identification

O.3 Inspection of valves with supervision need to be verify, on a quarterly basis, that the valves are in the following condition:

(a) In the normal open or closed position
(b) Locked, or supervised
(c) Accessible
(d) Provided with appropriate wrenches
(e) Free from external leaks
(f) Provided with appropriate identification

O.4 On an annual basis the operating stems of outside screw and yoke valves need be lubricated. The valve then will need to be completely closed and reopened to test its operation and to distribute the lubricant.

O.5 Annually each control valve needs to be operated through its full range and returned to its normal position. Post indicator valves need to be opened until spring or torsion is felt in the rod,

indicating that the rod has not become detached from the valve. Post indicating and outside screw and yoke valves may be backed a one-quarter turn from the fully open position to prevent jamming. This test will normally be conducted every time the valve is closed.

O.6 Control Valve Switch needs to be operated and signal receipt verified to be within the first two revolutions of the hand wheel or within one-fifth of the travel distance, or per the manufacturer's specifications.

P. – Portable Extinguishers
Testing based on: NFPA 10 – 2002 Chapter 6; NFPA 10 – 2002 Chapter 7

	Component	Activity	ACCEPTABLE NEIL Frequency
P.1	Portable Extinguisher	Inspect	Quarterly
P.2	Portable Extinguisher	Maintain	Annual

CAUTION: ***The NEIL ACCEPTABLE frequency has been determined for insurance purposes only. The Member must review the effect on Local, State, Federal, and other Jurisdictional requirements.***

P.1 Fire extinguishers need to be inspected to ensure they are available and will operate. It is intended to give reasonable assurance that a fire extinguisher is fully charged and operable. This is done by verifying that it is in its designated place, that it has not been actuated or tampered with, and that there is no obvious or physical damage or condition to prevent its operation. Personnel making inspections need to keep records of all fire extinguishers inspected, including those found to require corrective action.

The inspections frequency needs to be based on the need of the area in which fire extinguishers are located. The NEIL ACCEPTABLE inspection frequency is a minimum. An inspection may need to be more frequent if any of the following conditions exist:

(a) High frequency of fires in the past
(b) Severe hazards
(c) Susceptibility to tampering, vandalism, or malicious mischief
(d) Possibility of, or experience with, theft of fire extinguishers
(e) Locations that make fire extinguishers susceptible to mechanical injury
(f) Possibility of visible or physical obstructions
(g) Exposure to abnormal temperatures or corrosive atmospheres
(h) Characteristics of fire extinguishers, such as susceptibility to leakage

P.2 Fire extinguishers need to be subjected to maintenance at intervals of not more than 1 year, at the time of hydrostatic test, and when specifically indicated by an inspection. Maintenance is a thorough examination of the fire extinguisher. It is intended to give maximum assurance that a fire extinguisher will operate effectively and safely. It includes a thorough examination and any necessary repair or replacement. It will normally reveal if hydrostatic testing or internal maintenance is required.

The maintenance needs to include a thorough examination of the three basic elements of a fire extinguisher:

(a) Mechanical parts
(b) Extinguishing agent
(c) Expelling means

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SECTION 8-3E APPENDIX 3.B.2
Appendix 3.B.2 applies to the Primary Property Program only.

HIGH VALUED WAREHOUSES

High valued warehouses containing combustible materials Shall be provided with ACCEPTABLE fixed automatic extinguishing system(s) and constructed of noncombustible or fire-resistive building materials. High insurable values Shall be separated and additional administrative controls are required in order to minimize the possibility and extent of loss by fire. The following is an ACCEPTABLE method of satisfying this Standard, however, other methods of satisfying this Standard will be considered on an individual basis.

A. General - This Appendix applies to all warehouses which contain a combustible occupancy where the insurable value of the building and contents combined is equal to or greater than $45 million in any single fire area. In addition, other provisions of the Property Loss Control Standards will continue to apply except as modified herein.

B. Separation of Values - Maximum insurable values (i.e., combined building and contents values) allowable in a single fire area Shall not exceed $75 million. The maximum overall size of any one warehouse building Shall be limited to two fire areas separated by a fire barrier with a three-hour fire resistance rating; alternatively, no such limitation applies if the fire areas are separated by fire barriers of four-hour fire resistance ratings.

C. Fire Barriers - Where fire barriers are required to meet the provisions in B above, the following requirements apply:

C.1. Construction of the fire barrier Shall be submitted to NEIL for review to determine whether it is ACCEPTABLE.

C.2. The only penetration openings in the fire barrier (wall) "should" be doors. The number and size of door openings "should" be limited to those required to allow efficient movement of stored items. There "should" be no mechanical penetrations (e.g., pipe, duct, electrical cable trays) through the fire barrier (wall).

C.2.a. Where penetrations are unavoidable, the design and installation Shall be ACCEPTABLE for a fire resistant rating equal to the fire barrier (wall).

C.3. Fire barrier (wall) door openings Shall be protected with UL or FM labeled automatic closing fire doors and frames having a fire resistance rating equal to the fire resistance rating of the fire barrier (wall).

D. Building Features

D.1. In addition to egress design requirements, exterior doors and interior aisles Shall be provided to permit the use of outside (hydrant) hoses and inside (standpipe) hoses by fire fighting forces.

D.2. Each fire area Shall have a minimum of one exterior wall and door to permit access for fire fighting.

D.3. A specific ACCEPTABLE determination Shall be obtained when:

D.3.a. Warehouses are located beneath overhead-type electrical power transmission lines or within 400 feet of gas transmission pipelines.

D.3.b. Warehouses are located within 400 feet of flammable or combustible liquid unloading stations or above ground flammable or combustible liquid storage tanks (or equivalent flammable gases) of over 20,000-gallon capacity.

D.4. Lightning protection Shall be provided in accordance with Standard Section 3.C.10.

E. Fire Protection

E.1. ACCEPTABLE water supplies, looped yard mains, and yard hydrants Shall be provided in accordance with Section 3.D.

E.2. ACCEPTABLE automatic water-type extinguishing systems Shall be designed and installed in accordance with the appropriate NFPA Standards (e.g., NFPA Nos. 13, 231, and 231C).

E.3. Alarms for all automatic extinguishing systems Shall be provided and arranged to report in the Control Room or at an ACCEPTABLE constantly attended location.

E.3.a. The automatic extinguishing system control valve position "should" be supervised in accordance with Standard 3.D.4, and/or locked in the open position and inspected monthly.

E.4. Each automatic system Shall be controlled by an ACCEPTABLE indicating valve.

E.4.a. Indicating valves "should" be located not less than 30 feet from the building.

E.5. Where wet pipe sprinkler systems are provided with alarm check valves they "should" be UL Listed or FM Approved.

E.6. Hose stations containing no more than 100 feet of hose Shall be provided.

E.6.a. A sufficient number of hose stations "should" be so located as to permit the application of two hose streams on any one location in the warehouse.

F. Fire Surveillance - ACCEPTABLE recorded fire surveillance rounds, at least once per shift, Shall be provided during unattended periods. Hourly fire surveillance rounds Shall be made during impairments of the automatic extinguishing systems.

G. Administrative Controls - In addition to the administrative controls in Standard Section 3.A, the following are applicable:

G.1. Smoking Shall be strictly prohibited, except in ACCEPTABLE smoking areas, and "No Smoking" signs Shall be posted in prohibited areas.

G.2. Welding, cutting, or other hot work Shall not be permitted unless it is not practical to perform the work outside of the warehouse; in such instances, Standard 3.A.4 Shall be followed. The welding

permit Shall be authorized and signed by appropriate supervisory personnel at the site. The work area and all adjacent areas where sparks might have spread Shall be in constant attendance for at least 30 minutes after each welder's work period has been completed.

G.3. Combustible trash Shall be placed in covered metal containers or ACCEPTABLE self-extinguishing containers pending proper disposal at the end of each work day.

G.4. Stocks and/or supplies of flammable gases and liquids, combustible liquids, and/or lubricants Shall not be stored in or within 50 feet of the warehouses.

G.4.a. Vehicles transporting such gases and liquids "should" be required to use roadways which are at least 50 feet from the warehouse at the nearest point.

G.5. All fire doors "should" be kept normally closed except when doors are being used for passage.

G.6. Motor or engine-powered vehicles, including personnel carriers, Shall not be parked overnight or recharged/refueled/repaired inside the warehouse unless an ACCEPTABLE area is provided.

G.7. Railroad locomotives Shall not be allowed inside the warehouse.

G.8. All stock "should" be stored a sufficient height above the floor to prevent or minimize water damage.

G.9. Idle combustible pallets Shall be stored in an ACCEPTABLE area or a minimum of 50 feet from the warehouse.

H References

NFPA 13	2002	Standard for the Installation of Sprinkler Systems
NFPA 204	2002	Standard for Smoke and Heat Venting
NFPA 230	2003	Standard for the Fire Protection of Storage
NFPA 505	2002	Fire Safety Standard for Powered Industrial Trucks Including Type Designations, Areas of Use, Maintenance and Operations

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SECTION 8-3F APPENDIX 3.C.1.c

FOAM PLASTIC BUILDING MATERIALS

The following constitutes an ACCEPTABLE method of meeting the intent of limited combustible material by use of foam plastic building materials in noncritical buildings.

A. Plastic Construction Materials - The use of plastic materials (e.g., polyurethane, polyisocyanurate, and polystyrene) in any configuration Shall be reviewed for ACCEPTABILITY on an individual basis. The performance of these materials when exposed to fire Shall be evaluated based on full-scale fire test results.

B. Acceptability - In order to be considered ACCEPTABLE to meet the intent of limited combustible material, insulated metal sandwich panels Shall meet or exceed all of the following criteria:

B.1. Foam plastic insulation Shall be separated from the building interior by a thermal barrier with a 1/2-inch gypsum wallboard or equivalent thermal barrier material which will limit the average temperature rise of the unexposed surface to not more than 250□F after 15 minutes of fire exposure complying with the ASTM E-119 standard time-temperature curve.

B.2. The potential heat of foam plastic in any portion of the wall or panel Shall not exceed 6,000 Btu per square foot of projected area as determined by tests conducted in accordance with NFPA No. 259.

B.3. The foam plastic core, coatings, and facings Shall have a flame spread rating of 25 or less and a smoke-developed rating of 450 or less as determined in accordance with ASTM E-84 (NFPA No. 255).

B.4. The results of full-scale fire tests reflecting an end-use configuration Shall be submitted for ACCEPTANCE demonstrating that the assembly does not propagate flame over the surface or through the core when exposed on the exterior face to a fire source.

C. References

NFPA 259 2003 Standard Test Method for Potential Heat of Building Materials.
NFPA 255 2000 Standard Method of Test of Surface Burning Characteristics of Building Materials.
FM Standard 4880 FM Building Corner Test Procedure
Underwriters Laboratories, Building Materials Directory
Factory Mutual, Approval Guide

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SECTION 8-3G APPENDIX 3.C.3

PROTECTION OF FIRE BARRIER PENETRATIONS

ACCEPTABLE protection "should" be provided for all electrical, pipe, and periphery HVAC duct openings through fire barriers. The following is an ACCEPTABLE method of satisfying these Standards, however, other methods will be considered on an individual basis.

A. General

A.1. This Appendix applies to all electrical, pipe, and periphery (i.e., an opening made to accommodate passage) HVAC duct penetrations. Such penetrations through fire barriers "should" be protected consistent with hourly fire resistance ratings of the fire barrier.

A.2. This Appendix does not apply to the protection of other types of fire barrier openings such as those provided for doors or for the protection of the interior of HVAC duct penetrations that require UL Listed or FM Approved or ACCEPTABLE equivalent doors or dampers as specified in Property Loss Control Standards, Section 3.C.3.b.

B. Qualification Test for Electrical and Pipe Penetration Seals

B.1. To evaluate the fire endurance capabilities of penetrations through fire barriers, an ACCEPTABLE qualification test "should" be made in accordance with IEEE 634 or ACCEPTABLE equivalent, except as modified in B.2. below.

B.1.a. The penetration test specimens Shall be representative of the construction as to materials, workmanship, and details.

B.1.b. Materials "should" be fabricated under conditions representative of those that can be obtained under practical construction conditions as delineated in the appropriate specification for the intended plant application. The materials tested "should" exhibit the capability to remain intact and fully functional (i.e., meet or exceed design specification) during the full test period. The qualification tests "should" be witnessed by an ACCEPTABLE accredited testing facility (e.g., Factory Mutual or Underwriters Laboratories).

B.2. The following apply to the IEEE 634 qualification test: (IEEE 634 Paragraph 6.1.2 on Page 14 does not apply)

B.2.a. Transmission of heat through the fire barrier, including penetrations, during the fire endurance test "should" not have been such as to raise the temperature on the unexposed surface an average of more than 250□F above its initial temperature.

B.2.a.(1) If any temperature readings on the unexposed surface exceed the 250□F rise by greater than 30%, the reason Shall be investigated and documented in the test report.

B.2.b. Test results for floor slab specimens may be utilized for penetrations through fire barrier walls. Test results for wall specimens cannot be extrapolated to floor configurations.

B.2.c. Installed penetration seals "should" not exceed the maximum size of specimen opening in

the qualification test and "should" be installed per the manufacturer's instructions. Any penetration seal smaller than the specimen opening in the qualification test is ACCEPTABLE, providing it is representative of the test specimen.

C. Qualification Test for Periphery Openings Around HVAC Duct Penetrations

When the penetration of a fire barrier by an HVAC duct cannot be avoided: the following applies:

C.1. The periphery openings made in the fire barrier to accommodate the duct "should" not exceed one-inch average clearance on all sides and "should" be closed per the damper manufacturer's instructions.

C.2. Construction materials used as seals "should" be qualified for acceptance in accordance with Section B, "Qualification Test for Electrical and Pipe Penetration Seals."

D. Construction Materials

D.1. All construction materials used in the fabrication of a penetration seal and which will remain as a part of the seal Shall have been included in the qualification test.

D.2. Combustible damming materials used during the fabrication of a penetration seal Shall be removed following the installation of the penetration seal.

E. References

IEEE 634		Standard for Cable Penetration Fire Stop Qualification Testing
NFPA 70	2002	National Electrical Code
NFPA 80	1999	Standard for Fire Doors and Windows
NFPA 90A	2002	Standard for the Installation of Air Conditioning and Ventilating Systems

SECTION 8-3H APPENDIX 3.C.5

ROOF ASSEMBLIES

The following is an ACCEPTABLE method of satisfying this Standard; however, other methods will be considered on an individual basis.

A. General

A.1. Roof systems Shall be designed and installed for the anticipated total load.

A.2. Design and installation "should" be performed:

A.2.a. In strict adherence to the manufacturers instructions, specifications of materials used, and Listings/Approvals.

AND

A.2.b. Under the supervision of experienced personnel.

B. Design and methods of construction.

B.1. Roof systems "should" be selected, designed, and evaluated as an entire assembly.

B.1.a. Unprotected deck roof systems "should" be:

B.1.a.(1) UL Fire Classified and/or FM Class 1 Fire Rated or Noncombustible

AND

B.1.a.(2) UL and/or FM Class A Rated or Noncombustible

AND

B.1.a.(3) UL Classified and/or FM Approved for wind load and uplift pressures calculated in accordance with the current edition of ASCE 7.

B.1.b Protected deck roof systems "should" be:

B.1.b.(1) UL and/or FM Class A Rated or Noncombustible

AND

B.1.b.(2) UL Classified and/or FM Approved for wind load and uplift pressures calculated in accordance with the current edition of ASCE 7.

C. References

Underwriters Laboratories, Building Materials Directory

Factory Mutual, Approval Guide
ASCE 7

SECTION 8-3I APPENDIX 3.C.7.e

SMOKE AND HEAT VENTING

ACCEPTABLE smoke and heat venting "should" be provided. The following constitutes an ACCEPTABLE method of meeting the intent of providing smoke and heat venting; however, other methods of accomplishing this requirement will be considered on an individual basis.

A. General

A.1. The purpose of providing heat venting during a fire is to reduce damage to exposed structural steel and reduce the workload on automatic fixed water extinguishing systems.

A.2. The purpose of smoke venting during a fire is to enhance manual fire fighting performance and to reduce smoke contamination.

A.3. The release of smoke and heat to the environment will be dependent upon an evaluation of the products of combustion to insure that radioactive release limits are not violated.

A.4. Consideration must be given and allowances made for areas protected by carbon dioxide, Halon, or other such fixed fire suppression systems such that these areas can be purged without interference to the function of the fixed fire protection system(s).

B. Criteria for Heat Venting - Methods of Providing Heat Venting - Venting ratios "should" conform to Standard 3.C.7. HVAC system(s) "should" be accomplished by one or a combination of the methods outlined below: (These are listed in the order of preference.)

B.1. Automatically operated roof vents.

B.1.a. Vents "should" be either UL Listed or FM Approved.

B.1.b. Installation "should" conform to NFPA 204.

B.1.c. Vents "should" have an exterior manual release.

B.2. Plastic melt-out roof vents.

B.2.a. Vents "should" be FM Approved.

B.2.b. Installation "should" conform to NFPA No. 204M.

B.3. Continuous gravity vents (ridge vents) - Actuation "should" be automatic.

B.4. Powered ventilation (mechanical)

B.4.a. Ventilation rates "should" be 300 CFM at 70F for each square foot of free venting area, that would be required if venting were accomplished per B.1.

B.4.b. Equipment "should" be UL Listed under "Power Roof Ventilators."

B.4.c. All components exposed in air stream "should" be capable of operating at temperatures of at least 325F.

B.4.d. Electric power "should" be independent of the electrical system in the hazard area to be vented and cabling "should" not be routed in the area to be vented.

B.4.e. Actuation "should" be automatic.

B.4.f. Manual control "should" be provided from outside the area to be vented.

B.4.g. Consideration "should" be given to the effects of negative pressure because of venting.

C. Criteria for Smoke Venting - smoke venting "should" be provided using NFPA 204 or NFPA 90A as a guide.

C.1. Methods of Providing Smoke Venting - Venting ratios "should" conform to Standard 3.C.7. Venting system(s) "should" be accomplished by one or a combination of methods outlined below: (These are listed in the order of preference.)

C.1.a. Automatically operated roof vents (see B.1.).

C.1.b. Plastic melt-out roof vents (see B.1.).

C.1.c. Continuous gravity vents (see B.3).

C.1.d. Powered ventilation (see B.4).

C.1.e. Powered ventilation via adaptation of HVAC systems.

C.1.e.(1) Ventilation rates "should" be 300 CFM at 70F for each square foot of free venting area which would be required if venting were accomplished per B.1.

C.1.e.(2) Installation "should" be made in accordance with NFPA 90A.

C.1.e.(3) Electric power "should" be independent of the electrical system in the area to be vented and cabling "should" not be routed in the area to be vented.

C.1.e.(4) Actuation "should" be automatic.

C.1.e.(5) Manual control "should" be provided from outside the area to be vented.

C.1.e.(6) Consideration "should" be given to the effects of negative pressure because of venting.

C.1.e.(7) Piercing a fire barrier with HVAC ducts and the installation of integral fire dampers (doors) could negate the use of the HVAC system for smoke control. The integrity of the fire barrier takes precedence over venting, and therefore, this limitation "should" be considered in the initial system design.

C.1.f. Portable Ventilation Equipment (ejectors) - Portable ventilation equipment that is available for use by Fire Brigade personnel.

D. References

NFPA 90A 2002 Standard for the Installation of Air Conditioning and Ventilation Systems
NFPA 204 2002 Standard for Smoke and Heat Venting
Underwriters Laboratories Building Materials Directory
Factory Mutual Approval Guide

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SECTION 8-3J APPENDIX 3.C.7.f

CHARCOAL FILTERS

ACCEPTABLE fire detection and extinguishing systems, with alarms to the Control Room, "should" be provided to aid in control of charcoal filter fires. The following is an ACCEPTABLE method of satisfying this Standard, however, other methods will be considered on an individual basis.

A. General: This Appendix applies to charcoal filters containing 250 pounds or more of charcoal which are components of either normally operating or standby air filtration systems associated with light water reactor plants. Standby air filtration systems are normally exposed to no airflow, and both detection and suppression systems "should" be designed to function with and without airflow. Detection and suppression systems of normally operating air filtration systems typically found in BWR plant-controlled area building ventilation systems "should" be designed to function under design air flow conditions.

Note: This Appendix does not apply to charcoal absorbers associated with off-gas treatment systems.

B. Detection: An ACCEPTABLE fire detection system "should" be provided for total area thermal detection in close proximity to the charcoal to indicate incipient ignition at a temperature 50□F below the ignition temperature of the filter medium. Detector response "should" be indicated in the Control Room.

C. Suppression: Suppression "should" be provided by either an automatic or manual water deluge system with water densities in accordance with the following:

C.1. Horizontal Tray Filters: Density "should" be 2.0 gpm/sq. ft. of projected top surface area with water introduced over the highest tray.

C.2. Vertical Rechargeable Filters: Density "should" be 2.0 gpm/sq. ft. of projected top surface area, with water introduced directly over or into the charcoal hopper area.

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SECTION 8-3K APPENDIX 3.D.3.c

HYDRANTS AND HOSE EQUIPMENT STATIONS

The following constitutes ACCEPTABLE hydrant and hose equipment stations for outside use; however, other methods of accomplishing this requirement will be considered on an individual basis.

A. Hydrants

A.1. All hydrants "should" be appropriately protected from damage by vehicular traffic.

A.2. All hydrants Shall be UL Listed or FM Approved, or ACCEPTABLE.

A.3. All hydrants Shall have at least two 2-1/2 inch hose outlets.

A.4. Hose threads for couplings, hydrants, nozzles, and accessories Shall be consistent with those used by the public fire department most likely to respond to a fire at the plant or suitable adapters provided.

A.5. Hydrants and post indicator valves "should" open in the same direction.

B. Hose Equipment Stations

B.1. An ACCEPTABLE arrangement of UL Listed, FM Approved, or other ACCEPTABLE houses or hose cabinets or mobile units "should" be provided.

B.2. As a minimum, each hose house or hose cabinet "should" contain the following equipment:

B.2.a. 200 feet of 1-1/2 inch woven jacket lined hose, preferably pre-connected.

B.2.b. Two UL Listed or FM Approved 1-1/2 inch adjustable spray nozzles.

B.2.c. Two universal spanners.

B.2.d. Two adapters 2-1/2-inch to 1-1/2-inch (unless preattached to hydrants).

B.2.e. One hydrant wrench.

C. Other On-site Equipment - As a minimum, each site "should" provide the following additional equipment:

C.1. 500 feet of 2-1/2-inch woven jacket lined hose.

C.2. Two 2-1/2-inch x 1-1/2-inch x 1-1/2-inch gated wye.

C.3. Two 2-1/2-inch adjustable spray nozzle.

C.4. Four universal spanners.

C.5. Two hydrant wrenches.

C.6. Two axes, two pry bars, and two emergency lights.

C.7. Spare hose gaskets.

D. References

NFPA 24 2002 Standard for the Installation of Private Fire Service Mains and Their Appurtenances

Underwriters Laboratories, Fire Protection Equipment Directory

Factory Mutual, Approval Guide

SECTION 8-3L APPENDIX 3.D.4.g

FIRE PROTECTION FOR HAZARDS ASSOCIATED WITH TURBINE GENERATORS

Fixed automatic extinguishing systems "should" be provided to properly protect against all known hazards under the turbine operating floor, hydraulic control systems utilizing combustible fluids, and combustible oil hazards associated with turbine generators. The following is an ACCEPTABLE method of satisfying this Standard, however, other methods will be considered on an individual basis.

A. General

A.1. All automatic fixed extinguishing systems "should" be designed and installed in accordance with applicable NFPA Codes.

A.2. Control valves and other control devices "should" be accessible during fire conditions.

A.3. The plant "should" be designed and equipment arranged such that combustible lubricating oils will be confined to a specified area. The use of trenching, curbs, and dikes plus the utilization of natural holding sumps, such as condenser pits, can serve as an aid in accomplishing this feature.

A.4. Proper drainage to prevent burning oil from being floated to unprotected areas of the plant "should" be provided for all oil hazards.

B. Under the Turbine Operating Floor - Fixed automatic water extinguishing systems "should" be provided to protect against all known oil hazards under the turbine operating floor.

B.1. The area beneath the turbine generator and the designated holding sumps plus an area 20 feet around the periphery "should" be protected with a calculated water spray system and/or hydraulically balanced automatic sprinkler system designed to deliver a density of 0.30 gpm per sq. ft. for any 3,000 sq. ft. of floor area (including the most remote) affected, and a density of 0.20 gpm per sq. ft. for any 10,000 sq. ft. area affected below the turbine operating floor.

NOTE: A minimum design density of 0.30 gpm per sq. ft. for any 5000 sq. ft. of floor area (including the most remote) Shall be used for new systems installed after July 1, 1993.

B.2. In plants where oil piping beneath the turbine generator is entirely enclosed by radiation shield walls, protection "should" be provided inside the shield wall enclosure as outlined in B.1 above.

B.3. Individual oil hazards (e.g., hydrogen seal oil conditioning unit, turbine generator feed water pumps) and other areas of combustible occupancy "should" be protected with an automatic sprinkler system with a minimum design density of 0.30 gpm per sq. ft. of floor area.

B.4. Turbine oil reservoirs and other oil storage tanks "should" be protected with separate deluge water spray systems designed to provide a minimum density of 0.30 gpm per sq. ft. of tank surface area and surrounding floor area. Where oil hazards are separated from the other areas of the plant by three-hour rated fire barriers, protection inside the fire barriers is sufficient.

B.5. If adequate confinement of combustible oils is not accomplished (as outlined in A.3 above), a

hydraulically balanced automatic sprinkler system designed to deliver a density of 0.30 gpm per sq. ft. for any 3,000 sq. ft. of floor area (including the most remote), and a density of 0.20 gpm per sq. ft. for any 10,000 sq. ft. of floor area "should" be provided beneath the entire turbine operating floor and for all areas where the oil might spread.

NOTE: A minimum design density of 0.30 gpm per sq. ft. for any 5000 sq. ft. of floor area (including the most remote) Shall be used for new systems installed after July 1, 1993.

B.6. A density of 0.25 gpm per sq. ft. over 8,000 sq. ft. of floor area may be utilized as an alternative to the density specified in B.1 and B.5. A density of 0.30 gpm per sq. ft. "should" be utilized for floor areas of 3,000 sq. ft. or less. A linear interpolation "should" be made for floor areas between 3,000 sq. ft. and 8,000 sq. ft. (i.e., 0.29/4,000, 0.28/5,000, 0.27/6,000, 0.26/7,000).

NOTE: A minimum design density of 0.30 gpm per sq. ft. for any 5000 sq. ft. of floor area (including the most remote) Shall be used for new systems installed after July 1, 1993.

C. Hydraulic Control Systems Utilizing Combustible Fluids - Fixed water, gas, or dry chemical extinguishing systems "should" be provided for hydraulic control systems that utilize combustible fluids.

C.1. Fixed Water Extinguishing Systems

C.1.a. A water density of 0.30 gpm per sq. ft. of floor area "should" be provided in the area of combustible fluid hazards.

C.1.b. Water extinguishing systems "should" be automatically controlled sprinkler systems or automatic preaction systems.

C.2. Carbon Dioxide and Dry Chemical Extinguishing Systems

C.2.a. The extinguishing system(s) "should" be automatically controlled.

C.2.b. The design of carbon dioxide and dry chemical systems will depend on the configuration of the individual area to be protected, and the flow and extinguishing characteristics of the fluid selected; however, a minimum application in accordance with the applicable NFPA Standards "should" be provided for carbon dioxide systems. The extinguishing system(s) "should" have an adequate reserve in accordance with the applicable NFPA standards.

D. Hazards Associated With Turbine Generator Bearing Lubrication Oil and Hydrogen Seal Oil - Fixed water, carbon dioxide, or dry chemical extinguishing systems "should" be provided for all oil hazards associated with turbine generator bearings and seals.

D.1. Fixed Water Extinguishing Systems

D.1.a. Water extinguishing systems "should" be designed to provide a minimum density of 0.30 gpm in the area of the combustible fluid hazard.

D.1.b. Water extinguishing systems "should" be automatically controlled.

D.2. Fixed Carbon Dioxide and Dry Chemical Extinguishing Systems

D.2.a. The extinguishing system(s) "should" be automatically controlled.

D.2.b. The design of carbon dioxide and dry chemical systems will depend on the configuration of the individual area to be protected, and the flow and extinguishing characteristics of the fluid selected; however, a minimum application in accordance with the applicable NFPA Standards "should" be provided for carbon dioxide systems. The extinguishing system(s) "should" have an adequate reserve in accordance with the applicable NFPA standards.

D.2.c. Sufficient carbon dioxide or dry chemical storage "should" be provided to maintain extinguishment considering the duration of the entire coast-down period for the turbine.

E. References

NFPA 12 2000 Carbon Dioxide Extinguishing Systems
NFPA 13 2002 Standard for the Installation of Sprinkler Systems
NFPA 15 2001 Standard for Water Spray Fixed Systems
NFPA 16 2003 Installation of Foam Water Sprinkler and Foam Water Spray Systems
NFPA 17 2002 Standard for Dry Chemical Extinguishing Systems
NFPA 850 2000 Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations

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SECTION 8-3M APPENDIX 3.D.5.b

HOSE STREAM DEMAND WHEN SUPPLIED BY SPRINKLER SYSTEMS

Hose stream allowance, if included in the design of a sprinkler system(s) and water spray (deluge) system(s) "should" be designed to meet the following criteria.

A. General

A.1. A properly designed, installed and maintained sprinkler system is intended to control a fire, not to extinguish it. If the sprinkler system performs effectively, little hose stream assistance is required. Therefore, a realistic view must be taken of possible contingencies and of the amount of water that might be needed for hose streams.

A.2. The greater the hazard, the greater the hose stream allowance. In determining the hose stream demands, one must consider the amount of water needed for final extinguishment and overhaul operations. To accomplish this, the MINIMUM hose stream allowances as outlined in this Appendix are to be included in the design of a sprinkler system(s).

B. Criteria For Hose Stream Allowances

B.1. Critical Buildings - A total hose stream allowance of 500 gpm "should" be added to the water demand at the base of the sprinkler system(s) riser.

B.2. Non-critical Buildings - A total hose stream allowance "should" be added in accordance with the following table:

HAZARD CLASSIFICATION	INSIDE ALLOWANCE (GPM) AT BASE OF SPRINKLER SYSTEM RISER	TOTAL COMBINED INSIDE AND OUTSIDE ALLOWANCE (GPM)
Light	100	100
Ordinary	100	250
Extra Hazard	100	500

C. References

NFPA Standard 13 1996 Standard for the Installation of Sprinkler Systems
NFPA Standard 15 1996 Standard for Water Spray Fixed Systems for Fire Protection
NFPA Fire Protection Handbook - Seventeenth Edition

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SECTION 8-3N APPENDIX 3.D.8

COOLING TOWERS

The following is an ACCEPTABLE method of satisfying this Standard; however, other methods of satisfying this Standard will be considered on an individual basis.

A. Noncombustible Cooling Towers

A.1. Cooling towers Shall be constructed of concrete, including columns, walls, beams, deck, shroud, and hyperbolic stack (in the case of natural draft towers).

A.2. The louvers, fill, drift eliminators, fan decks, and fan stacks Shall be noncombustible.

B. ACCEPTABLE Material Cooling Towers

B.1. Cooling towers Shall be constructed of concrete or ACCEPTABLE fiberglass reinforced materials with a flame spread rating of 25 or less, including columns, walls, beams, deck, shroud, and hyperbolic stack (in the case of natural draft towers).

B.1.a. Fiberglass reinforced plastics Shall have UV Inhibitors and reactive inhibitors added to the resin matrix and a UV inhibitor (gelcoat) applied to all hand-laid parts. Pultruded parts Shall include UV inhibitors in the fabrication process.

B.2. The louvers, fill, drift eliminators, fan decks, or fan stacks Shall utilize materials with a flame spread rating of 25 or less.

B.2.a. Fire barriers "should" be installed in accordance with the Listing / Approval. If the Listing /Approval does not specify fire barrier configuration or provide for a clear space between cells, they "should" be provided as follows:

B.2.a.(1) For mechanical draft towers each cell "should" be separated from adjacent cells by fire-resistant partition with a minimum 20-minute fire resistance rating. These barriers "should" extend to at least 4 inches below the normal water operating level. Gaps in fire barriers "should" be sealed utilizing materials that provide a fire rating equivalent to the barrier.

B.2.b.(1) For hyperbolic (natural draft) cross flow cooling towers a minimum of six radial fire-resistant partitions with a minimum 20-minute fire resistance rating "should" be provided across the fill and drift eliminator areas, spaced equidistant around the circumference. The fire barrier "should" extend from at least 4 inches below the normal water operating level or 6 feet below the fill, whichever is less, to the underside of the hot water distribution basin.

C. Combustible Cooling Towers

C.1. Fire barriers for combustible cooling towers Shall be provided as follows:

C.1.a. Each cooling tower Shall be divided into a number of sections such that the fire protection water supply system can deliver the water demands required in Paragraph C.2. below.

C.1.b. Fire resistant partitions of a minimum 20-minute fire resistance rating Shall be provided to separate each section of cells. The fire resistant partitions Shall extend the full width of each tower in mechanical draft towers. For hyperbolic towers, the fire resistant partitions Shall extend entirely across the cooling tower from the inside of splash boards and passing through the drift eliminators to the inner vertical members and vertically from the underside of the distribution deck to 4 inches below the normal operating water level in the reservoir.

C.1.c. Noncombustible sheathing "should" be provided on top of the fan and extended fan deck.

C.2. Fire protection for combustible cooling towers Shall be provided.

C.2.a Cooling tower type nozzles "should" be utilized for protection of the fill in cross-flow towers.

C.2.b UL Listed and/or FM Approved or ACCEPTABLE equivalent devices "should" be provided.

C.2.c On towers having extended fan decks which completely enclose the distribution basin, open directional spray nozzles "should" be located under the extension and discharge over the basin and on the underside of the fan deck extension.

C.2.d A line of open sprinklers under intermediate decks above the drift eliminators "should" be provided and be capable of delivering a minimum density of 0.50 gpm per sq. ft. with sprinklers not more than 10 feet apart.

C.2.e. A fire protection system "should" be designed to deliver a rate of application of:

C.2.e.(1) 0.50 gpm per sq. ft. under the fan deck, including the fan opening, and over the fan motor of counterflow towers.

C.2.e.(2) 0.33 gpm per sq. ft. under the fan deck, including the fan opening, and over the fan motor of crossflow towers with open distribution basins.

C.2.e.(3) 0.50 gpm per sq. ft. over the fill area of crossflow towers, utilizing cooling tower type nozzles for towers with open distribution basins.

C.2.e.(4) On crossflow towers with enclosed distribution basins, 0.35 gpm per sq. ft. discharging on the distribution basin and 0.15 gpm per sq. ft. discharging on the underside of the fan deck extension.

C.2.f. A protection system with actuating detectors over the fan motor, under the fan deck, around the circumference of fan opening and under the extended fan deck over the distribution basin "should" be provided. The detectors "should" be spaced no greater than 8 feet apart, including the fan opening.

C.2.g. Each tower section "should" be protected by its own deluge valve with the supply main from the deluge valve to feed sprinklers routed from the side of tower (rather than through the tower from the end).

C.2.g.(1) The water demand "should" be calculated based on waterflow needs for one section plus 500 gpm allowances for hose streams.

C.2.h At least one access point to the interior of each tower section "should" be provided.

C.2.i Tripping of deluge valves "should" alarm in the Control Room and shut down the associated fans.

C.2.j A water supply to the cooling towers through underground legs from the main fire loop "should" be arranged such that no single break in any section of the system can prevent supplying water to any section of the cooling tower fire protection systems.

C.2.k An underground fire loop "should" be provided around each cooling tower of adequate size with sufficient divisional valves arranged such that essentially only one half of a tower protection system needs to be shut down in the event of a single break in the tower underground loop.

C.2.l Hydrants and hose equipment "should" be provided in accordance with NEIL Property Loss Control Standards, Section 3.D.3 and Appendix 3.D.3.c Hydrants and Hose Equipment Stations.

D. Special Precautions

D.1. The fire protection system in the tower construction area "should" be completed to the point such that fire hydrants are in service prior to starting construction.

D.2. The deluge systems (when required) for each tower "should" be in operation prior to the installation of fill and/or drift eliminator material.

D.3. During periods when completed combustible towers are not in operation, the towers "should" be periodically wetted.

E. Reference

NFPA 214 2000 – Standard on Water Cooling Towers

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SECTION 8-3O APPENDIX 3.D.10

TEMPORARY NEW FUEL STORAGE

All temporary storage of new fuel Shall be ACCEPTABLE. The following is an ACCEPTABLE method of satisfying this Standard; however, other methods of satisfying this Standard will be considered on an individual basis.

A. General - Where it is necessary to store new nuclear fuel in areas other than the permanent storage facilities, prior approval of the method and procedures for temporary storage is necessary for the area where new nuclear fuel is to be stored.

B. Outside Storage

B.1. The outside storage area "should" be separated from other areas of construction and/or buildings by a minimum clear space of 50 feet.

B.2. The storage area and the 50-foot clear space surrounding the area "should" be stripped of all vegetation.

B.3. Vehicular traffic, except that associated with new fuel storage, "should" be prohibited within the storage area and the 50 feet clear space.

B.4. The new fuel "should" be stored within a locked chain-link security fence or have 24-hour personnel surveillance.

B.5. The new fuel "should" be stored with adequate spacing to ensure that nuclear criticality cannot be achieved in the water-flooded condition.

B.6. The new fuel "should" be adequately protected against damage by the elements.

B.7. All combustible packaging and shipping material "should" be removed from around the new fuel container and no combustible material "should" be allowed in the storage area.

B.8. An ACCEPTABLE fire hydrant with a properly equipped hose station "should" be readily available near the new fuel storage area.

B.9. Care "should" be taken to ensure that no objects could be dropped onto the new fuel.

B.10. Lighting and surveillance "should" be provided in the storage area.

C. Inside Storage

C.1. New fuel Shall be stored only in noncombustible buildings when stored inside.

C.2. The new fuel storage area "should" be separated from other areas by a minimum clear space of 10 feet.

C.3. The storage area and the 10- foot clear space "should" be kept free of all combustible materials.

C.4. The new fuel "should" be stored within a locked building, or within a locked chain-link security fence within the building, or have 24-hour personnel surveillance.

C.5. The new fuel "should" be stored with adequate spacing to ensure that nuclear criticality cannot be achieved in the water-flooded condition.

C.6. All combustible packaging and/or shipping material "should" be removed from the new fuel and no combustible material "should" be allowed in the storage area.

C.7. An ACCEPTABLE standpipe hose system "should" be readily available near the new fuel storage area.

C.8. Care "should" be taken to ensure no objects could be dropped onto the new fuel.

SECTION 8-3P APPENDIX 3.F.2.b(1)

FABRICS (TARPAULINS)

The following is an ACCEPTABLE method of satisfying this Standard; however, other methods of satisfying this Standard will be considered on an individual basis.

A. ACCEPTABLE tarpaulins are fabrics that are UL Listed or FM Approved as weather resistant and flame retardant.

B. Flame-retardant treatment of tarpaulins exposed to weather "should" be of a type to prevent leaching of the flame-retardant chemicals over a period of time.

C. The following fabrics are ACCEPTABLE if the manufacturer is UL Listed or FM Approved:

C.1. Flame Retardant Fabrics, Impregnated

C.2. Flame Retardant Fabrics, Plastic Coated

C.3. Flame Retardant Fabrics, Synthetic

C.4 Flame Retardant Fabrics, Plastic Faced

C.5. Noncombustible Fabrics.

D. Fabrics not listed by UL or FM will be ACCEPTABLE if they have successfully passed the Large Scale Test contained in NFPA 701, "Methods of Fire Tests for Flame Resistant Textiles and Films."

E. References

NFPA 701 - 2004 Methods of Fire Tests for Flame-Resistant Textiles and Films
Underwriters Laboratories, Building Materials Directory
Factory Mutual, Approval Guide

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SECTION 8-3Q APPENDIX 3.F.2.e

TEMPORARY SERVICES

ACCEPTABLE procedures controlling the installation of temporary services "should" be established. As a minimum, these procedures "should" address all temporary electrical and hose (both hydraulic and pneumatic) installations, and temporary heating devices including fuel supplies. Procedures addressing the following will provide an ACCEPTABLE method of satisfying this Standard, however, other methods will be considered on an individual basis.

A. Electrical

A.1. Temporary **Power** Cables - Prior to **the** installation **of** temporary electrical **power** cables **a review "should"** address **at least the following**:

A.1.a. Sizing of the cable relative to the required power load.

A.1.b. Adequate sizing of the circuit breakers or other overcurrent protection relative to the cable size.

A.1.c. Cable connections are proper and tight.

A.1.d. **Non-permanent electrical circuits required for temporary power and lighting installations "should" not be placed in cable trays with permanent circuits unless they meet the same requirements as permanent circuits.**

A.1.e. Cable derating, if necessary.

A.1.f The electrical supply for each temporary structure "should" be capable of being de-energized from outside the structure by a single switch. Temporary services to these structures "should" be shut off when it is not in use.

A.2. Temporary Extension Cords - Prior to **the** installation **of** temporary extension cords **a review "should"** address~~ing~~ **at least the following**:

A.2.a. Inspection of extension cords prior to use to ensure the cord, plug and receptacles are free of damage.

A.2.b. Extension cords "should" not be routed in active cable trays.

A.2.c. **Extension cords "should" be plugged directly into an approved receptacle, power tap, or multiplug adapter and "should", except for approved multiplug extension cords, serve only one portable appliance.**

A.2.d. Purchased extension cords "should" be UL listed or ACCEPTABLE equivalent. Extension cords made at the station "should" be constructed of UL listed or ACCEPTABLE equivalent parts and assembled by a qualified **individual**.

A.2.e **Extension cords "should" not extend through walls, ceilings, or floors, or under doors or floor coverings without engineering review. Extension cords "should" not be subject to environmental or physical damage.**

B. Hoses - Prior to installation, **a** review "should" be conducted for temporary hoses, lines and tubing addressing:

B.1. Separation from sources of ignition.

B.2. The routing of the temporary hoses, lines and tubing.

B.3. Heat dissipation if carrying hot products.
B.4. The use of the properly rated hose, line or tube for the intended service.

C. Temporary Heating Devices - Only safely installed ACCEPTABLE heating devices and their fuel supply systems Shall be utilized inside buildings.

C.1. General

C.1.a. Refueling of heaters "should" be controlled **in accordance with the manufacturers instructions.**

C.1.b. Only UL Listed or FM Approved or ACCEPTABLE equivalent safety **containers** Shall be used for refueling operations.

C.1.c **Adequate surveillance Shall be provided whenever heating devices are used for heating or warming purposes.**

C.2. ACCEPTABLE Equipment

C.2.a. UL Listed or FM Approved or other ACCEPTABLE electric heaters, gas (MAPP, L.P., or natural) or oil-fired heaters Shall be allowed inside buildings. Gasoline and other fuels **Shall** not **be** permitted.

C.2.b. Chimney or vents, where required, on direct-fired units Shall be maintained at least 18 inches from combustible material unless UL Listed or FM Approved or ACCEPTABLE equivalent for less clearance.
C.2.c. Heating devices Shall be located on noncombustible base or floor and arranged so that they are unlikely to overturn.

C.2.d. Heating devices "should" be located **in accordance with the applicable codes and manufacturers recommendations.**

C.2.e. All units Shall be set up, operated, and maintained in accordance with the manufacturer's instructions.

D. References

NFPA 31 - 2001 Standard for the Installation of Oil-Burning Equipment
NFPA 54 - 2002 National Fuel Gas Code
NFPA 58 - 2004 Liquefied Petroleum Gas Code
NFPA 70 - 2002 National Electric Code

SECTION 8-4LOSS CONTROL BULLETINS

Note: *Loss Control Bulletins affecting the Property Program have been identified with the Suffix "P". Loss Control Bulletins affecting the Boiler and Machinery Program have been identified with the Suffix "B".*

SECTION 8-4A	-	***BULLETIN NEIL83-01B*** Generator Step-up Transformer Winding Failure	**251**
SECTION 8-4B	-	***BULLETIN NEIL83-02B*** Steam Generator Damage Due to Loose Parts	**255**
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SECTION 8-4D	-	***BULLETIN NEIL90-01B*** All Main Turbines - Emergency Lubricating Oil	**261**
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SECTION 8-4A BULLETIN NEIL83-01B

GENERATOR STEP-UP TRANSFORMER WINDING FAILURE

NUCLEAR ELECTRIC INSURANCE LIMITED
BOILER & MACHINERY LOSS CONTROL BULLETIN

NEIL Loss Control Bulletins address matters vital to loss control and are issued (1) to introduce new loss control subjects or (2) to clarify existing Loss Control Standards or (3) to provide interim guidance or (4) to provide information concerning losses or other significant events.

I. TITLE:

Generator Step-up Transformer Winding Failure

II. BACKGROUND:

This bulletin was originally issued March 1, 1983 and contained two recommendations. The first recommendation required Members to ascertain whether they had the transformers which were the subject of this bulletin. The second recommendation required Members to report by May 15, 1983 any corrective actions taken.

This revision contains specific recommendations for the subject transformers and general recommendations for all generator step-up transformers. No response is required to the bulletin at this time.

A PWR, owned and operated by a Member utility, was operating at approximately 30% power following an extended maintenance and refueling outage. The "B" phase transformer suffered a high to low voltage winding through fault of sufficient magnitude to rupture the transformer tank, damage the "B" phase bus duct, and breakdown the generator stator winding insulation. The resultant damage required the replacement of the transformer, replacement and repair of sections of the "B" phase bus duct, rewinding of the generator stator and possible restacking of the stator iron, rewinding of the generator rotor, and extensive cleaning of the generator enclosure.

The property damage as a result of this failure is estimated at $13 million. This incident would have resulted in an extended repair outage of six to nine months duration had a complete generator replacement not been available at the plant.

III. GENERAL DISCUSSION:

In reviewing this loss, it is instructive to consider the transformer loss history at this plant. This was the seventh in a series of transformer failures commencing in November 1980. Five failures were to transformers associated with Unit 2, the sixth and seventh failures were to transformers associated with Unit 1.

The transformers in question are all similar in size, construction, and were manufactured by Westinghouse. The transformers are single phase, oil-filled, sealed units rated at 330 MVA OA/FA, 22KV/500KV. The insulating oil is blanketed with nitrogen, and tank pressure is maintained in the range of 0.5 to 5 psig with a mechanical relief device set to relieve at 10 psig.

A brief summary of the seven transformer losses follows:

First and Sixth Failures
These failures involved winding to ground faults reportedly caused by nitrogen gas bubbles released from the insulating oil due to a partial vacuum drawn on the tank as a result of expansion and contraction of the insulating oil with the inert gas system isolated.

Second and Third Failures
These failures involved high voltage bushing to ground faults reportedly caused by improper storage of the high voltage oil-filled bushings prior to installation. The improper storage allowed portions of the bushing insulation system, normally covered and impregnated with insulating oil, to dry out.

Fourth Failure
This failure involved a high voltage winding to ground fault reportedly caused by an incipient fault as a result of the failure of a companion transformer (third failure).

Fifth Failure
This failure involved an electrical insulator bushing failure. No proximate cause for this failure is known at this time.

Following the sixth failure, the transformer manufacturer recommended that Unit 1 transformers be modified to a Constant Oil Pressure System (C.O.P.S.) which separates the insulating oil from the inert gas blanket by a flexible diaphragm. This modification was subsequently carried out on the Unit 1 transformers prior to that unit's return to service and prior to the seventh failure.

Seventh Failure
This failure is the subject of this Loss Control Bulletin and involved a high voltage to low voltage winding through fault. No proximate cause for this failure is known at this time.

IV. CLARIFICATION:

A more detailed explanation of each transformer failure can be found in the United States Nuclear Regulatory Commission Inspection and Enforcement Information Notice No. 82-53 dated December 22, 1982. This notice was addressed to all nuclear power reactor facilities holding an operating license (OL) or construction permit (CP).

V. CONCLUSIONS:

Although the proximate causes of failure differ, two factors link six of the seven failures. These two factors are:

A. Transformers were subject to one or more documented over voltage incidents at the low voltage windings (up to 31 KV).

and/or

B. Transformers were exposed to fault conditions during failure of a companion unit.

There is no documented evidence at this time to link the transformer involved in the sixth failure

with the other six failures through either of condition A. or B. above. It is reasonable to assume, however, given the number of failure incidents, that the transformer may have been subject to either of A. or B.

VI. INTERIM GUIDANCE:

The NEIL Engineering Advisory Committee (EAC) discussed these transformer failures during its meeting on February 17, 1983. It was agreed that the transformers in question [Westinghouse - 7 million series (Serial No. beginning 7,00-,---), single phase, utilized as generator step-up transformers, 200 MVA and over] could present an increased exposure to NEIL.

The Boiler & Machinery Subcommittee of the EAC was charged with reviewing the manufacturer's recommendations concerning these transformers along with other pertinent information, and has developed the following recommendations with respect to NEIL's interests:

A. Constant Oil Pressure System (COPS)

This modification involves the installation of a flexible diaphragm separating the insulating oil from the nitrogen gas blanket. NEIL recommends that this modification be made on a case-by-case basis after consultation with the manufacturer by all NEIL insureds who have the transformers in question in use at, or being maintained as spares for their nuclear facilities.

B. Removal of High Voltage Bushing Insulation

The transformer manufacturer made this recommendation to the utility experiencing the failures outlined in this Bulletin. While there were sound reasons for removal of the cylindrical insulation around the high voltage bushing connections in these instances, NEIL recommends that the removal of insulation should be made on a case-by-case basis only after consultation with the manufacturer.

C. Change in Start-Up Procedures

The manufacturer recommended to the utility experiencing the failures that a change be made to the start-up procedures which involved not running the insulating oil pumps before the unit is energized. NEIL recommends that changes in operating procedures should be made on a case-by-case basis and subject to consultation with the manufacturer.

D. General Recommendations - The following general recommendations apply to all generator step-up transformers, not just the Westinghouse transformers discussed in this Bulletin:

1. A review should be made of procedures which limit low side generator voltages especially during synchronization or power factor adjustment.

2. Where transformers are subject to over voltage in excess of 105% of rated generator voltage, the insulation system of the transformer should be assessed by electrical testing at the first available opportunity. Where a transformer is subject to a documented over voltage, it is suggested that the frequency of gas-in-oil analysis (gas

chromatography) be greatly increased until such time as the presence of an incipient fault due to the over voltage condition is proved or disproved.

3. Where transformers are subject to documented over voltage in excess of 110% rated generator voltage, it is suggested that immediate steps be taken to assess the transformers' insulation system integrity by electrical testing.

4. Where transformers are subject to fault conditions through failure of a companion transformer, the insulation system integrity should be assessed by electrical testing. Serious consideration should also be given to an internal examination to detect looseness in winding support structures, evidence of electrical discharge and carbonization of the insulating oil.

5. It is recommended that surveillance of generator step-up transformers be included in the operator daily rounds. Physical surveillance should include ambient temperature, top oil temperature, oil temperature, hot spot temperature, winding temperature, number of cooling fans in operation, transformer tank pressure, bushing oil level, transformer tank oil level where provided and inert gas system integrity.

6. The highest priority should be assigned to maintaining transformer temperature indicators and inert gas systems in an operable condition.

7. Main circuit breakers and generator protective relays should be tested and calibrated at least annually to ensure that they operate within the design time frame.

SECTION 8-4B BULLETIN NEIL83-02B

STEAM GENERATOR DAMAGE DUE TO LOOSE PARTS

NUCLEAR ELECTRIC INSURANCE LIMITED
BOILER & MACHINERY LOSS CONTROL BULLETIN

NEIL Loss Control Bulletins address matters vital to loss control and are issued (l) to introduce new loss control subjects or (2) to clarify existing Loss Control Standards or (3) to provide interim guidance or (4) to provide information concerning losses or other significant events.

I. TITLE:

Steam Generator Damage Due to Loose Parts

II. BACKGROUND:

Damage to steam generator tubes as a result of impact by loose parts or debris can be costly in terms of reliability and lost generation. Repair outages as a result of loose parts damage can exceed six months in duration. The following brief synopsis of incidents involving loose parts in the primary loop and secondary side of steam generators.

1979 - Tube Rupture

Steam generator "A" tube rupture was caused by mechanical impact of loose parts. The loose parts were determined to be sections of a spring introduced into the secondary side during a previous outage for tube sheet cleaning. The rupture was detected by primary to secondary flow and steam generator level fluctuations.

1979 - Tube End/Tube Sheet Damage

Tube end and tube sheet damage was discovered following multiple impacts by loose parts in the primary loop. The subsequent repair outage was approximately seven months in duration. The damage was detected by inspection during a steam generator outage.

1980 - Loose Parts/Debris

Steam generator replacements were made necessary by extensive tube degradation. Prior to operation, a secondary side inspection was carried out. The inspection revealed loose debris associated with the fabrication process.

1981 - Loose Parts

In response to a loose parts indication an inspection was performed on the primary loops of the steam generators. No loose parts were detected, however, during the inspection process a surveillance camera was damaged and introduced loose parts into the primary loop of steam generator "A".

1981 - Loose Parts/Debris

Debris was detected during a secondary side inspection of steam generators, consisting of tools, locking wire and metal scrap. It was determined that the debris may have been in the steam generators from the time of installation.

1982 - Tube Rupture

A steam generator tube rupture was caused by mechanical impact as a result of loose parts. The loose parts were determined to be sections of a flow resistance orifice plate which had been cut out and removed during a previous outage. The tube rupture was detected by primary to secondary flow and steam generator level fluctuation.

1982 - Loose Parts

During a steam generator inspection, loose parts were found in the primary side. The loose parts were determined to be stainless steel hinges from an aluminum cover used during a previous outage. No sign of the aluminum cover was detected.

1982 - Tube End/Tube Sheet Damage

Extensive damage to tube ends and the tube sheet of a steam generator was caused by mechanical impact of loose parts. The loose parts were determined to be a nut and sections of failed guide tube assembly split pins. The damage was detected by loose parts indications and subsequent inspection. The repair outage as a result of this damage approached six months in duration.

1983 - Loose Parts/Debris

During flow testing of steam generators at a foreign plant, loose parts indications were received. The subsequent inspection revealed loose parts consisting of tools, nuts and metal scrap associated with the fabrication and installation process.

Steam Generator tubes are subject to deterioration through many mechanisms. Degraded tubes are more susceptible to failure through impact or vibrational stresses. Loose parts propelled by steam generator flow can cause impact damage or set up damaging vibrations in steam generator tubes or tube supports. Tube ends and tube sheets are also susceptible to impact damage from loose parts propelled by reactor coolant flow.

III. RECOMMENDATIONS

In order to reduce incidents of steam generator tube and tube sheet damage due to loose parts, the following loss control recommendations are offered:

A. An inspection of the secondary side of steam generators should be conducted prior to initial start-up. This inspection should occur after the final flush or the last work entry, whichever is later. A thorough close-out inspection should be performed following each secondary side work entry. These inspections should be performed in order to:

1. detect loose parts or debris left over from previous inspection/repair work or initial installation.

2. visually correlate observable secondary side conditions with eddy current testing results.

B. Loose parts/impact monitoring should be installed for both primary and secondary sides of steam generators.

C. Repair or inspection work in reactor vessels and steam generators should be controlled by stringent quality control procedures designed to prevent lost parts and tools and to maintain a high level of vessel cleanliness.

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SECTION 8-4C BULLETIN NEIL85-01B

HYDROGEN ADDITION SYSTEMS IN BWRs

NUCLEAR ELECTRIC INSURANCE LIMITED
BOILER & MACHINERY LOSS CONTROL BULLETIN

NEIL Loss Control Bulletins deal with matters vital to Property Loss Control and are issued (1) to introduce new Property Loss Control subjects, (2) for clarification of existing NEIL Property Loss Control Standards, or (3) to provide interim guidance.

I. TITLE

Hydrogen Addition Systems in BWRs

II. BACKGROUND

Oxygen reduction in the primary coolant system is a recent solution for resolving the problem of intergranular stress corrosion cracking. In BWRs oxygen reduction has been accomplished by hydrogen addition. The hydrogen addition principle was originally developed and tested in Europe. One NEIL Member plant has been employing hydrogen addition on an experimental basis for two years and is currently designing a permanent system. Based on the results obtained, hydrogen addition systems may become a permanent plant installation at several more BWRs.

III. GENERAL DISCUSSION

Hydrogen addition involves the injection of gaseous hydrogen into the condensate booster pump suction lines. Bulk hydrogen (gaseous or liquid) is typically stored in truck trailers, cylinders, or permanent storage tanks. Typical storage consists of four 30,000-gallon gaseous hydrogen trailers or a 25,000-gallon liquid hydrogen tank. Liquid hydrogen storage uses a vaporizer to convert to hydrogen gas. Nominal 1/2" diameter piping is then utilized to transfer hydrogen from bulk storage to the condensate pumps.

Hydrogen addition impacts on the off-gas recombiner system. Since the hydrogen absorbs much of the oxygen in the feedwater system, oxygen is injected into the off-gas system in conjunction with hydrogen addition systems. Liquid oxygen storage tanks are used for storage the necessary oxygen.

IV. CLARIFICATION

The primary concern with hydrogen addition systems is the storage and distribution of gaseous or liquid hydrogen. Hydrogen burns in air with a pale blue, almost invisible flame. At atmospheric pressure, the flammable range is approximately 4% to 74% by volume of hydrogen in air.

V. CONCLUSION

Although hydrogen utilization at power plants is not uncommon, i.e., generator cooling, the hydrogen addition system discussed herein is a new concept that requires larger storage facilities and modified piping systems. Original plant designs and property loss control also did not contemplate hydrogen addition systems.

VI. INTERIM GUIDANCE

A. The installation of hydrogen addition systems "should" be in accordance with NFPA 50A for gaseous hydrogen and 50B for liquid hydrogen. In addition, NFPA 50A "should" be utilized for bulk oxygen systems.

B. The location of above ground hydrogen storage tank(s) "should" be in accordance with NFPA 50A and/or 50B with a minimum distance of 30 feet from permanent buildings or structures regardless of NFPA. These tanks should not be located under overhead electrical lines.

C. Adequate area ventilation or other provisions, such as guarded piping "should" be provided to eliminate hydrogen accumulation.

D. Indoor areas or rooms in which hydrogen is being injected "should" be protected by an automatic sprinkler system.

E. Adequate remote equipment supervisory alarms to the Control Room "should" be provided and interlocked to shut off the flow of hydrogen upon:

1. high condensate booster pump bearing temperature
2. condensate booster pump not running
3. low hydrogen flow and pressure
4. high hydrogen flow and pressure
5. low feedwater flow
6. low oxygen in off-gas system

F. When the condensate system is taken out of service, specific and positive measures should be taken to prevent the accumulation of hydrogen leakage into the shutdown condensate system.

SECTION 8-4D BULLETIN NEIL90-01B

ALL MAIN TURBINES - EMERGENCY LUBRICATING OIL

NUCLEAR ELECTRIC INSURANCE LIMITED
BOILER & MACHINERY LOSS CONTROL BULLETIN

NEIL Loss Control Bulletins deal with matters vital to Boiler & Machinery Loss Control and are issued (1) to introduce new Boiler & Machinery Loss Control subjects, (2) for clarification of existing NEIL Boiler & Machinery Loss Control Standards, or (3) to provide interim guidance.

I. TITLE:

All Main Turbines - Emergency Lubricating Oil

II. BACKGROUND:

The knowledge gained from the review of this failure can be applied to Member plants and may result in reduction of damage potential and increase unit reliability. This Loss Control Bulletin concerns damage to a main turbine-generator's shaft bearings due to a failure of the turbine seal oil backup pump (SOBP), the AC turbine bearing oil pump (BOP) and the emergency bearing oil pump (EBOP) to have a positive suction head when they were started due to a turbine trip.

III. GENERAL DISCUSSION:

The root cause of the turbine trip was a clogged lubricating oil strainer, feeding oil to the Lovejoy speed controller for the "A" steam generator feedwater pump turbine.

The strainers are changed each 4 to 6 hours of operation after placing in service; as experience has shown, the new filters will clog due to the release of filter fibers (loose filter media).

At 0600, a trouble alarm indicated the speed controller had a clogged strainer. The "A" speed-controller strainer was shifted and cleaned prior to 0730.

At 1013, a trouble alarm was received indicating a clogged strainer on the "A" speed controller. The "A" turbine was immediately started, slowing, allowing pump discharge pressure to drop from 1039 psig to 678.5 psig in approximately 35 seconds.

The "B" pump increased to maximum flow to compensate for the decreasing flow from "A". Manual control of the "B" pump was assumed by operations to ensure maximum flow. "A" pump started to increase in speed and discharge pressure from 689.3 psig to 1129 psig in approximately 53 seconds. The increase in speed and discharge pressure of the "A" pump required more suction flow to be supplied.

The booster pump suction pressure dropped low enough to auto-start the standby hot-well pump. The standby hot-well pump failed to auto-start. The condensate booster pump did not auto-start until after both the "A" and "B" main feed pumps had tripped on low suction pressure, which generated a main turbine trip and reactor trip.

Approximately 5 minutes after the main turbine trip, the turbine seal oil backup pump (SOBP), AC turbine bearing oil pump (BOP) and the emergency bearing oil pump (EBOP) auto-started. There was negligible discharge pressure from the BOP and the EBOP.

The main turbine lift pump auto-started when the turbine speed reached approximately 600 RPM. Lubricating oil was blowing from the main generator at this time. The hydrogen was manually vented to prevent leakage into the turbine building in the event generator seals were lost.

At approximately 20 minutes into the trip, operations turned off the EBOP and tried to bump-start it, to no avail. A zero psig signal was received in the control room for low main turbine bearing oil pressure.

At approximately 24 minutes after the trip, the BOP was bump-started and a normal discharge pressure established. The main turbine indicated zero speed at approximately 39 minutes after the trip. Attempts to place the turbine on the turning gear failed.

Inspection revealed all turbine and generator shaft bearings were damaged.

IV. CONCLUSIONS:

It could not be determined how excessive sludge instantaneously clogged the Lovejoy speed-controller strainer on the "A" feed pump turbine.

It was determined the reason for the BOP and EBOP not developing a discharge pressure was due to the pumps being air-bound.

Previous concerns by the member resulted in the installation of a 1/4-inch vent line from the pump cavity into the air space above the oil reservoir.

After this occurrence, the vent line has been increased to 1/2-inch in size. Additionally, a procedure requiring a vacuum pump to pull a full flow of oil through the EBOP once each week has been developed.

A dismantle inspection of the BOP and the EBOP did not indicate any mechanical or physical deficiencies with the pumps.

VI. GUIDANCE:

1. The availability of the AC turbine bearing oil pump and the emergency bearing oil pump should be verified at least once per fuel cycle, as required by B&M Standard IV.D.2.b.7.

2. Each Member should review current station procedures to ensure adequate testing and verification is followed to ensure that availability of the AC turbine bearing oil pump and the emergency bearing oil pump.

3. Each Member should review current station procedures to insure adequate testing and verification is followed to assure the availability of the hot-well and the condensate pumps.

SECTION 8-4E BULLETIN NEIL90-01B

REACTOR PRESSURE VESSEL THERMAL SHIELDS IN PWRs

NUCLEAR ELECTRIC INSURANCE LIMITED
BOILER & MACHINERY LOSS CONTROL BULLETIN

NEIL Loss Control Bulletins address matters vital to loss control and are issued (1) to introduce new loss control subjects, (2) to clarify existing loss control standards, (3) to provide interim guidance or (4) to provide information concerning losses or other significant events.

I. TITLE:

Reactor Pressure Vessel Thermal Shields In PWRs.

II. BACKGROUND:

A. A PWR, owned and operated by a Member Utility, was shutdown for a scheduled refueling outage. An inspection of the reactor vessel revealed damage to the core barrel and thermal shield due to the failure of the shield supporting pins and positioning pin lock bar.

The unit was shutdown for forth-eight (48) weeks to remove the thermal shield and to repair to the core barrel.

B. A PWR, owned and operated by a Member Utility, was shutdown for a scheduled refueling outage and to inspect for suspected damage to the thermal shield (based on experience gained from Background Item A). Significant damage to the thermal shield was discovered and the major portion of the shield had shifted from its normal position on the core support barrel, and broken pieces were found at the bottom of the reactor.

The unit was shutdown for thirty-one and one half (31.5) weeks to remove the thermal shield and to repair the core barrel.

C. A PWR, owned and operated by a Member utility, was in a coast down preparatory to a scheduled refueling outage when it became apparent that fuel rods had been damaged.

Internal inspection of the reactor vessel revealed that numerous fuel rods had suffered impact damage by metal flakes and debris, presumably resulting from work done to the thermal shield attachment devices during the previous refueling outage.

Anticipated outage length is approximately twenty-nine/thirty (29/30) weeks, during which time reconstitution of a major portion of the fuel core will be necessary, along with removal of the thermal shield. The fuel reconstitution effort became the critical path.

III. GENERAL DISCUSSION:

In reviewing the circumstances of these incidents, it is evident that, in each case, the incident resulted from damage and/or repairs to the thermal shields and supports. All of these have resulted n claims against the NEIL I Program.

Based on the NEIL I loss history, the NEIL Boiler & Machinery Subcommittee have been asked to review potential NEIL I exposures due to thermal shields. The Boiler & Machinery Subcommittee have reviewed each incident discussed in the background section, along with the results of the Boiler & Machinery evaluations.

Since the first occurrence, some PWR owners have elected to operate PWR's without a thermal shield, and no adverse conditions have been reported as a result of these decisions.

IV. CONCLUSIONS:

A. Recent NEIL Boiler & Machinery Evaluations of fifty-eight (58) PWR units showed that forty-six (46) had thermal shields installed. Of these, only seven (7) units were performing inspections on the thermal shields each fuel cycle.

B. The configuration of the lower portion of some shields may not be accessible for remote visual inspection.

The following are being considered:

1. Revise the mandatory NEIL Boiler & Machinery inspection Standards to require thermal shield inspections each fuel cycle;

2. Propose to the NEIL Insurance Advisory Committee that some underwriting consideration (i.e. premium adjustments, adjustments of the deductible period, etc.) be given to those units with thermal shields installed.

V. RESPONSE:

A. Please complete and return the attached questionnaire no later than Friday, May 25, 1990.

NUCLEAR ELECTRIC INSURANCE LIMITED
PWR THERMAL SHIELD QUESTIONNAIRE

INTRODUCTION

Over the past several years, three claims have been made against the NEIL I Program associated with outages resulting from damage and/or repairs to PWR thermal shields and their supports. The Engineering Advisory Committee's Boiler & Machinery Subcommittee was asked to review the thermal shield issue to determine if plants with thermal shields significantly increase NEIL's exposure to loss.

The Subcommittee is considering whether provisions should be made to the minimum B&M Inspection Standards to require thermal shield inspections each fuel cycle and whether to recommend additional underwriting considerations for those units with thermal shields installed. However, prior to taking that step, the Subcommittee would like to obtain input from the NEIL Membership on existing inspection programs and their effectiveness.

The following questions are directed to all NEIL Members, not just those who operate PWR's with thermal shields installed.

QUESTIONS

1. Does your company operate a PWR unit(s) with a thermal shield installed in the reactor vessel?

   YES ( ) NO( )

   If NO, proceed to Question 5.

   If YES, go to Question 2.

2. Briefly describe the types of inspections currently being carried out on the thermal shield and supports and the frequency of such inspections.

   Frequency

   _____

   _____

3. Are there areas of the thermal shield supports which cannot be inspected using the above methods?

   YES ( ) NO( )

   If YES, please comment.

   _____

   _____

4. Have previous inspections discovered damage to the thermal shield or supports which require repairs?

   YES ( ) NO( )

   If YES, please describe.

   _____

   _____

5. Given the loss history, do you feel that NEIL should consider:

   a. Adopting mandatory inspection requirements for thermal shields?

      YES ( ) NO( )

   b. Applying additional underwriting (i.e. premium adjustments, deductible period adjustments, etc.) for units with thermal shields installed?

      YES ( ) NO( )

   Please comment.

   _____

   _____

   _____

Completed by:

Name _____

Company _____

Date _____

Please return this questionnaire no later than Friday, May 25, 1990 to:

Gregory Wilks
NUCLEAR ELECTRIC INSURANCE LIMITED
1201 Market Street, Suite 1200
Wilmington, DE 19801

QUESTIONS? - CALL 302 - 888 - 3000 (FAX - 302 - 888 - 3008)

SECTION 8-4F BULLETIN NEIL90-02B

EXCITER RETAINING RINGS

NUCLEAR ELECTRIC INSURANCE LIMITED
BOILER & MACHINERY LOSS CONTROL BULLETIN

NEIL Loss Control Bulletins deal with matters vital to Boiler & Machinery Loss Control and are issued (1) to introduce new Boiler & Machinery Loss Control subjects, (2) for clarification of existing NEIL Boiler & Machinery Loss Control Standards, or (3) to provide interim guidance.

I. TITLE:

Exciter Retaining Rings

II. BACKGROUND:

During a recent outage involving a non-NEIL insured unit at a Member Company's fossil plant, the air cooled GE Alterrex Exciter was disassembled and inspected. This was the first inspection conducted since 1982. Defects were discovered on both the collector end and turbine end retaining rings. Information supplied by the manufacturer indicated that the rings were magnetic; however, testing revealed that the retaining rings were actually constructed of an 18Mn-5Cr non-magnetic alloy.

III. GENERAL DISCUSSION:

Inspections done with the rings in place and following removal of the rings by GE showed multiple stress-assisted elongated pit clusters and single point defects on both the OD and ID surfaces. No cracks were identified.

The defects were removed through sanding and polishing, and analysis determined that the exciter rings should have a service life of a least three years after removal of the flaws. The utility plans to replace the retaining rings with rings fabricated from the more corrosion resistant 18Mn-18Cr material in late 1991.

IV. CONCLUSIONS:

A. Manufacturer information on Alterrex exciter retaining rings, including those at NEIL insured plants, may be incorrect.

B. Application of 18Mn-5Cr retaining ring materials in uncontrollable environments, such as air cooled exciters, should be avoided. These materials have been shown to be susceptible to pitting and stress corrosion cracking in moist environments.

V. GUIDANCE:

A. NEIL Member plants with GE Alterrex Exciters should inspect the exciter retaining rings at the next available opportunity to determine the material of construction.

B. Detailed inspection techniques should be employed to identify defects on exciter retaining rings found to be constructed of non-magnetic or 18Mn-5Cr materials.

3. Replacement rings, if required, should be fabricated from a more corrosion resistant material (i.e.: 18Mn-18Cr).

No formal response to this Bulletin is required.

SECTION 8-4G BULLETIN NEIL91-01B

REACTOR POLAR BRIDGE CRANE PINION GEAR

NUCLEAR ELECTRIC INSURANCE LIMITED
BOILER & MACHINERY LOSS CONTROL BULLETIN□

NEIL Loss Control Bulletins deal with matters vital to Boiler & Machinery Loss Control and are issued (1) to introduce new Boiler & Machinery Loss Control subjects, (2) for clarification of existing NEIL Boiler & Machinery Loss Control Standards, or (3) to provide interim guidance.

I. TITLE:

Reactor Polar Bridge Crane Pinion Gear

II. BACKGROUND:

This bulletin concerns damage to a drum pinion gear of a Member's reactor polar bridge crane due to lack of lubrication between the gear teeth.

III. GENERAL DISCUSSION:

During the Member's inspection of the reactor polar bridge crane, the manufacturer's technical representative noted abnormal drum pinion gear tooth wear and powdering of five of the fifteen gear teeth. The root cause of the abnormal pinion gear tooth wear was considered to be lack of lubrication between the gear teeth. The loss of the lubrication film enabled the face of the gear teeth to come in direct metal to metal contact and galling ensued. It was noted that the crane is blocked with the same gear teeth meshed, and in the same position, after each use. The periods between operation could be as long as 18 months.

IV. CONCLUSIONS:

The Member determined that the lack of lubrication between gear teeth allowed metal to metal contact, and galling ensued. If allowed to continue, the galling would build up creating a stress point at the build up, and then be wiped by the sliding contact of the gears. This build up and removal of material has the potential to change the profile of the gear teeth which will increase the sliding effect and subsequent wearing of the gear teeth. The prolonged periods between operation may have contributed to the lack of lubrication.

V. GUIDANCE:

A. NEIL Member plants with reactor polar bridge cranes should inspect them before and after use for an even lubrication film on the gear teeth.

B. Each Member should review current station procedures to ensure that adequate inspection and preventive maintenance techniques are employed for the reactor polar crane.

No formal response to this Bulletin is required.

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SECTION 8-4H BULLETIN NEIL91-02B

DISTRESS OF ROTOR TOOTH TOPS IN INNER-COOLED GENERATOR ROTORS

NUCLEAR ELECTRIC INSURANCE LIMITED
BOILER & MACHINERY LOSS CONTROL BULLETIN□

NEIL Loss Control Bulletins deal with matters vital to Boiler & Machinery Loss Control and are issued (1) to introduce new Boiler & Machinery Loss Control subjects, (2) for clarification of existing NEIL Boiler & Machinery Loss Control Standards, or (3) to provide interim guidance.

I. TITLE:

Distress of Rotor Tooth Tops of Inner-Cooled Generator Rotors.

II. BACKGROUND:

During a recent generator dismantle inspection at a Member plant, the rotor retaining rings were removed and cracking was discovered in the fillet area of the rotor tooth "Tee Heads". The generator was manufactured by Westinghouse and has been in commercial operation since 1971.

The manufacturer has reportedly issued guidance to utilities with units of similar design which included suggested methods of repair and modifications to reduce the possibility of further cracking.

III. GENERAL DISCUSSION:

Generator rotor tooth top cracking has been discovered in the fillet area of the rotor tooth "Tee Head" under the retaining ring nose. This problem reportedly affects certain specific designs and can occur after a few hundred to several thousand start-stop cycles. Alternating stress from compression when the rotor is at rest, to stress from tension at speed, may cause fatigue cracking. As noted above, the number of start-stop cycles required for crack initiation could vary considerably, depending on rotor configuration.

Examination by ultrasound with the retaining ring in place will not normally determine if cracking has started due to geometric configurations. Although cracking areas are fully contained under the retaining rings, eliminating the possibility of catastrophic failure, crack propagation can possibly lead to a forced outage and major repairs due to rotor grounds or structural failure.

IV. GUIDANCE:

Generator rotor tooth top cracking could lead to failure of the tooth tops at the tee head. Although not catastrophic in nature, such a failure could result in costly repairs.

No formal response to this Bulletin is required.

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SECTION 8-4I BULLETIN NEIL92-01B

LOW PRESSURE TURBINE FAILURE DUE TO TURBINE GENERATOR TORSIONAL VIBRATION RESPONSE

NUCLEAR ELECTRIC INSURANCE LIMITED BOILER & MACHINERY LOSS CONTROL BULLETIN□

NEIL Loss Control Bulletins address matters vital to loss control and are issued (1) to introduce new loss control subjects, (2) to clarify existing Loss Control Standards, (3) to provide interim guidance or (4) to provide information concerning losses or other significant events.

I. TITLE:

Low Pressure Turbine Failure due to Turbine-Generator Torsional Vibration Response

II. BACKGROUND:

In 1991, the Boiler & Machinery Subcommittee of the NEIL Engineering Advisory Committee, in reviewing potential risks to the NEIL I Program, identified Turbine- Generator Torsional Vibration Response as an area of particular interest.

In an effort to assess the probability of a significant loss due to Turbine-Generator Torsional Vibration Response, the Subcommittee developed and distributed a questionnaire to the NEIL Member Utilities. The questions were designed to obtain information on how many Member plants were aware of the turbine generator failure at Taiwan Power's Maanshan Unit 1, if any torsional vibration tests or evaluations had been recommended by their turbine vendor, and if any had been conducted. Responses were received from 67 of the 71 Member plants insured in the NEIL I and NEIL II Programs. The purpose of this bulletin is to inform the NEIL Member utilities of the Turbine Generator Torsional Vibration Questionnaire results.

Note: *A copy of the completed Questionnaire(s) pertaining to your Company's plant(s) is attached. If no Questionnaire was returned, a blank copy of the Questionnaire is included.*

III. DISCUSSION:

Analysis of the Questionnaire responses and comments revealed the following:

+ Of the 28 plants that reported actually testing their machines, six needed to perform modifications to move natural resonant frequencies away from the critical frequency range.

+ 18 of the responding plants indicated that calculations or analysis had determined their machines were not susceptible to this mode of failure.

+ Two (2) plants reported that the OEM had recommended torsional testing; however, such testing has not yet been conducted, but NDE of the last stage bucket finger dovetails and exciter shaft had revealed no cracking.

+ One (1) plant reported that the OEM had done analysis and recommended testing and possible modification to separate natural frequencies from the critical frequency range, and the plant was still evaluating the recommendation.

+ One (1) plant reported that the manufacturer had conducted analysis on a similar design, but not on the particular last stage blade length in their turbine.

IV. CONCLUSION:

During its last meeting, the B&M Subcommittee reviewed the questionnaire responses and determined that the potential for a NEIL loss due to torsional vibration response is relatively low, but if an incident were to occur, it would be significant, and therefore, a concern to NEIL. The Subcommittee also suggested that the most probable event to initiate this type of loss would be a single phase fault.

The Subcommittee agreed that plants which had conducted torsional vibration testing or demonstrated through analysis that their machines were not susceptible to this type failure probably posed less exposure of loss, and should somehow be recognized. One suggestion was for NEIL to take some underwriting action in an effort to place all plants on an equal risk basis.

This issue was further discussed by the EAC's Executive Committee during its meeting in October, 1992, and it was agreed that due to the low probability of such an event, a recommendation for underwriting action in the form of coverage limitations or increased premiums would be inappropriate. However, the Executive Committee agreed with the Subcommittee that some recognition of reduced loss potential should be made for those plants which had demonstrated that their turbine generators were not susceptible to this failure mode. The B&M Subcommittee was charged with developing a proposal to modify the Boiler & Machinery Credit Program to include additional premium credit for such plants. The Subcommittee will undertake this project during the upcoming year with the goal of having a new credit item in place for the 1994 policy renewal.

V. INTERIM GUIDANCE

None at this time.

NUCLEAR ELECTRIC INSURANCE LIMITED
TURBINE - GENERATOR QUESTIONNAIRE

PLANT: _____

COMPLETED BY (NAME): _____ DATE _____

INTRODUCTION

The Boiler & Machinery Subcommittee of the NEIL Engineering Advisory Committee is currently reviewing potential risks to the NEIL I Program, and has identified turbine generator torsional vibration response as one are of particular interest. In 1985, a nuclear turbine-generator unit operated by the Taiwan Power Company experienced a catastrophic failure. Investigations concluded that the most probable cause was excitation resulting from grid imbalances which was sufficient to induce enough torsional vibration energy to cause cracking in the low pressure turbine bucket finger pin dovetails. A brief description of that incident is provided below.

BACKGROUND

In July, 1985, Maanshan Unit 1, a 950 MWe Pressurized Water Reactor Plant in commercial operation for less than one year, suddenly tripped. The whole building was sensed to be shaking heavily and a plant operator rushed to the turbine deck and discovered a fire between the generator and exciter. After two hours, the fire was extinguished and investigations into the cause and extent of the damages were initiated.

The manholes of the low pressure turbines were opened and when plant personnel entered the LP outer casing they found that eight last stage buckets at the generator end of the LP-B turbine were missing. This discovery led to a complete disassembly of the turbine-generator for inspection. The major damage discovered included the following:

- Some buckets on the HP Rotor were damaged by rubbing.
- Both LP Rotors were seriously damaged.
- Inner and outer cylinders of both LP Turbines were damaged.
- All bearings were seriously damaged.
- The lower part of the generator frame was distorted due to overheating.
- All the main lead bushings were broken.
- All main lead connectors and associated current transformers were damaged.
- The neutral bus was damaged.
- The stator and field were sooted.
- The exciter-end seal oil ring was damaged.
- The exciter shaft was broken into two parts inboard of the No. 9 journal bearing.
- The exciter stator and field were extensively burnt.
- Four sets of rectifiers were extensively burnt.
- The exciter enclosure and parts inside were extensively burnt.
- Eleven instruments were damaged.
- Extensive replacement of conduit and cable was also required.

The initiating event for this incident was determined to be the breaking off or one more last stage buckets from the generator end of the low pressure "B" turbine. Severe imbalance and high vibration resulted in serious rubbing between rotating and stationary parts, which caused the extensive damage.

Based on the results of several independent metallurgical analyses and other investigations, the failure was determined to be from fatigue of the bucket material. In order to determine the root cause of the failure, investigations of operation, maintenance, design and manufacture of the machine were conducted and a list of possible causes were identified. It was concluded that the most plausible cause of the fatigue failure of the bucket material was torsional resonance at the natural frequency of the unit's shaft system due to grid imbalances. The Maanshan Unit 1 turbine- generator was supplied by General Electric Company, with a rated output of 952 MWe. The turbine is a tandem-compound, four flow unit, consisting of three sections: a double flow high- pressure section and two double flow low-pressure sections. The original generator was a 4-pole, Y-connected and directly coupled to the turbine. Stator core and field were hydrogen cooled and stator windings were water cooled.

QUESTIONS

To assist the Subcommittee in the review of the turbine-generator related issues, the following information is requested:

1. Are plant personnel responsible for the operation of the turbine generators at your Company plant(s) familiar with the details and the root cause of the Maanshan Unit 1 incident?

   YES ( ) NO( )

2. If you answered YES to Question 1., have any evaluations or torsional resonance tests been conducted at your Company's plant(s) to determine if your turbine generator unit(s) are potentially susceptible to a similar failure mode?

   YES ( ) NO( )

   If YES, please describe the evaluation or testing which was done, and summarize the results:

   _____
   _____
   _____

3. If you answered NO to Question 1., do you plan to obtain information on the failure and conduct appropriate failure mode screening evaluations or tests at your Company plant(s)?

   YES ( ) NO( )

   If NO, please explain:

   _____
   _____

Please return the completed questionnaire no later than Friday, January 17, 1992 to:

Thomas McCaskill
Nuclear Electric Insurance Limited
1201 Market Street, Suite 1200
Wilmington, DE 19801

Questions? Phone: (302 - 888 - 3000)
Fax: (303 - 888 - 3008)

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SECTION 8-4J BULLETIN NEIL93-01B

FUEL POOL CHEMISTRY

NUCLEAR ELECTRIC INSURANCE LIMITED
BOILER & MACHINERY LOSS CONTROL BULLETIN

NEIL Loss Control Bulletins deal with matters vital to Loss Control and are issued (1) to introduce new Loss Control subjects, (2) for clarification of existing NEIL Loss Control Standards, or (3) to provide interim guidance.

I. TITLE:

Fuel Pool Chemistry

II. BACKGROUND:

In 1991 the Engineering Advisory Committee (EAC) of the Members of NEIL conducted a survey of the Member Utilities to determine what procedures are currently in place for testing of fuel pools for radioactivity concentrations and for "CRUD" levels. The results of this survey indicated a wide variation in the sampling frequencies and acceptable limits for radioactivity and "CRUD" levels among the Members. This variation is probably due to the fact that there are few regulatory requirements concerning fuel pools, except for the visual clarity requirement.

The Fuel Handling Subcommittee of the EAC has noted that there could be a significant loss exposure to NEIL from contamination clean-up, in the event of an incident involving the fuel pool. The probability of a significant loss is constantly increasing as the amount of spent fuel stored in the pools is also increasing.

III. GENERAL DISCUSSION:

The NEIL EAC is considering the establishment of Standards addressing:

Maximum fuel pool water gross activity levels (beta-gamma).
Maximum fuel pool "CRUD" levels (ppb).
Minimum sampling frequencies to determine radioactivity / CRUD levels.

Specific sampling frequencies and acceptable levels will be determined based on Members responses and on values that are acceptable to NEIL.

Those plants not meeting minimum requirements may be subjected to a rating penalty.

IV. MEMBER ACTIONS:

Members are requested to submit to NEIL recommended minimum sampling frequencies and acceptable limits for radioactivity and "CRUD" levels in the spent fuel pool.

NUCLEAR ELECTRIC INSURANCE LIMITED
FUEL POOL CHEMISTRY QUESTIONNAIRE

UTILITY: _____

STATION: _____

COMPLETED BY: _____

TELEPHONE NUMBER: _____

Please complete this questionnaire regarding fuel pool chemistry and sampling requirements.

1. What should be the maximum gross activity levels (beta-gamma) in the spent fuel pool water?

2. How often should the spent fuel pool be sampled to determine the gross activity level?

3. What should be the maximum "CRUD" levels in the spent fuel pool water?

4. How often should the spent fuel pool be sampled to determine the "CRUD" level?

5. Is there any other analysis that should be performed on a routine basis on the spent fuel pool water? What analysis and how often should the analysis be performed?

USE REVERSE OR ADDITIONAL SHEETS AS NECESSARY TO RESPOND.

PLEASE RETURN THE COMPLETED QUESTIONNAIRE NO LATER THAN DECEMBER 15, 1993 TO:

RICHARD C. STACEY
NUCLEAR ELECTRIC INSURANCE LIMITED
1201 MARKET STREET, SUITE 1200
WILMINGTON, DE 19801

QUESTIONS? CALL (302) 888 - 3000
FAX (302) 888 - 3095

SECTION 8-4K BULLETIN NEIL93-02P

ON-SITE RADWASTE AND SPENT FUEL STORAGE

NUCLEAR ELECTRIC INSURANCE LIMITED
PROPERTY LOSS CONTROL BULLETIN

NEIL Loss Control Bulletins deal with matters vital to Loss Control and are issued (1) to introduce new Loss Control subjects, (2) for clarification of existing NEIL Loss Control Standards, or (3) to provide interim guidance.

I. TITLE

On-Site Radwaste And Spent Fuel Storage

II. BACKGROUND

With the uncertainty of available off-site radwaste disposal sites, nuclear power generation stations are being required to address the issue of providing on-site storage facilities for low and high level radwaste. In addition, stations are also being required to address the issue of on-site fuel storage when their spent fuel pools become full.

III. GENERAL DISCUSSION

In light of these issues, the NRC has addressed this issue in Generic Letter 81-38, Storage Of Low-Level Radioactive Wastes At Power Reactor Sites. Generic Letter 81-38 was the basis for a EPRI study, EPRI TR-100298s Vol. 2, Part 1, Interim On-Site Storage Of Low Level Waste. The NRC further expanded on the need to store low-level radwaste on-site in Information Notice 90-09, Extended Interim Storage Of Low-Level Radioactive Waste By Fuel Cycle And Materials Licensees.

These documents discussed at length certain conditions and criteria that should be met to minimize the risk of on-site storage. The NEIL Engineering Advisory Committee (EAC) has reviewed these documents with particular emphasis on the possible on-site consequences of a fire involving such materials or other potential site contamination scenarios.

In general, the EAC feels that these documents sufficiently cover most areas of concern, and that if a station meets the intent of the items covered in the NRC and EPRI documents, the insurable risk would be acceptable.

IV. CONCLUSION

To ascertain that all items of concern have been adequately addressed, the EAC has asked the NEIL staff to gather information on how Member plants are addressing the issue of on-site radwaste and spent fuel storage.

While the NEIL Property Loss Control Standards continue to be the basis for insurance compliance, storage configurations which are determined to significantly increase insurance risks will be reviewed on a case-by-case basis, and may be subject to additional requirements. Such situations

will be discussed in detail with the affected Member so that a mutually agreeable solution can be established.

In keeping with the EAC's desire to gather information from the Members regarding on-site radwaste and spent fuel storage, the attached questionnaire has been developed. The questionnaire should be completed and returned to NEIL no later than November 30, 1993.

NUCLEAR ELECTRIC INSURANCE LIMITED
ON-SITE RADWASTE AND SPENT FUEL STORAGE
QUESTIONNAIRE

UTILITY: _____

STATION: _____

COMPLETED BY: _____

TELEPHONE NUMBER: _____

Please complete this questionnaire regarding your on-site radwaste and spent fuel storage plans.

1. Has your station addressed NRC Generic Letter 81-38 and Information Notice 90-09? If so, please attach any written comments, responses and internal resolutions to the above documents.

2. Does your station have a plan for low and high level radwaste storage. If so, please attach a copy of the plan.

3. If YES to No. 3, does the station plan to address the possible effects of natural hazards (i. e., hurricane, tornado, earthquake, etc.) on the storage arrangement?

4. Does the station plan to have or currently have on site storage of spent fuel outside the spent fuel pool? If so, please attach a copy of any documents detailing to storage arrangement.

PLEASE RETURN THE COMPLETED QUESTIONNAIRE NO LATER THAN DECEMBER 15, 1993 TO:

WAYNE R. SOHLMAN
NUCLEAR ELECTRIC INSURANCE LIMITED
1201 MARKET STREET, SUITE 1200
WILMINGTON, DE 19801

QUESTIONS? CALL (302) 888 - 3000
FAX (302) 888 - 3095

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SECTION 8-4L BULLETIN NEIL93-03P

PLANT DECOMMISSIONING

NUCLEAR ELECTRIC INSURANCE LIMITED
PROPERTY LOSS CONTROL BULLETIN

NEIL Loss Control Bulletins deal with matters vital to Loss Control and are issued (1) to introduce new Loss Control subjects, (2) for clarification of existing NEIL Loss Control Standards, or (3) to provide interim guidance.

I. TITLE

Plant Decommissioning

II. BACKGROUND

Several NEIL Members have units that are either in the decommissioning stage or will be entering the decommissioning process.

Plant decommissioning, by its nature, could increase the potential for a property loss.

III. GENERAL DISCUSSION

Prior to a plant entering the decommissioning stage, plans need to be developed to assure that the existing property loss control program is carried forth. Decommissioning carries with it hazards similar to those encountered during plant construction.

While it is recognized that insurable values may be reduced during the decommissioning phase, the potential for contamination requiring significant clean-up could result in a substantial loss.

The NEIL Property Loss Control Standards need to be strictly adhered to in order to reduce the loss potential.

IV. INTERIM GUIDANCE

The following items need to be identified and addressed by the NEIL Member when they are decommissioning a unit or site:

A. Fire Brigade Organization and Response - This would include maintaining a station fire brigade in accordance with NEIL and NRC requirements. Fire response plans utilizing off-site fire suppression organizations in accordance with the NEIL Property Loss Control Standards, Appendix III.A.1.d would need to be addressed.

B. Combustible Loading - Increases in combustible loading in power block areas needs to be addressed. This would include both storage and staging areas. Procedures addressing transient combustible loading would need to be adhered to.

C. Cutting, Welding, and Grinding - The station's cutting and welding program needs to be continued to reduce the potential for a loss.

D. Fire Protection Systems - Fire suppression systems need to be operable as long as the hazard exists. This would include sprinkler, Halon, carbon dioxide, dry chemical systems along with hose stations. Testing, maintenance, and inspections must be carried on in conjunction with the applicable NEIL Property Loss Control Standards.

Detection systems need to be maintained in all areas where hazards exist.

Before any fire suppression and detection system is permanently shut down, an ACCEPTABLE evaluation needs to be made and discussed with NEIL.

E. Dismantling Support - Evaluations need to be made regarding trailer placement, the use of tarpaulins, and plastic sheeting.

F. Reporting Requirements - Fire suppression system impairments would need to be reported to NEIL as required by the NEIL Property Loss Control Standards. Systems taken out of service permanently need to be reported to NEIL.

G. Watchman Services - A fire watch program needs to be in effect in accordance with the NEIL Property Loss Control Standards. Fire watches are to be assigned as indicated in the plant procedures. Surveillance tours need to be conducted in unoccupied plant areas.

SECTION 8-4M BULLETIN NEIL94-01B

OUTDOOR TURBINE GANTRY CRANE DAMAGE DUE TO UNEXPECTED HIGH WINDS

NUCLEAR ELECTRIC INSURANCE LIMITED
BOILER & MACHINERY LOSS CONTROL BULLETIN

NEIL Loss Control Bulletins deal with matters vital to Boiler & Machinery Loss Control and are issued (1) to introduce new Boiler & Machinery Loss Control subjects, (2) for clarification of existing NEIL Boiler & Machinery Loss Control Standards, or (3) to provide interim guidance.

I. TITLE:

Outdoor Turbine Gantry Crane Damage due to Unexpected High Winds

II. BACKGROUND:

In mid-1993, the outdoor Turbine Gantry Crane at a Nuclear Electric Insurance Limited Member plant was removed from service for maintenance. The crane was moved from its normal Stop Lock position to an area where the motors could be removed, and then secured with a five eighths inch (5/8") steel choker type sling and come-a-long to a beam on the Turbine Deck. Several days after the crane was relocated, a wind storm came up and caused it to move. The securing sling broke and the crane traveled down the tracks until it hit the runaway stops at the other end of the Turbine Deck. Both runaway stops sustained severe damage and had to be replaced before the crane could be operated again.

III. GENERAL DISCUSSION:

When reviewing this incident, it was determined that maintenance personnel felt that necessary precautions had been taken to ensure the scheduled maintenance on the crane would be completed safely and within a reasonable time. The maintenance was planned and before commencing work, a pre-job briefing was held for personnel involved to discuss the job. The need to move the crane from the Stop Lock position, "take a clearance" for removal of the motors, the need to secure the crane, and the possibility of high wind were all discussed during the pre-job briefing.

There were no plant procedures or instructions for securing the crane for maintenance, nor any requirement to return it to the Stop Lock position, with the exception of the plant's Adverse Weather Condition procedure. The maintenance crew (from an off-site group) could not locate any instructions on crane securing, and were told by plant maintenance personnel that the come-a-long and choke cable securing method was common practice. The maintenance crew did not find it necessary to move the crane back to the Stop Lock position after the motors were removed, as there was a clearance and it was secured with the sling and come-a-long.

Immediately after the incident, the maintenance crew was recalled to the plant and the crane was anchored in place where it had stopped with six come-a-longs and four C-clamps. The following day the crane was moved to its normal idle position and secured with the installed Stop Locks and four come-a-longs.
The investigation conducted after the Incident revealed the following:

- The steel choke cable was determined to be 1/2 inch instead of 5/8 inch as originally thought by the maintenance crew. However, the choker failed due to fretting from the crane moving and not from exceeding its breaking strength.

- The come-a-long had been attached to a seismic support for the Main Steam System. Maintenance personnel felt that since there was no tension being applied to the support, there should be no concern. Following examination of the structure and the failed choker cable it was concluded that the support was seismically operable at all times.

- When the motors are removed from the crane, the Hydraulic Brake System is disabled. However, the crane has a Rail Clamp System that is designed to activate after crane motion is stopped for over 30 seconds or if power is lost. The Rail Clamp System is designed to apply 40,400 pounds of drag resistance, and although this is not considered adequate to hold the crane during a high wind condition, it should apply sufficient drag to slow movement considerably.

- The Rail Clamp System apparently did not operate as designed because the shock absorbers at the end of crane traveled full stroke and the crane was moved with a Fork Lift with the power off. Subsequent investigation revealed that the clamps were so badly worn that they were not in contact with the rails. The top rail rubbing surface had to be built up about 3/4 inch and the side rubbing surfaces had to be built up 3/4 to 1-1/4 inches. The Rail Clamp System was not included in the plant's Preventive Maintenance Program.

- Wind direction at the time the crane moved was from directly down the tracks to about 50 degrees off the tracks. Wind speed reached 42 - 46 miles per hour.

IV. CONCLUSIONS:

No claim was made as a result of this Incident and the estimated repair costs did not exceed the $100,000 physical damage Incident Reporting requirement identified in the NEIL Implementation Program. However, had the runaway stops at the end of the rails failed, the crane could have toppled off of the Turbine Deck resulting in substantial damage to the crane and equipment below. This Incident provides an example of the need to plan for and evaluate possible consequences when infrequent evolutions are conducted. While the need to secure the crane was considered, the adequacy of the securing method was not evaluated.

The Nuclear Electric Insurance Limited Boiler & Machinery Loss Control Standards contain general and specific requirements that were not observed during this incident. Specifically, the following was not observed:

Only equipment rated for the load "should" be used for lifting. Equipment "should" be identified by tags, vibro-etching, stamps or by another means of identifying safe working loads.

Due to lack of attached identification, the size of the sling used to secure the crane was misidentified by the maintenance crew. Although the sling in question was not used in a lifting operation, lack of proper identification resulted in an inappropriately sized sling being used.

V. GUIDANCE:

This Bulletin is intended to remind Member personnel that infrequently performed maintenance

operations could result in conditions that have not been adequately evaluated. Planning for such activities should include a detailed review and evaluation of circumstances that might become hazardous to plant personnel or equipment. Personnel familiar with equipment and their supervisors should review the adequacy of precautions taken to prevent such occurrences.

No formal response to this Bulletin is required.

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SECTION 8-4N BULLETIN NEIL95-01P (REVISED APRIL 2002)

APPLICATION OF THE FIRE PROTECTION SYSTEM TESTING MATRIX AND REQUIREMENTS FOR PERFORMANCE BASED INSPECTION/TESTING/MAINTENANCE PROGRAMS (APPENDIX 3.A.6)

NUCLEAR ELECTRIC INSURANCE LIMITED PROPERTY LOSS CONTROL BULLETIN

NEIL Loss Control Bulletins deal with matters vital to Property Loss Control and are issued (1) to introduce new Property Loss Control subjects, (2) for clarification of existing NEIL Property Loss Control Standards, or (3) to provide interim guidance.

Note: The material contained in this Loss Control Bulletin has been incorporated into NEIL Property Loss Control Standards, Appendix 3.A.6 effective March 2002.

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SECTION 8-4O BULLETIN NEIL95-01B

DISMANTLED INSPECTIONS OF THE MAIN TURBINE GENERATOR

NUCLEAR ELECTRIC INSURANCE LIMITED
BOILER & MACHINERY LOSS CONTROL BULLETIN□

NEIL Loss Control Bulletins address matters vital to loss control and are issued (1) to introduce new loss control subjects, (2) to clarify existing Loss Control Standards, (3) to provide interim guidance or (4) to provide information concerning losses or other significant events.

This bulletin is retired since robotic inspection was approved as an acceptable substitute for rotor out inspections of the main generator in March 2001.

I. TITLE:

Dismantled Inspections of the Main Generator.

II. BACKGROUND:

The NEIL Boiler & Machinery Standards requires a dismantled inspection be performed on the turbine-generator/exciter in accordance with industry practice, on a Shall frequency of no more than eight (8) calendar years. A new technology, involving robotic inspection of the generator, has been developed that does not require the removal of the rotor to perform an inspection of the generator internals. Several Members have requested use of this technology as a replacement for the required dismantled inspection.

III. DISCUSSION:

A review of documentation supplied by Members on the capabilities of robotic inspections was performed by the Boiler & Machinery Subcommittee. While the robotic inspection technique does offer some obvious advantages over a dismantled inspection (heavy lifts eliminated), the Subcommittee determined that while the technology has improved, it is still not comparable with a dismantled inspection. The review did not answer specific questions, such as:

1. Is the technique generic for all generators, or is it specific to particular models of the OEM?

2. Does the robotic inspection meet the warranty requirements of the OEM?

The review also concluded that in some specific cases, the robotic inspection technique may be useful in allowing an extension to the interval between dismantle inspections, provided additional inspections or tests are performed.

IV. INTERIM GUIDANCE:

Members may request an extension to the generator dismantled inspection frequency, in conjunction with the robotic inspection techniques, for one operating cycle past the eight (8) calendar year Shall requirement, under the following conditions:

1. A specific recommendation from the OEM, stating that the robotic inspection technique is applicable to that design of generator.

2. Results of a specific comparison of the data from a dismantle inspection and a robotic inspection of the generator. Variations in the data from the inspections must be adequately resolved.

3. Monitoring devices must be installed on the generator for:

   - Continuous On-Line diagnostic system
     OR
   - Continuous hydrogen gas monitoring for incipient generator faults
     AND
   - Radio- Frequency monitors
     AND
   - Generator end turn vibration monitoring
     AND
   - RTD's or thermocouples embedded in gas passages, or an installed and operating Pyrolysate System

   Extension of dismantle inspections will be handled on a case-by-case basis, after review of the above information.

   For more information , the Member should refer to Section **8-1G, Procedure for Handling Noncompliance With Shall Requirements** and **Section 8-2A Note B**.

V. RESPONSE:

No response is required.

SECTION 8-4P BULLETIN NEIL95-02B

TRANSFORMER CONTINUOUS DISSOLVED GAS-IN-OIL ANALYZERS

NUCLEAR ELECTRIC INSURANCE LIMITED
BOILER & MACHINERY LOSS CONTROL BULLETIN

NEIL Loss Control Bulletins address matters vital to loss control and are issued (1) to introduce new loss control subjects, (2) to clarify existing Loss Control Standards, (3) to provide interim guidance or (4) to provide information concerning losses or other significant events.

I. TITLE:

Transformer Continuous Dissolved Gas-in-Oil Analyzers

II. BACKGROUND:

Thermal and electrical stress will break down the dielectric fluids in transformers into a variety of combustible and noncombustible gases. These gases are indicative of developing faults in the transformer and their early detection will trigger the actions necessary to prevent costly equipment failures. Currently, there are various instruments and sensors that can continuously detect and monitor the evolution of fault gases in transformer insulating oils.

NEIL's B&M Loss Control Standards require routine sampling and laboratory analysis of the insulating oils for dissolved gas-in-oil every 9 months, as a minimum. The analysis of routine samples, with trending of results, is a good indication of the condition of the transformer. However, the availability of a continuous dissolved gas-in-oil detector, could give indications of a developing fault during the time between routine oil samples.

III. DISCUSSION:

During routine operator rounds at a Member plant, the operators noted an increase in the continuous dissolved gas-in-oil monitor readings. An oil sample was taken, and the acetylene level was 42 ppm, with hydrogen at 82 ppm. A confirmation sample taken the following day was at 43 ppm for acetylene, with hydrogen at 100 ppm. All other dissolved gas-in-oil results were normal. The unit was shut down, the oil was removed, and an internal inspection conducted. During the inspection, the fiberboard insulation between the core and the grounding device was found to be deteriorated. Flashover had been occurring between the grounding device and the windings. A denser insulation material was used to replace the fiberboard. The oil was processed and the transformer refilled.

Since the last routine oil sample was drawn for analysis six weeks prior to the identification of the elevated gas levels, absence of the continuous dissolved gas-in-oil analyzer would have allowed this condition to go undetected until the next routine sample 18 weeks later. This condition could have deteriorated to the point of catastrophic transformer failure.

IV. INTERIM GUIDANCE:

The installation of continuous dissolved gas-in-oil monitors on plant can transformers provide early detection of an impending fault in the transformer.

The NEIL B&M Subcommittee is reviewing this technology as a possible new credit item under the NEIL Boiler & Machinery Standards.

V. RESPONSE:

No response is required.

SECTION 8-4Q BULLETIN NEIL95-03B

DETERMINATION OF TURBINE GENERATOR NATURAL RESONANT FREQUENCIES DUE TO TORSIONAL VIBRATION

NUCLEAR ELECTRIC INSURANCE LIMITED
BOILER & MACHINERY LOSS CONTROL BULLETIN□

NEIL Loss Control Bulletins address matters vital to loss control and are issued (1) to introduce new loss control subjects, (2) to clarify existing Loss Control Standards, (3) to provide interim guidance or (4) to provide information concerning losses or other significant events.

I. TITLE:

Determination of Turbine Generator Natural Resonant Frequencies due to Torsional Vibration.

II. BACKGROUND:

NEIL's B&M Loss Control Standards(Turbine-Generator/Exciter-Operating) requires that:

Natural Resonant Frequencies due to Torsional Vibration response Shall be determined by testing or analysis, on the turbine-generator. If the natural response frequency is in the critical range of 118 to 122 Hz, the Member Shall take actions to separate natural frequencies from this critical frequency range or Shall provide the technical justification to NEIL why such actions are not necessary. Testing or analysis Shall be performed whenever a rotating element of the turbine-generator is replaced. Replacement of a "like kind" rotating element does not require testing or analysis.

The NEIL Engineering Advisory Committee's Boiler & Machinery Subcommittee recommended this requirement be added to the B&M Loss Control Standards, following review of information submitted by the Members in response to a questionnaire on this topic. The responses to the questionnaire are summarized in NEIL Loss Control Bulletin 92-01. The information submitted indicated that while some Members had performed actual testing and were in the critical range, no action had been taken to perform modifications to move the natural resonant frequencies away from the critical range. Other Members had indicated that calculations or analysis had determined their machines were not susceptible to the failure mode. Still other plants had indicated that neither a test nor analysis had been performed, and a small percentage were unaware of the torsional resonance phenomenon.

III. DISCUSSION:

During the current plant evaluation cycle, the NEIL Loss Control Representatives (LCR's) have been collecting unit specific torsional vibration response data. Based upon information obtained so far, for plants that have performed an analysis and subsequently conducted a test, there appears to be some significant inconsistencies between the calculated natural resonant frequencies and those determined by actual testing. In some cases, resonance calculated to exist at frequencies near 120 Hz could not be excited during the actual test. Table 1 compares calculated natural resonant frequencies to those obtained by testing for plants that have provided the information to date.

TABLE 1

PLANT	CALCULATED RESONANCE FREQUENCY (Hz)	TESTED RESONANCE FREQUENCY (Hz)	DIFFERENCE (Hz)
A	119.62	123.50	3.78
B	123.60	121.20	2.40
C	123.60	121.40	2.20
D	120.20	124.70	4.50
E	120.20	124.20	4.00
F	125.20	121.80	3.40
G	118.76	Note 1	---
H	119.71	Note 1	---
I	120.72	Note 1	---
J	123.10	122.50	3.60
K	120.74	119.38	1.36
L	119.99	120.50	0.06
M	119.76	118.60	1.16
N	117.80	118.10	0.30
O	120.46	121.10	0.64

Note 1: *Calculated value not excited during on-line or ramp testing.*

When the torsional vibration concern was identified several years ago, the testing developed to determine a unit=s susceptibility was thought by some to place the turbine generator unit in unnecessary jeopardy. In fact, a few plants experienced significant problems in conducting the test, and based on this and other concerns, several plants have indicated a reluctance to perform an actual torsional resonance test.

However, modifications to the original testing methods, along with improvements and developments in the required instrumentation have made the test less onerous. One unit recently completed a modified test and in the words of the EAC Representative, there was Ano operational impact on the plant≅.

The NEIL Engineering Advisory Committee=s Boiler & Machinery Subcommittee is continuing to review this issue, along with the information being obtained during NEIL=s plant evaluations. The Subcommittee will be considering whether the critical frequency range (118-122 Hz) currently contained in the Standards should be widened, and whether there are equipment designs or other circumstances where NEIL should require an actual torsional resonance test.

IV. INTERIM GUIDANCE:

Based on a review of information made available to the B&M Subcommittee thus far, it appears that the only definitive method of determining whether a unit is susceptible to torsional vibration is a torsional resonance test. Plants relying solely on a torsional vibration analysis should review the analysis results closely, and discuss the possible error margins with the organization that performed the analysis.

V. RESPONSE:

No response to this bulletin is required.

Unit specific torsional resonance analysis or test results should be available for review by NEIL=s Loss Control Representatives during routine plant evaluations. Anyone having information that they think would be helpful to the B&M Subcommittee in its review of this issue should contact Richard Stacey (302-573-2297) or Gregory Wilks (302-573-2273) in NEIL=s Loss Control Department.

VI. REFERENCES:

INPO SER 18-90, *Problems Experienced During a Special Test of the Main Turbine*
INPO SOER 91-01, *Conduct of Infrequently Performed Tests of Evolutions*

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SECTION 8-4R BULLETIN NEIL97-01P

FIRE BRIGADES DURING PLANT DECOMMISSIONING

NUCLEAR ELECTRIC INSURANCE LIMITED
PROPERTY LOSS CONTROL BULLETIN

NEIL Loss Control Bulletins deal with matters vital to Loss Control and are issued (1) to introduce new Loss Control subjects, or (2) for clarification of existing NEIL Loss Control Standards or (3) to provide interim guidance.

I. TITLE

Fire Brigades During Plant Decommissioning.

II. BACKGROUND

Several NEIL Members have units that are either in or will be entering the decommissioning process. Questions have been raised regarding the reduction of fire brigade staffing during plant decommissioning. The NEIL Property Loss Control Standards addresses fire brigades for operating plants in Section 3.A.1 and Appendix 3.A.1.

III. GENERAL DISCUSSION

Property Loss Control Standards Section 3.A.1 requires that each plant Shall cause to be formed an ACCEPTABLE fire brigade with a written administrative plan.

Appendix 3.A.1 details the duties and training of the fire brigade. The Property Loss Control Standards and the Appendix do not specifically mandate the number of responding personnel on the fire brigade. NEIL has found ACCEPTABLE the United States Nuclear Regulatory Commission mandated five-person fire brigade. The five-person fire brigade is considered sufficient to handle fire emergencies that may occur within insured structures.

Plants undergoing decommissioning will retain a significant number of fire hazards during the decommissioning process. It is important to have an adequately staffed fire brigade to properly handle any fire emergency. Increased fire hazards such as extensive hot work and increases in combustible loading mandate a properly staffed fire brigade.

IV. GUIDANCE

Fire Brigade staffing levels need to be maintained at an ACCEPTABLE level for insured structures. Plants undergoing decommissioning will initially contain a significant number of hazards which dictates the need for a five-person fire brigade response. Fire brigade staff reductions will be considered by NEIL on a case-by-case basis based on the fire hazard to be protected and the plant decommissioning schedule.

The requirements of the NEIL Property Loss Control Standards will continue to be applicable to all plants undergoing decommissioning unless specifically waived by NEIL.

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SECTION 8-4S BULLETIN NEIL97-01B

BREAKER MAINTENANCE

NUCLEAR ELECTRIC INSURANCE LIMITED
BOILER & MACHINERY LOSS CONTROL BULLETIN□

NEIL Loss Control Bulletins address matters vital to loss control and are issued (1) to introduce new loss control subjects, (2) to clarify existing Loss Control Standards, (3) to provide interim guidance or (4) to provide information concerning losses or other significant events.

I. TITLE:

Breaker Maintenance

II. BACKGROUND:

During its review of recent industry events, the Boiler & Machinery Subcommittee of the NEIL Engineering Advisory Committee identified the potential for substantial loss to insured property and time to repair associated with failure of switchyard circuit protection. The Subcommittee noted that the Loss Control Standards do not include switchyard protection equipment such as protective relays, breakers and backup battery power supplies.

A recently completed survey of about 5% of the NEIL-insured sites indicates a wide assortment of breaker surveillance and maintenance activities are actually being performed.

III. DISCUSSION:

The B&M Subcommittee began reviewing breaker surveillance and maintenance activities in June 1996 as a possible way to mitigate losses from torsional events that result from grid disturbances and transmission line imbalances. A recent study by one Member has concluded that properly functioning protection systems can preclude turbine-generator damage from torsional excitation caused by high negative sequence currents. Another Member Plant's generator was recently damaged when a breaker failed to operate as designed. An initiating event occurred, but one phase of one breaker did not open to isolate the plant from the power system and the generator became a single-phase motor. The breakers on the other two phases and the exciter field breaker opened as designed. From preliminary information provided by the Member it appears that indications of blown fuses in both the primary and back up circuits that supply power to the warming heaters went unnoticed. The root cause determination and damage estimates for the incident are incomplete.

Based on this and other recent industry events, the B&M Subcommittee is forming a Switchyard and Generator Protection Systems Task Force that will review breaker surveillance and maintenance activities to recommend appropriate loss control standards which would reduce potential risks to NEIL. The Task Force will be made up of several members of the B&M Subcommittee and "Technical Experts" from Member Companies.

IV. INTERIM GUIDANCE:

Members are requested to review surveillance and maintenance activities for the relays, breakers and battery power supplies of concern to ensure proper operation and adequate protection for plant equipment. Technical Specifications and UFSAR system descriptions should also be reviewed to ensure that specific performance commitments are being performed.

V. RESPONSE:

Members desiring to nominate a company "Technical Expert" to participate in the Breaker Task Force, please submit the candidate's name and telephone number to:

Nuclear Service Organization
Suite 1200, 1201 Market Street
Wilmington, DE 19801
Phone: 302-888-3000
Facsimile: 302-888-3095
Email: nso@nmlneil.com

SECTION 8-4T BULLETIN NEIL97-02B

POTENTIAL BRAZE FAILURE IN GENERATOR BUSHINGS

NUCLEAR ELECTRIC INSURANCE LIMITED
BOILER & MACHINERY LOSS CONTROL BULLETIN□

NEIL Loss Control Bulletins address matters vital to loss control and are issued (1) to introduce new loss control subjects or (2) to clarify existing Loss Control Standards or (3) to provide interim guidance or (4) to provide information concerning losses or other significant events.

I. TITLE:

Potential Braze Failure in Generator Bushings

II. BACKGROUND:

As part of an investigation of a generator bushing overheating problem, a Member observed a condition at a nuclear generating station which may be of interest to other NEIL Members.

The OEM had previously advised the owners of large generators of possible problems with heating of bushings in 1993. The OEM suggested that the area of distress is the threads on the OD of the bushing. This area is shown in Figure 1, attached.

During the Member's failure analysis of their incident, the bushing and plug were sectioned into four 90-degree pieces through the cap screw holes. This exposed the thread cross-section and the brazed joint between the plug and bushing. The sectioned piece and the location of the braze joint are shown in Figure 2.

Figures 3, 4 and 5 are magnified (15 x) views of three polishes of the braze joint. The as-found condition of the braze joint, documented in these figures, raises serious questions about the integrity of the hydrogen pressure boundary. This bushing was placed in service in 1989 and removed from service in November 1996 as a result of overheating.

The Member has implemented a temperature and vibration monitoring program for the bushings and continues to monitor for hydrogen leakage. A design review of the newest bushing design is in progress.

III. GENERAL DISCUSSION:

It must be noted that the braze mentioned above, is part of the pressure boundary between the 70 psig hydrogen and ambient air. Had this braze joint failed, the resulting hydrogen leak could have ignited causing a loss to the NEIL Member. While this event did not result in a loss, others may experience problems with bushings of this design which might result in a loss.

VI. INTERIM GUIDANCE:

Members should determine if their design of generator bushing is susceptible to this condition and take appropriate corrective actions.

Additional information on this subject can be obtained by contacting:

Nuclear Service Organization
Suite 1200
1201 Market Street
Wilmington, DE 19801
Phone 302-888-3000
Fax 302-888-3095
Email nso@nmlneil.com

FIGURE 1
Generator Bushing (Not to Scale)

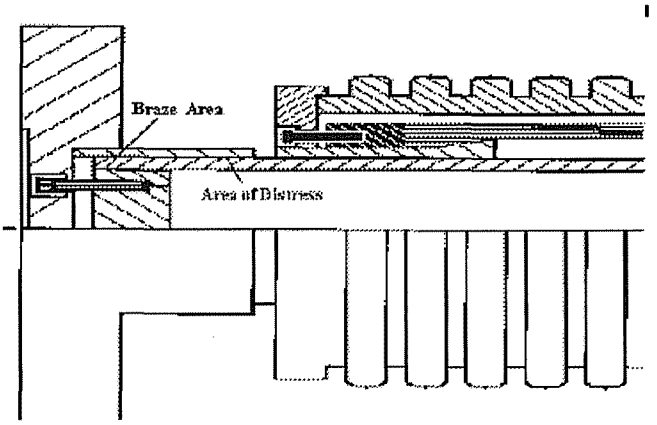


FIGURE 2

The arrow points to the location of the braze joint. The bushing and plug are upside-down in this picture. Note that the brazing material has started to flow from the joint (look above the "Plug B" card).

The hydrogen side is where the plastic spacer is. This spacer is not part of the assembly. The "Plug B" card would be on the air side.

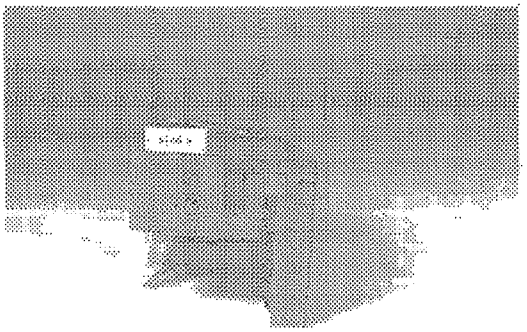


FIGURE 3

Hydrogen side is left (lower). Air side is right. Plug is at bottom, bushing on top and left. Arrows point to voids in braze.

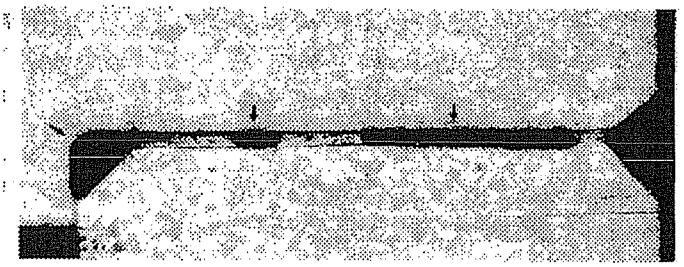


FIGURE 4

Hydrogen side is left (top), air side is right. Here the plug is on the top. Arrows point to some of the voids in the braze.

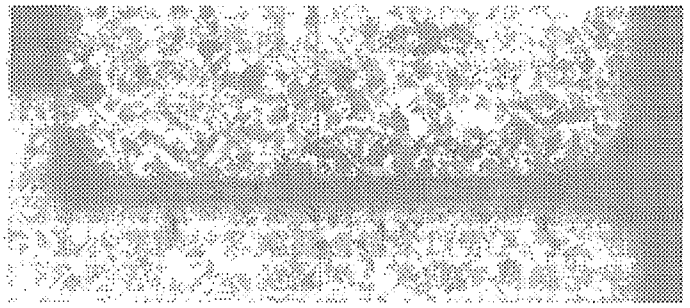
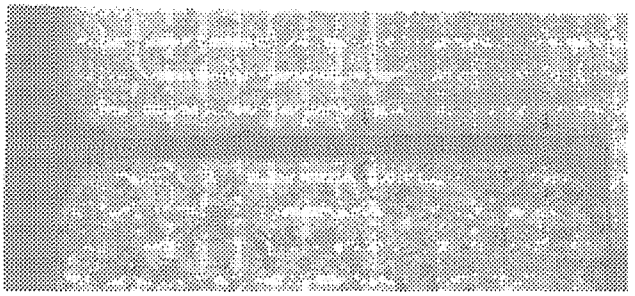


FIGURE 5

Here very few areas of braze remain (arrows). It is possible that between polishes there may be a hydrogen leakage path. In this picture, the air side is left, and the hydrogen right (lower). The plug is on the bottom.



SECTION 8-4U - BULLETIN NEIL99-1B

CERTIFICATION OF PERSONS PERFORMING THERMAL/INFRARED TESTING & VIBRATION ANALYSIS

NUCLEAR ELECTRIC INSURANCE LIMITED BOILER & MACHINERY LOSS CONTROL BULLETIN□

NEIL Loss Control Bulletins deal with matters vital to Loss Control and are issued (1) to introduce new Loss Control subjects, or (2) for clarification of existing NEIL Loss Control Standards, or (3) to provide interim guidance.

I. TITLE

Certification of Persons Performing Thermal/Infrared Testing & Vibration Analysis

II. BACKGROUND

The NEIL Primary Property (PP) Insurance Program currently allows extra Boiler & Machinery (B&M) credit (25 points) to be assessed if the person performing Thermal/Infrared Testing (Thermography) is certified to the American Society of Nondestructive Testing (ASNT) Society for Nondestructive Testing-Technical Council-First Document (SNT-TC-1A). The current credit does not specify the level of certification. There are no extra credits for certified Vibration Analysts.

III. GENERAL DISCUSSION

At the Fall 1998 meeting of the NEIL EAC, a proposal was made to modify the B&M Credit Program, specifying the use of the ASNT SNT-TC-1A as a guideline to qualify Thermographers to Level I and Level II. At the time, objections were raised as to the use of ASNT SNT-TC-1A as the certification document, due to what is thought to be excessive training and experience requirements contained therein. Since then, the B&M Subcommittee has proposed an added qualification for Vibration Analysts.

After thorough review of ASNT SNT-TC-1A and discussions with persons at ASNT, the following should be noted:

A. The title page of ASNT SNT-TC-1A reads: "This document is intended as a guideline for employers to establish their own written practice for the qualification and certification of nondestructive testing personnel. It is not intended to be used as a strict specification." Recommended Practice No. SNT- TC-1A, 1996.

B. Throughout ASNT SNT-TC-1A there are many references that the document contains "recommended" practices.

C. As with all the NDE disciplines, it is the Member (owner) that establishes a written practice describing the training programs for each discipline, using the ASNT SNT-TC-1A document as a guideline. The Administrative Level III who establishes the written practice need not be certified in the discipline for which the written practice is being established. (Note: *If Thermographic Inspections /Vibration Analysis are performed by contractors/utility service shop personnel, the contractor/utility shop would need to establish their own written practice*).

D. Only if a person is attempting to get a ANational Certification,≅ do the requirements of ASNT-SNT-1A apply fully. In most cases, if a Member (owner) certifies a person to their written practice, this certification is voided once that person leaves that Member's organization.

E. There are no similar documents, published by non-private organizations, available as guidance for certification.

F. While certification does not assure a knowledgeable analyst, certification to a nationally recognized document to standardize the certification should enhance the results of the testing process. It is also recognized that testing performed by those persons not certified to ASNT SNT-TC-1A is still of some benefit.

IV. PROPOSAL

A. At the Spring 1999 Engineering Advisory Committee (EAC) Meeting, the NEIL B&M Subcommittee will propose to:

1. Maintain current credit values assigned for Thermography/Vibration Analysis, with the elimination of the current 25 points for ACertified Thermographer. (To be noted as Partial Credit).

2. Assign higher point values for Thermography/Vibration Analysis based upon the SNT-TC-1A qualification of the person performing the Thermography/Vibration Analysis and the person reviewing the results. Credit is applied if the person performing and the person reviewing thermographic results are certified to SNT-TC-1A, Level I and Level II, respectively. Partial credit is applied if either the person performing or person reviewing is not certified to SNT-TC-1A.

3. If either the performer or reviewer is not qualified to the appropriate level, then the Partial Credit would be applied.

VII. INTERIM GUIDANCE

A. EAC Members should review this proposal with appropriate utility personnel, being prepared to vote for or against the proposal at the Spring 1999 meeting of the EAC. These proposed changes will be included in the February 5, 1999 mailing of proposed Standard Changes.

B. If you desire an E-mail copy of this bulletin or if there are any questions or clarifications needed prior to the meeting, please contact:

Nuclear Service Organization
1201 Market Street
Suite 1200
Wilmington, De 19801
Phone: 302-888-3000
Email: nso@nmlneil.com

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SECTION 8-4V BULLETIN NEIL01-01P

FIRE BRIGADE TRAINING and LIVE FIRE PRACTICE

NUCLEAR ELECTRIC INSURANCE LIMITED
PROPERTY LOSS CONTROL BULLETIN

NEIL Loss Control Bulletins deal with matters vital to Loss Control and are issued (1) to introduce new Loss Control subjects, or (2) for clarification of existing NEIL Loss Control Standards or (3) to provide interim guidance.

I. TITLE

Fire Brigade Training and Live Fire Practice.

II. BACKGROUND

Several NEIL Members have reviewed or are in the process of reviewing their Fire Brigade Training Program to determine the effectiveness of their program and how many hours of training are required. The NEIL Property Loss Control Standards address fire brigade training for operating plants in Section 3.A.1 and Appendix 3.A.1.

III. GENERAL DISCUSSION

Property Loss Control Standards Section 3.A.1 requires that each plant Shall cause to be formed an ACCEPTABLE fire brigade with a written administrative plan.

(NOTE: ACCEPTABLE, as used in this bulletin, means that it satisfactorily meets the requirements of NEIL for insurance purposes).

Appendix 3.A.1 details the duties and training of the fire brigade but does not provide specific Job Performance Requirements (JPRs) for the brigade members. The Property Loss Control Standards and the Appendix do not specifically mandate the number of hours required to attain proficiency as a Fire Brigade Member (FBM) or Fire Brigade Leader (FBL). In May, 2001, the National Fire Protection Association adopted NFPA Standard 1081 *B Standard for Industrial Fire Brigade Member Professional Qualifications* as the standard for minimum job performance requirements necessary to perform these duties. The NEIL Standards utilize NFPA requirements, with exceptions reasonable for a nuclear power facility, to evaluate the effectiveness of the plant fire brigades.

IV. GUIDANCE

Fire brigade training needs to be maintained at an ACCEPTABLE level. Proficiency of the fire brigade to work as a team and to know their level of ability to control fires is essential to minimize loss from a fire. Fire brigade members must have levels of demonstrated proficiency prior to being placed on a Fire Brigade (Initial Training), Continuing on the Fire Brigade (Continuing Education and Training (CET)), and attaining additional responsibility and education (Fire Brigade Leader Training). Also, some job performance requirements may be met with familiarity training as opposed to formal in-depth training programs since some appliances are not frequently required to be used by the brigade (i.e. ladders, master stream appliances).

The ability to handle and use ladders may be less important at a nuclear power facility than a Fire Department responding to a fire at an industrial property. Therefore, less formal training might be expected on this topic, but familiarity training would be required. Another example would be the use of master stream appliances. The nuclear power facility may not have a master stream appliance, and therefore less emphasis on training would be expected on this topic. However, familiarity with such devices would be expected as the brigade may work with responding fire companies. Appropriate training should be provided for all Job Performance Requirement topics.

Fire Brigade Management:

Fire brigade management must assure that fire brigades are properly manned, equipped, and trained in accordance with NRC Regulations, recognized standards and station procedures. Inadequacies identified during live fire training, quarterly training, meetings or drills need to be captured in the Station Corrective Action Program or equivalent.

Fire Brigade Entrance Requirements:

Fire brigade members must meet the entrance and educational requirements established by the management of the Fire Brigade and the medical and job-related physical requirements established by NFPA 600, *Standard on Industrial Fire Brigades*; NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, or equivalent.

Fire Brigade Member B Interior Structural/Advanced Exterior Level (Initial and CET):

Prior to being qualified or certified as Fire Brigade Member level, individuals must meet the job performance requirements established by the management of the Fire Brigade with reference to NFPA 1081, *Standard for Industrial Fire Brigade Member Professional Qualifications,* Chapters regarding: Incipient Industrial Fire Brigade Member; Advanced Exterior Industrial Fire Brigade Member; and Interior Structural Industrial Fire Brigade Member or equivalent, and the applicable site-specific requirements as defined by the management of the fire brigade.

Fire Brigade Leader (Initial and CET):

Prior to being qualified or certified as Fire Brigade Leader level, individuals must meet the job performance requirements established by the management of the Fire Brigade with reference to NFPA 1081, *Standard for Industrial Fire Brigade Member Professional Qualifications* Chapters regarding: Incipient Industrial Fire Brigade Member; Advanced Exterior Industrial Fire Brigade Member; and Interior Structural Industrial Fire Brigade Member or equivalent, and the applicable site-specific requirements as defined by the management of the fire brigade.

Fire Brigade Apparatus Driver/Operator (Initial and CET)

This requirement is applicable to sites that use Fire Brigade Apparatus. Prior to being qualified or certified as Fire Brigade Apparatus Driver/Operator, individuals must meet the job performance requirements established by the management of the Fire Brigade and as defined by NFPA 1002, *Standard on Fire Apparatus Driver/Operator Professional Qualifications* or equivalent, and the applicable site-specific requirements as defined by the management of the Fire Brigade. It is recognized that some JPRs listed in NFPA 1002 do not apply to nuclear power facilities.

All JPRs must be accomplished for initial Fire Brigade Member (FBM), Fire Brigade Leader (FBL) or Fire Brigade Apparatus Driver/Operator Qualification. For Continuing Education and Training (CET) all JPRs must be accomplished over a two-year period.

V. CONCLUSION

NEIL Loss Control Evaluations have identified wide variations in the fire brigade training requirements and programs at insured nuclear power facilities. As expected, differences have also been noted in the performance and abilities of fire brigade members during witnessed drills.

The NEIL Property Loss Control requirements regarding fire brigade member training and qualifications have historically been very general in nature. Little guidance has typically been provided on what constituted an ACCEPTABLE program. NFPA Standard 1081, *Standard for Industrial Fire Brigade Member Professional Qualifications* provides a good basis for developing a comprehensive program.

The Property / Fire Protection Subcommittee of the NEIL Engineering Advisory Committee (EAC) will be considering proposed revisions to the NEIL Loss Control Standards based on nationally recognized standards (i.e. NFPA 1081) and relevant internationally recognized standards to provide additional guidance and clarity on NEIL expectations. Comments or other input on this issue are welcome and should be directed to your company=s EAC Representative or to the NEIL Loss Control Representative assigned to your plant.

APPENDIX

United States Federal Law Required Training:

Although not required by NEIL, it may be necessary to consider the following federal laws regarding Fire Brigade training as it may be mandatory under the OSHA - Occupational Safety & Health Act, 1970:

29 CFR 1910.120	Hazardous Materials Refresher	Annual
29 CFR 1910.146	Confined Spaces (Permit Required)	Annual
29 CFR 1910.151	Medical Services/First Aid	Triennial
29 CFR 1910.151	CPR	Annual
29 CFR 1910.156	Fire Brigades	Quarterly
29 CFR 1910.157	Portable Fire Extinguishers	Annual
29 CFR 1910.134	SCBA-Self-Contained Breathing Apparatus	Annual
29 CFR 1910.1200	Hazard Communication Program	Initial/Changes
29 CFR 1910.1200	Hazard Communication (HM100)	Annual/Changes
29 CFR 1910.1030	Blood-borne Pathogens	Annual
29 CFR 1926.650	Excavation (Trench Rescue)	Initial/Changes
29 CFR 1926.450	Scaffold	Initial/Changes

The above references, while not intended to be all inclusive, satisfy the federal rules with respect to fire brigades and include the Right-to-Know laws covering hazard communication programs.

The following may be required depending on conditions at the site and include; asbestos, Spill Plan and Pollution Prevention Plan (SPCC), hazardous wastes, toxic substances, hearing conservation, and lockout/tagout.

CAA 40 CFR 61.145(c)(8)	Asbestos	Annual
CWA 40 CFR 112	Spill Prevention and Control Plan (SPCC)	Annual
RCRA 40 CFR 122-124	Pollution Prevention Plan	Annual
RCRA 40 CFR 262.34	Hazardous Waste	Annual
TSCA 40 CFR 721	Toxic Substances	Annual
29 CFR 1910.95	Hearing Conservation	Annual
29 CFR 1910.147	Lockout/Tagout	Annual

SECTION 8-4W BULLETIN NEIL01-02P

COOLING TOWER STRUCTURAL CONCERNS

NUCLEAR ELECTRIC INSURANCE LIMITED
PROPERTY LOSS CONTROL BULLETIN

NEIL Loss Control Bulletins deal with matters vital to Loss Control and are issued (1) to introduce new Loss Control subjects, or (2) for clarification of existing NEIL Loss Control Standards, or (3) to provide interim guidance.

I. TITLE

Cooling Tower Structural Concerns.

II. BACKGROUND

Several NEIL Member plants are dealing with deteriorating structural conditions in their cooling towers. These deteriorating structural conditions have lead to structural failures such as partial cooling tower collapse, fill collapse, falling material hazards and deteriorated walkways and decking. Non-nuclear plants have experienced cooling tower structural failures and complete fill collapses causing shutdown of the generating station. Cooling tower structural failure (collapse) occurs more frequently than fire damage, according to the Cooling Technology Institute (CTI), an industry technical association. Structural failure (complete loss of a cooling tower) has the same severity potential of causing a property damage and accidental outage loss to NEIL as does a fire.

NEIL Property Loss Control Standard (PLCS) Section 3.D.8 and Appendix 3.D.8 provides for fire protection considerations for cooling towers. There is now a requirement in the PLCS for structural inspections of cooling towers. Section 3.D.8.c was added in March 2001 and states: ACooling towers "should" be assessed for structural integrity.≅

According to CTI, the highest frequency and cost associated with cooling tower property damage are:

1. Ice damage to fill.
2. Fan wrecks causing structural and fill damage.
3. Component corrosion and deterioration leading to structural failures including fill collapse.
4. Structural deterioration leading to partial and total cooling tower collapse.
5. Fire causing loss of a cooling tower.

There are several occurrences of partial or total cooling tower collapse annually in the United States with a fire occurring once every five to ten years according to CTI. Partial or total collapse of a cooling tower required for condenser cooling can have an impact to NEIL from a property damage and accidental outage standpoint.

III. DISCUSSION

NEIL Property Loss Control Standard (PLCS) Section 3.D.8 and Appendix 3.D.8 provides for fire protection considerations for cooling towers. There is now a requirement in the PLCS for structural inspections of cooling towers. Section 3.D.8.c was added in March 2001 and states: ACooling towers "should" be assessed for structural integrity.≅ The loss potential to NEIL policies from structural failure of cooling towers is greater than from fire since structural failures have a higher frequency of occurrence, according to CTI, and a severity similar to a fire. Adequate structural inspections and corrective actions are necessary for continued cooling tower operation and uninterrupted plant operation. Outage length has been reduced to the point that rebuilding a severely weakened cooling tower will need to be done on-line and during outages increasing the length of time a tower is structurally compromised. Rebuilding a tower increases the loss potential to NEIL as these reconstruction projects occur over one or several years. The following case studies illustrate the potential problems:

Case 1: Duane Arnold Nuclear Power Plant: On August 27, 1999, during a system walk-down by the Cooling Tower System Engineer, a leak was discovered on the 60" diameter fiberglass distribution piping in the AA≅ Cooling Tower. Investigation found the distribution piping header leak was caused by failure of the distribution column header supports. This partial cooling tower collapse dropped the C and D cells 6 inches causing the cracking of the piping, which was identified by the leak. The cooling tower did not completely collapse due to 4" x 6" supports installed during original construction on one side and the added strength provided by the fire barrier wall transite board on the other side. Otherwise, the entire tower may have collapsed. On September 3, 1999 the failure of the AA≅ Cooling Tower distribution header column supports in the D Cell east side caused the plant to shutdown the AA≅ Cooling Tower. This shutdown caused a reduction of Mega Watt electrical (Mwe) production. The plant reduced power to 45% until September 16, 1999 when the distribution pipe was supported with shoring independent of the tower and the tower returned to service. Root cause analysis identified four contributing factors:

(1) The existing wood deterioration was not identified in time to complete replacement activities.

(2) The distribution header piping was increased in size from 54" to 60" diameter piping when two new cells were added in 1989. That size piping extended further down the tower without structural upgrading for the new weight load.

(3) Before modifications, Original Equipment Manufacturer (OEM) Cooling Tower prefabrication practices included pre-drilled holes for bolts and shear discs that were never utilized, which caused weakening of the main supports resulting in a deteriorated condition.

(4) Other modifications from 1990 through 1992 involved notching girts and the removal of load rings to allow for the installation of new fill without proper structural review.

The combination of an aged wooden structure, inadequate control of modifications and changes, incomplete/inadequate structural inspections and prefabrication work practices

during original construction lead to an overloaded condition in several cells of each tower. These factors contributed to the partial collapse. The AB≅ Cooling Tower was inspected and the same cells were sagging under the load and in danger of collapse. Corrective Action has included complete structural replacement of the C and D cells in the AA≅ Cooling Tower and P and Q cells in the AB≅ Cooling Tower to provide proper structural support for the 60" piping. All structural wood in all cells in the AA≅ and AB≅ Cooling Towers will be replaced in the next three years. The two newer cells of a different manufacturer on the end of each tower will be structurally inspected at the outage in the spring of 2001. Each tower will have structural inspections completed in the future.

Case 2: Prairie Island Nuclear Power Plant: One cell partially collapsed in one cooling tower on May 15, 1998 followed by the collapse of another cell in another cooling tower on June 1, 1998. This required the plant to lose efficiency at higher circulating water temperatures and to seek environmental approvals for higher water discharge temperatures. The cooling tower original design was known as the Awounded knee≅ design and the towers had structural failures soon after initial start-up. Structural inspections in 1989 concluded that replacement of the towers would be required in the near future due to structural concerns. Follow-up inspections in 1991 and 1992 stated confidence in tower integrity for at least 10 years. An inspection in the spring of 1998, prior to the collapse, recommended continuing with the current preventive maintenance program. The root cause was similar to Case 1.

Case 3: On July 8, 1998, one of the two seven cell mechanical draft cooling towers serving American Electric Power=s (AEP) 780 MW Conesville Unit 4 collapsed into the cold water basin. The root cause was similar to Case 1.

Case 4: In 1962, Kentucky Power Company's Big Sandy Unit 1 cooling tower was the first large scale natural draft design with a reinforced concrete hyperbolic shell in the USA. A treated wood framing structure arranged in a radial pattern housed the treated wood splash bar fill section. The two-pass drift eliminator blade assemblies were also constructed of treated wood. The entire wood framing system was supported by a free-standing reinforced concrete grillage system. The concrete grillage system consisted of columns connected by radial and circumferential beams. The original perimeter members had suffered damage over time from freeze-thaw cycles, and from the weight and falling impact of ice formed during wintertime operation. In the late 1970's the tower began experiencing problems with the wood framing structure. Distressed columns and bracing members were causing radial compression of the structure. To avoid a potential collapse, extensive "sounding" checks of all the concrete members was conducted and it was determined that only the outermost columns, radial members and circumferential beam required replacement. PVC material was selected as the new primary fill system. PVC components included film fill, modular type drift eliminators and hot water distribution piping. The PVC fill material was specified to be bottom-supported by a pressure treated Douglas fir structure, and installed multi-layered in a criss-cross pattern. These modifications were successful. Monitoring and repair of the cooling towers at AEP is now conducted continuously.

Case 5: Palo Verde Nuclear Generating Station (PVNGS) has three nuclear generating units with nine reinforced concrete cooling towers. These towers have concrete members (columns, beams, fan deck slabs, etc.) that had concrete damage due to the corrosion of the reinforcing steel. The corrosion is caused by chloride in the cooling water. Treated sewage is piped fifty miles from Phoenix to the power station, retreated and used for the cooling water. Chloride content in this water is extremely high. When concrete becomes contaminated with chlorides and other elements, the pH is lowered around the reinforcing steel, the passive layer disappears, and the steel begins to corrode. As the steel corrodes, the corrosion product (rust) expands to at least four times the volume of the original steel exerting pressures of 10,000 psi, which will crack the concrete. A replacement program for damaged members has been ongoing since 1995. Replacement of the damaged concrete members with an improved design has been very successful. None of these replaced members have exhibited any signs of corrosion related concrete damage. Repair methods implemented over time have included patching and epoxy injection. These methods have had limited success. There are two main ways to stop the corrosion in the contaminated concrete: (1) Remove all of the contaminated concrete before patching or (2) Cathodic protection. A pilot cathodic protection system has been installed and is being evaluated for expanded application. Additional structural repair methods are also being developed. Structural monitoring of the cooling towers at PVNGS is performed during each refueling outage.

Summary of Cases:

Cooling towers have shown significant deterioration over time due to the harsh environmental conditions in which they operate. Wood towers are subject to iron rot and other fungus attack and corrosion. Some concrete natural draft cooling towers utilize wood rings or have a wooden structure inside the tower for fill support. Reinforced concrete cooling tower rebar is subject to corrosion. The rebar may not have been coated with epoxy or the concrete was not quality controlled or the thickness covering the rebar is inadequate, the rebar corrodes and expands cracking the concrete and weakening the structure.

IV. GUIDANCE

Rate of strength degradation is specific to each cooling tower. It is affected by the original design, structural components used, geographic location, quality of construction, duration and mode of tower operations, preventive/corrective maintenance, and, quality and control of modifications.

Cooling tower structural integrity maintenance and inspection programs need to be instituted to prevent and reduce cooling tower damage. All programs need to include: (1) Frequent visual review of cooling towers and support systems. (2) Reduction of ice loads on the cooling towers by operating and maintaining installed ice melting systems or employing other means to reduce heavy ice loads. (3) Installation and maintenance of vibration-monitoring equipment for fans. (4) Conducting in-depth structural reviews of cooling towers and correction of deteriorating conditions before a significant structural problem occurs.

Some structural review guidelines are:

Natural Draft and Reinforced Concrete Cooling Towers

These concrete structures need to be maintained and inspected for surface deterioration. Cracks and spalling need immediate repairs with epoxy injection, grout, concrete or coatings. A maintenance work program to repair freeze-thaw damage must be instituted. Thorough extensive "sounding" checks of all the concrete members needs to be conducted. Damaged support columns need to be restored to their original diameter using a high strength grout mixtures or other processes. Stress analysis must be conducted to confirm that the support columns are adequate. Repairs must be performed to prevent any further deterioration. An external inspection must be made of the tower's shell to evaluate its condition. Shell exteriors exhibiting water staining and discoloration at construction joints need to be identified and corrected.

Wood Cooling Towers

Most damage can be assessed through visual observation. Typical damage includes lengthwise and diagonal splits, buckling, crushing of the wood, and the deterioration of the connections. Mechanical (destructive) testing of representative specimens provides the most direct means of determining the current structural reliability of a wood cooling tower. The Resistograph drill is an instrumented electrical drill, which records the resistance to the penetration of a 3 mm drill bit and is used for structural evaluation. A Non-destructive (NDE) method exists and is used in the inspection of cooling tower columns. This method is based on the vibration spectra analysis of an impact signal induced into the column.

Visual inspection, nondestructive evaluation, and/or destructive testing of representative samples of structural members and their connections needs to be conducted to determine cooling tower integrity. Based on this test information, the current condition of a specific cooling tower and the original design stresses, rates of strength degradation can be established for critical components. These degradation rates, combined with the structural analysis, can be used to project the life expectancy of the tower. Determination of the actual safety factors for columns is complicated and needs to be accomplished by certified companies. Since the safety factor is different for crushing stress than for modulus of elasticity, the safety factor for columns varies depending on the specific cooling tower design.

Fiberglass Reinforced Plastic (FRP) Composite Structures

Solar degradation and moisture penetration (wicking) are the most severe and variable issues to predicting long-term life of an FRP Composite structure. The three main design concerns of composite structures are sun, creep (sag), and shear. Fiberglass structured towers need an inspection procedure that routinely monitors critical structural elements of the tower for early signs of excessive wear or distress. The first indication will be excessive or accelerated deflection or creep. By measuring this deflection and creep rate, the failure point can be predicted with reasonable accuracy.

Preventive maintenance programs need to ensure that the protective coating integrity on FRP parts are maintained. A field-applied coating is available and is easily sprayed or hand-painted on all exterior surfaces to extend the protective coating life for FRP components.

A general visual inspection of the tower should be performed in conjunction with routine maintenance of mechanical equipment. Particular attention should be given to fasteners to make sure major structural bolts are tight. Any penetration of protective coating should be repaired routinely. Inspect structural fasteners by removing the bolts and inspecting the bearing surface for water migration and bearing wear. The FRP surface needs to be inspected for oxidation and thinning or fiber blooming.

V. CONCLUSION

Deteriorating structural conditions of cooling towers can be found and evaluated with corrective actions taken before the tower has a serious structural problem. This requires cooling tower system engineers to review the structural integrity of the cooling towers. Adequate walk-down of these structures is necessary. Obtaining qualified structural inspections is important.

Cooling towers need to be properly winterized. Towers in seasonal and long-term storage need to have proper lay-up procedures developed and followed.

For information related to specific incidents mentioned in this bulletin contact the station representative listed below:

Frank L. Michell Principal Engineer American Electric Power Pro Serv, Inc. 1 Riverside Plaza Columbus, OH 43215-2373 614-223-1745 email **flmichell@aep.com**	Joseph K. Flynn, Projects Manager Palo Verde Nuclear Generating Station Po Box 52034 MS 7668 Phoenix, AZ 85072-2034 623-393-6724 email **jkflynn@apsc.com**
George R. Carr, Team Leader Mechanical Components, Project Engineering Duane Arnold Energy Center 3277 DAEC Road Palo, IA 52324-9785 319-851-7444 email: **georgecarr@alliant-energy.com**	Scott Marty, Senior Project Engineer Nuclear Management Company Prairie Island Nuclear Plant 1717 Wakonade Drive East Welch, MN 55089 651-388-1121 x 5096 email: **scott.marty@xcelenergy.com**

Information related to proper cooling tower practices can be obtained from this cooling tower industry technical association:

Cooling Technology Institute
PO Box 73383
Houston, TX 77273
http://www.cti.org/
Phone: 281-583-4087
Fax: 281-537-1721

For information related to information contained in this bulletin contact:

Chris M. Dahms, Manager - Loss Control Communications and Research
Nuclear Electric Insurance Limited
1201 Market Street
Suite 1200
Wilmington, DE 19801

302-573-2278
cdahms@nmlneil.com

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SECTION 8-4X BULLETIN NEIL02-01B

TRANSFORMER CASUALTIES AVOIDED DUE TO ON-LINE GAS-IN-OIL MONITORING

NUCLEAR ELECTRIC INSURANCE LIMITED
BOILER & MACHINERY LOSS CONTROL BULLETIN

Nuclear Electric Insurance Limited (NEIL) Loss Control Bulletins address matters vital to loss control and are issued (1) to introduce new loss control subjects, (2) to clarify existing Loss Control Standards, (3) to provide interim guidance, or (4) to provide information concerning losses or other significant events.

I. TITLE

Transformer Casualties Avoided Due to On-Line Gas-In-Oil Monitoring

II. BACKGROUND

In 1995, Loss Control Bulletin NEIL95-02B, *Transformer Continuous Dissolved Gas-in-Oil Analyzers*, was issued. The bulletin discussed the breakdown of transformer insulating oils and the value of continuous on-line dissolved gas-in-oil monitors for early detection of transformer problems. Since 1995, several insured plants have documented transformer casualties, which were avoided ("saves") due to having on-line gas-in-oil monitors installed. This bulletin is being issued to provide information on these transformers "saves".

III. DISCUSSION

Several NEIL Members have documented "saves" of Large Transformers that were being used as Generator Step-Up Transformers or Auxiliary Transformers during the period since NEIL issued Loss Control Bulletin NEIL95-02B, *Transformer Continuous Dissolved Gas-in-Oil Analyzers*. In 1995, NEIL began offering Premium Credits for installed Continuous Gas-In-Oil Monitoring systems. Several "saves" are noted below:

Experience #1: Auxiliary Transformer:

During routine rounds at Quad Cities Nuclear Power Station, the operators noted a significant increase in the continuous dissolved gas-in-oil monitor readings. The oil was sampled and the Dissolved Gas-In-Oil Test result for acetylene was 42 ppm with hydrogen at 82 ppm. A confirmation sample was taken the following day and acetylene was 43 ppm and hydrogen 100 ppm. All other Dissolved Gas-In-Oil Test results were normal.
The unit was shut down, the oil was removed from the transformer, and an internal inspection was performed. During the inspection, it was discovered that the fiberboard insulation between the core and the grounding device was deteriorated. Flashover had been occurring between the grounding device and the windings. A denser insulation material was used to replace the fiberboard. The oil was processed and the transformer refilled.

The oil from this transformer had been sampled and analyzed per the routine schedule six weeks before the elevated gas levels were identified. Without the continuous dissolved gas-in-oil analyzer, this condition could have gone undetected until the next routine sample, approximately 18 weeks later. The condition of the transformer could have continued to deteriorate until catastrophic transformer failure occurred without warning.

Experience #2: Main Step-Up Transformer:

While monitoring the on-line Dissolved Gas-In-Oil Monitor on a Main Step-Up Transformer at Three Mile Island, Site Engineering and Operations personnel observed an increase in the Monitor reading. Additional oil samples were obtained and were analyzed. The results indicated that Total Dissolved Combustible Gas level was 2116 ppm and increasing at a rate of 214 ppm per day. These results were considered "Adverse Condition Level III" (High Level of Deterioration) under the NEIL Standards. The gas types indicated a high temperature thermal fault and later samples showed the gas level and rate of increase to be that of a "Condition IV (Excessive Deterioration)" Adverse Condition.

Based on the gases being produced, and after evaluation by an engineering expert panel, the conclusion was that damage to the insulation was not involved and therefore aging or damage to the transformer winding was not occurring. However, the transformer was removed from service six days after the initial concern was observed and various testing and internal examinations were performed as soon as possible.

Testing of the lower core ground straps indicated a potential cause. The #1 and #2 core straps were found to be very near to a solid ground when disconnected from the intentional ground. This unintended ground path was deemed the likely cause for the gassing, or at least a major part of the gas generation. The lack of a large resistance at this location indicated that large currents could flow causing overheating.

Plant Engineering personnel suggested that the transformer should be rewound, or that new transformers be procured.

The rapid change of gas levels and gas generation in this transformer were detected over a period of approximately one week through monitoring the on-line Dissolved Gas-In-Oil Monitor. Had this transformer not been equipped with a continuous on-line Dissolved Gas-In-Oil Monitor, it could have failed catastrophically without warning.

Experience #3: Main Step-Up Transformer:

The bushings on a Main Step-Up Transformer at Diablo Canyon were replaced during a refueling outage. After the bushing replacement, the transformer vacuum structural support was over pressurized during preparations to refill the transformer with oil. A visual inspection was performed and discussions with the transformer vender concluded that the over pressurization could not have adversely affected the transformer. There were no apparent weld cracks, no damage to the bushings, no stress on the line leads to the bushings, and no clearance problems were identified. The transformer was filled with oil, pressurized with nitrogen, and no leaks were identified. About one week later, the transformer was energized and returned to service.

About a month later, just prior to start-up from the refueling outage, the continuous on-line Dissolved Gas-In-Oil Monitor was indicating 23 ppm in the morning; that evening (at 11:00 p.m.) the monitor reading was 225 ppm.

The next day, with the unit in operation at approximately 35 percent reactor power during power ascension, the Main Generator Radio Frequency (RF) Monitor alarmed indicating potential arcing in the 25 KV System. Power ascension was halted while investigating the RF Monitor alarm condition. At 10:15 p.m., the on-line Gas-In-Oil Monitor was indicating 728 ppm. An oil sample was taken from the transformer and the results showed acetylene at 127 ppm. This result indicated a high-energy discharge. A later sample was taken which indicated that acetylene had increased to 260 ppm. The unit was shut down and the transformer was replaced with a spare.

The very rapid change of gas levels and gas generation in this transformer were detected over a period of less than two days, by monitoring readings from the continuous on-line Dissolved Gas-In-Oil Monitor. Without the continuous on-line Dissolved Gas-In-Oil Monitor, this transformer could have failed catastrophically.

IV. INTERIM GUIDANCE:

The installation of continuous on-line Dissolved Gas-In-Oil Monitors on plant transformers provides a means for early detection of transformer problems, which if allowed to continue uncorrected, could result in catastrophic transformer failure.

There have been a significant number of transformer losses over the history of NEIL coverage. A relatively low number of the transformers currently in operation at insured plants are equipped with continuous on-line Dissolved Gas-In-Oil monitoring devices.

Many plants are considering power up-rate projects and license extension projects that include replacement or modification of Generator Step-Up and Auxiliary Transformers. Installing continuous on-line Dissolved Gas-In-Oil Monitors on upgraded or replaced transformers could be a cost-effective way for plants to provide added assurance of their transformers' health and early indication of transformer failure in the future. This would also be an excellent opportunity to take advantage of additional Insurance Rating Credits.

V. RESPONSE

No response to this Loss Control Bulletin is required. However, additional information on this subject can be obtained by contacting:

Nuclear Service Organization
Suite 1200
1201 Market Street
Wilmington, DE 19801
Phone: 302-888-3000
Fax: 302-888-3095
Email: **nso@nmlneil.com**

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SECTION 8-4Y BULLETIN NEIL02-02B

MOLDED CASE CIRCUIT BREAKERS IN NON-SAFETY RELATED APPLICATIONS

NUCLEAR ELECTRIC INSURANCE LIMITED
BOILER & MACHINERY LOSS CONTROL BULLETIN

NEIL Loss Control Bulletins deal with matters vital to Loss Control and are issued: (1) to introduce new Loss Control Subjects, (2) to clarify existing NEIL Loss Control Standards, (3) to provide interim guidance, or (4) to provide information concerning losses or other significant events.

I. TITLE:

Molded Case Circuit Breakers in Non-Safety Related Applications

II. BACKGROUND:

During the investigation of a fire in a feeder breaker for a Non-Vital Bus at a nuclear generating station, a condition was observed that might be of interest to all NEIL Members.

During start-up from a refueling outage, while performing the normal transfer of Non-Safety Related AC buses from the Reserve Auxiliary Transformer to the Unit Auxiliary Transformer, a 4160 Volt circuit breaker fault caused a fire, a partial loss of off-site AC power, and a reactor shutdown. When Non-Safety Related AC power was lost, the normal Turbine AC Lubricating Oil Pumps also lost power. However, the Turbine DC Emergency Lubricating Oil Pump did not start because its supply breaker, a molded case circuit breaker, tripped prematurely. The loss of lubricating oil caused the turbine to coast down without lubrication and cooling, resulting in significant damage to the Turbine-Generator.

During the Root Cause Evaluation of the event, failure analysis of the supply breaker for the Turbine DC Emergency Lubricating Oil Pump determined that it tripped well below the expected current value.

III. DISCUSSION:

The supply breaker used for the Turbine DC Emergency Lubricating Oil Pump is a Molded Case Circuit Breaker (GE TBC43400F14G, 3-Pole Motor Circuit Protector with integral current limiter). In DC circuit applications, only phases A and C of 3-Pole breakers are typically used.
This breaker has a trip setting that is adjustable from 1000 amps on "LO" to 3300 amps on "HI". It contains a magnetic instantaneous trip unit, which consists of an electromagnet connected to the breaker trip bar. Line current passing through the magnet element results in an attractive magnetic force on the magnet armature, a movable metal paddle. When an over current condition occurs, the magnetic force overcomes internal spring tension and the armature moves and actuates the latch on the breaker mechanism causing the breaker to trip.

The setting knob adjusts the internal spring tension with a spiral cam linkage varying the magnet pick up setting. The higher the spring tension, the higher the breaker tripping current.

The breaker that failed was new. It was manufactured, purchased, received, and issued in 2000. It was bench tested and installed in January 2001.

The failed breaker was removed following the event and tested in the "as found" trip setting (set on "HI"). It tripped at 510 amps on Phase A and 880 amps on Phase C. This is well below the motor starting current of 630 amps for the Turbine DC Emergency Lubricating Oil Pump Motor, the expected trip value of 3300 amps for the "HI" setting, and the pre-event bench test value of 1250 amps on Phase A and 1219 amps on Phase C with the breaker set on "LO". X-ray examination of the breaker was performed and no reason for the breaker tripping at such a low setting was identified. Plant and Vendor personnel then examined the breaker externals and internals.

The external examination noted wear marks on the Phase C adjustment knobs, but not on Phase A or B. The trip-setting device was found damaged and incapable of responding to setting adjustments. The breaker was disassembled and inspected by Vendor personnel. The Phase A cam follower was found bent out and away from the cam, which would not allow the cam linkage to apply tension to the armature spring. It was concluded that the Phase A trip adjustment had been rotated past the "LO" position in the counterclockwise direction. The Phase C cam pivot linkage rivet was off and loosely connected to the cam linkage mechanism. Due to the conditions on Phases A and C, the adjustment knobs had little or no effect on spring tension and, therefore, little or no effect on the trip set point.

Five Molded Case Circuit Breakers of the same model were procured for testing. All five breakers were received with the trip set on "HI" and had satisfactory trip tests in the received condition. Four of the breakers were tested after rotating the trip adjustment from "HI" to "LO" in the clockwise direction. One breaker tripped within the acceptable band each time. The other three breakers operated the same as the failed breaker. The trip set point was low and did not vary significantly between settings.

The fifth breaker was satisfactorily tested at all settings from "LO" to "HI" while maintaining the set point adjustment between "LO" and "HI", moving the adjustment knob clockwise from "LO" to "HI" and counterclockwise from "HI" to "LO".

The Vendor acknowledged that the trip mechanism could be damaged if the trip adjustment is rotated past the "LO" position in the counterclockwise direction. The Member also determined that adjustment past the "HI" position in the clockwise direction can result in damage to the trip mechanism. There were no precautions against incorrect rotation of the trip mechanism adjustment knob in the Vendor manual.

IV. INTERIM GUIDANCE:

Members should review the application and use of Molded Case Circuit Breakers with adjustable trip settings in Non-Safety Related service and verify proper operation of the trip mechanism and current set points.

V. RESPONSE

No response to this Bulletin is required. However, if additional information on this subject is desired it can be obtained by contacting:

Nuclear Service Organization
1201 Market Street, Suite 1200
Wilmington, DE 19801

Phone: 302-888-3000
Fax: 302-888-3095
Email: **nso@nmlneil.com**

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SECTION 8-4Z BULLETIN NEIL02-03P

LIGHTNING PROTECTION SYSTEMS INSPECTION and MAINTENANCE

NUCLEAR ELECTRIC INSURANCE LIMITED
PROPERTY LOSS CONTROL BULLETIN

NEIL Loss Control Bulletins deal with matters vital to Loss Control and are issued (1) to introduce new Loss Control subjects, or (2) for clarification of existing NEIL Loss Control Standards or (3) to provide interim guidance.

I. TITLE

Lightning Protection Systems Inspection and Maintenance.

II. BACKGROUND

Based on a recommendation from the Engineering Advisory Committee, section 3.C.10.b Lightning Protection System Testing and Maintenance was added to the NEIL Property Loss Control Standards (PLCS). This section requires that lightning protection systems Shall be inspected and maintained in a condition that would allow the system to function as designed. An Interpretive Guide was developed to identify methods for compliance with this Standard.

III. GENERAL DISCUSSION

The Interpretive Guide identified three inspection and test methods that would satisfy the Standard requirement. They are; (1) visual inspection of accessible system components, (2) continuity tests of system components not visible, and (3) ground resistance tests of the ground termination system. The test and inspection methods were those recommended by National Fire Protection Association (NFPA) Standard 780, Installation of Lightning Protection Systems.

As compliance with this standard section was being reviewed by the NSO Property Loss Control Representatives (LCR's) at Member stations it was discovered that completion of several of the test methods might not be possible. Some plant personnel have expressed a concern that the test methods for continunity and ground resistance testing will endanger other sensitive plant systems that are tied into the grounding systems.

IV. GUIDANCE

The Interpretive Guide for NEIL Property Loss Control Standards, Section 3.C.10.b is being reviewed by the NSO Property Loss Control Staff and the NEIL Property Protection Subcommittee. It is recognized that the requirements for continunity and ground grid testing may not be able to be performed at some plants. Therefore, these requirements are being held in abeyance pending further review.

Requirements of Section 3.C.10.b for a plant to have a lightning protection system inspection and maintenance program and to conduct visual inspections are still applicable and will be enforced.

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SECTION 8-4AA BULLETIN NEIL04-01B

DETERMINING TURBINE-GENERATOR TORSIONAL VIBRATION NATURAL FREQUENCIES

NUCLEAR ELECTRIC INSURANCE LIMITED
BOILER & MACHINERY LOSS CONTROL BULLETIN

NEIL Loss Control Bulletins address matters vital to loss control and are issued (1) to introduce new loss control subjects, (2) to clarify existing Loss Control Standards, (3) to provide interim guidance, or (4) to provide information concerning losses or other significant events.

I. TITLE:

Determining Turbine-Generator Torsional Vibration Natural Frequencies.

II. BACKGROUND:

The NEIL Boiler & Machinery Loss Control Standards (Standard 3B - Turbine- Generator/Exciter-Operating Tests) requires that:

Natural Resonant Frequencies due to Torsional Vibration response Shall be determined by testing or analysis, on the turbine-generator. If the natural response frequency is in the critical range of 118 to 122 Hz, the Member Shall take actions to separate natural frequencies from this critical frequency range or Shall provide the technical justification to NEIL why such actions are not necessary. Testing or analysis Shall be performed whenever a rotating element of the turbine- generator is replaced. Replacement of a "like kind"-rotating rotating element does not require testing or analysis.

Torsional vibration is imposed on the generator at twice the current and voltage frequency whenever an imbalance exists between the generator's three electrical phases. A measure of such imbalances is the resulting negative sequence current. If a natural frequency in torsion of the rotor line coincides with the excitation frequency, then torsional vibration amplitude can increase to levels beyond material endurance limits leading to failure. This occurs because a turbine- generator rotor line is a highly undamped mechanical system in the torsion mode.

NEIL has chosen the critical range given above based on possible grid frequency disturbances of ± 1 Hz and uncertainties inherent in determining the possible existence of a natural frequency in the critical range.

III. DISCUSSION:

In a previous NEIL Loss Control Bulletin (95-03B), it was reported that our members' experience in determining natural frequencies by analysis was prone to far greater error than assumed by NEIL in establishing the critical range requiring action. Comparison with test results showed error greater than 2 Hz in many cases. NEIL Bulletin 95-03B discussed the ***Nuclear Electric Insurance Limited – Loss Control Standards*** reluctance on the part of some members to perform torsional vibration testing for fear of damaging the machines or because of the cost and time required. Since that time, cost effective means of measuring torsional vibration during online operation have been developed.

Recently a member experienced significant turbine blade failures attributed to torsional vibration after making a component replacement of a "like kind". The original equipment manufacturer expected the replacement would not affect torsional natural frequencies and no testing was considered necessary. This case again shows that reliance on analytical means for determining torsional natural frequencies can be unreliable.

NEIL is also concerned that members may not realize how grid frequency in their areas may drift for significant amounts of time from the 60 Hz standard. Significant periods of time can be as short as a few minutes if it lingers right on a natural frequency or a few hours if operating very close to a natural frequency with concurrent excitation caused by phase imbalance.

The NEIL Engineering Advisory Committee's Boiler & Machinery Subcommittee will continue to review this issue. The Subcommittee will be considering whether the critical frequency range (118-122 Hz) currently contained in the Standards should be changed based on a site specific determination of historical grid frequency variation or some other basis.

IV. INTERIM GUIDANCE:

Turbine-generators that have operated successfully for several years and have shown through inspection that fatigue related degradation has not occurred may be assumed to not be vulnerable to torsional vibration problems. However, when physical changes are made that can affect the natural frequencies of the rotor line, then members should plan on performing tests capable of measuring torsional natural frequencies in the critical range. NEIL should be made aware whenever physical changes are made that can affect the mass or elasticity of the system and the plans for measuring the torsional natural frequencies in the critical range after modifications are accomplished.

V. RESPONSE:

A response to this bulletin is requested whenever significant changes to the turbine generator rotor line as described above are contemplated. Please contact Tom McCaskill (302-573-2280) or Greg Wilks (302-573-2273) in the NEIL Loss Control Department for additional information.

VI. REFERENCES:

INPO SER 18-90, *Problems Experienced During a Special Test of the Main Turbine*
INPO SOER 91-01, *Conduct of Infrequently Performed Tests of Evolutions*

SECTION 8-4AB BULLETIN NEIL05-01B

ISOPHASE BUS FLEXIBLE LINK CONNECTOR FAILURES

NUCLEAR ELECTRIC INSURANCE LIMITED
BOILER & MACHINERY LOSS CONTROL BULLETIN

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I. TITLE:

Isophase Bus Flexible Link Connector Failures

II. BACKGROUND:

During a review of recent industry events and incident reports, the Boiler & Machinery Subcommittee of the NEIL Engineering Advisory Committee identified the potential for substantial loss to insured property and extended plant shutdowns for repairs associated with failures of Generator and Isophase Bus Flexible Link Connectors.

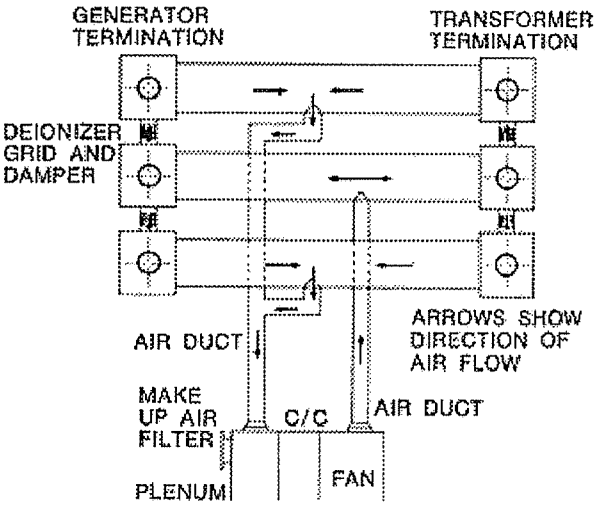
Flexible Link Connectors provide the means to connect the output of the generator to the main transformers via the isophase bus and also connect isophase bus sections together. They help to isolate main lead vibration and allow for minor mechanical misalignment of the components. The typical design is copper or aluminum laminations annealed or welded into a solid piece. Failure of these connectors can result in grounds on the Isophase Bus bars.

III. DISCUSSION:

There have been several incidents that were caused by Flexible Link Connector failures that resulted in plant shutdowns for repairs. The following is summarized from INPO SER 4-04, *Isophase Bus Ground Faults.* "...recent events are indicating age-related and condition-based failures of flexible connectors."

The most recent event was caused by several electrical faults in the isophase bus that resulted in a Generator trip, a Reactor scram, and a fire involving the Main Transformer. A loose piece of aluminum laminate from a flexible connector broke into several pieces and migrated to the low voltage bushing box causing ground faults as it did so.

The arcing resulted in catastrophic failure of the "A" phase surge arrestor and subsequent failure of the "C" phase surge arrestor, and a fire on top of the Main Transformer. The plant was shut down for 18 days to replace major portions of the isophase bus and Main Transformer components.



Ref: SER 4-04

The second event was a Reactor scram and Generator trip due to a 10-inch section of aluminum laminate from the bus expansion joint causing a ground on the isophase bus duct. The failure was caused by vibration-induced fatigue of the expansion joint, and increased cooling airflow may have been a contributing factor. Damage was limited to one broken laminate connector, one cracked laminate in an adjacent connector and a broken partial discharge analysis wire. The plant was shut down for three days to make the required repairs.

The third event was a Generator trip and manual Reactor trip due to a short on the Generator output causing an intermittent neutral voltage alarm and ground fault. The outer copper layer of a flexible connector failed and was making contact with the isophase bus duct. Several excitation control cards failed, resulting in a loss of field trip of the Generator. Damage was limited to the outer copper layer of the flexible connector. The unit was shut down for ten days to investigate and to make repairs.

There have been nine (9) operating experience reports addressing isophase bus events since September 1995 of which eight (8) were caused by flexible link connectors. Failure causes include cracking and failure of the flexible link outer copper layer, detached or cracked laminate layers of aluminum flexible links, and heat damage to the flexible link connectors causing charring and melted tinning of the connectors.

[Events: 2004-3 2002-1; 1998-1; 1997-2; 1995-1]

IV. INTERIM GUIDANCE:

NEIL Members should review INPO SER 4-04 for guidance and review surveillance and maintenance activities to ensure proper operation and adequate condition of the Isophase Bus Flexible Links.

NEIL B&M Loss Control Standard 3C.24 requires inspection of accessible iso-phase bus supports and bus duct conditions. The inspections should be detailed enough to observe the condition of the laminate layers of flexible link connectors for cracking, overheating, and heat damage.

V. RESPONSE:

No response to this Bulletin is required. However, if additional information on this subject is desired it can be obtained by contacting:

Tom McCaskill
Boiler & Machinery Loss Control Manager
Nuclear Service Organization
Suite 1100
1201 Market Street
Wilmington, DE 19801

Phone: 302-573-2280
Fax: 302-888-3095
Email: tmccaskill@nmlneil.com

VI. REFERENCES:

INPO SER 4-04
INPO SOER 90-1

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SECTION 9-0 REVISIONS

SECTION 9-1 MARCH 2001 REVISIONS

Boiler & Machinery Loss Control:

Section 8-2, Standard 2 - Steam Generator, Deleted generic requirement for Steam Generator Tubing to be inspected every outage; Replaced with requirement to implement a Steam Generator inspection program in accordance with NEI 97-06, Steam Generator Program Guidelines.

Section 8-2, 3C.1 - .10, Turbine-Generator/Exciter Dismantled Inspections, Extended dismantled inspection interval for Low Pressure Turbines with mono-block or welded rotor construction to 96 Months for "should" and 120 Months for Shall.

Section 8-2, 3C.15, Turbine-Generator/Exciter Dismantled Inspections, Added Note stating that rotor-out or complete robotic inspection that is ACCEPTABLE to NEIL will meet requirement.

Section 8-2E, REFERENCED DOCUMENTS, Added NEI 97-06, Steam Generator Program Guidelines.

Property Loss Control:

Standard II.D - Glossary of Terms – Added a definition for the term "Bulk Hydrogen and Flammable Gas".

Standard 3.A.6 - Protection Systems Operability –Added a new item, 3.A.6.d, stating that post maintenance and/or repair testing of fire protection equipment "should" be performed to ensure that the equipment will perform its design function.

Standard 3.C.3.a(1) - Fire Barriers and Penetration Requirements - Delete section 3.C.3.a(1)(t) requiring Diesel Fuel Day Tanks to be enclosed in three-hour rated enclosures.

Standard 3.C.3.c - Fire Barrier Openings Testing and Maintenance - Added a new section 3.C.3.c specifying inspection and maintenance requirements for protection devices such as doors, dampers, seals, etc. in NEIL required fire barriers.

Section 3.D.8 - Cooling Towers - Added section 3.D.8.c requiring as a "should" requirement an assessment of the cooling tower for structural integrity. This assessment would address the collapse potential of the tower.

Section 3.F.2.g - Cadweld Welding Material and Concrete Thermal Cutting Devices - Deleted section. Requirement was based on plant construction era requirements.

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SECTION 9-2 SEPTEMBER 2001 REVISIONS

Property Loss Control:

Appendix 3.A.6 – Fire Protection Systems Testing, Maintenance and Inspection – Sections E.6, F.8, H.10, J.6 and K.5 – These sections modified changing the detector testing frequency from annual to 18 months. These detectors initiate activation of special suppression systems. Associated tests of special extinguishing system functions and components are on an 18-month frequency and the EAC recommended making the detector testing intervals consistent with other component testing.

Appendix 3.A.6 – Fire Protection Systems Testing, Maintenance and Inspection –Section G.4 - This section modified changing Dry Pipe Sprinkler System Low Air Alarm testing from semi-annual to annual prior to freezing weather. Low air pressure can lead to a trip of the system. Reliability of this alarm is crucial before the onset of freezing temperatures.

Loss Control Implementation – Section 8-1E – Plant Evaluations – Section B.1 modified to list specific reports, audits and assessments utilized by NEIL to assess the adequacy of a plant's fire protection program. New section B.1 added requiring the Member to submit to NEIL the reports listed in section B.1 along with a list of fire protection Corrective Action Reports issued since the last evaluation.

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SECTION 9-3 MARCH 2002 REVISIONS

The Changes summarized below were approved by the NEIL Board of Directors in March 2002:

The B&M Subcommittee developed one change to the B&M Standards and Credit Programs:

In the Accidental Outage B&M Credit Program to re-allocate the Credit Points available for installation of continuous On-Line Dissolved Gas Analyzers from the current 25 Points for Main Step-Up Transformers and 25 Points for Auxiliary Transformers to 40 Points for Main Step-UpTransformers, and 10 Points for Auxiliary Transformers.

The Property/Fire Protection Subcommittee developed several proposed changes to NEIL's Property Loss Control Standards during a meeting held October 2, 2001. They were formally presented for consideration by the EAC during a meeting held on February 28, 2002.

The changes are as follows:

Appendix 3.A.6 – Fire Protection Systems Testing, Maintenance and Inspection –
Loss Control Bulletin 95-01P – Application of the Fire Protection Systems Testing Matrix (Appendix 3.A.6)

- Consolidated the explanatory material contained in Loss Control Bulletin 95-01P into Appendix 3.A.6. The consolidation provides the user with a single document that is easier to use.

- There were no frequency changes to the Appendix

- Interpretive Guidance was added for the following sections:
  - Performance Base Testing and Maintenance Guidance previously contained in Bulletin 95-01P
  - NEIL ACCEPTABLE Interior Tank Inspection (Appendix 3.A.6 Table B Item 2) previously contained in Bulletin 95-01P
  - NEIL ACCEPTABLE System Main Drain Testing (Appendix 3.A.6 Tables D, E, F G) previously contained in Bulletin 95-01P
  - NEIL ACCEPTABLE Smoke Detector Testing and Sensitivity Testing guidance (Appendix 3.A.6 Table N Items 5 and 6)

- The Loss Control Bulletin material was updated to reflect the current requirements of the referenced NFPA document.
  - Clarification of sprinkler head strainer requirements for inspection and maintenance. (Appendix 3.A.6 Tables D through G)
  - Foam Systems divided into those installed by NFPA 16 and 11. The testing requirements for the two systems are different.
  - Hydrostatic testing of inside fire hose was clarified to define a NEIL Acceptable Practice.
    - NEIL accepts the Manufactures Service / Proof Test
    - Requires in-service hydrostatic testing only after the fifth year and every third year there after.
  - Hydrostatic testing of outside hose is treated as attack/supply hose with an inspection and service test or manufacturers test performed prior to being placed in service for the first time and annually thereafter.
  - Fire Alarm System testing was clarified and statement of testing requirement not being

duplicated were added
- Heat detector testing requirements were clarified for when heat tests are required.
- Testing for each type of automatic fire detector was added N5 smoke detector testing.

- Administrative information was removed and information reordered.
  - Purpose and Recommendation information in Section G. and H were removed.
  - Section C requires performance-based intervals to be reduced to the NEIL ACCEPTABLE instead of NFPA Frequency when the failure rate is exceeded.

Appendix 3.A.6 – Fire Protection Systems Testing, Maintenance and Inspection –Section P –
Standard 3.D.5 – Extinguishers and Standpipes –
Standard 3.A.4.c(5) – Hot Work Safety Procedures – Area Preparation –

- Added section "P" to Appendix 3.A.6 for Fire Extinguishers.

- Modified section 3.D.5 requiring fire extinguishers as a Shall and fire extinguishers "should" be maintained and inspected in accordance with Appendix 3.A.6, section P.

- Added section 3.A.4.c(5) stating that fire extinguishers used for hot work activities need to be referenced on the hot work permit and confirm that the fire extinguisher is in operational condition prior to starting the hot work activity.

Glossary of Terms – BB – Noncombustible Materials
Standard 3.D.8 – Cooling Towers
Appendix 3.D.8 – Cooling Towers

- Added to Glossary BB, Noncombustible Materials, fiberglass reinforced materials with a flame spread equal to or less than 25.

- Modified section 3.D.8 to add reference to Appendix 3.D.8.

- Modified Appendix 3.D.8 recognizing new tower technology with fiberglass reinforced materials with a flame spread equal to or less than 25.

- Modified Appendix 3.D.8 section "B", Noncombustible Cooling Towers with ACCEPTABLE fill changed Shall requirement to "should" for fire barriers as the fire risk in noncombustible towers is reduced.

- Changed section "C" Combustible Cooling Towers to require fire protection as a Shall requirement rather than a "should" since the risk of fire is greater.

SECTION 9-4 SEPTEMBER 2002 REVISIONS

Property Loss Control Standard 3.A.1 - Fire Brigade
Appendix 3.A.1 - Operating Plant Fire Brigades
Appendix 3.A.1.c - Fire Response Plans Utilizing Off-Site Fire Suppression Organizations (was deleted and the information included in the revision of Appendix 3.A.1)
Loss Control Program Implementation Section 8-1P - Witnessed Fire Brigade Drills:

NEIL loss control evaluations have identified variations in the fire brigade programs at Member plants. Not unexpectedly, differences have also been noted in the performance and abilities of fire brigade members during witnessed drills. In mid-2001, NEIL issued Property Loss Control Bulletin 01-01P, Fire Brigade Training and Live Fire Practice, discussing fire brigade issues and informing the Membership that an EAC subcommittee would be considering changes and clarification of the NEIL requirements. Comments and input were solicited from interested parties at that time. In October 2001, Bulletin 01-01P was re-issued along with draft changes to Appendix 3.A.1. Comments and input were again requested for the subcommittee's consideration. Several comments were received that were reviewed by the subcommittee during its development of the proposed changes. These proposed changes are intended to clarify the NEIL requirements and expectations pertaining to brigade composition, training, drills and coordination with off-site organizations, and will enable NEIL's Loss Control Representatives to perform more consistent evaluations of brigade performance and capabilities.

Property Loss Control Standard 3.E - Hydrogen, Flammable Gas and Flammable and Combustible Liquids Storage:

This section was reorganized for simplification and clarification. A number of questions have been raised concerning the application of referenced NFPA Standard 30, Flammable and Combustible Liquids Code. This revision is intended to clarify the application of NFPA 30 as it relates to the NEIL Standards, and separates the various commodity categories and storage arrangements. Containment and drainage requirements were added in this section as the previously cited section primarily dealt with containment around oil filled equipment.

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SECTION 9-5 SEPTEMBER 2003 REVISIONS

Revisions to the Boiler & Machinery Standards:

Standard 4 – Transformers
Section 8-2F, Primary Property Program B&M Credits
Standard 10B, Mechanical Drive Turbines - Dismantled Inspections
Standard 10C, Mechanical Drive Turbines - Dismantled Tests
Standard 14, Switchyard Equipment

The B&M Subcommittee met in February 2003 and several changes to the B&M Standards were proposed and accepted at the EAC Meeting in August and the Board Meeting in September. These changes are summarized as follows:

1. **Standard 4 - Transformers**

   Based on recommendations from the Transformer Issues Task Force, the following changes:

   a. An introductory paragraph similar to other B&M Standards
   b. Add *Desiccant* to list of items to be observed in 4.1.
   c. Add *Lightning arresters* to 4.5 to be Power Factor Tested, and change Shall frequency for Power Factor Testing from 10 Years to 8 Years.
   d. Add new item, 4.10, to require *preventive maintenance including oil analysis and thermography on load tap changers.*

2. **Section 8-2F, Primary Property Program B&M Credits**

   a. Change item I.E.2.a from Multiple Gas Analyzer (Gas-in-Oil) to *On-line Gas Analyzer (Gas-in-Oil)* and increase Credit from 200 to *300 Points.*
   b. Change item I.E.2.b, Partial Discharge Monitor Credit Points from 200 to *100.*
   c. Delete item I.E.2.c, One Gas Analyzer (Gas-in-Oil).
   d. Change item I.E.2.d, Moisture Content Analyzer, to item *I.E.2.c.*
   e. Add item *I.E.3, Additional Testing, with 200 Credit Points available for performing the following tests: Frequency Response Analysis, Partial Discharge Test, Furan Analysis, Static Electrification Detection, and Geomagnetically Induced Current (GIC) Testing.* For each Additional Test, 100 Credit Points is available, but only 200 Credit Points is available for I.E.3.
   f. Delete after Note: Credit is available for E.2.a OR E.2.c, not both. Add after Note: *Maximum of 200 Credit Points available for Additional Testing.*

3. **Standard 10B, Mechanical Drive Turbines - Dismantled Inspections**

   Change all "should" frequencies from 72 Months to *96 Months* and all Shall frequencies from 96 Months to *120 Months.*

4. **Standard 10C, Mechanical Drive Turbines - Dismantled Tests**

   Change Shall frequency from 96 Months to *120 Months.*

5. **Standard 14, Switchyard Equipment**

a. Delete: *Standard 14 DOES NOT apply to the Accidental Outage Program. See Section 8-2A, IV.B*
b. Add after the Note: *For Switchyards insured by NEIL, all breakers and associated relays and batteries are subject to the requirements of this Standard. For Switchyards not insured by NEIL,* the Breakers referenced are:

Revisions to the Property/Fire Protection Standards:

Standard 3.D.4.g(5) – Automatic Fixed Extinguishing Systems
Standard, 3.C.4 – Wind Design
Appendix, 3.C.5 – Roof Assemblies
Appendix 3.A.1, section B.2, new section B.2.a.4 – Fire Brigade Drills
Standard, 3.D.2.a – Fire Pumps, Alarms, Controllers

The Property/Fire Protection Subcommittee met May 8, 2003 and several changes to the Property/Fire Protection Standards were proposed and accepted at the EAC Meeting in August and the Board Meeting in September. These changes are summarized as follows:

1. **Standard 3.D.4.g(5) – Automatic Fixed Extinguishing Systems**

This section was modified to define where fixed fire suppression systems are required for High Value Electronic Equipment Rooms. Fixed fire suppression system are required for High Value Electronic Equipment Rooms such as computer room, telephone equipment rooms, etc. which are not constantly attended.

2. **Property Los Control Standard, 3.C.4 – Wind Design**
3. **Property Loss Control Appendix, 3.C.5 – Roof Assemblies**

The change reflects the requirements contained in the current edition of ASCE Standard 7, Standard for Wind Design Requirements. ASCE 7 has replaced the 50-year and 100-year design requirement with a three second, 100 mile per hour gust requirement. This new requirement would be applied for new structures and buildings.

4. **Property Loss Control Appendix 3.A.1, section B.2, new section B.2.a.4 – Fire Brigade Drills**

This change establishes the requirement that plants perform at least one station fire brigade drill per year in NEIL insured areas and structures outside the power block where the full station fire brigade is the primary response.

5. **Property Loss Control Standard, 3.D.2.a – Fire Pumps, Alarms, Controllers**

This change adds to the existing requirement for ACCEPTABLE fire pump design requirements. The proposal requires that discharge piping arrangements to and from the pumping system be arranged such that no single impairment will result in the inability of the fire pumping system to deliver the required water supply to the site fire protection systems.

SECTION 9-6 SEPTEMBER 2004 REVISIONS

Revisions to the Boiler and Machinery Loss Control Standards:

Revised Standard 3 - Turbine Generator / Exciter
Revised Standard 4 – Transformers
Retired Loss Control Bulletin NEIL95-01B on Dismantled TG Inspections
New Standard 18 – Circuit Breakers, Low and Medium Voltage
New Loss Control Bulletin NEIL04-01B on Torsional Vibration added

The B&M Subcommittee met in November 2003 and May 2004 and several changes to the B&M Standards were proposed and unanimously accepted at the EAC Meeting in August 2004. The President of NEIL approved the unanimous standards change proposals following the meeting. These changes are summarized as follows (the staff is currently developing Interpretative Guidance):

1. ***Loss Control Bulletin NEIL95-01B, Dismantled Inspection of the Main Turbine-Generator*** - The bulletin is retired since robotic inspection was approved as an acceptable substitute for rotor out inspections of the main generator in March 2001.

2. ***Loss Control Bulletin NEIL04-01B, Determining Turbine-Generator Torsional Vibration Frequencies*** - New Loss Control Bulletin on Torsional vibration discussing the effects of natural resonant frequency changes to the turbine shaft system resulting from component replacement. The Bulletin requires that NEIL be notified whenever physical changes are made that would affect the mass or elasticity of the rotor line and requires measuring the natural resonant frequencies after such changes are made.

3. ***Standard 3 Turbine-Generator / Exciter*** – There were several changes approved to Standard 3:

    a. Standard 3.A.9 now includes Emergency Seal Oil Pumps.
    b. Standards 3.C.11 and 3.C.25 includes changing Turbine Valves (Turbine Control, Stop, Reheat Stop, Intercept, Bypass and Extraction Check Valves) dismantled inspections "should" frequency from 72 to 96 Months and the Shall frequency from 96 to 120 Months.
    c. Standard 3.D Main Turbine Generator / Exciter Electronic Overspeed Trip Testing includes a new Standard paragraph for appropriate testing of electronic overspeed devices as several plants have installed, or proposed to install, electronic overspeed trip devices on Main Turbine-Generators.

4. ***Mechanical Drive Turbines*** - Table IV.C, Note 5, for Turbines Driving Auxiliary Feedwater, HPCI, & RCIC Pumps was not changed last year when the dismantled inspection frequency for Mechanical Drive Turbines was changed. Note for Mechanical Drive Turbines for ECCS Pumps - since the dismantled inspection frequency for mechanical drive turbines had been extended, the frequency for turbines driving ECCS Pumps should also be extended from 10 years to 12 years and that "regardless of horsepower" should be included.

5. ***New Standard for Low and Medium Voltage Circuit Breakers*** – Establish a PM and inspection program for non Class-1E breakers of critical equipment, including breakers of 600 Volts and below (Low Voltage Breakers) and 6.9 KV and below (Medium Voltage Breakers) and should also include a requirement for the plant to provide a Critical Equipment list and results of a breaker coordination study.

6. ***Transformer Gas-in-Oil Testing*** - The Transformer Gas-In-Oil Testing Interpretive Guidance that clarifies IEEE bases Condition on individual gas results and the NEIL Guideline bases Condition on Total Dissolved Combustible Gas levels.

Revisions to the Property/Fire Protection Standards:

Loss Control Program Implementation
Program Section 2-7 Periodic Audits, Adequacy of Design Reviews
Appendix 3.A.6, Fire Protection Systems Testing
Appendix 3.A.1, Operating Plant Fire Brigades
Appendix 3.D.8, Cooling Towers
Appendix 3.B.2, High Value Warehouses
Standard 3.A.1, Fire Brigade
Standard Section 8-3A, Section D, Referenced Standards

The Property/Fire Protection Subcommittee met October 28 and 29, 2003 and May 5 & 6, 2004 and several changes to the Property/Fire Protection Standards were proposed and unanimously accepted at the EAC Meeting in August 2004. The President of NEIL approved the unanimous standards change proposals following the meeting.

The changes are as follows:

1. ***Loss Control Program Implementation – Section 8-1D – Loss Control Organization*** – Update of the NEIL Design Review Program.

2. ***Loss Control Program Implementation – Section 8-1F –Design Reviews*** - Update of the NEIL Design Review Program.

3. ***Loss Control Program – Section 2-7 – Periodic Audits – Adequacy of Design Reviews*** - Update of the NEIL Design Review Program.

4. ***Property Loss Control Standard, Appendix 3.A.6 – Fire Protection Systems Testing*** Two year review of Appendix 3.A.6. Clean Extinguishing Agents added to Section K. Several changes reflect clarification to the tasks needed to comply with the requirement. Frequencies in sections M & N, Alarm Systems, extended from annual to 18 months. Section E.11 on deluge system flushing was removed. The appendix now references the recently released EPRI/NMAC document on Fire Protection Equipment Surveillance Optimization and Maintenance Guide.

5. ***Property Loss Control Standard, Appendix 3.A.1, Section C – Operating Plant Fire Brigades*** - When an off-site fire response organization protects NEIL insured areas of the plant as the primary responder, the organization is promptly called when a fire is indicated.

6. ***Property Loss Control Standard, Appendix 3.A.1, Section B – Operating Plant Fire Brigades*** - Requires fire brigade drills involve a drill scenario that is a credible emergency situation and is assessed in accordance with the NEIL Property Loss Control Standards.
7. ***Property Loss Control Standard, Appendix 3.D.8 – Cooling Towers*** - Fire barrier gaps need to be sealed with s in mechanical draft cooling towers.

8. ***Property Loss Control Standard – Appendix 3.B.2 – High Value Warehouses*** - Requirement for the use of alarm check valves in wet pipe sprinkler systems in high value warehouses.

9. ***Property Loss Control Standard – 3.A.1 – Fire Brigade*** - A change in terminology for fire pre-plans is now consistent with plant terminology.

10. ***Property Loss Control Standard – Section 8-3A, Section D – Referenced Standards*** - Clarifies the intent for the use of referenced standards from other organizations.

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SECTION 9-7 SEPTEMBER 2005 REVISIONS

Revisions to the Boiler and Machinery Loss Control Standards:

Standard 3 - Turbine Generator / Exciter
B&M Credits Section IX.A – Electric Motors and Motor Generator Sets
Interpretative Guidance Standard 3
Interpretative Guidance Standard 18 – Circuit Breakers
Interpretative Guidance 8-4C. Inspection Schedule – Maximum Inspection Interval (Grace Period)
Standard 10C – Mechanical Drive Turbines Overspeed Trip Tests

The B&M Subcommittee developed several proposed changes to NEIL's B&M Loss Control Standards during a meeting held May 3 – 4, 2005. These proposed changes were presented to the EAC Executive Committee on Thursday June 2, 2005 and approved for comment. A comment period was open from Tuesday June 7th through Tuesday July 12th. These changes were formally approved by the EAC during a meeting that was held on August 4, 2005. The Board approved the changes during a meeting that was held September 9, 2005. The B&M Subcommittee met on October 13, 2005 and decided to expedite the change to Standard 10C for use during upcoming spring outages. A vote was sent via email on October 19th and a unanimous decision was received on November 7th . The President of NEIL approved the change and the change was incorporated into this Standards revision.

The changes are as follows:

1. ***Standard 3 Turbine-Generator / Exciter*** – There were several changes approved to Standard 3:

    a. Standard 3B.1 and Interpretative Guidance includes self-diagnostics of electronic overspeed trip devices should be monitored at the same frequency as the simulated overspeed trip test for mechanical overspeed trip systems.
    b. Standard 3.C.13 the Primary Lube Oil Pumps are kept at the 72 Month frequency, but the Turbine-Generator Auxiliary and Emergency Lubricating Oil Pumps and Motors could be added to Section 8-2B, Equipment List for the B&M Loss Control Standards, and subject to Standards 11, Electric Motors, and 12, Driven Pumps and be subject to dismantled inspection based on performance.
    c. Standard 3.C.24 includes electrical testing to determine the condition of the Iso-Phase bus and to extend the visual inspection interval. Electrical testing be completed every 2 Fuel Cycles and visual inspection of the entire Iso-Phase Bus be completed over 4 Fuel Cycles.

2. ***B&M Credits Section IX.A – Electric Motors and Motor Generator Sets*** - Thermographic surveys of Electrical equipment that is operated only for surveillance testing as the annual frequency does not allow the equipment to reach equilibrium temperatures. Therefore changing the frequency for equipment operated only for surveillance testing to each Fuel Cycle makes good sense.

3. ***Interpretative Guidance Standard 3 Turbine-Generator / Exciter*** – Include electronic systems.

4. ***Interpretative Guidance Standard 18 Circuit Breakers*** – There were changes made to the Interpretative Guidance including replacing "critical equipment" with "important plant equipment" and removing "Air" from before Circuit Breakers in Standard 18.1 and 18.2 due to other type breakers being used in these applications.

5. ***Interpretative Guidance Section 8-4C. Inspection Schedule*** - There should be no "grace period", only a maximum interval for each frequency identified in the Standards. This change incorporates frequencies that were not in the original guidance and eliminates the "grace period".

6. ***Standard 10C – Mechanical Drive Turbines Overspeed Trip Tests*** - Mechanical Drive Turbines with electronic speed controls and overspeed trip devices was added and reference to "mechanical" overspeed trip and the statement "For units without a mechanical overspeed trip device, an actual overspeed trip test at or near 110% is to be conducted to determine that the overspeed trip functions within the range specified by the manufacturer." was removed.

Revisions to the Property/Fire Protection Standards:

Standard 3.C.6. Containment and Drainage
Standard 3.D.11. Transformers
Appendix 3.A.1. Operating Plant Fire Brigades
Appendix 3.A.6. Fire Protection Systems Testing
Appendix 3.F.2.e. Temporary Services
Interpretative Guidance for Appendix 3.A.6.

The Property/Fire Protection Subcommittee developed several proposed changes to NEIL's Property Loss Control Standards during a meeting held May 4 & 5, 2005. These proposed changes were presented to the EAC Executive Committee on Thursday June 2, 2005 and approved for comment. A comment period was open from Tuesday June 7th through Tuesday July 12th. These changes were formally approved by the EAC during a meeting that was held on August 4, 2005. The Board approved the changes during a meeting that was held September 9, 2005.

The changes are as follows:

1. ***Standard 3.A.4. Hot Work Fire Watch*** - To proficiently use a fire extinguisher in the event of a fire, hands on, live fire training is necessary annually.

2. ***Standard 3.C.6. Containment and Drainage*** - Transformer oil containment pits in some cases have an accumulation of debris and dirt in them that potentially reduces the oil containment capability. This change recommends that there be a requirement to assure that oil containment pits retain the capability to hold the amount of oil and fire suppression system water that they were originally designed to hold.

3. ***Standard 3.D.11. Transformers*** – The wording of Standard 3.C.11.b.(1), Outdoor Separation From Adjacent Transformers, has requirements for fire barrier design that is inconsistent with NFPA and Factory Mutual requirements. This change brings the NEIL Property Loss Control Standards in agreement with other nationally recognized standards.

4. ***Appendix 3.A.1. Operating Plant Fire Brigades*** - Fire Brigade Drill Controllers / Evaluators Property Loss Control Standard – Appendix 3.A.1 – Section B.2 - While witnessing fire brigade drills it has been observed that in some cases fire brigade drill controllers and evaluators have limited knowledge and experience in assessing fire brigade drill performance. This change recommends that fire brigade drill controllers and evaluators have qualifications to perform the assessment of fire brigade performance during drills.

5. ***Appendix 3.A.6. Fire Protection Systems Testing*** - A comparison review of Appendix 3.A.6 Fire Protection System Testing and the EPRI Fire System Equipment Surveillance Optimization and Maintenance Guide was conducted. This change modifies performance based frequency extensions along with minor modifications to the sections on Fire Pumps, Carbon Dioxide, and Clean Agent and Halon.

6. ***Appendix 3.F.2.e. Temporary Services*** - temporary services was revised to capture changes suggested by a Member.

7. ***Interpretative Guidance for Appendix 3.A.6.*** - The changes are due to the Standard wording being repeated in the interpretative guidance.

8. ***Interpretive Guidance for Standard 3.C.3.c*** - A change for fire barriers indicates the EPRI Guide guidance would be an ACCEPTABLE method of complying with the Loss Control Standards.

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SECTION 14A B&M INTERPRETATIVE GUIDANCE

IV.C.2. Inspections and tests may be arranged so there will be no interference with power production.

Scheduling of Inspections/Tests

The following general statements apply:

If a Standard requirement comes due during the operating cycle, a statement should be made in the evaluation report, notifying the Member to perform the requirement at the next available opportunity. The length of the scheduled operating cycle has no bearing on the requirements.

If due to scheduling, a Standard requirement is due within days following the scheduled end of the outage, the Member still has until the next available opportunity to perform the requirement.

If due to scheduling, a Standard requirement was due within days following the scheduled end of the outage, and plant problems cause the outage to be extended, the requirements of the Standard should be evaluated on a case-by-case basis. Consult with the Manager - B &M Loss Control.

If a Standard requirement comes due during the scheduled outage dates, even if it is one day prior to the end of the scheduled outage, the Standard requirement should have been performed during that outage.

IV.C.4. Items "should" be inspected or tested once within the desired inspection frequencies and Shall be inspected or tested once within the insurability frequencies.

Permitted time between inspections/tests/surveillances.

Frequency	Maximum Interval
Weekly	**9 days**
Monthly	**38 Days**
Quarterly/3 Months	**15 weeks**
Semi-Annual/6 Months	**210 days**
9 Months	**10 months**
Annual/Yearly/12 Months	**15 months**
18 Months	**20 months**
X Hours or Operations	**X Hours or Operations**
Fuel Cycle	**1 Fuel Cycle**
24/72/96/120 Months	**2/6/8/10 Years**
2 Fuel Cycles	**2 Fuel Cycles**
Per Nat'l Standard or Guideline	**Per Nat'l Standard or Guideline**

The maximum intervals reflected in this table may not be exceeded without consequence. The Member is required to open appropriate dialogue with NEIL regarding any intent to exceed these maximum intervals. If these intervals are exceeded, recommendations may be issued at the time of the Evaluation.

Standard 3C - Turbine-Generator/Exciter - Dismantled Inspection

Request for an extension to the turbine - generator dismantle inspection interval.

In addition to the Items in Note 1, the following documents are requested to perform a complete review of the Members' request:

- **A history of previous refueling outage dates, noting when inspections of the requested component(s) were performed.**
- **Copies of the previous inspection results of the component(s) for which the request is being submitted.**
- **A projected schedule of future inspections.**
- **A projected schedule of future inspections.**
- **A letter from the OEM, on OEM Letterhead, stating their position on the Member request.**

Standard 1 - Reactor Pressure Vessel And Internals - Every Ten-Year Interval.

Review NIS-1 Report or view tape of Reactor Vessel inspection to ensure that required vessel examinations are performed. (Member may also have a procedure for Reactor Vessel and Internals Inspection.)

Review documentation of inspections performed on lifting equipment.

Standard 2 - Steam Generator

A Steam Generator inspection program is to be implemented in accordance with NEI 97-06, *Steam Generator Program Guidelines.*

PWR plants should have a procedure that outlines the inspections to be performed and tubing defect evaluation criteria.

Credit is available in the Accidental Outage Program for eddy current inspection or examination of all in service tubes over the full length.

Partial Credit, if all tubes are inspected in two (2) Refueling Outages; Full Credit, if all tubes are inspected every Refueling Outage.

3A Turbine-Generator/Exciter - Observations

Documentation for these items is usually on the Control Room Operators Log and/or the Turbine Building/Secondary Plant Operators Round Sheets. Item 3A.5 can be found in the Chemistry Logs and sometimes in a Daily Report or Plant Status Report. Item 3A.9 is usually logged only if the pumps are not available for use.

3B.1. Turbine-Generator - Operating Tests

Simulated Overspeed Trip Test

Also known as an "Oil Trip Test." Documentation of the trip test should include the desired and actual trip set points. Sat or Unsat results are required and corrective actions for Unsat results and the retest results are required. Results may be recorded in Operations Surveillance procedures, Startup procedures, Outage Reports, etc. Electronic systems with self-diagnostic capabilities should be monitored for satisfactory results.

3B.2. Turbine-Generator, Operating Tests

Integrity of electrical circuitry and power supply for heater extreme high level alarms, controls, switches and interlocks by testing.

Documentation of the testing performed. I&C procedures, Operations procedures, Work Orders, etc. Testing is required on those extreme high-level alarms (high-high alarms) associated with the prevention of water induction into the turbines and those associated with a turbine trip.

3B.3. Turbine-Generator, Operating Tests

Integrity of electrical circuitry and power supply of all remote operated heater drain and bypass valves by testing.

Documentation of the testing performed. I&C procedures, Operations procedures, Work Orders, etc.

3B.4. Turbine-Generator, Operating Tests

Actual observation of the mechanical freedom of all extraction line check valves. Where ALARA concepts preclude actual observation, this may be accomplished by monitoring remote valve position indicators.

Documentation of observations performed. Work Orders, Maintenance Test procedures, Operations Surveillances, Outage Reports, etc.

3B.5. Turbine-Generator, Operating Tests

Mechanical operation, interlocks and controls of all extraction line check and stop valves are tested to full closure. Verify seat/disc contact of extraction check valves.

Documentation of the observations performed. Seat/disc contact can be verified by valve position indicators, pressure changes in line or listening to contact. Work Orders, Maintenance Test procedures, Operations Surveillances, Outage Reports, etc.

3B.6. Turbine-Generator, Operating Tests

By simulating pressure decay, test the availability of emergency lubricating oil and emergency hydrogen seal oil pumps.

A test initiation signal is required. For example, isolation of the associated pressure switch, then bleeding the pressure off, observing the starting of the emergency lubricating oil and/or emergency hydrogen seal oil pumps. Operations Surveillance procedures, Work Orders, Maintenance procedures, etc.

3B.7. Turbine-Generator, Operating Tests

Test the ability of the emergency lubricating oil and emergency hydrogen seal oil pumps to provide adequate pressure to the turbine/generator centerline within the manufacturer's specified time frame.

Documentation that shows the manufacturer's requirements, (actual pressure at bearing and time to reach this pressure) and the as found pressure and time. Outage Reports, Turbine Reports, Operations Surveillance procedures, Maintenance procedures, etc.

3B.8. Turbine Generator, Operating Tests

Test operate each trip solenoid valve in the turbine trip system to ensure freedom of movement. If any solenoid fails to operate, then all trip solenoids in the turbine trip system will be removed, replaced or rebuilt and then tested per manufacturer's instructions.

For those solenoids that can cause a direct turbine trip, documentation showing the testing performed. (for Westinghouse units the solenoids can be designated 20/ET, 20/AST -1,2,3,4, 20/OPC-1,2; for GE units the solenoids can be designated the Master Trip Solenoids) The valves are to be tested INDIVIDUALLY to verify operability. Verification of Sat/Unsat conditions is required. If a solenoid fails there should also be documentation of repairs made and the retests performed. Turbine/Outage reports, Surveillances, etc. Ref: W AIB 9301, GEK -11367C.

3B.9. Turbine-Generator, Operating Tests

Verify the set pressures on all pressure switches used for turbine trips.

Documentation showing verification of the set pressures for the turbine trip pressure switches. I&C procedures, Maintenance procedures, Work Requests, etc.

3B.10. Turbine-Generator, Operating Tests

Determine the Natural Resonant Frequencies due to Torsional Vibration response by testing or analysis. If the natural response frequency is in the critical range of 118 to 122 Hz (for a 60 Hz electric system) or 98 to 102 Hz (for a 50 Hz electric system), actions are to be taken to separate natural frequencies from this critical frequency range or the Member is to provide the technical justification to NEIL why such actions are not necessary. Testing or analysis is to be performed whenever a rotating element of the turbine-generator is replaced. Replacement of a "like kind" rotating element does not require testing or analysis.

Documentation from the OEM/Vendor that states the closest frequencies to 120 HZ as determined by testing or analysis. Specific values are required. A statement such as "the unit is not susceptible to torsional vibration" is not sufficient. In cases where the only available documentation is a proprietary document, the LCR should write a memo to file, stating the values read from the documentation.

3C Turbine-Generator, Dismantled Inspections

Documentation of the actual work performed/inspections performed. This information is usually found in the turbine generator overhaul/outage report. Not all items will be in each report due to the rolling schedule.

NDE results should be reviewed and compared to previous reports. Qualification of personnel performing NDE should be reviewed (spot check).

Owner Approved Manufacturer's Bulletins should be reviewed for compliance / applicability.

A long-range dismantled schedule should be obtained that provides both look ahead and look back information. Vendor's Engineer Field reports, Turbine-Generator Overhaul reports, etc.

3C.27. Turbine-Generator, Dismantled Inspections

Remove, replace or rebuild and then test each trip solenoid valve in the turbine trip system per manufacturer's instructions.

For those solenoids that can cause a direct turbine trip, documentation showing the inspections performed on those solenoid valves. (for Westinghouse units the solenoids can be designated 20/ET, 20 -1,2,3,4 AST, 20 OPC-1,2; for GE units the solenoids can be designated the Master Trip Solenoids) Verification of Sat/Unsat conditions is required. If a solenoid fails there should also be documentation of repairs made and the retests performed. Turbine/Outage reports, Surveillances, etc. Ref: W AIB 9301, GEK-11376C.

3D.1. Turbine-Generator, Dismantled Tests

Every Fuel Cycle plus anytime maintenance work is performed on the front standard, an actual trip test (at or above normal running speed) Shall be conducted to verify that the overspeed trip used for primary protection operates in accordance with plant specifications.

If a mechanical overspeed trip device is used as primary overspeed protection, then an actual overspeed trip test Shall be performed. This test will ensure that the machine trips at the required speed and that all components function as intended. Documentation of the actual overspeed trip test results Shall be provided.

If work is performed on the front standard that could affect the overspeed trip mechanism, either directly or indirectly, an actual overspeed trip test Shall be performed.

A bench test of the overspeed trip mechanism may be performed in lieu of an actual overspeed trip test if previously approved by NEIL. Test documentation should include the desired and

actual trip set points. Results are to be documented and corrective actions for Unsatisfactory results and retest results are to be provided.

If an electronic overspeed trip device is used as primary overspeed protection, then an actual overspeed trip test at or above normal running speed Shall be performed. This test will ensure that all components function as intended and that the protection system operates in accordance with plant specifications. Documentation of the results of the test Shall be provided.

Results of overspeed trip tests may be recorded in Operations Surveillance procedures, Startup procedures, Outage Reports, etc.

3D.2. Turbine Generator, Dismantled Tests

When the exciter or permanent magnet generators are dismantled, appropriate tests Shall be performed to ensure adequate insulation of exciter bearings and associated electrical equipment.

Description of the actual work and inspections performed must be documented. This information is usually found in the turbine-generator overhaul/outage report.

4.1. Transformers

Observe the general condition of the transformers, to include, as applicable:

Oil Level In Tank Oil Level in Bushings
Nitrogen Pressure in Storage Bottle Nitrogen Blanket Pressure
Gas Accumulator Relay Operational Oil Leaks
Alarm(s) Operational Proper Number of Fans / Coolers in Operation
Operation of Control System(s)

Record general condition inspections; record and investigate any off-normal conditions.

Documentation is required only for off-normal conditions. A checklist in the instructions of the log for those items to be checked and an indication that all items were checked is sufficient.

Documentation for the above items is usually recorded on the Turbine Building or Outside Operator's logs. Some items may be checked as part of the rounds. In addition, some items may be performed by either System Engineers or T&D electrical personnel.

4.2. Transformers

Record/Correlate Readings of the Top Oil Temperature and Winding Temperature.

For the Top Oil/Winding Temperature Indications, the recording and correlation of the readings is required. Under normal conditions, the Winding Temperature should be higher than Top Oil Temperature

4.5. Transformers

Perform Power Factor Testing of Transformer Windings and Bushings.

Documentation of the tests performed. Usually a field report from the vendor or the test personnel from the utility. Start date-June 1996.

4.6. Transformers

Insulating Oil Tests of the transformers are made in accordance with IEEE C57.106-1991 and the results and interpretations reviewed by Inspection Personnel. Test results "should" include a measure of oil temperature at the time of sample collection in order to determine relative saturation of the insulating oil.

Documentation of sample results (Dielectric, Interfacial Tension, Neutralization & Moisture) including the required tests and dates. Failure to perform all tests within the required time frame should result in a recommendation.

Solubility of Water in Transformer Oil vs. Temperature

°C	ppm H_2O	°C	Ppm H_2O	°C	ppm H_2O	°C	Ppm H_2O
0	22	26	71	51	179	76	398
1	23	27	73	52	185	77	410
2	25	28	76	53	192	78	422
3	26	29	80	54	198	79	434
4	27	30	83	55	205	80	447
5	28	31	86	56	212	81	460
6	30	32	89	57	219	82	474
7	31	33	93	58	227	83	487
8	33	34	97	59	234	84	501
9	34	35	100	60	242	85	516
10	36	36	104	61	250	86	530
11	37	37	108	62	258	87	545
12	39	38	112	63	267	88	561
13	41	39	117	64	275	89	576
14	43	40	121	65	284	90	593
15	45	41	126	66	293	91	609
16	46	42	130	67	302	92	626
17	49	43	135	68	312	93	643
18	51	44	140	69	322	94	660
19	53	45	145	70	332	95	678
20	55	46	150	71	342	96	696
21	57	47	156	72	352	97	715
22	60	48	161	73	364	98	734
23	62	49	167	74	375	99	754
24	65	50	173	75	386	100	773
25	68						

Determination of Relative Saturation in Transformers: As an approximation, at the °C indicated, Mineral Oil in Transformers will hold, AT SATURATION, the indicated quantity of water, in ppm. (Formula from Mr. Paul Griffin, Doble Engineering Company)

$$\text{Log So} = \frac{-1567}{^{\circ}K} + 7.0895$$

where °K = Degrees Kelvin
So = Solubility of water in Mineral Oil

To determine Relative Saturation:

1. **At the time of sample collection, record the Transformer Oil Temperature (Top Oil Temperature).**

2. **Determine the saturation H_20 from the Table above. (e.g. @ 45 °C, saturated oil contains 145 ppm H_20).**

3. **Determine the ppm moisture in the oil. (For illustration purposes, it is determined to be 30 ppm).**

4. **Relative Saturation is determined by:**

$$\frac{\text{measured ppm}}{\text{saturation ppm}} \times 100 = \text{Relative Saturation}$$

$$\frac{30 \text{ ppm}}{145 \text{ ppm}} \times 100 = \sim 20\%$$

4.7. Transformers

Dissolved Gas Analysis Tests of the transformers are made in accordance with IEEE C57.104-1991 and the results and interpretations reviewed by Inspection Personnel.

Documentation of sample results including the required tests and dates. Failure to perform all the tests within the required time frame should result in a recommendation.

4.8. Transformers

Test results from 4.6 & 4.7above outside the acceptable limits by more than 110% "should" require further testing, investigation, and diagnosis.

If the test result for any transformer is at or above the "Trigger Limit" specified in Section 8-2C Figure 1A for Dissolved Gas-In-Oil or Section 8-2C Figure 1B for Insulating Oil Properties, at least one additional test to confirm the result must be performed. If the confirmation test result is less than the "Trigger Limit" specified in Figure 1A or Figure 1B, as appropriate, no additional testing or reporting is required. However, if the confirmation test result is at or above the "Trigger Limit", additional testing as outlined in the Transformer Testing Flowchart and Guidelines, Section 8-2C, Dissolved Gas-In-Oil Sampling Flowchart or Section 8-2C, Insulating Oil Sampling Flowchart

6A Auxiliary Boiler (including reboilers) is defined as: Any steam or hot liquid heating plant with an indicated or rated capacity that exceeds:

499 square feet of heating surface, OR
100 boiler HP, OR
1000 KW, OR
4 million BTU.
Regardless of pressure or temperature conditions

6A.1. Auxiliary Boilers

Internal inspections of auxiliary boilers are to include a thorough visual inspection of both sides of the pressure boundaries, where accessible, with attention directed at corrosion extent and rate, evidence of cracking or other distress, adequate weld reinforcement, and scale accumulation. Internal surfaces of low water fuel cut-off controls are to be inspected for sludge accumulation and mechanism operability.

Documentation detailing the performance of a VISUAL inspection concerning the above listed items. Boiler inspector reports, Work Orders and Procedures, etc.

6A.2. Auxiliary Boilers

External inspections of auxiliary boilers are to be made while the boiler is operating and include visual inspection of accessible pressure boundary areas. Safety features such as low water fuel cut-off controls and flame failure protective devices are to be tested for operability.

Documentation detailing the performance of a VISUAL inspection concerning the pressure boundary. Operator's Logs, Boiler inspector reports, Work Orders and Procedures, etc.

Documentation of operability testing of the low water fuel cutoff controls and flame failure protective devices. The trip should be tested on startup and then after thirty days of operation. Boiler Start up procedure, Operations/I&C procedures showing testing that include frequency of the tests, etc. Testing of the low fuel (power) cutoff controls applies to electrode type boilers.

Operability is defined as "does the equipment work or function as required".

6A.3. Auxiliary Boilers

Safety valves are to be exercised.

Documentation showing a means of testing which insures the valve is not stuck shut. A manual "lift" test meets the definition of exercising. Maintenance Procedure, Work Order, Outage Report, etc.

6B.1. Power Boilers

Internal inspection of Power Boilers used as steam generators for main Turbine-Generators are to include a thorough visual inspection of both sides of the pressure boundary, where accessible, with attention directed at corrosion extent and rate, evidence of cracking or other distress, adequate weld reinforcement, and scale accumulation. Internal surfaces of low water fuel cut-off controls are to be

inspected for sludge accumulation and mechanism operability. Additional attention is to be directed at condition of reheaters and superheater tube erosion, wall wastage, soot blower impingement, and refractory condition.

Documentation detailing the performance of a VISUAL inspection concerning the above listed items. Boiler inspector reports, Work Orders and Procedures, etc.

6B.2. Power Boilers

External inspections of Power Boilers used as steam generators for main Turbine-Generators are to be made while the boiler is operating and include visual inspection of accessible pressure boundary areas. Safety features such as low water fuel cut-off controls and flame failure protective devices are to be tested for operability. Operating logs are to be reviewed to discover unusual operating conditions or transients.

Documentation detailing the performance of a VISUAL inspection concerning the pressure boundary. Boiler inspector reports, Work Orders and Procedures, etc.

Boiler Start up procedure, Operations/I&C procedures showing testing that include frequency of the tests, etc.

6B.3. Power Boilers

Safety valves are to be tested.

Documentation showing the testing of the pressure relieving devices, testing requires that the device be operated to ensure it opens and reseats at the required pressures. Maintenance Procedure, Work Order, etc.

For safety valves, testing requires that the valves be operated to ensure it opens and reseats at the required pressures.

6B.4. High Temperature Steam Piping Inspection

Inspection programs should include piping stress analysis (ANSYS, ADL Pipe, or Equivalent), dimensional checks (a PI tape is used for verification of dimensions and may detect gross swelling), UT, MT, PT, Alloy Verification (a portable alloy analyzer is used to verify material chemistry), Chemical Etch or Eddy Current (where needed, to verify presence of seam welds), acetate replicas (where needed), and some use of acoustic emission. The program should include the scope of the baseline inspection and the interval for reinspection. Good inspection programs do not require 100% inspection of the ~~line~~ pipe. They do require inspections of high stress areas where creep occurs first.

7.1. Moisture Separators/Reheaters

Internal inspections of moisture separator/reheaters are to include a thorough visual inspection of both sides of the pressure boundary, where accessible. Attention is to be directed at corrosion extent and rate, evidence of cracking or other distress, adequate weld reinforcement and sludge/scale accumulation.

Documentation detailing the performance of a VISUAL inspection concerning the above listed items. An inspection where the MS/R is opened and visually inspected for corrosion/erosion rate and extent and distress, etc meets the requirements. MS/R inspection reports, Outage Reports, Work Orders and Procedures, etc.

7.2. Moisture Separators/Reheaters

Verify the operability of pressure relieving devices of the MS/R's.

Documentation showing the testing of the pressure-relieving device such that operability is verified. Work Orders, Outage Reports, Maintenance Procedures, etc.

Operability is defined as "does the equipment work or function as required".

7.3. Moisture Separators/Reheaters

External inspection of moisture separator/reheaters is to include verification of pressure boundary integrity, foundation, or support degradation.

Documentation concerning verification of the above detailing the performance of a VISUAL inspection concerning the pressure boundary, foundation and support degradation. This may be in the form of plant procedures that require the operators to observe plant conditions and log unusual or abnormal conditions. Operator's rounds sheets, Work Orders and Procedures, etc.

7.4. Moisture Separators/Reheaters

Wear areas of casings or shells of moisture separator/reheaters are to be examined to verify integrity and acceptable wall thickness.

Documentation of the NDE performed, inspections performed to verify integrity and acceptable wall thickness.

Note that no specific method of NDE is specified.

MS/R inspection reports, Outage Reports, Work Orders, etc.

8.1. Deaerators

Internal inspections of deaerators are to include a thorough visual inspection of both sides of the pressure boundary, where accessible. Attention is to be directed at corrosion extent and rate, evidence of cracking or other distress, adequate weld reinforcement and sludge/scale accumulation.

Documentation detailing the performance of a VISUAL inspection concerning the above listed items. An inspection where the Deaerators are opened and visually inspected for corrosion/erosion rate and extent and distress, etc meets the requirements. Deaerator inspection reports, Outage Reports, Work Orders and Procedures, etc.

8.2. Deaerators

Verify the operability of pressure relieving devices of the Deaerators.

Documentation showing the testing of the pressure-relieving device such that operability is verified. Work Orders, Outage Reports, Maintenance Procedures, etc.

Operability is defined as "does the equipment work or function as required".

8.3. Deaerators

External inspection of deaerators is to include verification of pressure boundary integrity, foundation, or support degradation.

Documentation concerning verification of the above detailing the performance of a VISUAL inspection concerning the pressure boundary, foundation and support degradation. This may be in the form of plant procedures that require the operators to observe plant conditions and log unusual or abnormal conditions. Operator's rounds sheets, Work Orders and Procedures, etc.

8.4. Deaerators

Wear areas of casings or shells of deaerators are to be examined to verify integrity and acceptable wall thickness.

Documentation of the NDE performed, inspections performed to verify integrity and acceptable wall thickness.

Note that no specific method of NDE is specified.

Deaerator inspection reports, Outage Reports, Work Orders, etc.

9 Combustion Turbines - **This Standard applies to combustion turbines used as a prime mover for electrical generation.**

9A Observations of Combustion Turbines are to be conducted. Determination of acceptable operating conditions is to be made in advance for comparison with those noted at the time of the observation. In all cases, where possible, remote and local indications are to be compared for consistency.

Items can usually be found in the operating logs and lube oil test results.

9B Combustion Turbines - Tests

Inspection Personnel are to review test results on the following items.

9B.1. Results of tests on installed protective devices.

These items can usually be found in the operating logs/surveillance reports.

9B.2 & .3. Combustion Turbines

Results of simulated overspeed trip tests.

Results of actual overspeed trip tests. Tests are to be performed following maintenance on the front standard or the overspeed trip mechanism.

Documentation of the testing performed. It should include the desired and actual trip set points. Sat or Unsat results are required and corrective actions for Unsat results and the retest are required. Operations/I&C Surveillances, Outage Reports, etc.

9C Combustion Turbines - Dismantled Inspections

Documentation of the inspections performed. Operating hours should be recorded at the time of the inspection. Inspections should cover the listed items. Overhaul/outage report, vendor field report, work orders, etc.

10A Mechanical Drive Turbines Observations

Documentation is usually on the Turbine Building/Secondary Plant Operators logs. Items 5, 6, 7, 9 and 10 may be in the form of plant procedures that require the operators to observe plant conditions. Any unusual or abnormal conditions would be logged; absence of these observations would meet the requirements. Item 8 should include the pumps present and available for use, this may only be logged when they are not available.

10B Mechanical Drive Turbines - Dismantled Inspections

Documentation of the actual work performed/inspections performed. This information is usually found in the turbine overhaul/outage report. Not all items may be in each report due to the rolling schedule.

NDE results should be reviewed and compared to previous reports. Qualification of personnel performing NDE should be reviewed (spot check).

Manufacturer's Bulletins should be reviewed for compliance/applicability.

A long-range dismantled schedule should be obtained that provides both look ahead and look back information.

10C Mechanical Drive Turbines Dismantled Tests

Following a dismantle inspection, an actual overspeed trip test is to be conducted to determine that the mechanical overspeed trip functions within the range specified by the manufacturer. For units without a mechanical overspeed trip device, an actual overspeed trip test at or near 110% is to be conducted to determine that the overspeed trip functions within the range specified by the manufacturer.

Documentation of an actual machine trip test. A bench test of the mechanism is not sufficient. It should include the desired and actual trip set points. Sat or Unsat results are required and

corrective actions for Unsat results and the retest are required. Operations Surveillance procedures, Startup procedures, Outage Reports, etc.

If an electronic overspeed trip device is used as primary overspeed protection, then an actual overspeed trip test at or above normal running speed Shall be performed. This test will ensure that all components function as intended and that the protection system operates in accordance with plant specifications. Documentation of the results of the test Shall be provided.

11A Electric Motors Observations

Documentation of the above items is not required; however there must be evidence that the conditions are being observed. Any unusual or abnormal conditions would be logged; absence of these observations would meet the requirements.

11B Electric Motors Dismantled Inspections

Documentation of the actual work performed/ inspections performed. This information is usually found in the outage reports/ work orders. Vendor's reports may also provide information. Electrical testing results should be reviewed. Comparisons to previous inspections should be made.

12A Driven Pumps Observations

Documentation of the above items is not required; however there must be evidence that the conditions are being observed. Any unusual or abnormal conditions would be logged; absence of these observations would meet the requirements.

12B Driven Pumps Dismantled Inspections

Documentation of the actual work performed/ inspections performed. This information is usually found in the outage reports/ work orders. Vendor's reports may also provide information. Comparisons to previous inspections should be made.

13 Other Prime Movers and/or Driven Equipment, 1000 HP and Over.

A review of equipment installed should be performed to determine if any equipment falls within the scope of this Standard. Typical components for this Standard are large air compressors, diesel driven auxiliary feedwater pumps. Documentation that outlines/describes the Predictive/Preventive Maintenance Program. Disassembly, inspection, parts replacement and manufacturer's recommendations should be included.

14 SWITCHYARD EQUIPMENT

14A.4. Insulating Medium Moisture Test

This is intended to apply to Oil Circuit Breakers (OCB) and Air Circuit Breakers (ACB). The Insulating Medium Moisture Test is not required on SF6 Gas Circuit Breakers. The

Switchyard Task Force determined that the loss of SF6 Gas for sampling would provide minimal benefit and any unexplained decrease in SF6 Gas pressure is an indication that there may be a problem and should be investigated to determine the cause.

14B Relays (Those relays associated with the breakers in Standard 14A).

The Relays that actually cause Breakers to operate and protect plant equipment from Grid disturbances. Breakers are usually operated by the closest Relay, normally a Lockout Relay or a Relay Bus. One test to determine that the Breaker operates when the signal from the Lockout Relay or Relay Bus is applied will meet the intent of the Standard. Other Relays that provide signals to the Lockout Relay or Relay Bus is to be calibrated and tested with the equipment on which they are installed, such as the Main Generator (Differential, Reverse Current, Loss of Excitation, etc.), Emergency Bus (Under Voltage), or Transformer (Sudden Fault Pressure, Differential, etc.).

14C.3. Perform the following Performance Testing for the specified battery type.

The Member can request a Variance from the Standard, as outlined in Section 8-1G of the Loss Control Program Implementation. The Variance request must include information outlining how the intent of the Standard is being met, such as in this case, performing other tests more frequently (say annually) and trending the results to determine the condition of the Switchyard Battery.

15 Cranes, Rigging, Fuel and Material Handling For Critical Lifts

15.1. Responsibility

A Member's Senior Representative at each site Shall be appointed the responsibility for the overall operations, inspections, equipment maintenance, and personnel training associated with Cranes, Rigging, and Fuel and Material Handling operations involving Critical Lifts

15.2. The Member's Senior Representative Shall:

- Assure that Supervisors (See definition of Supervisors on page 1303) are assigned responsibility for crane, rigging, and fuel and material handling operations.
- Assure that qualified crane operators/riggers are assigned to perform all critical lifts.
- Assure the proper operation and maintenance of all cranes, rigging, and fuel and material handling equipment.
- Assure that contractor personnel and equipment comply with the applicable portions of these Standards when working on the insured plant site.

Plant Administrative procedures/Corporate Safety procedures should provide this information. Contractor documentation can usually be found in the contract for the work performed.

15.3. Cranes, Rigging, Fuel and Material Handling For Critical Lifts
Training

- Crane, fuel, and material handling equipment operators "should" demonstrate their ability to

operate the crane, fuel, or material handling equipment to which they will be assigned by passing a performance test.
- Riggers and signalers "should" demonstrate their ability to perform the functions of their task by passing a practical test.
- Non-qualified personnel are not permitted to operate cranes, or fuel and material handling equipment unless under the close supervision and direction of qualified personnel.
- Severe weather procedures "should" be included in the initial and ongoing training program for all crane operators who operate outdoor cranes.

Training procedures and lesson plans should contain this information. Individual training records should provide qualification status on various cranes on site and rigging training. Training procedures/lesson plans should discuss severe weather procedures.

15.4. Cranes, Rigging, Fuel and Material Handling For Critical Lifts - Maintenance

- A preventive maintenance program Shall be established for cranes, rigging, and fuel and material handling equipment, which as a minimum, addresses the manufacturer's recommendations or other applicable specifications.
- All welding associated with crane repairs Shall be performed in accordance with procedures that meet applicable American Society of Mechanical Engineers or American Welding Society Standards, or according to manufacturer's directions. All repairs Shall be inspected by qualified inspection personnel.
- Repairs Shall meet or exceed the design requirements and manufacturer's specifications or generally accepted industry practice.

Documentation of the maintenance program for cranes and rigging equipment. Procedures should address manufacturer's recommendations. Welding repairs usually are included in the work orders/etc for the repairs made. Inspection personnel qualifications are usually noted in the work order. Repairs usually reference applicable ANSI/OSHA sections or manufacturer's recommendations.

15.5. Cranes, Rigging, Fuel and Material Handling For Critical Lifts - Equipment Design And Installation

All cranes, both fixed and mobile, and fuel and material handling equipment design, placement, assembly and/or installation Shall be done in accordance with applicable ANSI, OSHA, or manufacturer's specifications.

Standard References are ASME B30.2a-1991, Overhead and Gantry Cranes; ASME B30.9a-1991, Slings; ASME/ANSI B30.10b-1991, Hooks; OSHA 29 CFR Ch XVII 1910.179, Overhead and Gantry Cranes; OSHA 29 CFR Ch XVII 1910.184, Slings, The crane manufacturer's specifications should be in accordance with these references and there may be crane specific requirements.

15.6. Cranes, Rigging, Fuel and Material Handling For Critical Lifts - Equipment Operation And Inspections

Supervisors "should":
- Assure that operational procedures pertaining to all cranes, fuel and material handling, and rigging operations associated with critical lifts are written.

- Prior to use, perform a review of crane, fuel and material handling and rigging procedures and operations.

- Assure that operational procedures pertaining to all outdoor critical lift operations are written addressing:
- Limitations based on wind velocity in accordance with manufacturer's recommendations to include action levels for derating, termination of lifting activities, anchoring, and lowering of booms.
- Derating or termination of lifting activities in accordance with manufacturer's recommendations based on extreme temperatures or when ice build-up exists on lifting equipment.

Procedures for crane operations may fall within the requirements of NUREG 0612, Control of Heavy Loads at Nuclear Power Plants. If so, those cranes and lifts that are required to met those requirements will also meet items a and b above. Lifts that do not fall under NUREG 0612 such as lifts by the Turbine Crane and Intake Structures at some plants, should have operating procedures that address items a, b and c as appropriate.

15.6.d. Cranes, Rigging, Fuel and Material Handling For Critical Lifts - Equipment Operation And Inspections

- Monitor each critical lift with authority to shutdown that operation (to a safe condition) when acceptable standards are not being followed. The following specific requirements apply to all critical lifts:
- Critical lifts are to be preplanned through:
- Determination of the total working load weight (including the weight of rigging, etc.).
- Calculating the capacity of the load bearing components of the lift.
- Measuring/determining the lift radius, load path and interference, where applicable.
- Before outdoor lifts, weather reviews are to be conducted before performing a critical lift. Maximum allowable wind velocities are to be predetermined in case the wind velocity increases during the lift.
- Before performing underwater lifts, consider visibility.

Procedures for crane operations may fall within the requirements of NUREG 0612, Control of Heavy Loads at Nuclear Power Plants. If so, those cranes and lifts that are required to met those requirements will also meet items above. Lifts that do not fall under NUREG 0612 such as lifts by the Turbine Crane and Intake Structures at some plants should have operating procedures that address items as appropriate.

15.6.e. Cranes, Rigging, Fuel and Material Handling For Critical Lifts - Equipment Operation And Inspections

- Assure that initial, periodic, and post maintenance inspections, and full-capacity lift tests using the overload factors for all lifting devices are performed in accordance with applicable ANSI and OSHA Standards and documented.

Standard References are ASME B30.2a-1991, Overhead and Gantry Cranes; ASME B30.9a-1991, Slings; ASME/ANSI B30.10b-1991, Hooks; OSHA 29 CFR Ch XVII 1910.179, Overhead and Gantry Cranes; OSHA 29 CFR Ch XVII 1910.184, Slings, The crane manufacturer's

specifications should be in accordance with these references but there may be crane specific requirements.

15.6.f. Cranes, Rigging, Fuel and Material Handling For Critical Lifts - Equipment Operation And Inspections

- Assure that each contractor provides documented evidence of inspections and maintenance on its equipment.

Contractor documentation can usually be found in the contract for the work performed.

15.6.g.(1) Cranes, Rigging, Fuel and Material Handling For Critical Lifts - Equipment Operation And Inspections

- Assure periodic documented inspections of all cranes, fuel and material handling equipment as follows:

- Daily (Frequent Inspection as defined by OSHA/ASME) - visual inspection by qualified operators, during periods of use, documented by a checklist.

Per ASME B30.2/B30.10b the following items are to be inspected:

1. **operating mechanisms for proper operation, proper adjustment and unusual sounds.**
2. **upper limit device(s) operation,**
3. **air or hydraulic system components for leakage**
4. **hooks and hook latches (if used) for distortion, wear, cracks, nicks, gouges, latch engagement/condition and hook attachment**
5. **hoist ropes and end connections for gross damage such as distortion (kinking, crushing, unstranding, birdcaging, main strand displacement or core protrusion), general corrosion, broken or cut strands and number, distribution and type of visible broken wires**
6. **rope for proper spooling onto the drum(s) and sheave(s).**

A checklist should be used to document these inspections. A laminated checklist in the crane cab or at the pendant controls satisfies this requirement.

15.6.g.(2) Cranes, Rigging, Fuel and Material Handling For Critical Lifts - Equipment Operation And Inspections

- Assure periodic documented inspections of all cranes, fuel and material handling equipment as follows:

- Quarterly (Periodic Inspection as defined by OSHA/ASME) - detailed inspection by qualified inspection personnel during periods of use. (See definition of Qualified Inspection Personnel on page 1303).

Per ASME B30.2/B30.10b the following items are to be inspected:

1. **the items in g. (1) above**
2. **deformed, cracked or corroded members**

3. **loose or missing bolts, nuts, pins or rivets**
4. **cracked or worn sheaves and drums**
5. **worn, cracked or distorted parts such as pins, bearings, wheels, shafts, gears, rollers, locking and clamping devices, bumpers and stops**
6. **excessive wear of brake system parts**
7. **excessive wear of chain drive sprockets and excessive chain stretch**
8. **deterioration of controllers, master switches, contacts, limit switches and push-button stations**
9. **wind indicators for proper operation**
10. **power plants for proper operation**
11. **motion limit switches that interrupt power or cause a warning to be activated for proper operation**
12. **rope reeving for compliance with manufacturer's recommendations**
13. **function labels for legibility and replacement.**

Procedures or work orders documenting these monthly/ quarterly inspections should be reviewed.

15.6.g.(3) Cranes, Rigging, Fuel and Material Handling For Critical Lifts - Equipment Operation And Inspections

- Assure periodic documented inspections of all cranes, fuel and material handling equipment as follows:

- For cranes, fuel or material handling equipment used infrequently (i.e., inactive for more than one quarter), a detailed inspection by qualified maintenance personnel prior to use.

For those cranes out of service for more than one quarter, an inspection using the requirements of g.(2) **above should be performed prior to using the crane(s). Rx Polar cranes, Fuel Handling equipment and Turbine Building cranes usually fall into this category. Annual or Code compliance inspections usually provide this information.**

15.6.h. Cranes, Rigging, Fuel and Material Handling For Critical Lifts - Equipment Operation And Inspections

- Assure that rigging equipment and accessories meet the requirements outlined below and that periodic inspections of such equipment are conducted. Inspections are to be performed in accordance with applicable ANSI/ASME, OSHA or manufacturer's specifications.

ASME B30.9, *Slings*, requires an annual detailed inspection for slings in normal service (i.e.: loads within the rated load of the sling). ASME B30.10b, *Hooks*, requires an annual detailed inspection for hooks in normal service.

All associated hardware is to meet the requirements stated under Section 15.5.h.

16 Spent Fuel Pool Chemistry

Documentation as to the chemistry program the plant is following for the Spent Fuel Pool. Plant procedures should reference the requirements of the manufacturer or industry

guidelines, such as the BWR Owners Group, PWR Owners Group or EPRI/INPO guidelines for fuel pool chemistry.

17.1 Inspection Documentation

The Member is to require from Inspection Personnel, timely, detailed documentation of inspection activities.

Documentation can be outage/overhaul reports, automated work requests, computerized records, field reports, vendor reports, etc. The intent is to document the work performed, repairs required, retests, etc to show compliance with the Standard requirements.

17.3.1 Inspection Documentation

- Cranes, Rigging, Fuel and Materials Handling Related Items

- The Member Shall develop and provide to NEIL, a list of the cranes, hoists, and other fuel and material handling equipment that is used in conjunction with critical lifts. As a minimum, this list Should include the Reactor (Polar or Bridge Crane) Building and Turbine Building cranes, New Fuel, Spent Fuel and Cask Handling cranes and hoists. Rigging equipment designed for use in handling specific components (e.g. spreader beams and slings used to lift turbine casings) is to be included in the list. General hardware used for critical lifts need not be included in the list; however, this equipment "should" be maintained as specified in the applicable portions of these Standards. Equipment is to be listed by nomenclature, specific use and identifying serial numbers (if applicable).

The Member is to maintain the list current with changes submitted to NEIL as necessary.

17.4 Inspection Documentation

- Cranes, Rigging, Fuel and Materials Handling Related Items

- The following documentation "should" be available for review during plant evaluations:

- Signed and dated detailed inspection reports for cranes, fuel and material handling equipment and rigging. (Maintain for the life of equipment).
- Signed and dated maintenance reports for cranes, fuel handling equipment and rigging. (Maintain for the life of the equipment).
- Reports of investigations of crane and rigging related incidents (Maintain for five (5) years).
- Qualification records of operators involved in critical lifts. (Maintain for five (5) years).
- Periodic review of crane, fuel handling and rigging procedures and operations.
- Procedures used for pre-planning critical lifts.

Documentation can be outage/overhaul reports, automated work requests, computerized records, field reports, vendor reports, etc. The intent is to document the work performed, repairs required, retests, etc to show compliance with the Standard requirements.

18 Circuit Breakers (Low and Medium Voltage)

This Standard applies to non-Class 1E, low (600 Volts and below) **and medium (15 KV and below) voltage Circuit Breakers** for **important plant** equipment (equipment necessary for protection of the Turbine-Generator and Feedwater Pumps). This equipment includes Turbine-Generator Normal, Standby, and Emergency Lube Oil Pumps; Normal, Standby, and Emergency Seal Oil Pumps; Feedwater Pump Lube Oil Pumps; and the Bus Feeder Breakers for this equipment. **The Programs for** Circuit Breakers **are to include** Normal and Emergency Power Bus Feeders, and the breakers for **important plant** equipment based upon the plant's breaker coordination study. Preventive Maintenance, Overhaul, and Testing Programs should include **reference to** industry guidelines and/or manufacturers' recommendations.

Each plant should evaluate the Equipment List and determine which breakers are within the scope of the Standard based on plant design. The intent is for each plant to review INPO SOER 98-02, the EPRI Maintenance Guides, and the breaker manufacturers recommended practices and follow those guidelines for overhaul and inspection of the breakers they identify as within the scope.

TYPICAL IMPORTANT PLANT EQUIPMENT & CIRCUIT BREAKER LIST

Non-Class 1E, low voltage (600 Volts and below) Circuit Breakers for this equipment:

- **Turbine-Generator normal, standby, and emergency lube oil pumps**
- **Generator normal, standby, and emergency seal oil pumps**
- **Feedwater Pump lube oil pumps**
- **Bus feeder breakers for equipment above**

Non-Class 1E, medium voltage (15 KV and below) Circuit Breakers including:

- **The breakers for important plant equipment (equipment necessary for protection of the Turbine-Generator and Feedwater Pumps) based upon the plant's breaker coordination study and associated Normal and Emergency Power Bus Feeders.**

Equipment listed above that is powered from Class 1E power supplies, Shall be inspected in accordance with Class 1E requirements, in lieu of these B&M Loss Control Standards.

1. **Establish a Preventive Maintenance and Overhaul Program for Circuit Breakers.**

"should" - N/A { N/A }, Shall - As required

Procedures for Preventive Maintenance (PM) and Overhaul (OH) of circuit breakers for important plant equipment and documentation of those completed. Reference should be made to INPO SOER 98-2, EPRI CB Maintenance Guides, and/or Manufacturer's Recommendations, Procedures, and Instruction Manuals. Frequency of PM and OH may vary depending on manufacturer, type of breaker, and application.

2. **Establish an Inspection Program for new and refurbished Circuit Breakers to include functional testing prior to placing in service.**

"should" - N/A { N/A }, Shall - As required, prior to placing in service

Documentation of the Inspection Program for important plant equipment circuit breakers prior to placing these breakers in service to verify that they are fully functional. Reference should be made to INPO SOER 98-2, EPRI CB Maintenance Guides and/or Manufacturer's Recommendations,

Procedures, and Instruction Manuals. Actual trip testing of the CB is required. Initiating this test trip from a protective relay is desirable.

3. Establish an Inspection Program for Molded Case Circuit Breakers to verify breakers are fully functional and trip at the set amperage prior to placing in service.

"should" - N/A { N/A }, Shall - As required, prior to placing in service

Documentation of the Inspection Program for important plant equipment Molded Case Circuit Breakers prior to placing these breakers in service. Reference should be made to INPO SOER 98-2, EPRI CB Maintenance Guides and/or Manufacturer's Recommendations, Procedures, and Instruction Manuals. Actual overcurrent trip testing of the CB is required that satisfies overcurrent trip criteria.

1. Establish a Preventive Maintenance and Overhaul Program for Circuit Breakers.

"should" - N/A { N/A }, Shall - As required

Procedures for Preventive Maintenance (PM) and Overhaul (OH) of circuit breakers for critical equipment and documentation of those completed. Reference should be made to INPO SOER 98-2, EPRI CB Maintenance Guides, and/or Manufacturer's Recommendations, Procedures, and Instruction Manuals. Frequency of PM and OH may vary depending on manufacturer, type of breaker, and application.

2. Establish an Inspection Program for new and refurbished Circuit Breakers to include functional testing prior to placing in service.

"should" - N/A { N/A }, Shall - As required, prior to placing in service

Documentation of the Inspection Program for critical equipment circuit breakers prior to placing these breakers in service to verify that they are fully functional. Reference should be made to INPO SOER 98-2, EPRI CB Maintenance Guides and/or Manufacturer's Recommendations, Procedures, and Instruction Manuals. Actual trip testing of the CB is required. Initiating this test trip from a protective relay is desirable.

3. Establish an Inspection Program for Molded Case Circuit Breakers to verify breakers are fully functional and trip at the set amperage prior to placing in service.

"should" - N/A { N/A }, Shall - As required, prior to placing in service

Documentation of the Inspection Program for critical equipment Molded Case Circuit Breakers prior to placing these breakers in service. Reference should be made to INPO SOER 98-2, EPRI CB Maintenance Guides and/or Manufacturer's Recommendations, Procedures, and Instruction Manuals. Actual overcurrent trip testing of the CB is required.

8-2F Primary Property Program B&M Credits - Credit for Shutdown Plants

Section 8-2F Credit will be applied for those installed systems/equipment that are in operation.

If the system/equipment is tagged out for routine maintenance and the Member is making an effort to place it back in service in an expeditious manner, the credit should be applied.

If the system/equipment is tagged out and has been for some time or no concerted effort is being made to return it to service, then the credit should not be applied.

In all cases, the LCR should use his good judgment as to the effort being applied.

Credit points will continue to be assessed, based upon procedures or programs in effect on operating equipment, until the plant is classified as a "Permanently Shutdown Plant". After the plant is so classified, the Underwriters of NEIL will adjust the Boiler & Machinery Rating to a flat rate, which is not modified by the assessment of credit points. At that time, no credits will be assessed by the LCR.

In the NEIL Primary Property Rating Manual, a "Permanently Shutdown Plant" is classified by:

1. **(a) the unit must be in a permanent shutdown mode and have relinquished its Operating License; OR**

   (b) be in a permanent shutdown mode with documented proof that it is the intent of the Member Insured to decommission the plant as soon as possible and relinquish its Operating License.

2. **The status of the unit as noted in 1.(b) must be approved by the Nuclear Regulatory Commission.**

3. **The reactor vessel must be completely devoid of fuel, with any fuel on site stored in the spent fuel pool or dry cask storage.**

PP-I-A.1 Water Induction System. Turbine system designed in accordance with ASME TWDPS1 - Part 2. Partial credit is given for significant upgrading of turbines not designed to the ASME Standard.

ANSI/ASME TWDPS1-Part 2 states two independent means of automatically preventing water from entering the turbine from the extraction system should be provided. The standard recommends that either a and b or a and c be employed.

a. **An alternate automatic high condensate level drain system from the heater shell, activated by a high level signal with an alarm.**

b. **An automatic shutoff valve in the extraction line between the turbine and the heater, power operated and actuated by the high-hi level in the heater. (A check valve whether free-swing, power assisted or positive closing type is not adequate)**

c. **Automatic shutoff valves on all sources of water entering the heater shell, implying a bypass system for the Feedwater actuated by the high-hi level in the heater. Upgrades are thermocouples, testable check valves, M.O. check valves, etc.**

PP-I-A.2 Bearing Metal Temperature. All turbine generator bearings provided with bearing metal temperature detection. Partial credit is given for thrust bearings only.

This can be on a Control Room chart recorder, Process Computer, etc. This is the metal temperature, not the bearing drain oil temperature, (or oil return temperature).

PP-I-A.4 On-line Vibration Analysis. Continuous on-line vibration monitoring hardware with continuous trending and analysis.

This is an online system and there are several types in use. A system that continuously monitors and updates on a periodic (~15 minutes) basis and provides trending and analysis meets the requirements. A chart recorder does not meet the requirements.

PP-I-A.5 Independent Overspeed Protection. An independent system beyond the normal systems to provide additional assurance against excessive overspeed. The correct operation of this system should be verified each fuel cycle.

Backup electrical or mechanical overspeed trip system that is tested to ensure proper operation.

PP-I-B.2 Generator On-line Diagnostic System. Credit is given for a complete, installed diagnostic system that is continuously monitored for trends in the generator internal conditions.

Gen-Aid or similar type system.

PP-I-B.6 Pyrolysate System. An installed system for continuous collection of cooling gasses to detect the presence of particulates from sacrificial chemical compounds to readily detect location of overheating.

An automatic sampling system that will draw and collect a sample for removal and analysis. A manual sampling, (i.e.: technician opens valves to draw sample) does not meet the intent. The Environment One system with the tagging compounds in the generator meets the intent, as does the GE Pyrolysate collector.

PP-I-C.1 High Integrity Tubing - Condensers, Feedwater Heaters, and Moisture Separator/Reheaters having non copper-bearing materials. Partial credit is applied for all condensers or all Feedwater Heaters, including Moisture Separator/Reheaters.

Documented by design packages, work orders, or Engineer's reports that show replacement of the original piping with non-copper bearing piping.

PP-II.A.1 Monthly Rotating Equipment Spectral Vibration Analysis Program
Credit is provided for a monthly vibration analysis program which measures, records, and trends vibration spectrum signatures. Partial credit is available for Turbine Generator only or rotating equipment as noted in the NEIL Primary Property Standards only.

Credit is applied if the person performing and the person reviewing vibration analysis results are certified to SNT-TC-1A, Level I and Level II, respectively. Partial credit is applied if either the person performing or person reviewing is not certified to SNT-TC-1A.

Predictive Maintenance may provide a periodic report of the components monitored. NEIL Primary property equipment should be listed. These should be checked for alert and alarm levels in compliance with the vibration guidelines.

Check certifications of individuals to ASNT-TC-1A to obtain full credit.

PP-II-A.2 Credit is provided for the continuous operation of a vibration monitoring system installed on reactor coolant pumps/reactor recirculation pumps that has the capabilities of detecting shaft cracking and bearing degradation.

Predictive Maintenance may provide a report. These should be checked for alert and alarm levels in compliance with the vibration guidelines.

For the RCP/RRP vibration monitoring credit, the LCR should review the system capabilities with the System Engineer and obtain a copy of the system description and operating procedures if possible.

PP-II.B Full Spectrum Lubricating Oil/Control Fluid Analysis
Credit is provided for quarterly testing of oil samples by applying methods of quantitative and qualitative analysis to determine the presence of wear metals or contaminants.

Predictive Maintenance may provide a periodic report of the components monitored. NEIL Primary Property equipment should be listed. This can be onsite or offsite lab analysis. A system such as "Oil View" meets the intent as long as the results show wear metals and particulates, etc.

Samples of all components listed in the Primary Property Equipment List are analyzed with the required time frame. Missing one component is cause for not applying credit.

PP-II.F.1 & 2 Thermographic Surveys - Annual infrared surveys or equivalent of major equipment including transformers, motors, motor control centers, and associated bus ducts and pumps, including bearings, couplings and gears.

Semi-annual infrared surveys or equivalent of designated switchyard breakers and disconnect links.

It is intended that the equipment used be such that a broad view of the equipment being monitored is obtained. Infrared (Hot Spot) Guns do not meet the intent. Credit should not be given to a program that uses this type of monitoring equipment for regularly scheduled surveys. Predictive Maintenance group can provide this information.

PP-III-A Personnel Training - Credit is provided for the implementation of training programs for personnel whose activities concern the Turbine-Generator. Those training programs accredited by an industry - recognized authority in the following disciplines are considered, partial credits may apply.

A fully implemented program can be verified by the INPO accreditation of the program.

AO-I-A Reactor Pressure Vessel Internals

Observations should be made each refueling outage of the general condition, structural weld conditions, debris and condition of bolting and other fasteners and any associated lifting devices. These observations should identify any cracking or galling of reactor vessel internals and associated equipment. Results of such inspections should be recorded. A complete core off-load is not required, however observations are to be equivalent to those performed as if the core were completely off-loaded.

Credit is applied for visual observation of accessible reactor vessel internal surfaces and internal fittings. There are no ASME Code VT requirements for the inspection, but the scope of the observations is to include all areas that could be observed as if all fuel were removed from the vessel.

No additional disassembly beyond that normally done for a regular refueling outage is required.

The plant's NIS-1 Report to the NRC provides an excellent summary of inspections completed and their results. The plant may also have a procedure for the reactor vessel internal inspection.

FOSAR inspections by themselves do not meet the credit requirements

Lifting devices must also be inspected and results documented.

AO-I-B.1 Observations should be made each refueling outage and results recorded on the following:

Steam Generator- Tube bundle conditions to include:

a) Eddy-current examination results, hot and cold legs, in all unplugged tubes
b) Tube cracking
c) Tube thinning
d) Tube denting
e) Tube supports

Credit is applied for performing eddy current examination of the full-length, both hot and cold legs, of all unplugged tubes in all steam generators. Partial credit is applied if all tubes are examined over two refueling outages. Plants normally prepare a steam generator inspection summary that includes how many tubes were examined and identifies tubes were found defective, plugged, or recovered.

AO-I-B.2 Steam Generator - Tube sheets and shell internal conditions, including foreign object inspection.

Credit is applied for performing internal inspections of all areas of all steam generators each refueling outage. The foreign object search and retrieval (FOSAR) inspection does not meet the requirement for credit. The inspection must include internal areas of the steam generator shell and the tubesheet. Partial credit is applied if all steam generators are inspected in two refueling outages. The steam generator inspection summary will provide results of the inspections completed.

AO-I-B.5 Thermal shields (where installed) - Observations of all accessible areas using VT-3 methods to include:

a) General conditions;
b) Condition of support bolting, pins, welds, and/or surfaces.

Credit is applied for inspecting accessible areas of the thermal shield each refueling outage and partial credit is applied if it is inspected every other refueling outage. To receive the credit the vessel must have a thermal shield (either hanging from the core barrel or resting on supports) or neutron pads bolted to the core barrel 360° around the circumference.

AO-I-C.1 A hydrogen injection system should be installed with adequate provisions to ensure it's continued operation except under controlled conditions.

In order to receive the credit, the hydrogen injection system must have been operating with at least 85% availability, in Mode 1, since the last evaluation. This includes operating at the required injection rate determined for the plant.

For BWRs without a Hydrogen Injection System, the credits available are still added to the total available credits.

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SECTION 14B PROPERTY INTERPRETIVE GUIDANCE

3.A.1.c. Establish fire response pre-plans to all NEIL insured areas of the site.

See Section 8-3C, Appendix 3.A.1.c.

When a Member station chooses to utilize an off-site fire suppression organization in their permanent plant fire response plan for NEIL insured structures, a fire drill shall be conducted at least annually involving the responding organization. A question was raised as to what would be required to meet the intent of this drill.

The following guidelines should be followed when determining what would be an acceptable drill:

The responding organization may conduct a drill whereby a fire is simulated in the structure. They would stretch hose lines and flow water along with having members in full turnout gear and SCBA's. This type of drill should be conducted on a periodic basis.

They may also elect to conduct a pre-plan type drill where responding members are given an orientation tour of the facility. This type of drill should include familiarity with fire hydrant locations, occupancy, special hazards, fire suppression system locations and fire alarm annunciator panel locations. This type of drill may be conducted in lieu of a simulated fire type drill.

All fire drills are required to be documented, including the response time of the responding agency. The LCR should review such records during their periodic EVALUATION.

3.C.3.c. Fire Barrier Openings Inspection and Maintenance:

3.C.3.c.(1) Fire barrier opening protection devices (i.e. doors, dampers, seals, etc.) in walls required by NEIL as a Shall requirement, Shall be inspected and maintained in a condition which would allow the devices to perform their design function.

3.C.3.c.(2) Fire barrier opening protection devices (i.e. doors, dampers, seals, etc.) in walls required by NEIL as a "should" requirement, "should" be inspected and maintained in a condition that would allow the devices to perform their design function.

NEIL Required Fire Barriers

NEIL Standards require fire separations be provided for Property and Accidental Outage insurance purposes in several areas of the plant. Most of the barriers required by NEIL would usually be required by the plant regulatory requirements. Areas of the plant that may NOT be part of the regulatory requirements of the station are the focus of this NEIL Standard. Examples of areas required by NEIL that may NOT be regulatory required are listed below. The full list of NEIL required barriers is contained in the NEIL Property Loss Control Standards, sections 3.B.1.b, 3.B.2.b, 3.C.1.d, 3.C.3, and Appendix 3.B.2.

- **Between units on all levels below the operating floor;**
- **Between redundant fire pumps;**
- **Turbine generator lube oil storage tanks, lube oil reservoirs, etc.;**
- **Motor generator sets that contain greater than 100 gallons of combustible fluid;**
- **Peripheral control room offices or rooms for Accidental Outage;**
- **Electrical switchgear concentrations at risk of external exposure to fire for Primary Property;**
- **Simulator and their High Value Electronic Equipment;**
- **Attached Auxiliary Boiler areas;**
- **High Value Warehouse separation of values (NEIL Shall required fire barrier);**
- **Fire barriers provided as an alternative to building separation**

ACCEPTABLE Inspection and Maintenance Program

NSO is expecting that a floor level inspection of NEIL required fire barriers is performed at a regular interval. The inspection needs to identify defects in the barrier such as cracks, visible light, inappropriate routing of services and functional fire doors.

Fire barriers need to be identified such that maintenance and modification work can be performed without affecting the barriers rating. When maintenance is performed, which could affect the function of dampers, doors, or penetration seals a verification of the components capable of performing its design function needs to be performed.

The visual inspection of fire doors needs to verify door closure after normal passage, visible damage, holes in the skin, and a rated door is in place. NFPA – 80, Fire Doors and Fire Windows, can be used as a reference for the development of the inspection.

The EPRI Fire Protection Equipment Surveillance Optimization and Maintenance Guide, 1006756, chapter 7 contains information on the design and issues pertaining to fire barriers. Appendix N of the Guide provides recommended inspections, failure criteria, and consequences of a fire barrier failure. This guidance can be used while optimizing the fire barrier inspection program.

3.C.9.a.(1) Flame retardant cables - ACCEPTABLE if the cables have passed the fire and/or flame test as described in IEEE Standard 383 and/or 634 or ACCEPTABLE equivalent.

Cable Construction requires cables to pass the IEEE 383 fire test as a minimum. Based on the National Electrical Code, 1993 edition, the following fire tests will be ACCEPTABLE to NEIL when used in the listed configurations.

Plenum:

U.L. 910/NFPA 262 Standard Method Of Test For Flame Travel and Smoke Of Wires And Cables For Use In Air Handling Spaces.

Riser:

U.L. 910/NFPA 262 Standard Method Of Test For Flame Travel and Smoke Of Wires And Cables For Use In Air Handling Spaces.

U.L. 1666 Test For Flame Propagation Height Of Electrical And Optical-Fiber Cables Installed Vertically In Shafts

General Purpose:

U.L. 910/NFPA 262 Standard Method Of Test For Flame Travel and Smoke Of Wires And Cables For Use In Air Handling Spaces.

U.L. 1666 Test For Flame Propagation Height Of Electrical And Optical-Fiber Cables Installed Vertically In Shafts

U.L. 1581 Reference Standard for Electrical Wires, Cables, And Flexible Cords

IEEE 383 IEEE Standard For Type Test Of Class 1E Electrical Cables, Field Splices, And Connections For Nuclear Power Generating Stations, section 2.5 Flame Tests

3.C.10.b. Lightning protection systems Shall be inspected and maintained in a condition that would allow the system to function as designed.

INTERPRETIVE GUIDANCE:

Each station is expected to have a program in place to insure that the required inspections and tests are developed, scheduled and conducted. The program should include:

Visual Inspections

1. **Structures protected by air terminals.**

   At least once per 24 months:

   Conduct a visual inspection of air terminals and any exposed wiring and attachment devices to verify they are in serviceable condition. Physical access to and inspection from roofs should be made as practical. The use of binoculars or similar devices is permitted to reduce the cost impact of the inspection (i.e. cable runs down walls or structural items.

2. **Structures with limited accessibility to the top of the structure (Containment Domes, Hyperbolic Cooling Towers, Vent stacks, etc.) – When access is made to the top of the structure (at intervals not to exceed 10 years):**

   Conduct an inspection of the air terminals and any accessible down wires and attachment devices.

3. **Metal frame buildings grounded to an ACCEPTABLE grounding system.**

   At least once per 24 months:

   Conduct a visual inspection to verify that accessible grounding straps attached from the building framework to the grounding system are intact, not corroded, etc.

Continuity Testing

Stations should conduct continuity testing if modifications are made to the structure that may damage or alter the lightning protection system or there is some indication that those portions of the system that are not available for visual inspection may have been damaged.

Ground Resistance Testing

Ground resistance testing should be performed as required by NFPA 780 for any new structure that is being constructed and is not being connected to the plant-grounding mat.

Non NFPA 780 Systems

Buildings with lightning protection systems other than those installed to meet NFPA 780 (Early Streamer Emission Systems and Charge Dissipation Systems) inspections and testing should be conducted in accordance with the manufacturers recommendations.

3.D.3.a.(1) Looped fire mains Shall be designed and installed to meet the systems' flow requirements with the hydraulically least demanding portion of any one loop main out of service.

3.D.3.b. Hydrants - UL Listed, FM Approved, or other ACCEPTABLE hydrants Shall be provided per applicable NFPA standards.

3.D.3.b.(1) The maximum intervals "should" be 250 feet on the yard main.

INTERPRETIVE GUIDANCE

A Member has asked NEIL for guidance regarding the installation of fire mains and fire hydrants for insured structures and areas.

The NEIL Property Loss Control Standards (PLCS) state that looped fire mains Shall be designed and installed to meet the systems' flow requirements.

The NEIL Property Loss Control Standards (PLCS) state that fire hydrants "should" be spaced every 250 feet on the fire main. NEIL has allowed without a recommendation being written up to 300 feet spacing where 250 feet would not be practical, such as the hydrant being in the middle of a road.

NEIL utilizes NFPA 24, Installation of Private Fire Service Mains and Their Appurtenances, which indicates that a fire hydrant not be placed any closer than 40 feet from a structure. There is no maximum spacing requirement. NEIL would require a fire hydrant be within 250 feet of the structure. If there were no hydrant within 250 to 500 feet, a "should" recommendation would be written for hydrant spacing. If there is no hydrant within 500 feet a Shall recommendation would be written for no water supply and a "should" recommendation for fire hydrant spacing. NSO would look at each project on a case-by-case basis and determine the best course of action.

3.D.4.gAutomatic fixed water, gas, or chemical extinguishing systems "should" be provided for:

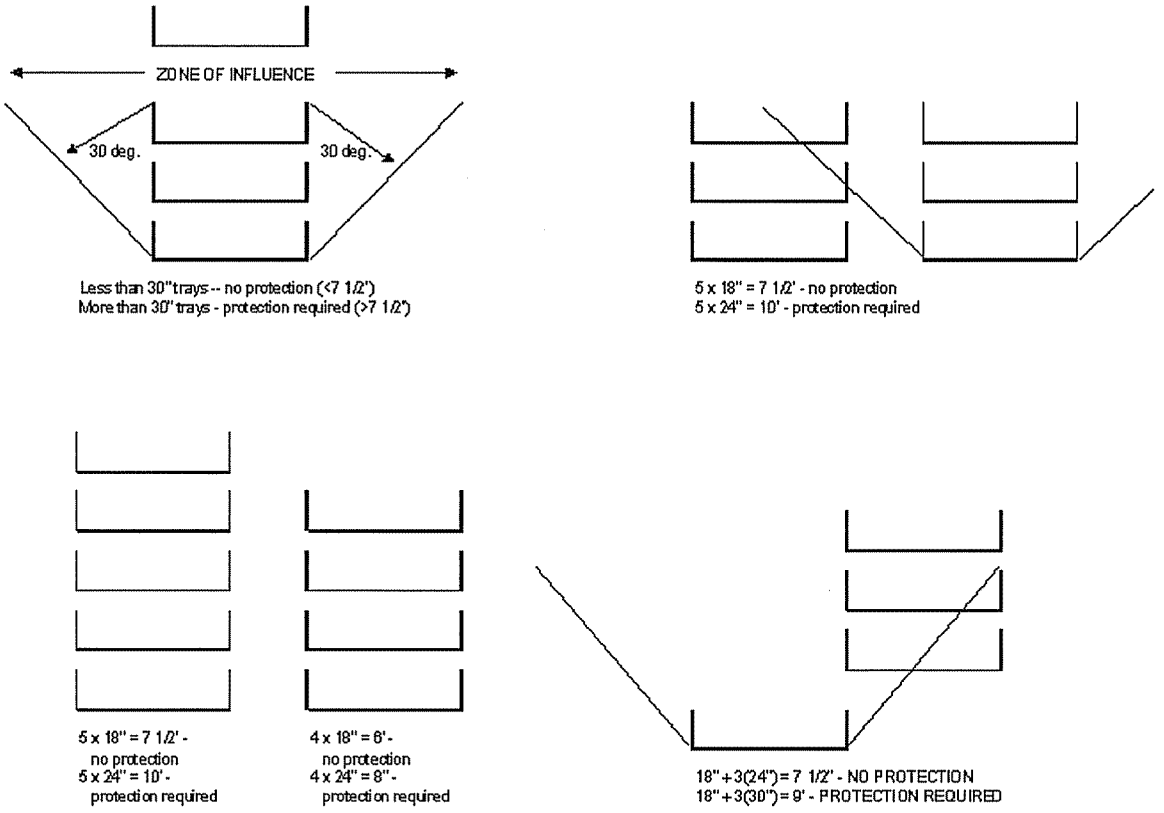
?3.D.4.g(4) Cable spreading rooms and other areas of high cable concentration.

The NEIL PLCS utilizes the term Aareas of high cable concentration≅ in referring to cable tray areas that would require a suppression system. The PLCS does not clearly define this term. Several questions have arisen in regard to what actually comprises an area of high cable concentration.

The definition of high cable concentrations for horizontal cable trays exists when more than 7 2 feet of total cable tray width exists in the Azone of influence≅. The zone of influence for solid bottom cable trays is determined by drawing lines from the bottom of the side rails of the lowest cable tray at a 30^0 angle from vertical. When open bottom (ladder) cable trays are utilized, all trays below the zone of influence subject to dripping cable insulation should be added to the total cable tray width. This is visualized in the accompanying diagram.

When a suppression system is required, NFPA 15, section 4-4.1.4, (1990 edition) should be utilized for open head spray systems designed for a rate of 0.15 gpm per square foot on the horizontal or vertical plane containing the cable trays. For closed head systems NFPA 13 should be utilized. NFPA 13 does not provide specific guidance for protection of cable trays. As a rule of thumb, a 0.15-gpm density should be used with heads spaced so that optimum coverage is attained with head spacing not to exceed 90 square feet. It is preferred to use an open head, water spray system to protect cable trays as a closed head system will have a slow response time.

3.D.4.g.4 B Areas of High Cable Concentrations (cont.)



CABLE TRAY FIRE ZONE OF INFLUENCE

3.D.11.a Outdoor separation from adjacent structures

3.D.11.a(1) Oil insulated transformers with a capacity of 500 gallons or more from adjacent structures by a two-hour rated fire barrier.

3.D.11.a(1)(a) Separation is ACCEPTABLE if the exposed wall is both one-hour fire rated and protected by an approved automatic water spray system.

3.D.11.a(1)(b) The fire barrier "should" extend in the vertical and horizontal direction such that the nearest point of the transformer is a minimum of 50 feet from any point on the wall not protected by the two hour fire barrier.

3.D.11.a(1)(c) Where a two-hour rated fire barrier is not provided, separation from adjacent structures "should" be a minimum of 25 feet for oil capacities of 500 to 5,000 gallons and 50 feet for oil capacities over 5,000 gallons.

3.D.11.a(1)(d) For oil insulated transformers with less than 500 gallons capacity, an ACCEPTABLE analysis Ashould≅ be performed which considers type and quantity of oil, size of postulated spill, type of construction of adjacent structures, and fire suppression systems provided.

3.D.11.b Outdoor separation from adjacent transformers

3.D.11.b(1) Oil filled transformers containing up to 5,000 gallons capacity "should" be separated from each other by a minimum clear space of 25 feet or a minimum one-hour rated fire barrier. The fire barrier "should" extend at least 2 feet horizontally beyond the line-of-sight from any point on the top of the transformer tank and its oil conservator (if applicable) to any adjacent transformer.

3.D.11.b(2) Oil filled transformers over 5,000 gallons capacity "should" be separated from each other by a minimum clear space of 50 feet or a minimum one-hour rated fire barrier.

The EAC upon recommendation of the Property Protection Subcommittee established that NFPA 850 be followed relative to the requirements for transformer fire barriers.

NFPA 850 requires that the firewall should extend one foot above the top of the transformer casing and oil conservator and at least two feet beyond the width of the transformer and cooling radiators. Fire barriers are not required to encompass the bushings. This information is derived from NFPA 850, 2005 edition, section 5.2.4.4.

3.D.11.a.(1)(d) For oil insulated transformers with less than 500 gallons capacity, an ACCEPTABLE analysis Ashould≅ be performed which considers type and quantity of oil, size of postulated spill, type of construction of adjacent structures, and fire suppression systems provided.

The following criteria should be employed to assist in determining whether the analysis is ACCEPTABLE to NEIL.

Physical separation should be based on the following:

1. **Type and quantity of the oil in the transformer.**
2. **Size of postulated oil spill, containment and drainage (will the spill flow to or away from the building).**
3. **Type of construction of the adjacent structures.**
4. **Power rating of the transformer.**
5. **Fire suppression systems, (if provided).**
6. **Type of electrical protective relaying.**
7. **Occupancy in the closest structure, (damage susceptibility).**

The majority of the above information was taken from NFPA 850, 1990 edition, section 3-1.3.2.

Appendix 3.A.6
□
PERFORMANCE BASED TESTING AND MAINTENANCE

B. It is recognized that many plants are investigating, or are in the process of implementing a performance-based approach to fire protection system inspection, testing and maintenance intervals. NEIL will review the results of a performance-based analysis and, if found ACCEPTABLE, will allow use of the performance-based inspection, testing and/or maintenance intervals in lieu of the intervals stated in this Appendix.

The EPRI/NMAC Technical Report on Fire Protection Equipment Surveillance Optimization and Maintenance Guide, reference number 1006756, will be viewed as an ACCEPTABLE alternative to the performance based method described in this document **and needs to be implemented in steps as described in B.1 through B.5 below.**

Frequencies may be extended as discussed in B.1 through B.5. Each progressive extension from monthly or less up to refueling outage must be accompanied with the appropriate amount of data for an extension at that frequency as provided in D.2.

B.1. **60 Days** or less performance intervals may be extended to Quarterly.

B.2. Quarterly performance intervals may be extended to Semi-Annual.

B.3. Semi-Annual intervals may be extended to Annual.

B.4. Annual performance intervals may be extended to Refuel.

B.5. Refuel frequency or greater intervals may **be extended to the greater of two times the refueling interval or twice the stated NEIL ACCEPTABLE frequency**.

C. Where an inspection, test or maintenance activity indicates that the system/equipment failure rate is higher than ACCEPTABLE to NEIL, the interval of the inspection, test or maintenance SHALL be reduced to the NEIL ACCEPTABLE Interval until ACCEPTABLE performance can be demonstrated.

D. Each performance-based analysis must be plant specific. Where inspection, testing and maintenance intervals exceed those listed in this Appendix, those intervals, with supporting documentation, "should" be submitted to NEIL for review and comment. As a minimum, the submittal "should" include:

D.1. A list of all equipment/systems whose proposed testing interval will exceed those listed in this Appendix, with the appropriate performance-based analysis for the equipment/systems.

D.2. The performance-based analysis must include a technical justification, including plant specific historical failure rate data on the equipment/system. Minimum time intervals for historical failure rate data are:

D.2.a. Monthly or less testing / inspection extended to Quarterly - 2 years of data at the monthly frequency.
D.2.b. Quarterly testing / inspection extended to Semi-annual - 3 years of data at the quarterly frequency.

D.2.c. Semi-annual testing / inspection extended to annual - 3 years of data at the Semi-annual frequency.
D.2.d. Annual testing / inspection extended to Refueling - 5 years of data at the annual frequency.
D.2.e. Refueling or greater testing/inspection - no extension of interval permitted.

D.3. The criteria and method for shortening the testing interval if higher than expected failure rates or other unexpected poor performance is found.

D.4. A frequency developed due to an ACCEPTABLE performance based analysis may supersede the ACCEPTABLE NEIL frequency in this Appendix as long as the performance-based analysis remains valid.

INTRODUCTION

Section B of Appendix 3.A.6 discusses the performance-based analysis method of extending frequencies for testing and maintenance of fire protection systems beyond those outlined in the Appendix. The discussion references historical plant specific failure rates and criteria for shortening the frequencies if failure rates are exceeded. The discussion does not provide guidance or definitions to assist in applying these terms or in development of failure rates.

The following terms, definitions, and methodology are presented as a suggested ACCEPTABLE way of satisfying the requirements for development of failure rates as contained in Appendix *3*.A.6 for performance based fire protection related frequency extensions. Other methods may be ACCEPTABLE, and will be reviewed on a case-by-case basis to determine their ACCEPTABILITY.

DISCUSSION

As part of the historical analysis conducted on plant specific records, a method of determining which records are actually applicable for inclusion in the analysis is usually necessary. This determination may be assisted by the application of certain definitions. The following definitions are specific to the NEIL Primary Property Loss Control Standards for fire protection related performance-based analyses, and are not to be linked to other plant programs. These, and other similar definitions, allow a more accurate record trail both for current review and for future analysis. Their use will assist NEIL in the review of submissions for frequency extensions and ongoing analysis to determine the continued validity of any extensions granted.

For the purposes of this discussion, the selection of which records are applicable for inclusion in a performance-based analysis may be determined by the use of three suggested definitions. Use of these definitions will allow a site to more accurately determine which records would need to be included in their analysis.

These suggested definitions constitute a two-step approach to selection of records for development of failure rates. The two steps consist of the application of three definitions. The first step, application of the first definition, allows the historically analyzed information to be reduced to a group of records that may, or may not, ultimately be included in the failure rate calculation. The second step consists of applying the remaining two definitions to eliminate those records, which may not have a bearing on the actual failure rate.

DEFINITIONS

The first suggested definition is:

Failure: The inability to complete all or a portion of a surveillance.

Note: This condition can result from many reasons including work conditions, such as high rad areas preventing the surveillance from being conducted, a relatively short-term problem with a system or a component resulting in initiation of a work order, or a non-standard or deviating condition or result.

Use of the above definition allows the plant to make an initial general selection of records to be included in their analysis.

Use of the following two definitions allows the initial record selection to be further analyzed to determine which records will be included in the final analysis.

The next two definitions are:

Administrative Failure: The inability to complete all or part of a surveillance due to administrative controls on the system or component, errors in the procedure, or plant operations issues which have directed this result.

Note: In this instance the system or component is reasonably believed to still be able to perform its intended function. A record in this category would not normally be included in the development of a failure rate.

Functional Failure: The inability to complete all or part of a surveillance due to operability issues with the specific system or component.

Note: This condition would result from the inability of the system or component to perform its intended function. This determination may be obvious from the surveillance information or it may require an analysis by a qualified engineer, including input from fire protection.

As an example, failure of a single component in a multiple component system, such as failure of a single detector in a multiple detector system or a zone of detectors in a multiple zone system would not normally impact the ability of the remaining system to perform its intended function. If that detector or zone were the only protection for an area or vital piece of equipment, this condition would impact the systems functional ability.

A further example would be the failure of a fire pump to meet its design basis requirements. This condition would have an impact on the ability of the fire protection system to perform its intended function.

This last category of records would normally be the one used to develop a failure rate.

FAILURE RATE CALCULATION

Application of these, or other similar definitions, will result in a selection of records, which would then be used to develop a system or component failure rate. The use of the selected records will also result in a plant specific failure rate as required by this Appendix. Development of an ACCEPTABLE failure rate calculation is a necessary part of an ACCEPTABLE technical justification used to request an extension of a surveillance frequency interval.

One ACCEPTABLE method of calculating a failure rate, which has been utilized in performance-based submissions, is the formula:

FR(t) = NF ÷ ((NC) (t))
where: FR(t) = Failure Rate (Failures per Year)
NF = Number of Failures
NC =Total Number of Components Inspected or Tested in the Surveillance
t = Time Interval of Review in Years

At some point in the performance-based analysis, a maximum allowable failure rate must be established. It is possible that more than one maximum allowable failure rate will be necessary depending on the number and types of systems or components undergoing analysis. A maximum allowable failure rate provides the test necessary to determine whether a system or component with a calculated failure rate is eligible for a surveillance frequency interval extension.

Maximum allowable failure rates which have been submitted and found ACCEPTABLE have been in ranges defined as absolute failures per a given number of surveillance performances, typically submitted as being >99% successful. Failure rates have also been submitted as an inverse statement relating to the availability of a system or component, submitted as <1 unavailability. Maximum allowable failure rates and formats will be reviewed on a case-by-case basis.

PERIODIC REVIEW

After comparison of system and/or component failure rates with the maximum allowable failure rates, the continuing effectiveness of the system or component has been determined. An ongoing review of surveillance performance can now be initiated to routinely determine whether the calculated failure rate is exceeding the maximum allowable failure rate. This determination is an essential part of an ACCEPTABLE performance based interval extension and must be proceduralized, repeatable and it must be carried out over a set period. This period will be determined on a plant specific basis and may range from immediately following the performance of the subject surveillance to some other defined periodic basis.

One ACCEPTABLE method could consist of a rolling period coinciding with the historical minimum time intervals used in the initial data review. For quarterly/semi-annual surveillances, this would mean a review of a rolling three years of data, with the oldest information being dropped from review as the newest information is added to the database. Subjective reviews by any single individual or group of individuals, without a proceduralized, repeatable format for review is NOT ACCEPTABLE. The proceduralized periodic review of

system and component failure rates associated with a frequency extension proposal will be evaluated by NEIL on a case-by-case basis.

Coupled with this ongoing review is a requirement for a formalized, proceduralized method of increasing the frequency of the surveillance performance in the event a system or component failure rate exceeds the maximum allowable failure rate.

The formal proceduralized methodology for reviewing the failure rates and increasing the frequency of performance may be located in an individual surveillance test, a maintenance order, a program procedure, an administrative procedure, a maintenance procedure or other consistently applied location.

SUMMARY

The essential parts of an ACCEPTABLE performance based interval extension are:

1. **Selection of appropriate records for use in the calculation of a system or component failure rate.**

2. **Calculation of a system or component failure rate using an ACCEPTABLE calculation method.**

3. **Determination of an ACCEPTABLE maximum allowable failure rate or rates to compare the calculated failure rates to.**

4. **A proceduralized method of routinely recalculating a system or component failure rate to ensure the continuing ACCEPTABILITY of the performance based extension.**

5. **A proceduralized method of reducing performance based intervals in the event the routine review finds the calculated failure rate exceeds the maximum allowable failure rate.**

6. **Review of the performance based interval extension methodology and controls for ACCEPTABILITY by NEIL.**

The intent of this information is not to limit a site to the calculation method stated above or to the maximum allowable failure rates stated above. Each performance based interval extension program will be reviewed on a case-by-case basis and each will have its ACCEPTABILITY determined individually. It should be noted that the only performance based interval extensions reviewed for ACCEPTABILITY by NEIL are those extensions for the maintenance, testing and inspection activities listed in this Appendix.

Appendix 3.A.6
□
PERFORMANCE BASED TESTING AND MAINTENANCE

B.2	Tank Interior	Inspect	5 Years

B.2 The interior of tank needs to be inspected every five years. Regardless of Corrosion protection or pressurization as discussed in the exceptions in the NFPA Standard. NEIL may ACCEPT a 10-year frequency when an impressed current cathodic protection system is present and maintained.

Item B.2, Interior Tank Inspection
□
The interior of tank needs to be inspected every five years. Regardless of corrosion protection or pressurization as discussed in the exceptions in the NFPA Standard. NEIL may Accept a 10-year frequency when an impressed current cathodic protection systems is present and maintained.□
□
NFPA 25 Chapter 6, "Water Storage Tanks" Section 6-2.4 indicates that the interior of the tank shall be inspected every 5 years or every 3 years for steel tanks without corrosion protection. NFPA 22 "Standard for Water Tanks for Private Fire Protection" Section 14-1.7 indicates that the inside of steel tanks without corrosion protection shall be made once every two years.

The details of what constitutes an ACCEPTABLE interior tank inspection are the focus of this section.

Introduction:

Natural waters, both potable and nonpotable are stored in steel tanks at many sites for fire protection water supplies. Steel surfaces submerged in water are subject to galvanic corrosion. Dissimilar metal corrosion in fire protection tanks can be caused by the copper or stainless steel heater coils and the weld seams where the metallurgy of the welding rod differs from the base plate metal. Bare or poorly coated tanks can have heavily corroded surfaces at lower submerged surfaces while the upper areas show little corrosion due to differential oxygen concentrations (there are lower oxygen levels at greater depths). Deep vertical gouges several inches or feet long can occur on uncoated surfaces of steel tanks. This phenomenon is caused by the development of an initial corrosion pit that generates soft oozing corrosion products. These products slough down the side of the tank wall shielding the lower surfaces from oxygen and rendering it anodic. When the internal surfaces of tanks are coated with a dielectric material, i.e. vinyl or epoxy, the corrosion activity will be concentrated at the holidays or "holes" in the coating. The breaks in the coating can result from mechanical damage, ice damage, improper surface preparation, or merely microscopic voids in the coating surface.

Many other factors influence the rate at which corrosion processes will proceed in water tanks. Among the most significant are electrolyte resistivity, water flow rates, and the extent of anodic surface areas with respect to cathodic areas, iron ion concentrations, and temperature and water level fluctuations.

Impressed Current Cathodic Protection:

If the tank is protected by a properly maintained impressed current cathodic protection system, uncoated tanks or coated tanks with holidays in the coatings or aging coatings, can be protected from corrosion. A coating's major function with a cathodically protected tank is to reduce the cost of power to protect the tank and reduce the rate of anode consumption. There are significant differences in manually and automatically controlled systems.

Automatically controlled, impressed current cathodic protection systems utilize one or more long-life reference electrodes, which constantly monitor the protection levels maintained on the submerged surfaces. The reference electrodes continuously determine the tank-to-water potential. A controller compares the actual tank-to-water potential to a preset value and automatically adjusts the output of the rectifier. The system needs to be maintained and adjusted to work properly, but this represents the best protection available for a water storage tank.

Manually controlled rectifiers are generally not recommended for use in water storage tanks because they require frequent monitoring, testing, and manual adjustment of the rectifier current output whenever the current requirements change due to changes in water level, coating condition, temperature, water chemistry, water turbulence, or accumulation of polarization films. Failure to adjust the rectifier current output can result in corrosion due to under protection or coating damage due to over protection.

The two major components of impressed current cathodic protection systems are the DC power supply controller (rectifier) and the anode system. The range of output current capacity required by the rectifier is determined by assuming the area of bare steel to be protected, 20% of submerged surface area before recoating for coated tanks, and the submerged surface area for uncoated tanks.

The second major component of an impressed current cathodic protection system is the anode system. The type of anode material and the type of suspension system is typically based on the tanks susceptibility to icing conditions. Seasonal or long-life anode systems are available. Seasonal arrangements consist of aluminum rods installed and serviced through hand holes in the roof. These are designed to be replaced annually after the icing conditions have passed. Long-life anode systems include suspension systems that are ice resistant and use long-life anode materials that have a design life of 10 years to 20 years.

Galvanic Cathodic Protection

Galvanic cathodic protection is not generally recognized as a method to protect the submerged surfaces of a steel water storage tank. The only feasible reason to permit this type of protection is if it is not possible to get an AC Power Supply to the tank. The maintenance requirements for such a system are extremely high. The sacrificial anodes used cannot vary the protection current and the problems of over and under protection can occur.

Coated or Uncoated Steel Tanks

The Fire Protection Water Storage Tank may rely on a coating system to protect the tank. American Water Works Association Standard D102 is the standard of reference for the proper installation of tank coatings. The coating systems have been improved over the years and

many now are dielectric material, i.e. vinyl or epoxy coatings. The coatings have various immersion resistances outlined in NACE Standard Test Method, TM-01-74, and Laboratory Methods for the Evaluation of Protective Coatings Used as Lining Materials in Immersion Service. All coatings can fail and are extremely susceptible to damage. Once they are damaged, the area becomes an accelerated pit corrosion area and failure probability is increased.

NEIL Acceptable Method of Compliance

Tanks With Galvanic Cathodic Protection:

If the tank is protected by a galvanic cathodic protection system or relies on a coating, NEIL requires an internal tank inspection every 5 years. The standard in the industry for the inspection of steel water storage tanks is AWWA M-42 Manual. The work requires a cleaned and drained inspection of the tank. NEIL will permit the use of a qualified underwater inspection company, if the inspection service meets the requirements of AWWA D101-53.

Tanks with Impressed Current Cathodic Protection:

If the tank is protected by a manually or automatically controlled impressed current cathodic protection system that is properly maintained, the tank is considered to be protected from corrosion and the 5 year submerged inspection can be extended to 10 years if annual independent inspection reports as indicated below are provided. The annual tank-to-water potentials must be measured at several locations representing the entire submerged surface area of the tank. Tank-to-water potentials must meet the criteria for protection. Corrosion reduction is then considered effective.

The following criteria must be met and appropriate data provided to the Property Loss Control Representative (LCR) to extend the submerged internal inspection to 10 years:

1. **A negative cathodic voltage is maintaining the tank-to-water potential within the range of -0.850v to -1.050v relative to a permanent copper-copper sulfate reference electrode in accordance with AWWA D104-91 Sec. 2.1. The bi-monthly rectifier readings are to be available for review.**

2. **The cathodic protection system should be checked bi-monthly to ensure that it is operating properly. The DC current and voltage outputs of the system, transformer tap adjustments, rheostat settings, and the potential set point should all be recorded bi-monthly. The records are to be available for review.**

3. **The systems accurate performance should be determined by annual surveys, utilizing a portable high impedance voltmeter and calibrated portable reference cell, representing the entire submerged surface area of the tank. The report should include measurements conducted, an evaluation of the measurements and recommendations for the continued performance of the system, including the condition of components such as rectifiers, long-life anodes and long-life reference electrodes. The annual report is to be available for review.**

4. **If seasonal or temporary anodes are used, the work is usually part of the annual service**

indicated in 3 above.

Note 1: Even if a tank is protected by an automatically controlled impressed current cathodic protection system, it does not mean that the tank is not corroding. The extent of the loss of protective coating may exceed the system design or there may be anode damage resulting in unprotected areas in the tank. None of these problems can be identified by the rectifier readings. Information provided in the independent annual survey is required or the five-year frequency enforced.

Note 2: The only other potential area of corrosion concern is the exterior of the tank bottom due to soil side corrosion. You may want to determine if any information exists on its condition. The only method of determining its condition is an Ultrasonic B-Scan inspection of the tank bottom in accordance with API 653 Deterministic Method. This would require draining the tank and cleaning of the tank bottom. Since operation of the tank is not affected, we do not require it. Corrosion of the internal submerged surface will be higher.

Suggested Survey Findings Explanation:

For tanks without Impressed Current Cathodic Protection:

Fire protection water storage tanks must be thoroughly inspected at intervals not to exceed five years in accordance with AWWA Standard D101-53. NEIL permits the use of a qualified underwater inspection service if the qualifications of the inspection service and the examination reports meet the intent of AWWA D101-53. An internal inspection "should" include inspection above the normal waterline to determine if corrosion is affecting the vapor zone of the tank internals and roof.

For tanks with improperly maintained Impressed Current Cathodic Protection:

Fire protection water storage tanks with impressed current cathodic protection must be thoroughly inspected at intervals not to exceed five years in accordance with AWWA Standard D101-53. NEIL permits the use of a qualified underwater inspection service if the qualifications of the inspection service and the examination reports meet the intent of AWWA D101-53. An internal inspection "should" include inspection above the normal waterline to determine if corrosion is affecting the vapor zone of the tank internals and roof. If the impressed current cathodic protection system is maintained in accordance with NEIL Standards, the submerged inspection interval can be extended to ten years.

For tanks with properly maintained Impressed Current Cathodic Protection:

The 5-year internal inspection requirement is extended to 10 years for steel fire protection water storage tanks with properly maintained impressed current cathodic protection. The tanks must be thoroughly inspected at intervals not to exceed ten years in accordance with AWWA Standard D101-53. NEIL permits the use of a qualified underwater inspection service if the qualifications of the inspection service and the examination reports meet the intent of AWWA D101-53. An internal inspection "should" include inspection above the normal waterline to determine if corrosion is affecting the vapor zone of the tank internals and roof.

Cathodic Protection Service Information:

Contact the American Water Works Association in Denver Colorado 303-794-7711 for information on tank inspection services, tank inspection reports and qualifications for tank inspection companies.

Underwater Inspection Service Information:

Contact the American Water Works Association in Denver Colorado 303-794-7711 for information on tank inspection services, tank inspection reports and qualifications for tank inspection companies.

Cost: The cost of an underwater inspection is usually less than the cost of the water that is lost during a drained inspection. The cost is approximately $2000 for the tank inspection with two report copies plus $500/inch for silt removal (dollar amounts are approximate figures for 1995).□

Appendix 3.A.6
□
PERFORMANCE BASED TESTING AND MAINTENANCE

C.9	Fire Pumps Full Flow Discharge	Test	18 Months

C.9 A flow test of each pump assembly needs to be conducted under minimum, rated, and peak flows for the fire pump. The test may be performed using the fire pump test header through playpipes or through a flow meter with discharge to a drain or water supply. NEIL requires that this test be conducted every eighteen months instead of the NFPA recommended annual frequency. NEIL does NOT require the water supply to be dumped to a drain on a three-year frequency when a bypass meter discharging back to the supply tank is used.

Item C.9 Fire Pump Full-Flow Discharge Test

INTERPRETIVE GUIDANCE

This Interpretive Guide is intended to determine Fire Pump performance for insurance purposes only.

Each station is expected to have a program in place to insure that the required full flow tests of the fire pumps are conducted. As a minimum these tests need to include testing the pumps at churn (no flow), 100% of rated flow capacity, and 150% (or maximum allowable flow) of rated flow capacity and the results recorded and reviewed to determine if the fire pumps' tests are ACCEPTABLE. The following methodology has been determined to be the suggested method to meet the full flow discharge test requirement.

A. Pump Pretest

1. **Look over fire pump and fire pump house, hoses, etc. for general conditions to be conducive for flow testing.**
2. **All gages utilized need to be verified as calibrated.**

B. Fire Pump Controller Testing (need not be done at time of full flow test)

1. **Start fire pump on a pressure drop.**
2. **Start fire pump manually by all designed measures.**
3. **Over speed trip test for engine driven pumps.**
4. **Failure to start.**

Note: All alarms need to be verified that they were received in the continually manned facility and/or control room.

C. Fire Pump Flow Testing

Each diesel driven fire pump needs to be run for a minimum of 30 minutes total.
Each electric motor driven fire pump needs to be run for a minimum of 10 minutes total.
Conditions of the pump and controller need to be checked periodically during these tests with any abnormalities corrected.

The following needs to be checked and recorded for each flow point:

1. **Flow (in gpm).**
2. **Pump suction pressure (in psi) and discharge pressure (in psi) at the same approximate time.**
3. **Pump speed.**

Recommended Practice: For electric fire pumps, the motor's voltage and current are recommended to be check, recorded and reviewed for irregularities.

The following flow tests need to be conducted in order to determine pump performance:

Note: The pressure relief valve test needs to be performed during the flow test.

1. **Churn Test (No Flow Test)**

Also verify circulation relief valve is operating properly during this part of test.

2. **100% of Rated Flow**

Recommended practice: The fire pump's actual rpm during this flow point is recommended to be adjusted to around the pump's rpm rating for variable speed engines. If the rpm's of the pump are adjusted, all test points need to be retested.

3. **150% of Rated Flow (or Maximum Allowable Flow)**

4. **Return valves, fire pump, controller, etc. to normal operation settings.**

D. Analyzing Pump Test Results

1. **Correct the fire pump's flow and pressure to the Rated Speed.**

   Correct flow using: $Q_2 = (N_2/N_1) \times Q_1$

   Where
   Q_1=capacity at test speed in gpm (L/min)
   Q_2 = capacity at rated speed in gpm (L/min)
   N_1= test speed in rpm
   N_2 = rated speed in rpm

2. **Correct pressure using:** $P_2 = (N_2/N_1)^2 \times P_1$

   Note: Suction head pressure needs to be subtracted when testing horizontal fire pumps.

   Where
   P_1 = pressure at test speed in (psi)
   P_2 = pressure at rated speed in (psi)
   N_1= test speed in rpm
   N_2 = rated speed in rpm

E. Graph results

3. Plot the results graphically using the three test point readings.

C. Compare test results

1. Compare the graphed results of the current test against the certified pump performance curve supplied by the fire pump manufacturer.

2. If the pump can meet the certified pump performance curve supplied by the fire pump manufacturer (with no more than 10% degradation) and the pump passed all other test procedures then the pump performance is ACCEPTABLE.

3. If the pump is not able to meet the certified pump performance curve supplied by the fire pump manufacturer (with no more than 10% degradation) or failed another test procedure then the results need to be reviewed to determine the best course of action to adequately protect the site.

References:

NFPA 25, 2002 Edition, Section 5-3.3 Annual Tests.

Appendix 3.A.6
□
PERFORMANCE BASED TESTING AND MAINTENANCE

D.6	System Main Drain	Test	18 Months
E.5	System Main Drain	Test	18 Months
F.6	System Main Drain	Test	18 Months
G.9	System Main Drain	Test	18 Months

A main drain test needs to be conducted on an 18-month frequency at each water-based fire protection system riser to determine if there has been a change in the condition of the water supply piping and control valves.

NEIL requires a main drain test on single feed systems with long runs of pipe or isolation valves not flow tested under other surveillances. □

NEIL Acceptable Method of Compliance:

System main drain tests are intended to determine if there has been a degradation in the water supply piping and valves to sprinkler, deluge, pre-action or dry pipe systems. A degradation in the water supply to a system caused by a dropped gate, partially closed valve, a degraded check valve or other obstruction will be evident by a drop in residual pressure when compared to previous test results.

Main drain tests are performed by fully opening the main drain valve on the system allowing the water to flow until the pressure stabilizes. The residual pressure is recorded. This residual pressure reading is then compared to pressure readings taken during previous tests. A reduction in residual pressure compared with previous test results could indicate a potential flow problem in the system. Further investigation would be necessary to determine the cause of the pressure reduction.

Flowing water at full flow through a 2-inch main drain until the flow has stabilized enough to take an accurate pressure reading could easily require the discharge of several thousand gallons of water. In nuclear plants, it is not always possible to pipe the main drain directly outdoors or to floor drains. In radiologically controlled areas of the amount of water introduced into the liquid radwaste system could be excessive.

Other flow tests can demonstrate that the supply piping and valves to the fire protection systems are inspected and tested adequately to assure the reliable operation of the fire protection water supply system at all times without performing the main drain test. This can be accomplished by evaluating the results of other fire protection surveillances normally performed.

ACCEPTABLE surveillances to be used to determine the reliability of the fire protection water supply system should include, but not limited to, the following:

(a) Fire Water Valve Verification.

(b) Fire Protection Valve Cycling.
(c) Annual Fire Protection Loop Flow Tests.
(d) Fire Suppression Water System Flow Test.
(e) Fire Protection Water System Flush.
(f) Hydrant Flush.
(g) Post Indicator Valve Testing.
(h) Wet Pipe, Deluge, and Preaction System Inspection.

The following is considered ACCEPTABLE to NEIL and no main drain test is required if any one of the following conditions exist:

1. **The site performs the necessary surveillances listed above with ACCEPTABLE results and the flowpath from the fire pump to the system control valve is verified on an 18-month frequency.**

2. **The fire suppression system is fed from two or more directions (dual feed systems) such that the failure of one isolation valve will not impair the system and the long runs of pipe are flow tested under other surveillances.**

   If a full flow trip test is performed, the main drain test criteria is satisfied.

3. **For single feed systems with multiple suppression systems on the same header, a main drain test of the most remote system will satisfy the main drain test for all systems on that header.**

Appendix 3.A.6
□
PERFORMANCE BASED TESTING AND MAINTENANCE

N.5	Smoke	Test	Annual
N.6	Smoke	Test-Sensitivity	Per Code of Record At Construction

N.5 Ionization and photoelectric detectors need to be tested in place to ensure smoke entry into the sensing chamber and an alarm response. Testing with smoke or listed aerosol approved by the manufacturer will be permitted as an ACCEPTABLE test method. Other methods approved by the manufacturer that ensure smoke entry into the sensing chamber will be permitted.

Projected beam detectors need to be tested by introducing smoke, other aerosol, or an optical filter into the beam path.

Tests of Smoke detectors with control output functions need to verified that the control capability remain operable even if all of the initiating devices connected to the same initiating device circuit or signaling line circuit are in an alarm state.

Air sampling detectors are tested per manufacturer's recommended test methods, detector alarm response will be verified through the end sampling port on each pipe run; airflow through all other ports needs to be verified as well.

N.6 When required by the stations code of record, any of the following tests may be performed to ensure that each smoke detector is within it's listed and marked sensitivity range:

(a) Calibrated test method
(b) Manufacturer's calibrated sensitivity test instrument
(c) Listed control equipment arranged for the purpose
(d) Smoke detector/control unit arrangement whereby the detector causes a signal at the control unit when its sensitivity is outside its listed sensitivity range
(e) Other calibrated sensitivity test method ACCEPTED by NEIL

Discussion

NEIL:

The NEIL Standards currently allow a Performance Based Analysis to extend the frequency of detector testing. It should be noted that the Performance Based Analysis used to extend the frequency of detector testing is based on an observed failure rate of individual detectors and not on a failure rate of the detection system. This is somewhat different than the method discussed below under NFPA.

The NEIL Standards do not discuss a program to test a percentage of detectors until 100% are tested within a specific period.

NFPA:

NFPA 72 allows sample testing of smoke detectors but only to the limit of the NFPA stated interval. In Appendix A, section A-7-3.2, states, "It is suggested that the annual test be conducted in segments so that all devices are tested annually." The NFPA annual test is the functional test.

In NFPA 72, section 7-3.2.1, testing detectors for sensitivity is required on initial installation and then every other year. This is nothing new and goes back at least as far as the 1982 revision of the code. At some time since then, NFPA decided that if "as found" sensitivity remains within specifications from the initial test to the second test, then the interval can be increased to testing once every 5 years, with some caveats.

The NFPA Fire Protection Handbook does not discuss sampling type programs for functional testing smoke detectors. The NFPA Handbook, in Section 5, Chapter 5, does make a strong case for testing the detectors at or near the prescribed NFPA 72 frequency through reliability analysis of a "typical" fire detection system. The analysis method is described in some detail in the Handbook. It uses the sum of component reliabilities to determine system reliability. Component reliabilities are determined from a Military Handbook (MIL Handbook 217) and the information is not provided in the NFPA Handbook. Failure rates are determined in much the same way, using the sum of component failure rates to determine system failure rate. The system failure rate is then treated mathematically to determine a reliability based maintenance interval. The method in the Handbook does not use observed data at any point. As stated above, the analysis provided in the Handbook strongly indicates that the NFPA intervals should be used for maintenance and testing of detection systems.

The Handbook does recognize that some systems may be extremely reliable and provides sufficient information on performing an equipment/ installation specific reliability analysis.

Conclusions

The problem with detectors is that all of them must work for a system to be considered operational. The installation design cannot always take into account overlap of the detection zones because of ceiling/ roof/ overhead design features such as beam pockets. Therefore, all detectors have to be tested on some routine basis. Testing some percentage of detectors and extrapolating to all of that system's detectors cannot be done and still ensure the detection system remains functional.

NFPA does acknowledge that detectors are stable devices once the "infant mortality" period is complete. The NFPA Code and Handbook both discuss that a major purpose of the semiannual visual inspection and the annual functional inspection is to ensure that products of combustion can actually enter the detector and cause the detector to function. The concern is that the detector has been fouled with dust, paint, etc., or that the detector has been damaged in some way.

So, if areas of a plant are relatively free of dust, have no regular painting performed, have no other clogging mechanism in place and rarely have potentially damaging work performed in the area, it can be concluded that the functional testing interval can be extended with little loss of reliability. A few areas in nuclear plants would seem to meet these criteria, with one area, cable spreading rooms, being ideal for extending the interval.

Cable Spreading Rooms are notorious for detectors that are very difficult to access and for having hazardous gaseous suppression system installed.

Recommendations

On a case-by-case basis, using the Professional Judgment process, functional testing of smoke detectors can be extended to the same interval as sensitivity testing provided all the following conditions are met:

- **The room/ area under consideration for extended functional testing is generally clean, has very little painting or other dust/ fume causing work performed in the area of the detectors, and a HVAC system that supplies filtered and air conditioned/ heated ventilation.**

- **The sensitivity of all smoke detectors in the room/ area have been proven for NFPA, and NEIL, purposes to be eligible for frequency extension. Smoke detectors that will be sensitivity tested at the NFPA interval of two years also meet this criterion.**

- **The site has a semiannual floor level detector inspection program implemented with ACCEPTABLE pass/ fail criteria.**

- **The extended testing procedure/ program includes criteria for reducing the interval in the event of smoke detectors failing the functional or sensitivity testing.**

If desired, the utility can perform a percentage of sensitivity testing such that 100% of the detectors are sensitivity tested once per ACCEPTABLE interval.

ACCIDENTAL OUTAGE FIRE RATE ANALYSIS

INTRODUCTION

The purpose of the following is to provide guidance on applying partial credit to the NEIL Fire Rate Analysis for plant conditions that do not meet the full requirements of the Accidental Outage Program Loss Control Standard.

STANDARD 3.C.1.b SUPERIOR CONSTRUCTION

Construction credits are reduced by 50% for 2-hour fire rated bearing walls and principal supports.

If superior construction is present in only a portion of the building or affected area, credits are applied according to the following table:

% of Superior Construction	% of Credit
less than 5%	0%
5 - 40%	30%
41 - 80%	70%
greater than 80%	100%

STANDARD 3C.3.a(1)(p) SEPARATION OF FIRE PUMPS

Full credit is given for fire barriers between fire pumps if redundant fire pumps are separated by 30 feet.

STANDARD 3.C.3.a SERVICE, WAREHOUSE AND SHOPS SEPARATION

Credits are applied in accordance with the following table for deficiencies in the required separation between power generation structures and Service, Warehouse and Shops:

Two-hour Wall	Clear Space Unrated Wall Without Protection	Percent of Credit
0 - 5 ft.	0 - 10 ft.	0%
5 - 10 ft.	10 - 20 ft.	50%
10 - 15 ft.	20 - 30 ft.	70%
15 ft.	30 ft.	100%

STANDARD 3.C.3.a(6) AUXILIARY BOILER SEPARATION

Credits are applied in accordance with the following table for deficiencies in the required separation between power generation structures and Auxiliary Boilers:

One-hour Wall	Clear Space Unrated Wall Without Protection	Percent of Credit
0 - 5 ft.	0 - 10 ft.	0%
5 - 10 ft.	10 - 20 ft.	50%
10 - 15 ft.	20 - 30 ft.	70%
15 ft.	30 ft.	100%

STANDARD 3.C.3.a(2) SEPARATION OF SAFETY RELATED CABLE DIVISIONS

If division 1 and division 2 safety related redundant divisions are separated by three-hour rated cable wrap systems, full credit is applied. If one-hour wrap and sprinkler protection is provided, 1/3 credit is assigned.

STANDARD 3.C.7.a HVAC SYSTEMS SMOKE DETECTION

If automatic fire detection in accordance with NFPA 90A is not provided, a credit reduction of 100 points is applied.

STANDARD 3.C.7.d(1) SMOKE AND HEAT VENTING

If deficiencies in smoke and heat venting exist, credit is applied based on the amount of fire resistive construction in the affected area in accordance with the following table:

Construction Classification	% of Credit
Noncombustible	0%
1-hour	30%
2-hour	70%
3-hour	100%

If superior construction is present in only a portion of the affected area, credits are applied in accordance with the table in Appendix IV.C.1

STANDARD 3.D.4.g(4)&(5) CABLE INSTALLATIONS

If electrical cable installations are not fire retardant, a credit reduction of 100 points is applied. Fire retardant is defined as those cables that, as a minimum, pass the fire and/or flame test as described in IEEE 383.

STANDARD 3.D.2. FIRE PUMPS, ALARMS AND CONTROLLERS

The following penalty points apply for each unlisted fire pump and controller: Unlisted Fire Pump - 250 points, Unlisted Controller - 250 points. If a shut-off control circuit for a fire pump is located outside the fire pump room, a 125-point penalty is applied for each pump.

STANDARD 3.D.4.a AUTOMATIC FIXED WATER EXTINGUISHING SYSTEMS

If the system is manually activated, base credit is reduced 50%.

STANDARD 3.D.4.d.(1) PROTECTION UNDER TURBINE OPERATING FLOOR

If a fixed fire extinguishing system does not protect all areas but is provided to properly protect all oil hazards below the Turbine Operating Floor and extends 20 feet beyond these hazards, then credit is reduced to a maximum of 40 points.

STANDARD 3.D.4.d.(2) PROTECTION OF EQUIPMENT W/ COMBUSTIBLE OIL

PUMPS: Lube oil associated with pumps is defined as the lube oil contained in the pump and motor combination. Condensate & condensate booster pumps, feedwater & auxiliary feed water pumps are rated with the Turbine Building regardless of their in-plant location. If these pumps are not provided, full credit is given.

COMBUSTIBLE OIL TANKS: Full credit is given for fire extinguishing systems if the tanks are located outdoors, buried or no tank is provided.

DIESEL FIRE PUMP: Full credit is given for fire extinguishing systems unless the unprotected diesel fire pump exposes other plant equipment required for operation.

STANDARD 3.D.4.g AUTOMATIC FIXED WATER, GAS OR CHEMICAL EXTINGUISHING SYSTEMS

If the system is manually activated, base credit is reduced 50%.

STANDARD 3.D.4.g.(2) PROTECTION TURBINE OIL HAZARDS

If the fire extinguishing system protects all the bearings but does not protect under the shroud of the Turbine, 50% credit is applied.

STANDARD 3.D.4.g.(4) PROTECTION FOR HIGH CABLE CONCENTRATIONS

Cables in metallic conduit are not included in concentration levels.

High cable concentration is defined as cables in trays with insulation exposed or cables in combustible conduit.

Horizontal Cable Trays: High cable concentrations are present if more than 7-1/2 feet of "total" cable tray width exists. For solid bottom cable trays, total cable tray width is determined by drawing lines from the bottom of the side rails of the lowest cable tray at a 30° angle from the vertical. If the

"total" width is calculated as 7-1/2 feet and the cable tray stack still presents an obstruction, suppression is required. For open (ladder) cable trays, if the sum of the widths of stacked trays subject to dripping cable insulation is 7-1/2 feet then it requires suppression. A credit reduction of 25% is applied for each instance up to a maximum of 100%.

In the Control Room or Safety Related Computer Room, high cable concentrations are found below the raised floor or in the horseshoe of the Control Panels and these areas require suppression. A credit reduction of 25% is applied for each condition if no suppression is present.

STANDARD 3.D.4.a. AUTOMATIC DELUGE WATER EXTINGUISHING SYSTEMS

If the system is manually activated, base credit is reduced 50%.

STANDARD 3.D.7.a.(4) SMOKE DETECTION - CONTAINMENT CABLES

If only the cable penetrations outside of containment are provided with smoke detection, partial credit of 50% is applied.

STANDARD 3.D.11 TRANSFORMERS

Credits are applied in accordance with the following table for deficiencies in the required Transformer separation:

Distance to Structure		Fire Extinguishing System		
One-hour Wall or Exposure Protection	Unrated Wall No Exposure Protection	(%) PERCENT OF CREDIT		
		None	Automatic	Manual
>25 ft.	>50 ft	100%	100%	100%
17.5 - 25 ft.	35 - 50 ft.	70%	90%	80%
10 - 17.5 ft.	20 - 35 ft.	50%	80%	70%
5 - 10 ft.	10 - 20 ft.	30%	70%	50%
<5 ft.	<10 ft.	0%	50%	30%

STANDARD 3.D.8 COMBUSTIBLE COOLING TOWERS

For properly protected combustible cooling towers credits are assigned as follows:

Single Cooling Tower: 0% Credit

Multiple Towers - all required for operation 0% Credit

Multiple Towers - Not all required for operation

Tower Spacing	% Credit
500' or greater	100% or 1250 points
400' - 499'	75% or 950 points
300' - 399'	50% or 625 points
Less than 300'	0% or 0 points

APPENDIX 3.D.8 AUTOMATIC FIXED WATER EXTINGUISHING SYSTEMS

If the system is manually activated, base credit is reduced 50%.

APPENDIX 3.D.8 COOLING TOWER FIRE BARRIERS

If the Cooling Tower lacks fire barriers between cells or has an unprotected deck, a 125-point penalty is assessed.

APPENDIX 3.D.8 COOLING TOWER FIRE MAINS

If no fire main, loop or hydrants are provided around the Cooling Tower, a 250-point penalty is applied.

STANDARD 3.E.7 SPECIAL HAZARDS

Deficiencies in separation for above ground combustible oil tanks and other hazardous material tanks to plant buildings and equipment are as follows:

Credits are applied in accordance with the following table for deficiencies in the required separation for tanks of less than 30,000-gallon capacity with approved diking:

Distance to Structure		Percent of Credit		
One-hour Wall or Exposure Protection	Unrated Wall No Exposure Protection	Fire Extinguishing System		
		None	Automatic	Manual
>25 ft.	>50 ft.	100%	100%	100%
17.5 - 25 ft.	35 - 50 ft.	70%	90%	80%
10 - 17.5 ft.	20 - 35 ft.	50%	80%	70%
5 - 10 ft.	10 - 20 ft.	30%	70%	50%
<5 ft.	<10 ft.	0%	50%	30%

Credits are applied in accordance with the following table for deficiencies in the required 100' separation for single tanks of greater than 30,000-gallon capacity or multiple tanks having a total capacity in excess of 60,000-gallons with approved diking:

Distance to Structure		Percent of Credit		
One-hour Wall or Exposure Protection	Unrated Wall No Exposure Protection	Fire Extinguishing System		
		None	Automatic	Manual
>30	=>50 ft	70%	100%	80%
20 - 29 ft.	35 - 49 ft.	50%	80%	70%
10 - 19 ft.	20 - 34 ft.	30%	70%	50%
<10 ft.	<20 ft.	0%	50%	30%

STANDARD 3.D.11.e PCB FILLED EQUIPMENT

Exposure Credits are reduced in accordance with the following table if PCB filled transformers (PCB concentration levels greater than 500 ppm) with a capacity of 10 gallons or more are present as follows:

Turbine Building - 10 points for each transformer up to a maximum credit reduction of 50 points.

Auxiliary Building - 10 points for each transformer up to a maximum credit reduction of 50 points.

Control Areas Including Computer Rooms - 5 points for each transformer up to a maximum of 25 points.

Primary Cabling/Cable Spreading - 5 points for each transformer up to a maximum of 25 points.

Switchgear/Relay Rooms - 5 points for each transformer up to a maximum of 25 points.

Above specified credit, reduction can be reduced by 50% if the transformer is protected by an automatic, fixed fire protection system.