REDACTED

FLORIDA PUBLIC SERVICE COMMISSION
AUDIT DOCUMENT/RECORD REQUEST
NOTICE OF INTENT

unredacted

TO: Maritza Iacono

UTILITY: Progress Energy – Florida

Carl Vinson
AUDIT MANAGER

FROM: Vinson

REQUEST NUMBER: DR-3

DATE OF REQUEST: 4/08/08

AUDIT PURPOSE: Nuclear Controls Review

REQUEST THE FOLLOWING ITEM(S) BE PROVIDED BY: 4/21/08
REFERENCE RULE 25-22.006, F.A.C., THIS REQUEST IS MADE: ___ INCIDENT TO AN INQUIRY

X OUTSIDE OF AN INQUIRY

ITEM DESCRIPTION:

Levy Units 1 and 2

1.a. Please provide current copies of all project planning documents for Levy Units 1 and 2.
  b. Please list and describe the planning and design documents and/or systems used to support, develop and maintain the project plan for Levy Units 1 and 2.

2. a. Please provide current copies of all project management documents for the Levy Units 1 and 2.
   b. Please list and describe the project management documents and/or systems used to track work completion and schedule status for Levy Units 1 and 2.

3. a. Please provide current copies of all contractor evaluation and quality assurance documents for Levy Units 1 and 2.
   b. Please list and describe the contractor evaluation and quality assurance documents and/or systems used to assess contract compliance, work completion and quality assurance for Levy Units 1 and 2.

4. a. Provide an organizational chart of the organizations and work units responsible for completing Levy Units 1 and 2, including the names of key managers in place.
   b. Provide a description of the primary responsibilities for each group involved in the projects' completion.
   c. Provide the number of employees in each group.

5. Provide copies of the purchasing, bidding, and contracting procedures applicable to Levy Units 1 and 2.
6. Provide copies of any project management procedures applicable to Levy Units 1 and 2.

7. a. Please list and describe all reporting mechanisms used to provide project status reports and updates to company management, corporate Board of Directors and joint owners.
   b. Please provide copies of all Board of Directors and managing committee meeting minutes that pertain to Levy Units 1 and 2.

8. Provide a list of all internal or external audits of Levy Units 1 and 2 planned for the period 2008-2010.

9. Please provide copies of all scoping studies and feasibility studies regarding the construction of Levy Units 1 and 2.

10. Please provide a recap and description of Levy County Units 1 and 2 planning, history, and work accomplished to date.

11. a) Please provide a description of the status of service and/or materials contracts for Levy Units 1 and 2. Please include descriptions of any negotiations that have not yet resulted in bids or contracts.
    b) Please provide copies of all executed service and/or materials contracts and addendums for Levy Units 1 and 2.
    c) Please provide copies of all sole-source or single-source justification explanations for any applicable Levy Units 1 and 2 contracts.

12. Please provide copies of any RFPs issued by PEF for Levy Units 1 and 2 and any RFP responses, bids or proposals received from potential contractors or suppliers.

COM ___
ECR ___
GCL ___
OPC ___
RCP 1
SSC ___
SGA ___
ADM ___
CLK ___

13. Please provide a description and timeline of planned 2008 Levy Units 1and 2 activities, events, work and milestones.

14. Please provide a description and timeline of NRC and other regulatory applications, approvals, and certifications that are required for Levy Units 1 and 2 over the period 2008-2010.

15. Please provide a description of how the company plans to coordinate the activities and workloads for the CR3 uprate project with those of Levy Units 1 and 2 construction projects. Include discussion of whether the management and support organizations may be involved in both projects, either simultaneously or phased from one to the other during later stages.

TO: AUDIT MANAGER Carl Vinson DATE: 4/22/08

THE REQUESTED RECORD OR DOCUMENTATION:

(1) ☒ HAS BEEN PROVIDED TODAY

(2) ☐ CANNOT BE PROVIDED BY THE REQUESTED DATE BUT WILL BE MADE AVAILABLE BY ________

(3) ☒ AND IN MY OPINION, ITEMS(S) 9 IS (ARE) PROPRIETARY AND CONFIDENTIAL BUSINESS INFORMATION AS DEFINED IN 364.183, 366.093, OR 367.156 F.S. TO MAINTAIN CONTINUED CONFIDENTIAL HANDLING OF THIS MATERIAL, THE UTILITY OR OTHER PERSON MUST, WITHIN 21 DAYS AFTER THE AUDIT EXIT CONFERENCE, FILE A REQUEST FOR CONFIDENTIAL CLASSIFICATION WITH THE DIVISION OF COMMISSION CLERK AND ADMINISTRATIVE SERVICES. REFER TO RULE 25-22.006, F.A.C.

(4) ☐ THE ITEM WILL NOT BE PROVIDED. (SEE ATTACHED MEMORANDUM)

SIGNATURE AND TITLE OF RESPONDENT Maritza N. Iacono
Supervisor - Regulatory Planning

LEVY00001740

Progress Energy

New Nuclear Baseload Generation Addition

Evaluation of Advanced Reactor Technologies

January 8th 2007 Update

Progress Energy Carolinas, Inc.
Progress Energy Florida, Inc.
410 South Wilmington Street
Raleigh, North Carolina 27601

NGG Nuclear Generation Group

Table of Contents

Update Executive Summary & Recommendation

Based on detailed review/analysis of the RFP responses and additional information provided by the vendors during follow-up meetings in late 2005, the reactor technology review team recommended that the Westinghouse AP1000 be selected as the reactor technology for deployment in 2015, both in the Carolinas and Florida. **This update serves to review new and pertinent information germane to the reactor technology selection prior to commencing detailed COLA preparation for a particular reactor technology for the selected Florida site.**

The approach for this update was to review the specific assumptions and technical/business evaluations of the January 17th, 2006 document, and identify specific updates and/or changes that are significant for consideration. Therefore this update is a "delta analysis" that must be used in concert with the original 2006 analysis to form a final business conclusion. The following subjects were reconsidered in this update:

- Key Assumptions & Evaluation Criteria
- Technical Evaluation Details
  - Design Certification and Licensing Confidence
  - Design Completeness
  - Construction, Project, Start-up Confidence
  - Capabilities and Partnering Strength
- Strategic Considerations
- Financial Evaluations
  - Commercial and Financial Attributes
  - Busbar Cost

For completeness, a list of additional reference documents (since 2005) is provided that provides the source of information considered relevant to the decision making.

Significant changes in the various broad areas of consideration: **design/licensing, technical, strategic**, and **financial**, were then reviewed in the collective and **the reactor technology recommendation was re-affirmed as the Westinghouse AP1000.**

Of particular note, GE and WEC were requested to provide updated overnight CapEx values. Levelized busbar calculations were completed on the revised values, and demonstrated that the dual-unit Westinghouse AP1000 station (at ~ 220 MWe) has the lowest CapEx and busbar cost, as compared to the single unit ESBWR (at ~ 1550 MWe) and/or single unit ABWR stations (at ~ 1350 MWe).

It should also be noted that the ABWR had a higher CapEx and levelized busbar cost than the single unit ESBWR station and single/dual unit AP1000 stations.

The *Summary Results* graphic (next page) and the *Summary Evaluation Results* table provide the detailed supporting basis.

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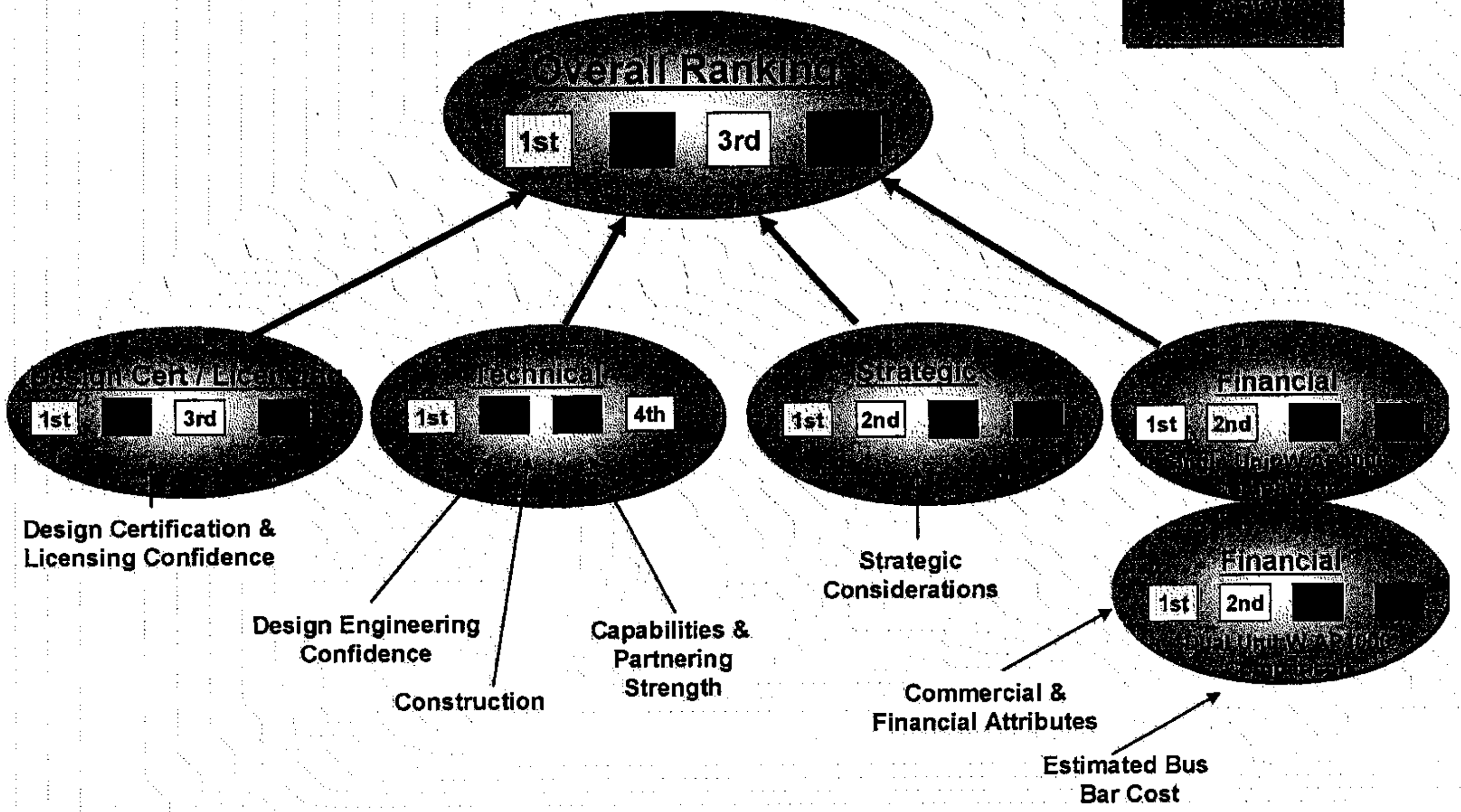
Summary Results

[redacted]



Key Assumptions and Evaluation Criteria

This updated evaluation broadened the consideration of reactor technologies to four types, the Westinghouse AP1000, the GE ABWR, the GE ESBWR, and the AREVA EPR.

During the late 2005 original evaluation process, certain key assumptions and/or criteria were used as "bounding conditions" to aid in the evaluation process. By invoking these key assumptions and/or criteria, the relative scores of the various technologies for a particular attribute, such as licensing confidence, were determined.

The following changes in key assumptions and/or criteria for this evaluation have occurred as indicated by *bold italics*:

- The new nuclear baseload generation must reach commercial in-service status by ***mid 2016, versus the 2015 date in the original evaluation.***
- Progress Energy would not choose an advanced reactor technology type that no other United States utility was considering. ***This assumption is re-affirmed because in the 2005 original evaluation, the GE ABWR technology was not considered a viable choice for PGN since there was no US industry interest observed and/or communicated with this evolutionary technology. NuStart member companies and Dominion were the only utilities contemplating building new reactors, and these utilities were only considering the AP1000, ESBWR, and EPR.***
    - ***Since that time Amarillo Power and NRG Energy have announced plans to develop COLAs for the GE ABWR. These companies are not members of NuStart. Amarillo Power is not a nuclear operator.***
    - ***Further, Mitsubishi Heavy Industries (MHI) have formally announced its intent to pursue a Design Certification on June 20, 2006 for the US-APWR (a 4451 MWt pressurized water reactor), and formally requested a pre-application review (by the NRC) of the U.S. APWR on August 31, 2006. No US utilities have communicated a commitment to this technology, and therefore it is not considered in this Update document.***
- The expected licensing path and regulatory outlook for the recommended reactor technology must minimize Progress Energy's schedule and financial risk for this project.
    - Current NRC regulations and NRC guidance (***as of November 2006***), including 10 CFR 50 – "Domestic Licensing of Production and Utilization Facilities", 10 CFR Part 52- "Early Site Permits, Standard Design Certifications, and Combined Licenses for Nuclear Power Plants", and ***SECY 06-187, Semiannual Update of New Reactor Licensing Activities and***

Future Planning for New Reactors", dated August 25, 2006, are used in evaluations related to vendor design certifications, COL preparation, and NRC review processes. ***In addition, draft final rules changes proposed for 10 CFR Part 52 (# 1767-002) published in late September 2006 are also considered.***

  - NRC Commission approval of the final rule amending 10 CFR Part 52 to certify the AP-1000 standard plant design, dated December 30, 2005, and SECY-05-0227, "Final Rule-AP1000 Design Certification".

  - NRC letter to GE dated December 1, 2005, "Acceptance of the General Electric Company Application for Final Design Approval and Standard Design Certification for the Economic Simplified Boiling Water Reactor (ESBWR) Design".

- The new nuclear plant must be compatible with Progress Energy's System Operation and transmission delivery capabilities. ***This assumption is re-affirmed as the GE ABWR at ~ 1350 MW has been added for consideration.***

- As part of the detailed financial comparisons for the various reactor technologies, financial impacts associated with transmission reserve costs, spinning reserve costs, and transmission upgrade costs (for system import capabilities), were all considered. These PEC/PEF impacts are based on required changes for transmission system reliability reserve requirements, required changes for spinning reserve requirements, and required upgrades to the transmission system to increase import capabilities, all above the existing values as of January 2006. These system changes are required because of the higher electrical output of the advanced reactor technology plants as compared to the existing largest generating plants in the PEC and PEF fleets. ***This assumption is re-affirmed as the GE ABWR at ~ 1350 MW has been added for consideration.***

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Evaluation Methodology

Review Team

This reactor technology evaluation update was directed by the Baseload Steering Committee, and included the following team members:

Team Members

Joe Donahue, VP - Nuclear Engineering & Services Department
Vinny Dolan, VP – Regulatory & Customer Relations
Alex Glen, Deputy General Counsel - Florida
Mark Meyers, VP – Corporate Planning
Sam Waters, Director – Systems Resource Planning
Garry Miller, Manager – Nuclear Plant Engineering

Additional input provided by

Robert Kitchen, Manager- Nuclear Plant Licensing
Cristina Ionescu (licensing)
James Nevill (engineering and construction)
Jeff Colborn (IT and digital controls)
Mike Brennan (financial)
Tony Owen (contract management)

The results of this evaluation and any changes in the reactor technology recommendation are presented to the Baseload Steering Committee for consideration and additional decision making (if necessary).

Summary Evaluation Results

The Summary Evaluation Results of this Update of the Reactor Technology Evaluation are recalculated from the specific tables in Attachments I, II, and III. These later tables were revised to include the GE ABWR, and also to revise specific scores for the GE ESBWR, Areva EPR, and Westinghouse AP1000 as noted, based on new and significant information relative to the specific reactor technology. Changes are denoted in bold italics.

Evaluation Criteria		Alternative Compliance								Changes in the Summary Basis of Evaluation Conclusion
		W AP1000		GE ESBWR		GE ABWR		Areva EPR		
	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
Technical Evaluation (Refer to Attachment I)										
Design Certification and Licensing Conditions	30	100%	30	***72%***	***21.6***	***93%***	***27.9***	***53%***	***15.9***	***The GE ABWR and Westinghouse AP1000 are both design certified. The GE ESBWR and AREVA EPR are not certified. The ABWR ranks lower than the AP1000 based on the fact that it was certified at a time in 1997 prior to new regulations associated with seismic siting requirements (Reg Guide 1.165) and the introduction of risk-informed regulations. In addition, its active safety system design with non-power block safety related structures (EDGs and emergency service water intake) are more affected by changes in security requirements.***

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Evaluation Criteria		**Alternative Compliance**								**Changes in the Summary Basis of Evaluation Conclusion**
		W AP1000		**GE ESBWR**		**GE ABWR**		**Areva EPR**		
	Weight	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**	
Total Normalized Score For DC / Licensing			30		*21.6*		*27.9*		*15.9*	
Design Completeness and Assurance of Final Design Accomplishment	20	100%	20	*84%*	*16.8*	*88%*	*17.6*	92%	18.4	
Confidence in Construction Approach, Project Completion and Startup Success	15	98.6%	14.8	91.2%	13.7	*94%*	*14.1*	100%	15	***The construction approach for the ABWR was very similar to the ESBWR and had the advantage of overseas construction experience; hence it ranks better than the ESBWR in this attribute.***

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Evaluation Criteria		Alternative Compliance								Changes in the Summary Basis of Evaluation Conclusion
		W AP1000		GE ESBWR		GE ABWR		Areva EPR		
	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
[redacted]	**5**	100%	5	73.5%	3.7	***82%***	***4.1***	91.9%	4.6	
Total Normalized Score For Other Technical		[redacted]	39.8	[redacted]	34.2	[redacted]	***35.8***	[redacted]	38	

Strategic Considerations (refer to Attachment II)

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Evaluation Criteria		Alternative Compliance								Changes in the Summary Basis of Evaluation Conclusion
		W AP1000		GE ESBWR		GE ABWR		Areva EPR		
	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
Strategic Considerations	10	100%	10	75.4%	7.5	***72%***	***7.2***	66.6%	6.7	***Two ABWR units could not be sited at the Carolina site due to cooling tower make-up water limitations. For the Florida site, the ABWR and ESBWR would be required to use saltwater as the condenser cooling medium, which is not optimum. In Florida, the ABWR and EPR would have a safety related heat sink structure outside of the OCA. Recent experience at the BNP facility demonstrates the operational challenge from a saltwater intrusion into the condensate system of a BWR type reactor from a condenser tube leak. Transmission costs from both lines leaving the station (and those required for import capability) would be higher for a two unit ABWR station as compared to the AP1000. The NuStart effort can only be leveraged with the GE ESBWR and AP1000 technologies, not the GE ABWR.***
Total Normalized Score for Strategic Considerations			10		7.5		***7.2***		6.7	

Attachment I - Technical Evaluation Details

Decision Analysis Data for Category: *Design Certification and Licensing Confidence*

For this Reactor Technology Evaluation Update, these Attachment I tables have been revised to add the GE ABWR, using information from the GE response to the RFP (which included ABWR and ESBWR responses). In addition, certain specific scores for the GE ESBWR, AREVA EPR, and Westinghouse AP1000 have been revised based on new and significant information as applicable (and are denoted in bold italics). GE specific RFP responses that are applicable equally to either the ESBWR or ABWR are scored the same below without additional explanation.

RFP Evaluation Criteria: Design Certification and Licensing Confidence		Alternative Compliance								Changes in the Basis of Evaluation Finding
		W AP1000		GE ESBWR		GE ABWR		Areva EPR		
RFP Criteria (Simplified)	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
D8 - Meeting applicable US Codes and Standards	10	10	100	8	80	***10***	***100***	8	80	***The ABWR meets all US codes and standards.***
G10 - Certainty for DC by 3rd Qtr 2007	10	10	100	6	60	***10***	***100***	0	0	***The ABWR was design certified. The ESBWR is expected to be certified in 3rd qtr 2008. The EPR will not get a certification schedule until late 2007 when it submits it DC application.***
L1 - Bidder position for COLA submission by 4th Qtr 2007	10	10	100	***8***	***80***	***8***	***80***	2	20	***Due to the late entry of the ABWR into the market with announcements by Amarillo Power and NRG Energy, it will be difficult to achieve a 2007 submittal. This is further challenged by this technology being outside of the NuStart effort. In regard to the ESBWR, the current NuStart schedule is to submit the COLA in late 2007, and will be reviewed in parallel to the design certification review by the NRC.***

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RFP Evaluation Criteria – Design Certification and Licensing Work Scope		Alternative Compliance								Changes in the Basis of Evaluation Finding
		W AP1000		GE ESBWR		GE ABWR		AREVA EPR		
RFP Question (Summarized)	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
L2 - Current % complete of engineering for Design Certification application and issuance, and COLA	10	8	80	6	60	*8*	*80*	4	40	***The ABWR is design certified and the engineering percentage complete for the COLA will support a 2007 – 2008 submittal.***
L3 - Schedule for completing Design Certification, Engineering Design, Component Specifications, Construction Design	10	10	100	8	80	*8*	*80*	7	70	***The ABWR is design certified but must complete ~ 50% of the BOP design for deployment in the US.***
L5 - Current NRC schedule for review and approval of DC	10	10	100	4	40	*10*	*100*	2	20	***The AP1000 and ABWR are both design certified. The ESBWR is expected to be certified in 3rd qtr 2008. The EPR will not get a certification schedule until late 2007 when it submits it DC application.***
L6 - Comparison of Bidder and NRC DC and COL schedules	10	10	100	4	40	*10*	*100*	2	20	***The ABWR is already design certified.***
L9 - Approach to ITAAC to minimize regulatory hearings	10	10	100	6	60	*10*	*100*	4	40	***ITAACs are already established in the Design Certification for the ABWR***
C31 - Construction and inspection procedures developed before COL or negotiated with NRC after COL	5	10	50	10	50	*10*	*50*	8	40	

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RFP Evaluation Criteria: Design Certification and Licensing Confidence		Alternative Compliance: W AP1000		GE ESBWR		GE ABWR		Areva EPR		Changes in the Basis of Evaluation Finding
[illegible]	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
D17 - Assessment of future NRC security requirements	5	8	40	10	50	***7***	***35***	***8***	***40***	
L4 - Major issues in Design Certification that need resolution	5	10	50	7	35	***10***	***50***	6	30	***The AP1000 and ABWR are design certified.***
D24 - Incorporation of Regulatory Risk for leak before break, snubbers, recirc sumps, seismic, CR habitability	5	10	50	10	50	***5***	***25***	9	45	***The ABWR was designed and certified prior to the work over the last 8 years to introduce informed regulatory risk into the regulations.***
D41 - Effort, schedule, and strategy for design acceptance criteria (DAC) development	5	10	50	9	45	***10***	***50***	9	45	***The ABWR already has the DACs identified in the certified design. They are very similar to the Westinghouse DACs.***
D7 - Compliance with RG 1.165 seismic response spectra	5	9	45	9	45	***6***	***30***	9	45	
E7 - Schedule for testing and qualification of first-of-a-kind components	5	9	45	7	35	***10***	***50***	10	50	***All first-of-a-kind testing for the ABWR was completed with their Japan deployment.***

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RFP Evaluation Criteria: Design Certification and Licensing Confidence		Alternative Compliance								Changes to the Basis of Evaluation Findings
		W AP1000		GE ESBWR		GE ABWR		Areva EPR		
RFP Question(s) Impacted	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
L11 - Status of NRC computer code approval for engineering and safety analysis	5	10	50	9	45	*10*	*50*	8	40	***The NRC has approved the relevant safety related computer codes for the ABWR.***
L7 - Interface plan with NRC for Design Certification review	5	10	50	4	20	*10*	*50*	2	10	***The AP1000 and ABWR are design certified.***
L8 - Will licensing activities have to be accelerated	5	10	50	6	30	*10*	*50*	5	25	***The AP1000 and ABWR are design certified.***
C12 - Permits required for the Owner to obtain	1	5	5	5	5	*5*	*5*	5	5	
G7 - Describe QA, CAP, and Configuration Mgmt, and Self Assessment programs	1	10	10	10	10	*10*	*10*	10	10	
L10 - Negotiation with NRC on testing of Distributed Control System	1	10	10	5	5	*6*	*6*	7	7	***Based on the Lungmen Project, there are 11 plans (per BTP-HICB-14) for the control & instrumentation design for the ABWR that would be submitted to the NRC during the COL process.***
C14 - Acknowledgement of on site NRC Resident Inspector with full access to all quality and licensing information	0	0	0	0	0	*0*	*0*	0	0	
Total Weighted Scores			1285		*925*		*1201*		*682*	
Normalized Scores			100%		*72%*		*93%*		*53%*	

Decision Analysis Data for Category: *Design Completeness*

GE specific RFP responses that are applicable equally to either the ESBWR or ABWR are scored the same below without additional explanation.

RFP Evaluation Criteria Potential Completeness and Assurance of Final Design Accomplishment		Alternative Compliance W AP1000		GE ESBWR		GE ABWR		Areva EPR		Changes in the Basis of Evaluation Findings
RFP Question(s) [illegible]	Weight	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
D1 - NSSS and BOP design percent complete	10	10	100	2	20	***10***	***100***	8	80	
D11 - Nuclear fuel core design, loading, and debris resistance	10	10	100	7	70	***7***	***70***	10	100	
D22 - Existing plant OE reflected in component selection, reactor trips, ISI , and material selection	10	10	100	9	90	***9***	***90***	10	100	
D30 - Design for digital hardware and software with upgrades due to obsolescence	10	10	100	5	50	***5***	***50***	9	90	
D5 - Identify BOP operational issues, correction in advanced design, and PRA reliability concerns (17 questions on BOP reliability)	10	10	100	9	90	***9***	***90***	10	100	
D25 - Incorporation of fire protection considerations	5	8	40	8	40	***8***	***40***	7	35	

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RFP Evaluation Criteria – Design Completeness and Assurance of Engineering Accomplishment		Alternative Compliance								Changes in the Basis of Evaluation Findings
		W AP1000		GE ESBWR		GE ABWR		Areva EPR		
Sub-criterion Description	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
C23 - Identify overseas outsourced engineering, and responsibilities for rework if detailed design is outsourced overseas	5	7	35	5	25	***5***	***25***	7	35	
D10 - Status of control room and simulator design completion	5	4	20	2	10	***6***	***30***	4	20	
D12 - Refueling machinery speed and fuel sipping capabilities	5	10	50	7	35	***10***	***50***	10	50	
D13 - Spent fuel wet pool storage design and capacity	5	***10***	***50***	8	40	***8***	***40***	8	40	
D19 - Rigorous configuration control for total life cycle	5	9	45	9	45	***3***	***15***	9	45	

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RFP Evaluation Criteria: Design Completeness and Assurance of Final Design Accomplishment		Alternative Compliance								Changes in the Basis of Evaluation Finding
		W AP1000		GE ESBWR		GE ABWR		Areva EPR		
RFP Question (Abridged)	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
D21 - OE, INPO, and EPRI use in improving plant reliability	5	10	50	9	45	***9***	***45***	9	45	
D23 - Ability to test and inspect to Tech Specs	5	9	45	9	45	***8***	***40***	10	50	
D31 - Design for robust predictive monitoring and remote monitoring	5	10	50	10	50	***10***	***50***	5	25	
D33 - Issues in the use of natural draft cooling towers	5	10	50	10	50	***10***	***50***	10	50	
D36 - Design of electrical bus for EDG, SBO, batteries, and transformers	5	10	50	10	50	***2***	***20***	3	15	
D37 - Transmission requirements for grid stability and tolerances of plant equipment	5	10	50	8	40	***8***	***40***	8	40	

RFP Evaluation Criteria: Design Completeness and Assurance of Final Design Accomplishment		Alternative Compliance W AP1000		GE ESBWR		GE ABWR		Areva EPR		Changes in the Basis of Evaluation Finding
RFP or Vendor Question	Weight	[illegible]	Weighted Score	[illegible]	Weighted Score	[illegible]	Weighted Score	[illegible]	Weighted Score	
D42 - Providing DBDs for future training, modification, and procedure development	5	10	50	10	50	***10***	***50***	10	50	
E10 - Types and quantities of spare parts	5	8	40	10	50	***10***	***50***	8	40	
E5 - Design specifications provide allowance for maintenance and equipment replacement equivalencies	5	10	50	10	50	***10***	***50***	10	50	
E6 - BOP and non-safety standards meet ISO standards or Appendix B standards	5	7	35	10	50	***10***	***50***	7	35	
G9 - Deviation from Utilities Requirements Document (URD)	5	8	40	8	40	***8***	***40***	6	30	
O4 - Does design deal with all classes of radwaste, and mitigate amount generated	5	9	45	10	50	***10***	***50***	10	50	
C32 - Codes that govern safety related piping and containment vessel fabrication	1	10	10	10	10	***10***	***10***	10	10	
***C33** - Completion stage of pipe support design at COL approval*	1	9	9	6	6	***8***	***8***	10	10	
D14 - Future provisions for dry fuel storage	1	10	10	10	10	***10***	***10***	8	8	

RFP Evaluation Criteria – Design Completeness and Assurance of on Job Accomplishment		Alternative Compliance W AP1000		GE ESBWR		GE ABWR		Areva EPR		Changes in the Basis of Evaluation Finding
RFP Question (simplified)	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
D16 - Features to minimize security guard staffing	1	10	10	10	10	*10*	*10*	10	10	
D20 - Estimate and technical basis for refueling radiation dose	1	10	10	8	8	*8*	*8*	10	10	
D26 - Philosophy on technology and equipment obsolescence	1	8	8	10	10	*10*	*10*	8	8	
D27 - Use of cyber security	1	10	10	5	5	*5*	*5*	8	8	
D28 - Use of wireless network	1	10	10	2	2	*2*	*2*	5	5	
D29 - Use of fiber network	1	10	10	8	8	*8*	*8*	10	10	
D32 - Design of plant communication system	1	10	10	10	10	*10*	*10*	10	10	
D34 - Natural draft cooling tower capacity to meet BOP design	1	10	10	10	10	*10*	*10*	10	10	
D35 - Provisions for large component access for future replacement	1	8	8	10	10	*10*	*10*	10	10	
D38 - Sizing of overhead cranes for equipment change out and dry fuel cask movement	1	10	10	10	10	*10*	*10*	10	10	

RFP Evaluation Criteria – Design Completeness and Assurance of Final Design Accomplishment		Alternative Compliance								Changes in the Basis of Evaluation Finding
		W AP1000		GE ESBWR		GE ABWR		Areva EPR		
RFP Question (Submittal)	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
D39 – Assumption that buildings adjoining Nuclear Island buildings will be seismically designed	1	10	10	10	10	***10***	***10***	10	10	
D40 - Scope of building painting and coatings	1	10	10	10	10	***10***	***10***	10	10	
D43 - Equipment hatches and paths allow for all equipment replacement	1	8	8	10	10	***10***	***10***	10	10	
D6 - Owner's Group involvement in advanced design	1	10	10	8	8	***8***	***8***	9	9	
D9 - Quality and Safety Classifications	1	10	10	10	10	***10***	***10***	10	10	
E1 - Schedule for equipment specifications for procurement	1	8	8	2	2	***10***	***10***	8	8	[redacted]
G1 - Description of overall design	0	0	0	0	0	***0***	***0***	0	0	
C18 - Containment vessel thickness, stress relief, and polar crane support	0	0	0	0	0	***0***	***0***	0	0	

RFP Evaluation Criteria: Design Completeness and Assurance of Final Design Accomplishment		Alternative Compliance W AP1000		GE ESBWR		GE ABWR		Areva EPR		Changes to the Basis of Evaluation Finding
RFP Question(s) Applied	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
D18 - Nuclear proliferation issues	0	0	0	0	0	*0*	*0*	0	0	
Total Weighted Scores			*1476*		1244		*1304*		1351	
Normalized Scores			*100%*		*84%*		*88%*		*92%*	

REDACTED

LEVY00001764

Decision Analysis Data for Category: Construction, Project, Startup Confidence

GE specific RFP responses that are applicable equally to either the ESBWR or ABWR are scored the same below without additional explanation.

RFP Evaluation Criteria Confidence in Construction Approach, Project Completion, and Startup Success		Alternative Compliance W AP1000		GE ESBWR		GE ABWR		AREVA EPR		Changes in the Basis of Evaluation Finding
RFP Question (Simplified)	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
C1 - Recent construction experience	10	4	40	7	70	***10***	***100***	8	80	***ABWRs have recently been placed in service in Japan and are under construction in Taiwan.***
C2 - Predicted Construction time from first pour to fuel load and to commercial operation	10	8	80	8	80	***7***	***70***	8	80	[redacted]
C3 - Construction philosophy and techniques to be applied and including partners experience	10	8	80	5	50	***5***	***50***	8	80	
C54 - Incorporation of ITAAC into construction plan	10	8	80	5	50	***5***	***50***	5	50	
E4 - Effective supply chain for qualified code suppliers as well as commercial grade equipment	10	8	80	8	80	***8***	***80***	8	80	
C13 - Handling of safety related allegations from workers	5	7	35	4	20	***4***	***20***	8	40	

LEVY00001765

RFP Evaluation Criteria Confidence in Construction Approach, Project Completion and Startup Success		Alternative Compliance W AP1000		GE ESBWR		GE ABWR		AREVA EPR		Changes in the Basis of Evaluation Finding
RFP Question (simplified)	Weight	Score	Weighted	Score	Weighted	Score	Weighted	Score	Weighted	
C25 - Basis and documentation to certify design, construct, and test to ITAAC conformance	5	7	35	7	35	***7***	***35***	5	25	
C28. Construction progress and cost documentation to be furnished including earned value	5	1	5	2	10	***2***	***10***	2	10	
C34 - Scope of as-built documentation to control recalculation efforts due to changes	5	5	25	4	20	***4***	***20***	2	10	
C36 - Confirm that Progress Energy will have access to manufacturer facilities	5	9	45	9	45	***9***	***45***	9	45	
C37 - Define direct and indirect labor	5	10	50	10	50	***10***	***50***	10	50	
C40 - Achieving manufacturing tolerance to ensure field fit-up of modular assemblies	5	5	25	5	25	***5***	***25***	5	25	
C5 - Proposed model for construction management	5	10	50	6	30	***6***	***30***	10	50	
C6 - Construction and startup organization with staffing basis	5	8	40	5	25	***5***	***25***	10	50	
L12 - Progress Energy support and outsourcing to support bidder's construction schedule	5	9	45	10	50	***10***	***50***	10	50	

LEVY00001766

RFP Evaluation Criteria: C - Confidence in Construction Approach, Project Completion and Startup Success		Alternative Compliance								Changes to the Basis of Evaluation Findings
		W AP1000		GE ESBWR		GE ABWR		AREVA EPR		
RFP Question (Simplified)	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
C26 - Timeline for simulator design, fabrication, and availability for training	5	7	35	7	35	***7***	***35***	7	35	
C10 - Activities expected to be by Progress Energy for construction security, public relations, field engineering, start-up, etc	1	10	10	10	10	***10***	***10***	10	10	
C11 - Describe expected construction security at existing plant	1	8	8	7	7	***7***	7	8	8	
C16 - Assumptions on weather and labor availability impact on construction operations	1	10	10	10	10	***10***	***10***	10	10	
C19 - Concrete placement duration for containment vessel considering curing, joint prep, and shrinkage	1	10	10	10	10	***10***	***10***	10	10	
C20 - Schedule impact due to grouting under containment vessel	1	10	10	10	10	***10***	***10***	10	10	
C21 - Schedule impact due to sandblasting and coating inside containment	1	5	5	5	5	***5***	***5***	5	5	

LEVY00001768

RFP Evaluation Criteria (Confidence in Construction Approach, Project Completion and Startup Success)		Alternative Compliance								
		W AP1000		GE ESBWR		GE ABWR		AREVA EPR		Changes in the Basis of Evaluation Finding
RFP Question (truncated)	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
C47 - Describe seismic isolation joints, how filled and cleaned	1	10	10	10	10	10	10	10	10	
C48 - Owner information required prior to beginning actual construction	1	10	10	10	10	10	10	10	10	
C49 - Will IMS monitor total plant construction as individual installed quantities progress	1	5	5	5	5	5	5	10	10	
C51 - Craft worker awareness of safety related and non-safety activities	1	10	10	10	10	10	10	10	10	
C52 - Communicating tolerances to iron workers	1	0	0	0	0	0	0	0	0	
C7 - What work will be direct hired labor and plans for subcontractors	1	10	10	10	10	10	10	10	10	
C8 - How much Construction management does bidder expect to be furnished by Progress Energy resources	1	7	7	10	10	10	10	10	10	
C9 - Procurement management located on site and coordination with international suppliers	1	10	10	10	10	10	10	10	10	
E8 - Longest lead time component and those to be ordered prior to COL approval	1	10	10	10	10	10	10	10	10	

LEVY00001769

RFP Evaluation Criteria Confidence in Construction Approach, Project Completion and Startup Success		Alternative Compliance								Changes in the Basis of Evaluation Finding
		W AP1000		GE ESBWR		GE ABWR		AREVA EPR		
RFP Question/Standard	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
C15 - Construction work week to meet schedule	0	0	0	0	0	*0*	*0*	0	0	
C17. Anticipation of union or open shop craft labor	0	0	0	0	0	*0*	*0*	0	0	
C22 - Use of slip forming for containment shield building	0	0	0	0	0	*0*	*0*	0	0	
C46 - Define limits of features like neat line	0	0	0	0	0	*0*	*0*	0	0	
Total Weighted Scores			960		887		*907*		973	
Normalized Scores			98.6%		91.2%		*94%*		100%	

Decision Analysis Data for Category: *Capabilities and Partnering Strengths*

GE specific RFP responses that are applicable equally to either the ESBWR or ABWR are scored the same below without additional explanation.

RFP Evaluation Criteria - Capabilities and Partnering Strengths		Alternative Compliance								Changes in the Basis of Evaluation Finding
		W		GE ESBWR		GE ABWR		AREVA		
RFP Question(s) Impacted	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
F17 - Limitations in transfer of all design information to Progress Energy	10	10	100	10	100	***10***	***100***	10	100	
G11 - Identify partners and relationships	10	9	90	***8***	***80***	***8***	***80***	10	100	

REDACTED

LEVY00001771

RFP Evaluation Criteria: Capabilities and Partnering Strengths		Alternative Compliance								Changes in the Basis of Evaluation Finding
		W		GE ESBWR		GE ABWR		AREVA		
RFP question(s) addressed	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
G3 - Capability to support multiple orders	10	10	100	*7*	*70*	*4*	*40*	10	100	
G4 - Identify major companies participating in engineering, procurement, construction, and startup	10	9	90	*6*	*60*	*6*	*60*	10	100	
G5 - Full scope power plant or just NSSS	10	10	100	10	100	*10*	*100*	10	100	

RFP Evaluation Criteria – Capabilities and Partnering Strength		Alternative Compliance								Changes in the Basis of Evaluation Finding
		W		GE ESBWR		GE ABWR		AREVA		
RFP Question/Requirement	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
G6 - Who are A/E and constructor partners	10	9	90	***8***	***80***	***8***	***80***	10	100	
E2 - Status of supply chain for suppliers of entire plant design	5	4	20	4	20	***4***	***20***	5	25	
G2 - Other utility interest in design, not one-of-a-kind, currently being built	5	10	50	10	50	***3***	***30***	2	10	***Two utilities have indicated they will develop COLAs for the ABWR, Amarillo Power and NRG Energy. Amarillo Power, however is not a nuclear operator, and it remains to be seen whether they will find a builder / owner / operator. Constellation remains the only EPR announced utility.***
L13 - Deployment schedule for reactor technology	5	10	50	4	20	***10***	***50***	6	30	

REDACTED

LEVY00001773

RFP Evaluation Criteria: Capabilities and Partnering Strength		Alternative Compliance								Changes in the Basis of Evaluation Finding
		W		GE ESBWR		GE ABWR		AREVA		
RFP Questions Impacted	Weight	Score	Weighted	Score	Weighted	Score	Weighted	Score	Weighted	
L14 - Dependency on DOE funding for Design Certification	5	10	50	5	25	***10***	***50***	10	50	***The ABWR is already certified.***
O2 - Scope of Operations and Maintenance procedures to be included	5	10	50	7	35	***7***	***35***	7	35	
O3 - Development of "generic" procedures or programs for a family of advanced designs; like EOP, TS, ISI, chemistry, etc	5	10	50	2	10	***7***	***35***	5	25	***Generic procedures have been developed for the ABWR.***
OS1 - Organizational set up to interface and support Progress Energy during *design, licensing,* construction, startup, and operations	5	10	50	8	40	***8***	***40***	10	50	
OS2 - Level of Progress Energy management oversight expected	5	9	45	8	40	***8***	***40***	10	50	
OS3 - Interface and control of major A/E to assist in design and implementation	5	10	50	8	40	***8***	***40***	6	30	
OS4 - Interface with work outside of scope	5	10	50	10	50	***10***	***50***	10	50	
C35 - Quality control and construction documentation transfer to Owner	1	10	10	10	10	***10***	***10***	10	10	
D15 - Initiatives with long term packaging of Low Level Waste	1	2	2	4	4	***4***	***4***	2	2	[redacted]

LEVY00001774

RFP Evaluation Criteria Capabilities and Partnering Strengths		Alternative Compliance W		GE ESBWR		GE ABWR		AREVA		Changes to the Basis of Evaluation Finding
RFP Question/Subtitle	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
OS5 - Interface with NuStart in delivery of a new plant	1	10	10	10	10	***0***	***0***	4	4	***Neither GE and/or Toshiba have any involvement with NuStart concerning the ABWR. In addition, the only announced nuclear utility interested in the ABWR is not a NuStart member. Constellation remains a NuStart member and is a bridge to EPR COLA activities***
G8 - 3rd party and subcontractor oversight program	1	10	10	10	10	***10***	***10***	10	10	
Total Weighted Scores			1067		854		***874***		981	
Normalized Scores			100%		73.5%		***82%***		91.9%	

REDACTED

LEVY00001775

Attachment II – Strategic Considerations Evaluation

For this Reactor Technology Evaluation Update, this Attachment II table has been revised to add the GE ABWR, using information from the GE response to the RFP (which included ABWR and ESBWR responses). In addition, certain specific scores for the GE ESBWR, AREVA EPR, and Westinghouse AP1000 have been revised based on new and significant information as applicable (and are denoted in bold italics).

Note this table represents evaluations of additional Progress Energy strategic considerations that are not addressed by the RFP questions and the associated vendor responses.

RFP Evaluation Criteria:		**Alternative Compliance**								**<u>Changes</u> in the Basis of Evaluation Finding**
Compliance with Progress Energy Business Considerations		**<u>W</u> AP1000**		**GE ESBWR**		**GE ABWR**		**Areva EPR**		
	Weight	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**	
New Technology Risks – reflects the potential risks for identification of unanticipated design / operational problems that may be revealed during the initial start-up and power ascension for the new technologies.	10	9	90	2	20	***8***	***80***	10	100	

LEVY00001776

RFP Evaluation Criteria: Compliance with Progress Energy Business Considerations	Weight	Alternative Compliance: W AP1000 Score	W AP1000 Weighted Score	GE ESBWR Score	GE ESBWR Weighted Score	GE ABWR Score	GE ABWR Weighted Score	Areva EPR Score	Areva EPR Weighted Score	Changes in the Basis of Evaluation Finding
Siting Physical Limitations – reflects the ability to actually site at least two units of the technology, considering limitations with cooling capacity, hydrology for cooling tower make-up, and geotechnical, environmental, etc.	10	10	100	6	60	6	60	5	50	*The Florida site has been selected and will use salt water as the BOP cooling medium. Based on prior experience with BNP, a BWR at an ocean site, salt water intrusion into the condenser is an operational and maintenance challenge. For the ABWR and the EPR, a safety- related emergency heat sink structure is required. For the proposed Florida site, this would require a separate vital structure beyond the site OCA. For the HNP site, the cooling lake analysis will not support two ABWRs, based on Cape Fear River make-up limitations.*
Transmission Deliverability and System Operations limitations – reflects the ability to site the technology, considering its MWe output, and the impact on system operations with respect to spinning reserve and unexpected shutdowns.	10	10	100	6	60	7	70	6	60	*Transmission upgrades for a two-unit station in Florida would be higher for the ABWR than the AP1000 technology based on the higher MWe electrical load output (2700 MWe vs. 2250 MWe). The transmission system would also require upgrades to address the additional required import capability for spinning reserves (based on the higher MWe rating of a single ABWR unit at 1350 MWe).*

RFP Evaluation Criteria: Compliance with Progress Energy Business Considerations	Weight	Alternative Compliance								Changes in the Basis of Evaluation Finding
		W AP1000		GE ESBWR		GE ABWR		Areva EPR		
		Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
Long Term Technology Approach Investment – reflects PGN's strategy for adopting the latest simplified advanced passive designs for new reactors deployed in the fleet considering that these reactor would enter service in ~***2016*** and operate for 60 years, as opposed to continuing with an evolutionary design using redundant active safety systems similar to 30 year old reactor technology.	10	9	90	10	100	*2*	*20*	2	20	
NGG Fleet Compatibility - reflects the technical compatibility with the existing PGN nuclear fleet of Westinghouse and GE reactor types.	5	10	50	7	35	*8*	*80*	10	50	

RFP Evaluation Criteria: Compliance with Progress Energy Business Considerations	Weight	**Alternative Compliance**								**Changes in the Basis of Evaluation Finding**
		W AP1000		**GE ESBWR**		**GE ABWR**		**Areva EPR**		
		Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
NuStart Participation Compatibility – reflects the technical compatibility with the AP-1000 and GE ESBWR chosen for the NuStart demonstration projects that PGN participates in.	5	10	50	10	50	*0*	*0*	0	0	*The ABWR has no role and/or support with NuStart, and therefore Progress Energy will not be able to leverage this 10-member utility cooperation toward achieving approved COLs and placing the reactors in service.*
Evaluation of Company Strength – reflects PGN's evaluation of the financial strength and depth of the advanced reactor technology vendor.	5	8	40	10	50	*10*	*50*	10	50	

REDACTED

RFP Evaluation Criteria:		**Alternative Compliance**								**Changes in the Basis of Evaluation Finding**
		W AP1000		**GE ESBWR**		**GE ABWR**		**Areva EPR**		
Compliance with Progress Energy Business Considerations	**Weight**	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**	
Progress Energy Previous Experience with the Vendor – reflects our ongoing business experience with the advanced reactor technology vendor (and principle partner if applicable).	5	10	50	10	50	10	50	10	50	
Total Weighted Scores			570		425		*410*		380	
Normalized Scores			100%		75%		*72%*		67%	

Attachment III - Financial Evaluation Details

Decision Analysis Data for Category: *Commercial & Financial Attributes*

For this Reactor Technology Evaluation Update, this Attachment III table has been revised to add the GE ABWR, using information from the GE response to the RFP (which included ABWR and ESBWR responses). In addition, certain specific scores for the GE ESBWR, AREVA EPR, and Westinghouse AP1000 have been revised based on new and significant information as applicable (and are denoted in bold italics).

GE specific RFP responses that are applicable equally to either the ESBWR or ABWR are scored the same below without additional explanation.

RFP Evaluation Criteria: Financial Attributes		Alternative Compliance								Changes in the Basis of Evaluation
		W AP1000		GE ESBWR		GE ABWR		Areva EPR		
RFP Question Number	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
D2 - Engineering Design to minimize Operations and Maintenance staffing levels	10	10	100	2	20	***2***	***20***	4	40	
D4 - Standardized design for NSSS and BOP for cost savings and efficiencies	10	4	40	10	100	***10***	***100***	0	0	
F16 - Schedule warranties by reactor vendor	10	2	20	4	40	***4***	***40***	2	20	
F20 - Limitations to transfer of all design information by reactor vendor or partners	10	4	40	8	80	***8***	***80***	8	80	
F24 - Provide sample contract of terms and conditions	10	0	0	7	70	***7***	***70***	0	0	
F9 - Degree of firmness in pricing from reactor vendor	10	2	20	10	100	***10***	***100***	2	20	

LEVY00001781

RFP Evaluation Criteria Financial Attributes		Alternative Compliance W AP1000		GE ESBWR		GE ABWR		Areva EPR		Changes in the Basis of Evaluation
[illegible]	Weight	Score	[illegible]	Score	[illegible]	Score	Weighted Score	Score	Weighted Score	
F14 - Additional cost of simulator if included	5	10	50	10	50	***10***	***50***	10	50	
F2 - Willingness for equity interest in the plant	5	1	5	5	25	***5***	***25***	0	0	
D3 - Assessment of advanced design to reduce component and commodity quantities	5	8	40	10	50	***3***	***15***	1	5	***Since the ABWR is evolutionary in design using active safety systems, there is less reduction in the components and commodities.***
F7 - Offer contingent on DOE funding or NuStart support	5	5	25	5	25	***10***	***50***	10	50	
O1 - Estimated number of personnel to operate the plant	5	5	25	5	25	***4***	***20***	5	25	
F19. What costs are in Vendor scope and in Progress Energy scope for mech systems, buildings, BOP, site work, Owner cost, spares	5	4	20	3	15	***3***	***15***	4	20	
F21 - Impact of duration from COL application to COL approval on terms and conditions	5	0	0	5	25	***5***	***25***	0	0	
F22 - Fix price for site construction labor	5	5	25	2	10	***2***	***10***	2	10	
F23 - Provide major milestones and payment expected	5	0	0	1	5	***1***	***5***	1	5	

LEVY00001782

RFP Evaluation Criteria Financial Attributes		Alternative Compliance W-AP1000		GE ESBWR		T-GE ABWR		AREVA EPR		Changes in the Basis of Evaluation
RFP Question # in initial	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
F5 - Provide curve of accrued financial obligations for termination	5	2	10	1	5	*1*	*5*	2	10	
F8 - Offer based on first-of-a-kind or average plant cost	5	4	20	5	25	*5*	*25*	3	15	
F3 - Guarantees relative to capacity factor, forced outage, fuel burn-up, O&M costs, etc	1	0	0	2	2	*2*	*2*	1	1	
F6 - Burden to Progress Energy for reactor vendor costs in COL preparation and NRC response	1	0	0	8	8	*8*	*8*	9	9	
E3 - Fraction of large equipment budget for US manufacturers	1	2	2	2	2	*2*	*2*	8	8	
F11 - Utility obligations in event COL cannot be obtained or if delayed or terminated	1	3	3	5	5	*5*	*5*	5	5	
F25 - Provide value earned milestone schedule	1	1	1	3	3	*3*	*3*	1	1	
C45 - Commitments by the Owner prior to COL for RV, SG, TG, RC Piping, etc	1	4	4	10	10	*10*	*10*	10	10	
C44 - At top level schedule, what milestone releases cable pulling	1	1	1	1	1	*1*	*1*	3	3	
C50. Avoidance of surprise indirect labor staffing - clerks, drivers, inspectors, janitors, field engineers, etc	1	8	8	5	5	*5*	*5*	8	8	

RFP Evaluation Criteria – Financial Attributes		Alternative Compliance W AP1000		GE ESBWR		GE ABWR		Areva EPR		Changes in the Basis of Evaluation
RFP Question Number	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
C53 - Cost code accounts for tax reporting and rate making	1	3	3	5	5	5	5	5	5	
E11 - Design life and options to extend life, and power uprate	1	8	8	10	10	10	10	9	9	
F10 - Is time between order and COL a pricing factor	1	1	1	1	1	1	1	1	1	
F12 - Address construction start delays associated with COL	1	1	1	5	5	5	5	3	3	
F13 - Address NSSS or BOP scope changes to obtain COL	1	1	1	1	1	1	1	1	1	
F18 - Estimate and basis for O&M costs	1	2	2	1	1	1	1	1	1	
F4 - Provide a capital spending curve	1	1	1	1	1	1	1	1	1	
C43 - Construction reimbursed by Owner on cost plus basis	0	0	0	0	0	0	0	0	0	
E9 - Vendor warranties and avoidance of expiration before startup and initial operation	0	0	0	0	0	0	0	0	0	
Total Weighted Scores			476		730		715		416	
Normalized Scores			65.2%		100%		98%		57%	

Note that RFP question **F1**, "*Price basis for offering of new plant design*", and RFP question **F15**, "*Additional costs of initial nuclear fuel core, if included*", are not listed in the above table. Instead these questions provide direct input to the following analysis section entitled "Summary of Busbar Cost Analysis".

Decision Analysis: *Summary of Busbar Cost Analysis*

NOTE – In January, 2006, an analysis was performed to compare the economics of three competing reactor technologies: the AREVA PWR, the GE ESBWR and the Westinghouse AP1000. The following is an update to that analysis, with the inclusion of the GE ABWR and the removal of the AREVA unit. The update to the analysis is primarily driven by new cost estimates provided to Progress Energy in December 2006 by both GE and Westinghouse.

To compare the economics of the three competing designs (AP1000, GE ESBWR and GE ABWR) in a consistent manner, the financial comparison was based on a calculation of the busbar costs for each vendor. The busbar costs represent the level, per MWhr total cost of generation for each plant design. The analysis was performed over a 40 year time horizon. The key inputs and assumptions used in the analysis are listed in a table following the summary charts. These comparisons were not site specific and are intended to present a comparison of the relative costs, on a $/MWhr basis, of each of the three nuclear plant technologies. This analysis includes the estimated cost impacts to the system in terms of installed reserve requirements, spinning reserve requirements and transmission upgrades to support import capacity requirements. These were included to reflect the fact that larger unit sizes, such as the GE ESBWR, would require more installed and spinning reserves in addition to requiring more investment in transmission assets to increase import capability. The analysis did not factor in transmission network upgrades. It is important to note that these network upgrades would likely be very similar in cost regardless of the plant design for nuclear or of the baseload technology chosen (i.e. coal versus nuclear).

The following chart shows the expected range of busbar costs ($/MWhr) for a single unit for each of the vendors. For the Westinghouse plant design, an additional scenario is included to show the estimated expected total busbar costs for two units at a single site. This scenario assumes that the second unit would be placed in service one year after the first and reflects the economies of scale for a second unit as presented in the Westinghouse bid.

Chart 1 – Busbar Cost Comparisons

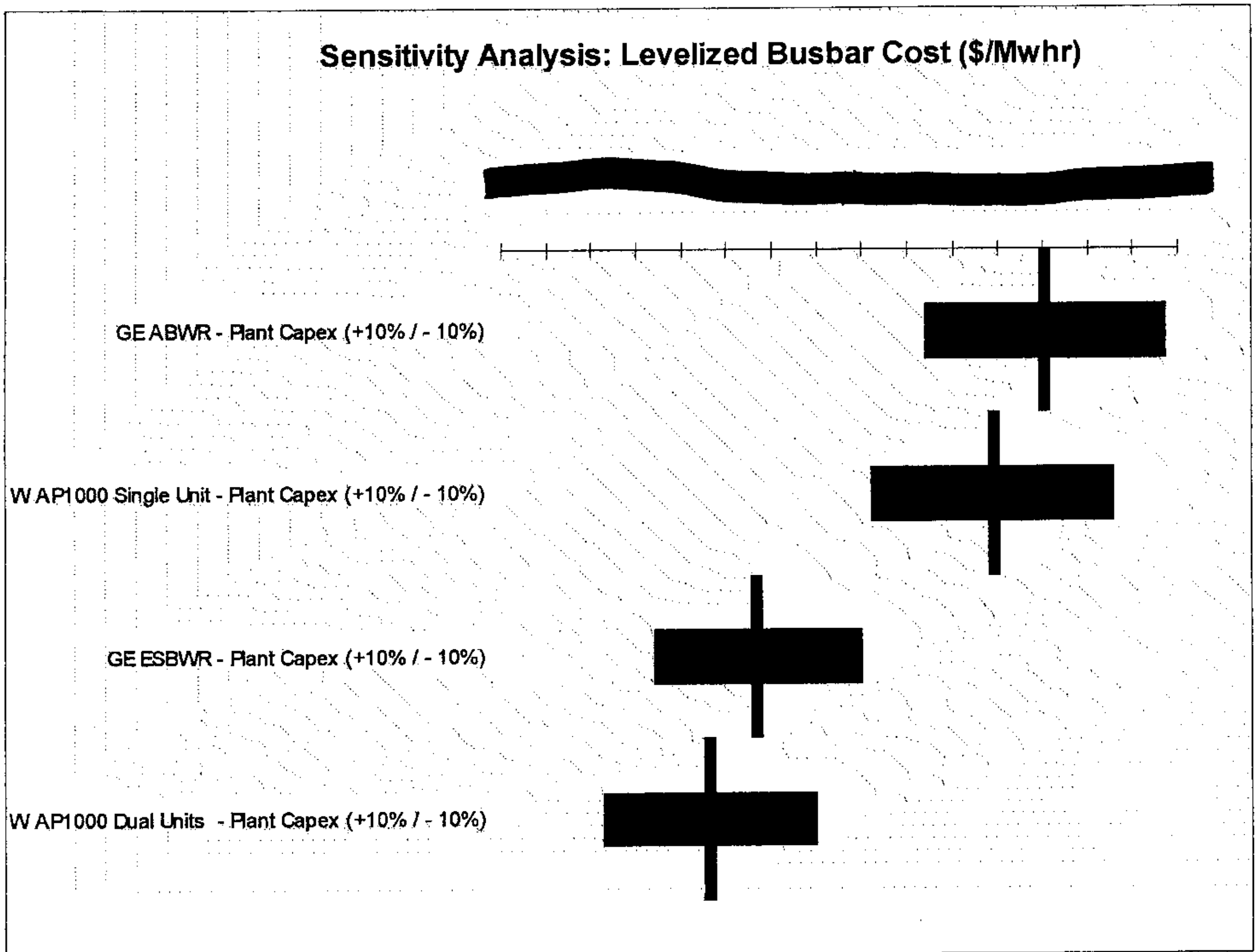

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Chart 2 – Sensitivity Analysis for First Westinghouse AP1000

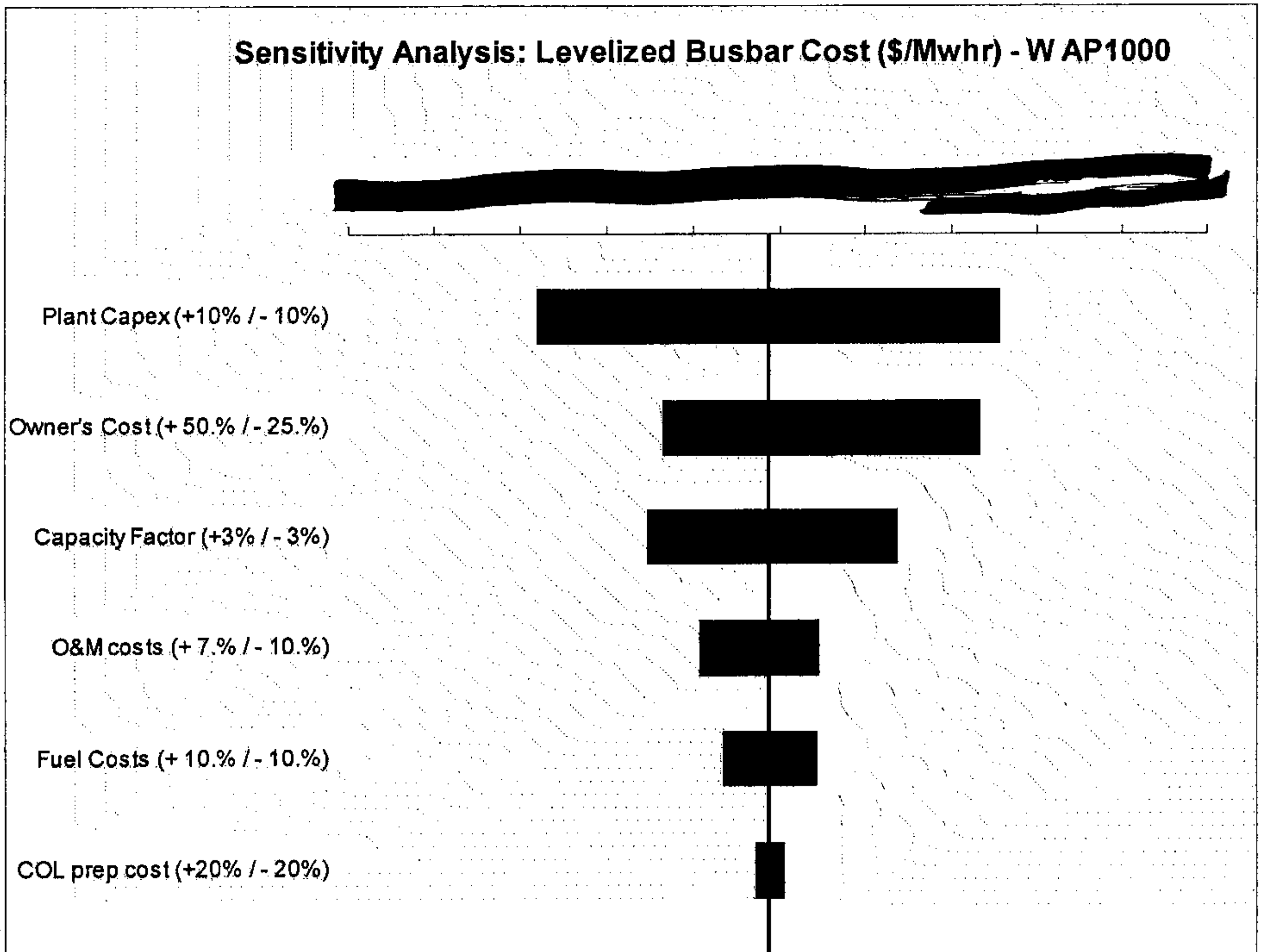

Chart 3 - Sensitivity Analysis for GE ESBWR

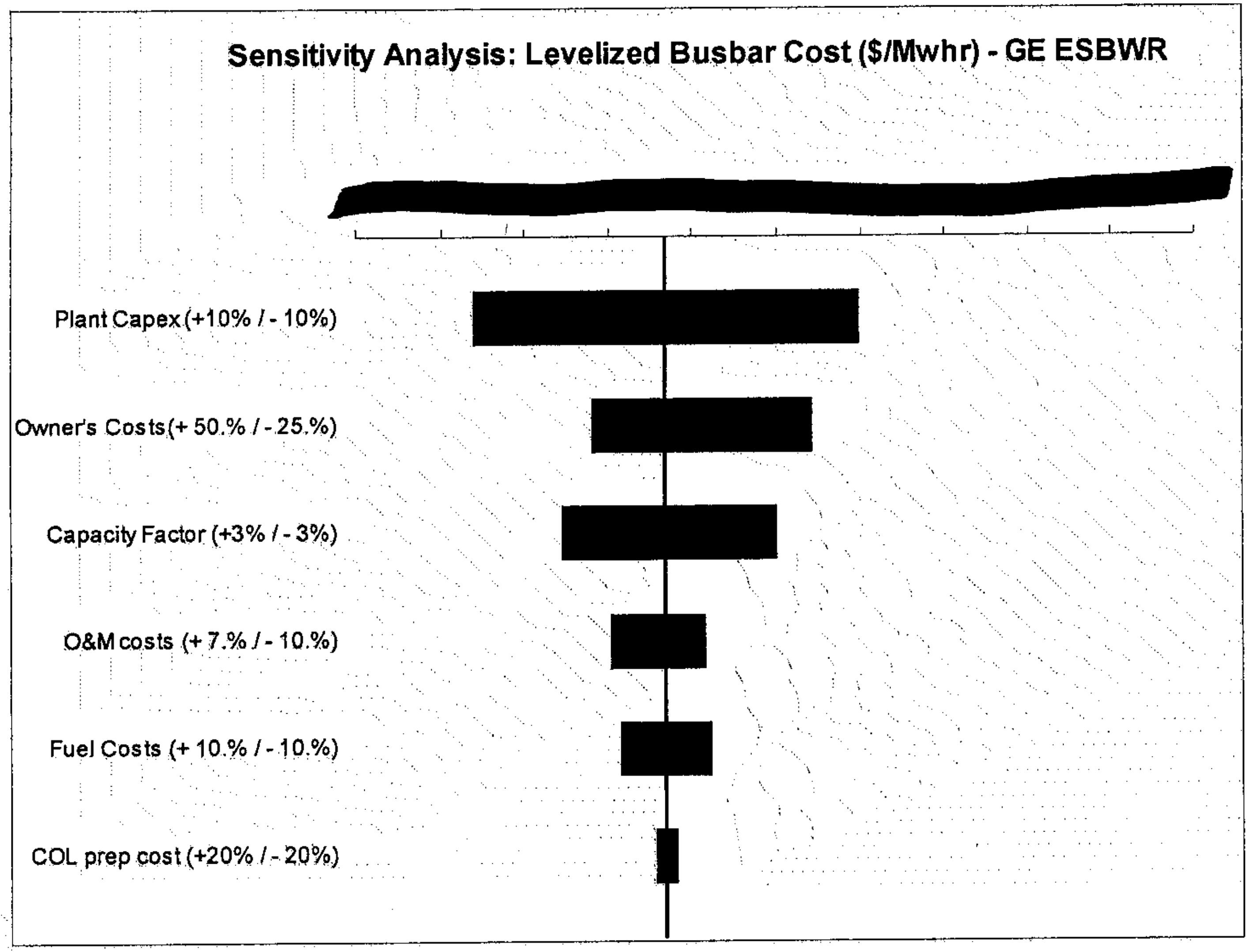

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Chart 4 - Sensitivity Analysis for GE ABWR

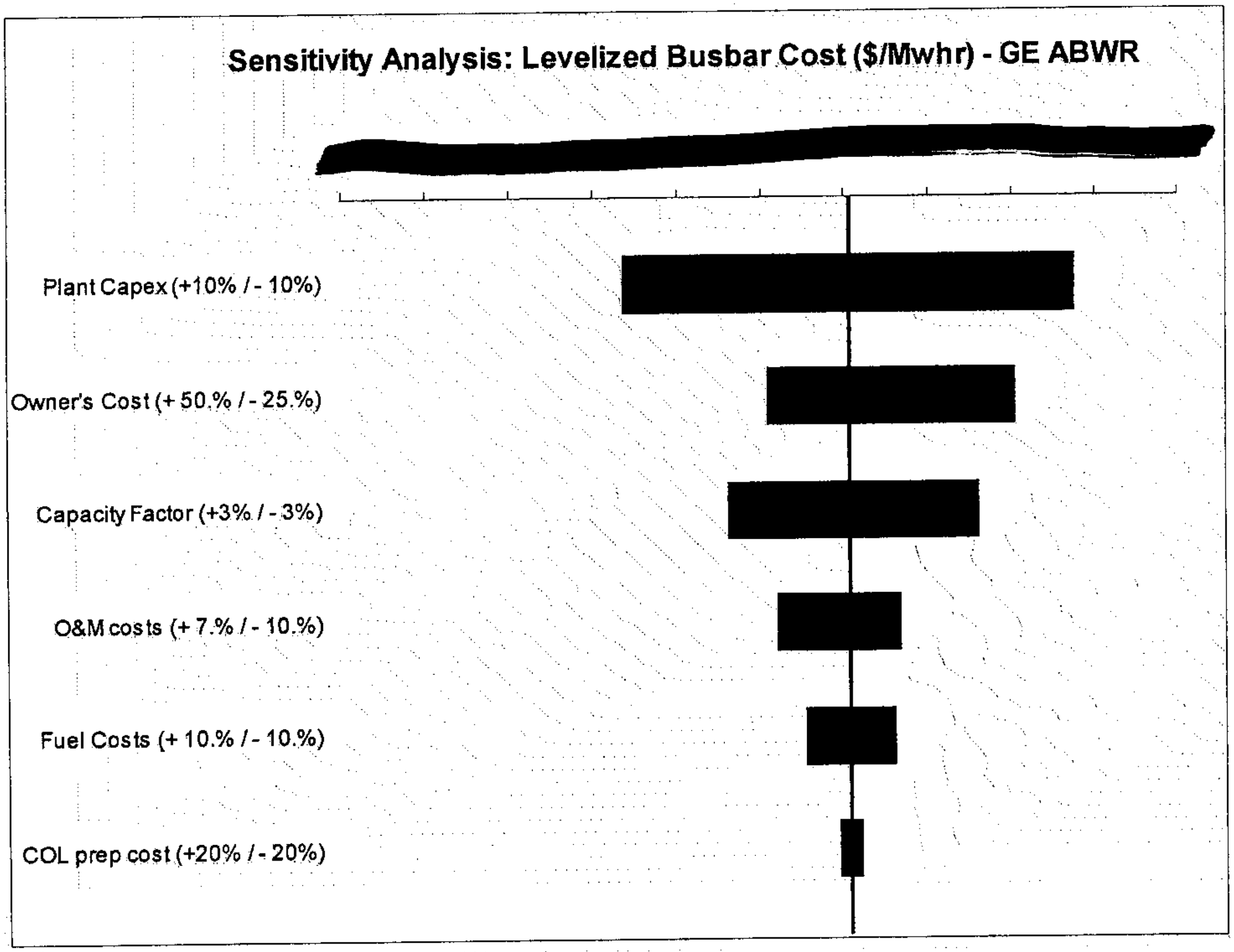

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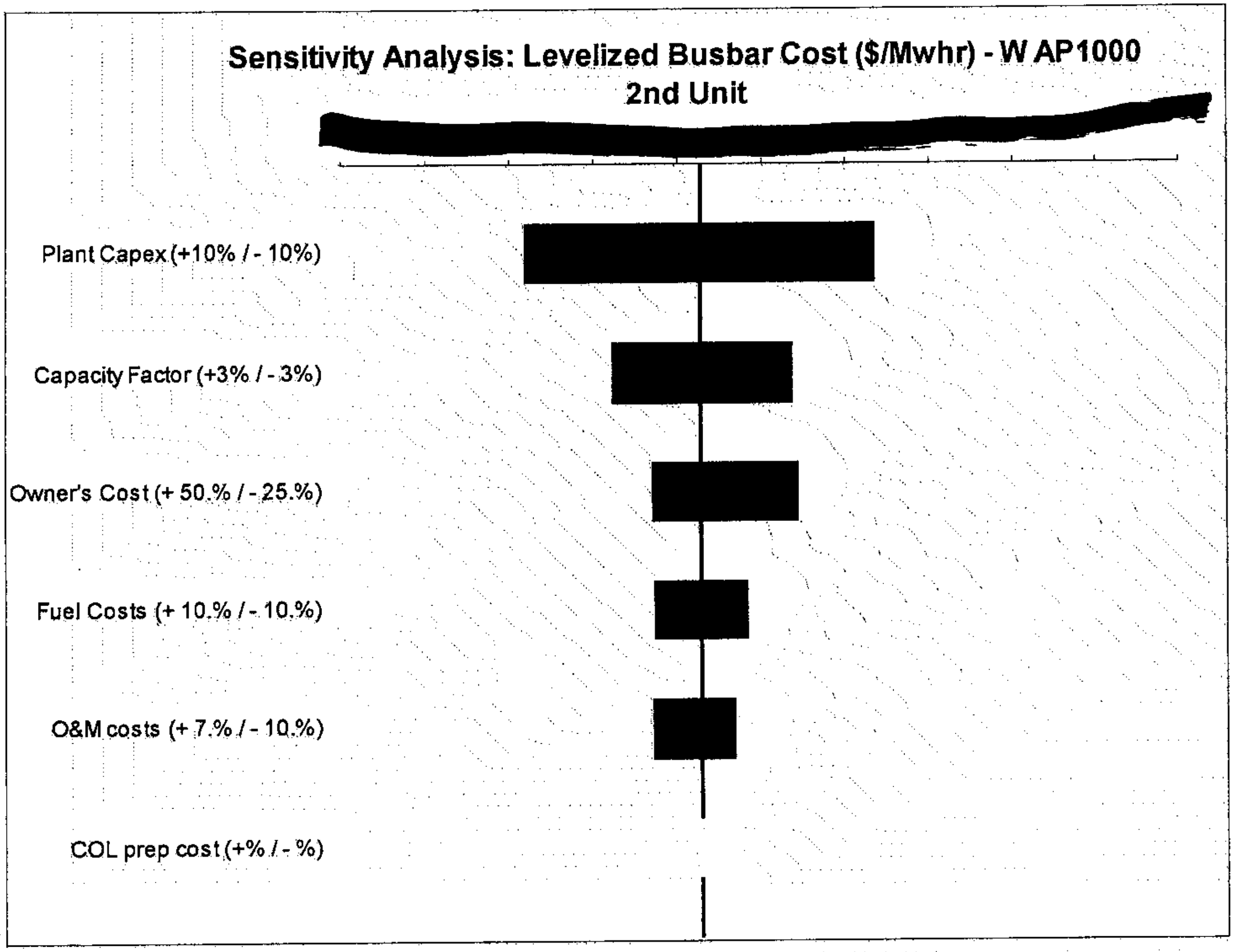
Chart 5 - Sensitivity Analysis for Second Westinghouse AP1000



REDACTED

Table of Key Inputs and Assumptions

[redacted]	W AP1000			GE ESBWR			GE ABWR			W AP1000 2nd Unit		
	Expected	Low Value	High Value	Expected	Low Value	High Value	Expected	Low Value	High Value	Expected	Low Value	High Value
COL Prep and Submittal												
Overnight Cost ($K)	[redacted]											
Average Escalation Factor [%]												
Plant CapEX												
Overnight Cost ($ per kW - Gross)	[redacted]											
kW - Gross												
Addders ($K)												
Overnight Cost ($K)												
Average Escalation Factor [%]												
Builders Risk Insurance												
Overnight Cost ($K)	[redacted]											
Average Escalation Factor [%]												
Owners Cost												
Overnight Cost ($K)	[redacted]											
Percentage of Vendor CapEx [%]												
Average Escalation Factor [%]												
Transmission Costs for Import Capacity - Delta Cost for PEF												
Overnight Cost ($K)	[redacted]											
Average Escalation Factor [%]												
Additional Capex - Installed Reserves - PEF Case shown												
Overnight Cost ($K)	[redacted]											
Average Escalation Factor [%]												
Startup Cost (% of Full year O&M Cost)												
Year 2014	[redacted]											
Year 2015												

Table of Key Inputs and Assumptions (Cont.)

[redacted]

Westinghouse	Total
COL Prep and Submittal	100.0%
Plant CapEX	100.0%
Builders Risk Insurance	100.0%
Owners Cost	100.0%
Transmission Cost	100.0%
Installed Reserves/ Spinning reserve	100.0%
GE ESBWR	Total
COL Prep and Submittal	100.0%
Plant CapEX	100.0%
Builders Risk Insurance	100.0%
Owners Cost	100.0%
Transmission Cost	100.0%
Installed Reserves	100.0%
GE ABWR	Total
COL Prep and Submittal	100.0%
Plant CapEX	100.0%
Builders Risk Insurance	100.0%
Owners Cost	100.0%
Transmission Cost	100.0%
Installed Reserves	100.0%
Westinghouse #2	Total
COL Prep and Submittal	100.0%
Plant CapEX	100.0%
Builders Risk Insurance	100.0%
Owners Cost	100.0%
Transmission Cost	100.0%
Installed Reserves	100.0%

Table of Key Inputs and Assumptions (Cont.)

[redacted]	Westinghouse			GE ESBWR			GE ABWR			Westinghouse #2		
	Expected	Low Value	High Value	Expected	Low Value	High Value	Expected	Low Value	High Value	Expected	Low Value	High Value
[redacted]	[redacted]			[redacted]			[redacted]			[redacted]		
Plant Yr												
[redacted]	[redacted]											

[redacted]	Westinghouse	GE ESBWR	GE ABWR	Westinghouse #2
Total Non-Fuel O&M, includes A&G	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]				
Refueling Outage O&M				
[redacted]				
Property and Other Taxes				
[redacted]				
Insurance and Misc. Operating Costs				
[redacted]				
Spinning Reserves Cost - PEF impacts shown				
[redacted]				
with PEF impacts				
[redacted]				
Front End				
[redacted]				
Back End				
[redacted]				

Description of Key Inputs and Assumptions

1) Cost of Capital, Tax Rates and Other Key Assumptions - WACC of 8.1% was used. Marginal Tax Rate of 38.58% was used.
2) Plant Capex as provided by vendors in response to Progress Energy's request for a refresh of the indicative pricing proposals received in late 2005. For GE, the latest proposal also included the cost estimates for the ABWR.
3) Owner's costs (site preparation, non-power block construction, permitting, etc) were assumed to be [redacted] for each of the technologies. For the second Westinghouse Unit, the additional owners costs were estimated at [redacted]
4) Builders risk insurance during construction was estimated at [redacted] per year for the Westinghouse plant and [redacted] per year for the GE and Areva plants. This estimate was provided by Gary Little based on input from our insurance underwriters. This was not updated from the 2006 analysis.
5) Transmission costs (for transmission import capacity only) reflect the differential in costs between the smallest unit, the AP1000, and the two larger sized units. For PEF, it is expected that, after the CR3 uprate, no additional transmission import capacity would be required for the AP1000. For the GE ESBWR, an estimate has been made that an additional 570 MW of import capacity would be required at an estimated cost of [redacted] For the GE ABWR, an interpolation was performed based on the size of this unit compared with the size of the ESBWR to estimate these costs.
6) Estimated annual costs to provide spinning reserves costs were included based on input from System Planning. Unique costs were developed for each jurisdiction (PEC and PEF).
7) Costs for additional installed reserves were included based on estimates from System Planning. Unique costs were developed for each jurisdiction (PEC and PEF).
8) The spending curves for the COL preparation and submittal, the owners cost, the site preparation costs and the transmission costs are high level internal estimates and are the same for all vendors. The spending curve for the plant capital is directly from the vendor responses to the RFP.
9) O&M estimates are based on the vendor responses to the RFP and internal benchmarking against Progress Energy's existing nuclear plants. This was not updated from the 2006 analysis (however, the ABWR estimates were extrapolated/ adjusted using the ESBWR estimates as the starting point).
10) Annual property taxes are based standard assumptions for an average cost rate per dollar of plant net book value, using a generic estimate for Florida property taxes.
11) Annual insurance costs were provided by Gary Little based on input from our insurance underwriters. This was not updated from the 2006 analysis.
12) Fuel costs are based on the vendor responses to the RFP and are the same for all vendors. Macroeconomic factors impacting nuclear fuel prices would be expected to have a similar impact on all vendors, in terms of cost per Mwhr.
13) Decommissioning costs were estimated based on the actual current estimates of decommissioning costs for our existing fleet, adjusted for the specifics of each of the three new units. This was not updated from the 2006 analysis (the ABWR costs were assumed to be equal to those estimated for the ESBWR).

Levelized Busbar Scoring

RFP Evaluation Criteria		Alternative Compliance								Changes in the Basis Finding
		W AP1000		GE ESBWR		GE ABWR		AREVA EPR		
Levelized Busbar Cost	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
Levelized busbar cost as calculated with RFP response information provided by the vendors	10	8	80	8	80	6	*60*	4	40	
Relative confidence of the calculated busbar cost data based on the actual design completion status or construction experience for the specific reactor technology	5	5	25	4	20	6	*30*	6	30	
Total Weighted Scores			105		100		*90*		70	
Total Normalized Scores			**100%**		95%		***86%***		*67%*	

Attachment IV – DC and COL Logic Timelines

The graphical depiction of the COL and Design Certifications is superseded with the following announced/published reactor technology schedules:

Westinghouse AP1000
- Fully design certified in early 2006.
- NuStart intends to submit the reference plant COLA (Bellefonte) in October 2007.
- Progress Energy intends to submit a COLA following the NuStart reference plant in late 2007.

GE ABWR
- Fully design certified in 1997.
- Amarillo Power intends to submit a COLA shortly after their late 2007 ESP submittal.
- NRG Energy intends to submit a COLA in late 2007.

GE ESBWR
- GE's Design Certification application was accepted in December 2005.
- If GE provides timely responses to the NRC RAIs, the ESBWR would be fully certified in late 2008.
- NuStart and Dominion intend to submit the reference plant COLA (either Grand Gulf or North Anna - TBD) in November 2007.

Areva EPR
- Areva expects to submit their DC application in late 2007.
- Based on this submittal date, a design certification would likely occur in 2010.
- Constellation intends to submit a COLA for Calvert Cliffs in late 2007.
- Constellation intends to submit a COLA for Nine Mile Point in late 2008.

It should be noted that the COLAs for the ESBWR and Areva EPR would be reviewed in parallel with ongoing design certification review by the NRC. This adds additional licensing complexity and regulatory risk for these reactor technologies.

Attachment V - Summary Comparison Table

For this reactor technology update, the GE ABWR information has been added to the Summary Comparison table. In addition, changes to this table for the GE ESBWR, Areva EPR, and Westinghouse AP1000 are shown in bold italics.

Design Attribute	Westinghouse AP1000	GE ESBWR	GE ABWR	Areva EPR

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Design and/or Attribute	Westinghouse AP1000	GE ESBWR	GE ABWR	Areva EPR
# of Safety-Related Pumps				
Safety Building Volume (m^3/MWe)				
# of Coolant Loops				
Operating Pressure (psia)				
Coolant Inlet Temp (F)				
Coolant Flow Rate				
Unique NSSS Features				
Core Active Height (ft)				
Number of Control Rods				
Number of Fuel Assemblies				
Type of Fuel Assembly				
Avg Discharge Burn-up(MWd)/ metric ton				
Avg Linear power Rate (kW/ft)				
Fuel Cycle (months)				
# of Steam Generators (SG)				
SG tube material				
Turbine/Generator Manufacturer				
Saturation Pressure (psia)				
# and Rating of Feed Pumps				
Main Steam Flow (Mlbm/hr)				

Design and/or Attribute	Westinghouse AP1000	GE ESBWR	GE ABWR	Areva EPR
# of Feedwater Heaters				
# of Natural Draft Cooling Towers				
Make-up water requirements (million gallons/day)				
Design Certification Status				
# of Open DCD COL Action Items				
Design % Complete - NSSS				
Design % Complete - BOP				
BOP A/E Design Partner				
Control Room Digital Platform				

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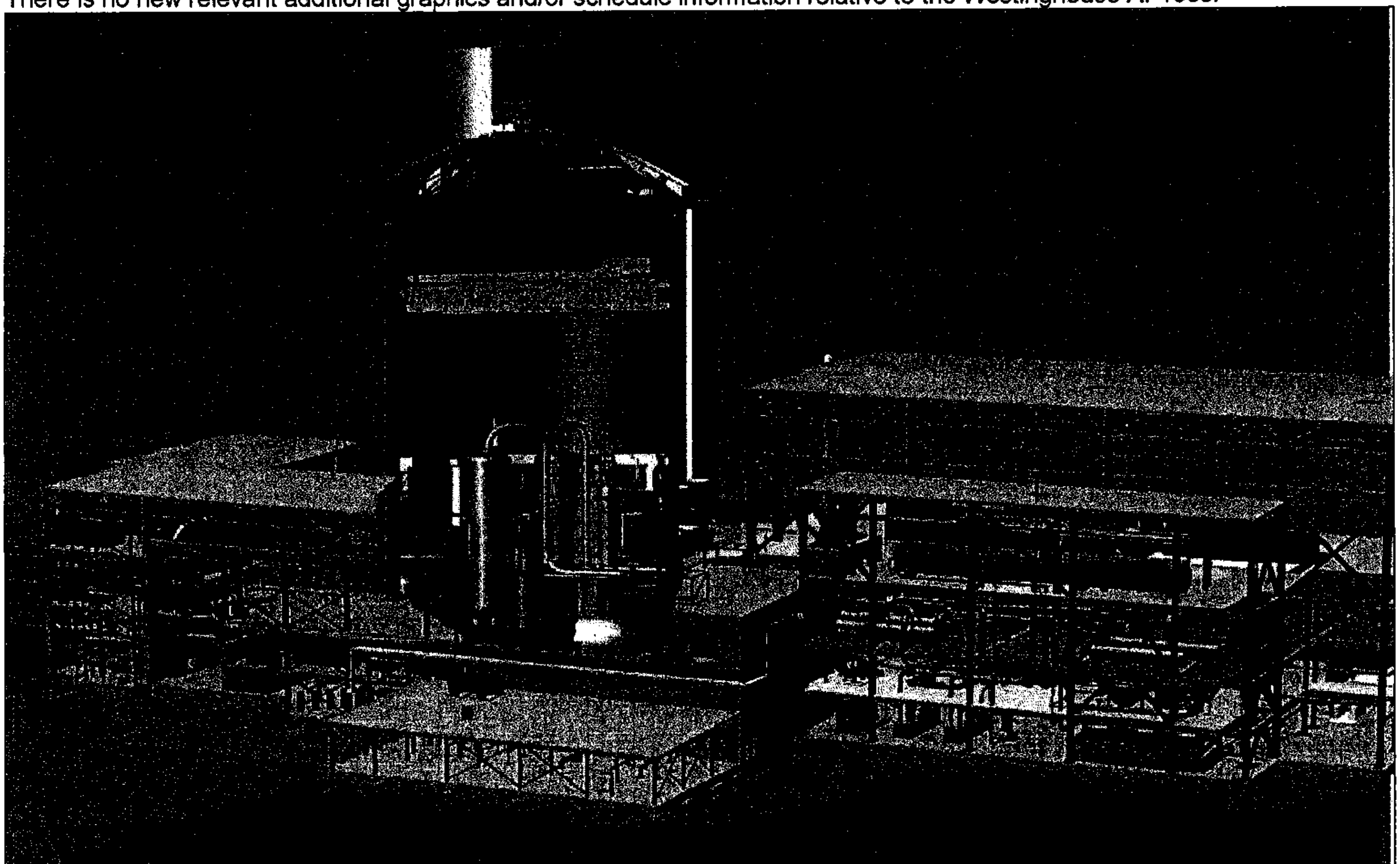
Design and/or Attribute	Westinghouse AP1000	GE ESBWR	GE ABWR	Areva EPR
Security Features				
Construction Approach (turn-key, etc.)				
Modularization Usage				
Construction Schedule (1st concrete to fuel load)				
Similar Recent Construction				

Attachment VI - Westinghouse AP-1000

There is no new relevant additional graphics and/or schedule information relative to the Westinghouse AP1000.



Attachment VII – GE ESBWR

The following graphics were not included in the original 2005 evaluation because they were not available at that time.

ESBWR Plant Depiction

Attachment VIII – AREVA EPR

There is no new relevant additional graphics and/or schedule information relative to the AREVA EPR

Attachment IX – GE ABWR

The following graphics are now provided for the GE ABWR, and were not included in the 2005 original analysis.

GE ABWR Plant Depiction

LEVY00001804

Attachment X – Environmental & Resource Planning Update

The following slide (on the next page) was taken from a November 29th, 2005 presentation by System Resource Planning to the Nuclear Baseload Steering Committee, and is provided herein for reference and discussion use.

For this December 2006 reactor technology review update, the system requirements/impacts aspects of the 1350 MWe GE ABWR must be considered and falls between the Westinghouse AP1000 (@ ~ 1125 MWe) and the larger GE ESBWR and Areva EPR (@ 1550 – 1600 MWe) that is compared on the following slide. As a result, for the GE ABWR, the installed reserve requirements, additional spinning reserve, and import capability would all increase as compared to the Westinghouse AP1000 technology, and can be estimated from the ranges on the slide.

Crystal River #3 is currently working on a power uprate that will increase the largest single Florida generating unit to ~ 1080 MWe (a +180 MWe increase) prior to the new nuclear units going into service. With this CR#3 increase, the import capability requirement for spinning reserve will be have to be addressed for this new largest single generator.

The incremental system changes to add a Westinghouse AP1000 unit operating at ~ 1125 MWe is not significant once the CR#3 uprate is in place. However, the GE ABWR, GE ESBWR, and Areva EPR all still represent a significant further increase in the largest generating unit MWe output in Florida. Therefore, they will have more substantial additional system cost to place in service.

Generation & Operations Strategy

Operating Requirements Associated with Large Generating Units

Larger units contribute less to system reliability than smaller units

- **a 1600 MW nuclear unit may increase installed reserve requirements 1-2% versus an 1100 MW unit**

Larger units require additional operating reserves

- **Operating reserves are based on loss of largest unit**
- **additional spinning reserve requirements will increase fuel costs PEC estimated increase from 363 MW to 646 MW plus 200 MW fast start**

Operating flexibility must be built into the large unit or dump power will increase significantly.

Transmission reserve requirements are proportional to unit size

- **Inrush flows and replacement energy must be accounted for**
- **Import capability may need to be increased into PEC and peninsular Florida for a 1600 MW unit.**

Progress Energy

Attachment IX – Update References

1. SECY 06-187, Semiannual Update of New Reactor Licensing Activities and Future Planning for New Reactors
2. 10 CFR Part 52 Draft Final Rule Language, "Licenses, Certifications, and Approvals for Nuclear Power Plants", (#1767-0002) posted 9/27/06.
3. NRC Letter to GE's Steve Hucik (dated December 1st, 2005) - SUBJECT: ACCEPTANCE OF THE GENERAL ELECTRIC COMPANY APPLICATION FOR FINAL DESIGN APPROVAL AND STANDARD DESIGN CERTIFICATION FOR THE ECONOMIC SIMPLIFIED BOILING WATER REACTOR (ESBWR) DESIGN
4. NuStart letter to S. Hucik, GE (dated November 2nd, 2006), ESBWR COL APPLICATION SCHEDULE PERFORMANCE
5. NRC Letter to GE's David Hinds (dated October 10th, 2006) regarding "ESBWR DESIGN CERTIFICATION STATUS AND SCHEDULE, APPLICATION FOR FINAL DESIGN APPROVAL AND STANDARD DESIGN CERTIFICATION OF ESBWR STANDARD PLANT DESIGN SUBMITTED ON 08/24/2006 BY GENERAL ELECTRIC COMPANY".
6. GE letter to Garry Miller, dated December 14th, 2006, regarding GE updated overnight plant CapEx values and cash flow for the ESBWR and ABWR.
7. WEC letter to Garry Miller, dated December 14th, 2006, regarding WEC updated overnight plant CapEx values and cash flow for the AP1000.

PROGRESS ENERGY FLORIDA

FINAL REPORT

PROPOSED FLORIDA NUCLEAR SITE TRANSMISSION PLANNING STUDY

APPENDICES

January 22, 2008

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ABB

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APPENDIX A

Dynamic Data for Levy Units

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APPENDIX B

Benchmarking of Stability Data

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PROGRESS ENERGY – PROPOSED FLORIDA NUCLEAR SITE PLANNING STUDY

Benchmarking of the Stability Data

The purpose of this benchmarking study was to validate the stability models against those used in the Phase-1 study. PEF provided the stability data for the study in the form of PSSE "snapshot" (NUC_started.snp), which also included the data for the proposed nuclear units interconnected to the system at Levy 500 kV bus. A power flow that corresponded to the stability data was also provided (merged4.sav). A "no-disturbance" simulation was first performed to ensure the stability models are initialized correctly. The outputs from the no-disturbance simulation did not show any "movement" from the respective steady-state values. Next, we performed a couple of simulations to benchmark the performance of the setup against the stability results discussed in the technical report (Proposed Florida Nuclear Site Transmission Planning Study – Final Report, May 21, 2007). The following fault cases were selected for benchmarking purposes:

1. [redacted]
2. [redacted]

The results from an earlier study in the report indicated that the critical clearing time associated with the case #1 above was observed to be 5.5 cycles and that for case #2 being 6 cycles. Upon the simulation of the above two faults, it was noted that case #1 was stable when the fault was cleared in 5.5 cycles whereas the Levy units became out of step when the clearing time was extended to 6 cycles. Similarly, in the case #2, the system was stable when the fault was cleared in 6 cycles and unstable for fault duration of 6.5 cycles. Figures 1 – 4 show the plots of machine angle and bus voltages in the study system for the above fault cases (critical clearing time determination). The results from using the stability models used in these simulations therefore conform to those used in the earlier study.

THE REMAINING DOCUMENTS COMPRISING
APPENDIX B ARE CONFIDENTIAL

APPENDIX C
HVDC MODEL PARAMETERS

DOCUMENTS COMPRISING
APPENDIX C ARE CONFIDENTIAL

APPENDIX D

NERC CATEGORY C2 AND C5 CONTINGENCIES

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APPENDIX E

Critical Clearing Time Determination for Preferred Options – Stability Plots

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APPENDIX E ARE CONFIDENTIAL

APPENDIX F

Results from Short Circuit Analyses

Option BF1B1B

DOCUMENTS COMPRISING
APPENDIX F – OPTION BF1B1B ARE
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Option CFB3D

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APPENDIX F – OPTION CFB3D ARE
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PROGRESS ENERGY FLORIDA

FINAL DRAFT REPORT

PROPOSED FLORIDA NUCLEAR SITE TRANSMISSION PLANNING STUDY

February 19, 2008

<u>NOTICE</u>: THIS DOCUMENT CONTAINS CRITICAL ENERGY INFRASTRUCTURE INFORMATION AND IS CONSIDERED CONFIDENTIAL. DO NOT RELEASE.

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ABB Inc – Grid Systems - Consulting

Technical Report

Progress Energy Florida		No. 2007-11589-2-R2.0
Nuclear Site Transmission Planning Study	Date : February 19, 2008	# Pages 91

Author(s): S. Subramanian

Reviewed By: F.S. Prabhakara

Approved By: W. Wong

Executive Summary

Progress Energy Florida (PEF) commissioned ABB to evaluate transmission alternative(s) required for the interconnection of the proposed 2x1,100 MW Nuclear generation plant in Levy County Florida, about 8 miles north of the existing Crystal River East 230 kV substation and northeast of Crystal River generation complex. The proposed generation is expected to be in-service by mid-2018. A preliminary screening of potential transmission alternatives to accommodate the Levy plant was recently completed by PEF (Phase-I study). In this phase-II study, all available capacity in the existing 500 kV and 230 kV network in Crystal River vicinity was utilized for optimizing the alternatives from the Phase-I of study. This also minimized the need for new rights-of-way, especially in the Coastal area between Crystal River and Lake Tarpon. [redacted]

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TABLE OF CONTENTS

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1.0 Introduction

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Progress Energy Florida (PEF) commissioned ABB to evaluate transmission alternative(s) required for the interconnection of the proposed 2x1,100 MW Nuclear generation plant in Levy County Florida, about 8 miles north of the existing Crystal River East 230 kV substation and northeast of Crystal River generation complex. The geographic transmission map of the study area is shown in Figure-1. The proposed generation is expected to be in-service by mid-2018. PEF has completed Phase-I of the Transmission Planning Study by screening potential transmission alternatives to accommodate the Levy Plant. Six specific alternatives (F1 through F6) have been evaluated in the first phase and PEF has determined that 500 kV alternative(s) need to be evaluated in detail for this Phase-2 study, for further optimization. In this study, all available capacity in the existing 500 kV and 230 kV network in Crystal River vicinity was utilized for optimizing the alternatives from the Phase-I of study. This also minimized the need for new rights-of-way, especially in the Coastal area between Crystal River and Lake Tarpon. [redacted]

2.0 Review of Phase-I Study

We started by reviewing the study reports from the Phase-I work, provided by PEF. These reports furnished the background information on the various alternatives studied by PEF. According to these reports, of all the alternatives that were studied (AC alternatives – 500 kV and 345 kV; DC Alternatives), the 500 kV alternatives looked more promising. [redacted]

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2 PAGES
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Power Systems Division
Power Delivery – Consulting

Progress Energy Florida, Inc.
Proposed Florida Nuclear Site
Transmission Planning Study

FINAL REPORT

MAY 21, 2007

Prepared by

Len Januzik
Alex Schneider
Kevin Fougere
TRC Solutions
Power Systems Division
Power Delivery Services

TRC

REDACTED

Executive Summary

Progress Energy Florida, Inc. (PEF) has requested TRC to perform a comprehensive transmission planning study to determine the feasibility of constructing a 1125 MW nuclear generation facility in Levy County northeast of the existing Crystal River complex and 8 miles directly north of PEF's Crystal River East Substation. The first unit is expected to be placed in service by June, 2017, with a potential second 1125 MW unit to be in service by June 2018. The study is intended to determine the required transmission upgrades to interconnect the plant(s) to the PEF transmission system and deliver the full output of the plant(s) to PEF, and thus will require a thorough study consisting of load flow analysis, stability analysis and short circuit analysis.

Power Flow Analysis -

Power flow analysis was conducted to determine the impact of hypothetical transmission expansion options in support of the additional capacity expected to be installed at the Levy county site. The analysis for each scenario centered on equipment loading and bus voltages within the study area under normal (pre-contingency) and design criteria contingency conditions. The analysis was first done without the unit additions and then with the project installed under various support alternatives to identify the incremental impact of the project and incremental support requirements.

Options reviewed in this analysis include various expansions and/or rebuilding of the PEF transmission system using 500kV, 765 kV, and High Voltage DC voltage levels. Upon the reduction of scenarios based on power flow results and facility cost estimates, additional work was done to determine breaker duty at stations and substations along with analysis to verify system stability with the new facilities.

The conclusions from steady state thermal and voltage review are as follows:

[redacted]

[redacted]

DOCUMENTS 3 AND 4
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Table of Contents

1. Introduction

Progress Energy Florida (PEF) has requested a transmission expansion study to support the addition of two 1125 MW class nuclear units to its system in the vicinity of Crystal River East substation in Levy County. The study is intended to determine the required transmission upgrades to interconnect the plant to the PEF transmission system and deliver the full output of the plant to PEF. Due the size of the facility and the potential impact of the facility on the existing bulk power network the study will need to be thorough and will consist of load flow, stability and short circuit analyses.

1.1 Description of the Project

Progress Energy Florida, Inc. (PEF) has requested TRC to perform a comprehensive transmission planning study to determine the feasibility of constructing a nuclear generation facility in Levy County northeast of the existing Crystal River complex and eight miles directly north of PEF's Crystal River East Substation. This location is identified in Figure 1-1. The first 1125 MW unit is expected to be placed in-service by June 2017, with a potential second 1125 MW unit to be placed in-service by June, 2018.

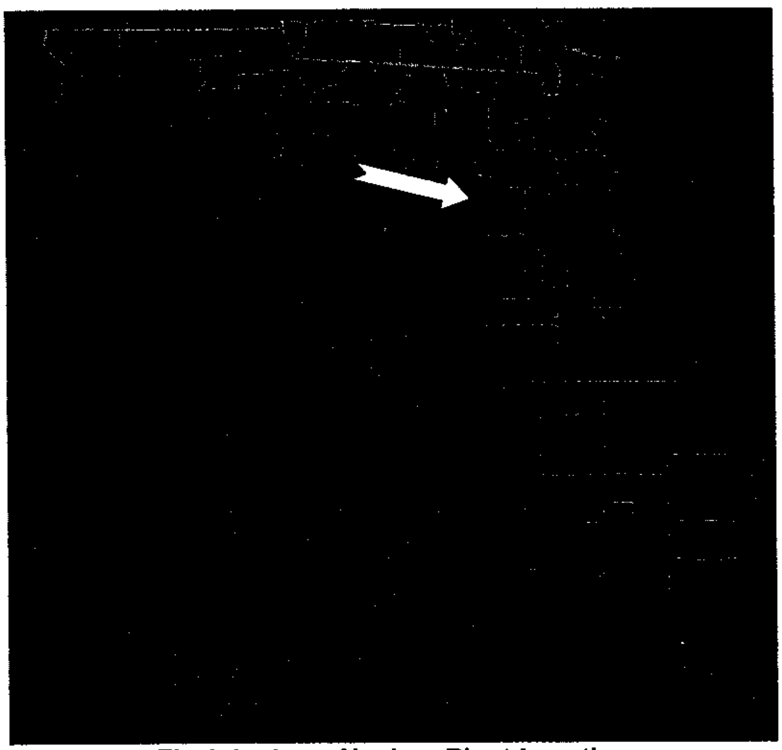

Fig.1-1 – Levy Nuclear Plant Location

The project consists primarily of:

1) The development of appropriate power-flow, short-circuit and dynamics models for the time period(s) indicated.

2) The analysis of viable transmission expansion plans with those models utilizing existing facilities to the maximum extent possible.

3) The review of the Florida – Georgia interface capability as impacted by the addition of the new nuclear facility.

4) The identification of new transmission and substation facilities along with their associated costs.

This report documents the results of the Levy Nuclear Plant review which was conducted in accordance with the applicable national and regional electric power system guidelines, procedures and practices.

2. Study Assumptions

There are a number of assumptions that have been made to facilitate this study and they are itemized within the applicable sections of this report, however, there are certain key assumptions that should be brought to the readers' attention.

The following key assumptions were used in performing this study:

2.1 Study Period

Two study periods were identified for the purpose of this analysis. Those periods are:

1) The summer of 2012 which reflects a 180 MW upgrade to the Crystal River #3 generator. PEF has requested that TRC review facility limits based on this upgrade.

2) The period from 2017 to 2018 which is the time span during which the addition of two 1125 MW nuclear units is proposed.

2.2 Study Area

The study was focused primarily on the Crystal River – Crystal River East area and those 500kV/230kV transmission facilities that occupy the Rights-of-Way from Lake Tarpon to Kathleen via Brookridge, Crystal River East, Crystal River, Holder and Central Florida as shown in Figure 2-1.

However, due to the potential impact of the proposed addition, facilities well north and south of the primary area of interest were also monitored and outaged.

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2.3 Base Case Conditions

PEF Staff provided the following base cases for use in this study.

y06_16sr1-1.sav	y06_16wr1-1.sav
y06_12sr1-1.sav	y06_12wr1-1.sav

The following dispatch files were also provided:

ED2012S.ecd	ED2012W.ecd
ED2016S.ecd	ED2016W.ecd

All cases required significant changes as directed by PEF to achieve useable cases for the time periods in question.

DOCUMENTS 9 THROUGH 67
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Progress Energy

New Nuclear Baseload Generation Addition

Evaluation of COLA Preparers

Progress Energy Carolinas Inc.
410 South Wilmington Street
Raleigh, North Carolina 27601

Nuclear Generation Group

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Executive Summary & Recommendation

Based on detailed review/analysis of the Combined License Applications (COLAs) vendor's response to the Progress Energy Request for Proposal, the review team recommends that Sargent & Lundy be selected as the preparer for two high quality COLAs, to support the potential deployment of advanced reactor technology units planned in the Carolina(s) and Florida in 2015. A COL is a Combined Construction Permit and Operating License issued by the NRC in accordance with the requirements of 10 CFR Part 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants" .

The graphical depiction provided later in this section shows how the potential COLA preparers ranked against the evaluation criteria and the attachments in the following sections of this document provide detailed scoring and analysis that yielded the graphical summary results. The six bidders evaluated are, in alphabetical order: Bechtel, Black & Veatch, Enercon, Sargent & Lundy, Shaw Stone & Webster, and Washington Group International.

This recommendation is based on the bounding key assumptions described in the next section of this document, and takes into account the relative scoring results across criteria and considerations relevant to preparation of two high quality COLAs. This report provides the method of evaluation employed, key assumptions applied, and results achieved.

Sargent & Lundy (S&L), is recommended as the COLAs preparer, since it leads scoring in the technical evaluation areas encompassing Corporate Experience (including recent 10 CFR Part 52 experience, major licensing submittals, etc.), Team Personnel, and Technical Plan, and also leads the scoring in the financial evaluation area. S&L provided a bid response for COLAs development on both the Westinghouse AP1000, and GE ESBWR reactor technologies.

Bechtel and Shaw Stone & Webster (SSW) also have high technical scores; however, they are already committed for major licensing submittals from an organizational viewpoint. SSW is the Westinghouse AP1000 partner. SSW is currently busy with the MOX initiative in the U.S., and is also very involved with new nuclear plants business development in China. Bechtel is the preferred AE for the AREVA EPR, is being estimated for the Constellation COLAs, is preparing the North Anna COLA (ESBWR) for Dominion, and the Vogtle ESP for Southern Company.

Sargent & Lundy was considered the best COLA preparer considering technical evaluation criteria to prepare and deliver the two COLAs on schedule. The Team offered by S&L to Progress Energy has the knowledge, experience, and capability to provide two high quality COLAs in accordance with the applicable NRC regulations and industry guidance. The NRC has stated that the COLA review schedule is highly correlated with the quality of the COLA submittal, developed in compliance with the applicable NRC regulations. Progress Energy plans to have the NRC accept the COLAs for docketing, after the initial submittal, without any sufficiency questions. The high quality COLAs will then facilitate a more timely NRC approval and issuance of the COLs in the time frame needed by Progress Energy to support the commercial operation of the new advanced reactors by mid 2015.

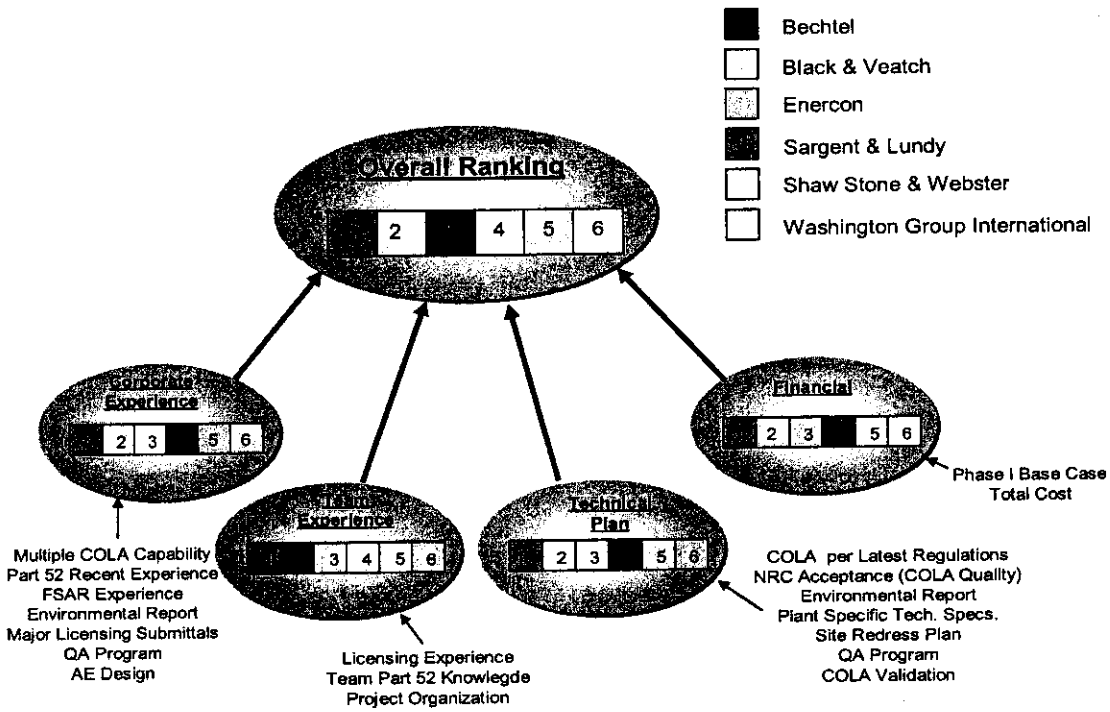
In regards to Progress Energy financial considerations, Sargent & Lundy also ranks the highest. Sargent & Lundy has the lowest cost associated with Phase I of the COLA preparation for the "base case" scenario. This "base case" assumes the new nuclear plant is built on an "existing" nuclear site owned by Progress Energy, and is based on the Westinghouse AP1000 reactor technology.

Washington Group International (WGI) scored high in the technical evaluation categories of Corporate Experience and Technical Plan, however, it was subsequently dismissed due to financial considerations (e.g., significantly higher costs than the other RFP responders).

Considering the collective results of all these reviews and analysis, Sargent & Lundy is recommended as the Preparer for the two COLAs, for two nuclear stations each with two units, that use the same reactor vendor technology, but are located separately, one in the Carolinas, and one in Florida.

The following graphical illustration depicts the ranking in the various evaluation categories and also depicts the overall ranking.

Summary Results in Graphical Form



Key Assumptions and Evaluation Criteria

This document includes the results of the evaluation for selecting an optimal preparer for two high quality Combined License Applications (COLAs) for two nuclear plants (two units each), that use the same advanced reactor type for new nuclear baseload generation. During the evaluation process certain key assumptions and/or criteria were used as "bounding conditions" to aid in the evaluation process. By invoking these key assumptions and/or criteria, the relative scores for a particular attribute of a COLA Preparer, such as Corporate Experience, Team Personnel, and Technical Plan, were determined.

The following key assumptions and/or criteria were established for this evaluation:

- **The new nuclear baseload generation must reach commercial in-service status by mid *2015*.**
- **The two COLAs will be prepared for two sites that use the same advanced reactor technology, two units each. One site will be located in the Carolinas and one in Florida.**
- **The potential sites include both, "Existing" sites and "Greenfield" sites. For the purpose of the scope of work, the term "Existing" site refers to one of the four Progress Energy existing nuclear sites in the Carolinas and Florida. The term "Greenfield" site refers to a site where currently no nuclear facility exists, and no Early Site Permit (ESP), or *Construction Permit (CP) exists*.**
- **The bid comparison is based on the "Base case" scenario which is for two COLAs, developed for two existing sites for two new units each, using the Westinghouse AP1000 design (NRC final rule for design certification expected *in December 2005). Additional options were included in the RFP response* for other reactor technologies (e.g., GE ESBWR, AREVA EPR), and additional cost for "Greenfield" sites versus "Existing" sites.**
- **Both *COLAs should be completed by the end of 2007; therefore*, the COLA preparer should have the experience, resources, and knowledge to provide the deliverables on schedule. Progress Energy expects that for the "Base case" scenario, the COLA should be developed within ~19 months. For the optional cases (e.g., "Greenfield" site, non-certified reactor design), the COLA should be prepared within ~24 months.**

- **The COLAs development will be conducted in two phases:**
  - **Phase 1 will encompass all tasks necessary to prepare and submit the two COLAs to the NRC, including NRC acceptance for review.**
  - **Phase 2 will involve supporting the NRC review of the two COLAs (after acceptance), including response to RAIs, attendance at meetings (e.g., ACRS) and hearings, review of draft NRC documents (safety evaluation report, environmental impact statement, etc.), and will continue through COL issuance by the NRC.**

- **The COLAs will be high quality documents, prepared to satisfy the regulatory requirements of 10 CFR Part 52, using the guidance of NEI 04-01, "*Industry Guideline for Combined License Applicants under 10 CFR Part 52*". Prior experience with 10 CFR Part 52 applications (e.g., ESP), is an advantage for the preparer.**

- **The COLA preparer should ensure that the application is prepared in accordance with the most recent applicable regulations and industry guidance (e.g., Security Plan, PRA, 10 CFR Part 52, etc.).**

- **The COLAs should be developed under a QA Program which complies with the requirements of 10 CFR Part 50 Appendix B.**

- **The COLAs submitted to the NRC should pass the acceptance review without questions related to quality, substance, completeness and accuracy. Otherwise, they will be supplemented/revised and/or resubmitted at preparer's cost.**

- **A complete COLA includes, at a minimum:**
  - Administrative and general information (e.g., decommissioning and antitrust information, financial qualifications, training qualifications, etc.)
  - Final Safety Analysis Report (Chapters 1-19), including
    - Emergency Plan (as referenced in FSAR Ch. 13)
    - Security Plan (as referenced in FSAR Ch. 13)
    - Plant-Specific Technical Specifications (FSAR Ch. 16)
    - Quality Assurance Program (FSAR Ch. 17)

   - Plant-Specific Probabilistic Risk Assessment, in accordance with the most current applicable regulations (FSAR Ch. 19)
   - Proposed ITAAC
- Environmental Report/Supplemental ER (as applicable)
- Program Plans and Manuals, as required, separate from FSAR submittal
- Report on departures from the generic DCD
- Site Redress Plan

- **A full environmental report (ER) in accordance with 10 CFR Part 51 is required to be submitted as part of the COLA for a "greenfield" site. For an "existing" Progress Energy site that has an approved CP along with a reviewed ER and associated Final Environmental Impact Statement (FEIS) at the CP stage, a "supplemental" ER will be required for the COLAs.**

- **The full ER and/or the "supplemental" ER will be prepared to satisfy the requirements of 10 CFR 52.79(a) (2), 10 CFR 51, and NUREG-1555, "*Standard Review Plans for Environmental Reviews for Nuclear Power Plants*".**

- **The COLAs for Progress Energy should not reference an ESP (this option is in accordance with the provisions of 10 CFR Part 52).**

- **The COLAs should include a Site Redress Plan, in accordance with 10 CFR Part 52. PGN intends to start site preparation activities by limited work authorization, 12 months prior to the NRC approval of the COLAs.**

- **The design level of detail must provide sufficient information to PE to perform budgetary estimates for the construction of non-power block structures (such as the intake structure) for the plants under the scope of the COL.**

- **The preparer must agree to validate each statement of fact in the COLAs, and provide the entire validation package (including the supporting documentation, calculations, records, reference documents, etc.), to Progress Energy prior to the start of the Owner's Review. This is necessary in order to ensure that the COLAs are complete and accurate in all material respects, per 10 CFR 50.9.**

- The COLAs preparer is expected to interact with other NuStart member utilities identified by Progress Energy to improve the efficiency of the COLA preparation process (e.g., coordinate the completion of certain chapters of the FSAR with other NuStart member companies that choose the same reactor vendor technology). This will result in cost reduction for Progress Energy and will achieve consistency in the COLAs. For example, some FSAR chapters such as Chapter 4 (Reactor), Chapter 6 (Engineered Safety Features), should be identical for a specific reactor technology.

Evaluation Methodology

Review Team

The potential preparers' Corporate Experience, Team Personnel, and Technical Plan for developing the COLAs, were reviewed by a comprehensive team representing several disciplines as follows:

Executive Team Lead - Joe Donahue, VP- Nuclear Engineering & Services Department (NESD)

Management Lead - Garry Miller, Manager – License Renewal

Reviewers/ Disciplines - Talmage Clements (engineering)
Cristina Ionescu (licensing)
Paul Snead (environmental)
Cheryl Vetter (environmental)
Tony Owen (contract services)

Detailed Evaluation Process

The review and evaluation process addressing the selection criteria for the COLAs preparer was separated into a two tier methodology. The first tier addressed the following attributes of the preparer: Corporate Experience, Team Personnel, and Technical Plan, and are accumulated in a summary level table. Each of these attributes contains items that are important in facilitating the selection of the most suitable COLAs preparer for Progress Energy. These items have been weighted and scored, based on the potential COLAs preparers' proposals.

This was followed by the financial reviews, where one of the six bidders has been eliminated due to having a significantly higher cost. The top three technical scoring bidders of the remaining five were then invited for follow-up interviews with Progress Energy. Subsequently, the technical scores were further refined based on the results of the meetings. The results of the detailed evaluation for the first tier, and the basis for scoring each item, are documented in Attachment I. The second tier methodology evaluated financial considerations, and results are shown in Attachment II.

The six bidders are listed in alphabetical order in the various Attachments.

Attachment III contains the project Organization Charts included in the proposals received from the potential COLA preparers. These organizational depictions support the scoring results regarding the preparers' capability to prepare two high quality COLAs for Progress Energy, in the desired time frame (i.e., by the end of 2007).

Summary Evaluation Results

Composite Rating Comparison

COLA Preparer Evaluation Criteria:	COLA Preparer					
	Bechtel	B&V	Enercon	S&L	Shaw	WGI
Corporate Experience Evaluation						
Composite Score for Evaluation of Corporate Experience	228	148	143	278	270	250

COLA Preparer Evaluation Criteria:	COLA Preparer					
	Bechtel	**B&V**	**Enercon**	**S&L**	**Shaw**	**WGI**
Team Personnel Evaluation						
Composite Score for Evaluation of Team Personnel	150	90	60	200	120	90

COLA Preparer Evaluation Criteria:	COLA Preparer					
	Bechtel	B&V	Enercon	S&L	Shaw	WGI
Technical Plan Evaluation						
Composite Score for Evaluation of Technical Plan	401	386	286	457	448	403

COLA Preparer Evaluation Criteria:	COLA Preparer					
	Bechtel	B&V	Enercon	S&L	Shaw	WGI
Financial Evaluation						
Composite Score for Financial Evaluation	20	30	30	50	10	0

Attachment I - Technical Evaluation

Evaluation Criteria **Corporate Experience**		COLA Preparer												Supporting Basis
		Bechtel		B&V		Enerc		SAI		Shaw		WGI		
	Weight	Score	WS	Score	WS	Score	WS	Score	WS	Score	WS	Score	WS	
Multiple COLA capability	10	4	40	3	30	1	10	5	50	4	40	5	50	

Evaluation Criteria **Corporate Experience**	COLA Preparer												
		[illegible]		B&V		[illegible]		[illegible]		Shaw		WGI	
	Wt	S	WS	S	WS	S	WS	S	WS	S	WS	S	WS
Corporate 10 CFR Part 52 experience	10	3	30	1	10	4	40	5	50	1	10	1	10
FSAR experience	10	4	40	1	10	3	30	5	50	5	50	5	50
Environmental Report	10	3	30	3	30	3	30	5	50	5	50	3	30

Supporting Basis

Evaluation Criteria		COLA Preparer													Supporting Basis
		Bechtel		B&V		[illegible]		S&L		Shaw		WGI			
Corporate Experience	Weight	Score	Ws	Score	Ws	Score	Ws	Score	Ws	Score	Ws	Score	Ws		
Licensing (Major submittals: Power Uprate, License Renewal)	10	4	40	1	10	2	20	5	50	5	50	4	40		
QA Program	10	5	50	5	50	3	30	5	50	5	50	5	50		
AE design capabilities	5	5	25	2	10	3	15	5	25	5	25	5	25		

Evaluation Criteria: Corporate Experience		COLA Preparer											
		[redacted]		[redacted]		[redacted]		[redacted]		[redacted]		[redacted]	
	Weight	Score	WS	Score	WS	Score	WS	Score	WS	Score	WS	Score	WS
Emergency Plan/Security Plan	1	3	3	3	3	3	3	3	3	5	5	5	5
Total Weighted Score for Corp Experience		**258**		**153**		**178**		**328**		**280**		**260**	

Supporting Basis

REDACTED

Evaluation Criteria: **Team Personnel**		COLA Preparer												Supporting Basis
		Bechtel		B&V		Enerc		S&L		Shaw		WGI		
	Weight	Score	WS	Score	WS	Score	WS	Score	WS	Score	WS	Score	WS	
Licensing experience	10	4	40	3	30	1	10	5	50	5	50	3	30	

Evaluation Criteria: **Team Personnel**	Weight	COLA Preparer											
		Bechtel		B&V		Enerc		S&L		Shaw		WGI	
		Score	WS	Score	WS	Score	WS	Score	WS	Score	WS	Score	WS
Proposed Team Member Part 52 knowledge and involvement with NEI TF	10	3	30	2	20	1	10	5	50	1	10	1	10

Supporting Basis

Evaluation Criteria: **Team Personnel**		COLA Preparer												Supporting Basis
		Bechtel		B&V		Enerc		S&L		Shaw		WGI		
	Weight	Score	WS	Score	WS	Score	WS	Score	WS	Score	WS	Score	WS	
Project Organization	10	5	50	4	40	1	10	5	50	5	50	4	40	
Total Weighted Score for Team Personnel			120		90		30		150		110		80	

Evaluation Criteria: **Technical Plan**		COLA Preparer												Supporting Basis
		Bechtel		B&V		Enerc		S&L		Shaw		WGI		
	Weight	Score	WS	Score	WS	Score	WS	Score	WS	Score	WS	Score	WS	
COLA per latest regulations	10	5	50	5	50	1	10	5	50	5	50	5	50	
NRC Acceptance (COLA quality)	10	4	40	5	50	1	10	5	50	5	50	3	30	
NRC Interface/RAI	10	3	30	4	40	3	30	5	50	5	50	5	50	

Evaluation Criteria: **Technical Plan**		COLA Preparer												Supporting Basis
		Bechtel		B&V		Enerc		S&L		Shaw		WGI		
	Weight	Score	WS	Score	WS	Score	WS	Score	WS	Score	WS	Score	WS	
FSAR level of detail	10	5	50	3	30	5	50	5	50	4	40	4	40	

Evaluation Criteria: **Technical Plan**		COLA Preparer											
		Bechtel		B&V		Enerc		S&L		Shaw		WGI	
	Weight	Score	WS	Score	WS	Score	WS	Score	WS	Score	WS	Score	WS
Environmental Report per NUREG-1551 and 10 CFR Part 51	10	4	40	3	30	4	40	3	30	4	40	3	30
Plant Specific Technical Specifications	10	4	40	4	40	5	50	5	50	5	50	5	50

Supporting Basis

Evaluation Criteria: **Technical Plan**	Weight	COLA Preparer: Bechtel		B&V		Enerc		S&L		Shaw		WGI		Supporting Basis
		Score	WS	Score	WS	Score	WS	Score	WS	Score	WS	Score	WS	
QA Program (COLA per 10 CFR 50 Appendix B)	10	3	30	4	40	1	10	5	50	5	50	4	40	

Evaluation Criteria: **Technical Plan**	Weight	COLA Preparer												Supporting Basis
		Bechtel		B&V		Enerc		S&L		Shaw		WGI		
		Score	WS	Score	WS	Score	WS	Score	WS	Score	WS	Score	WS	
Validation docs. provided to Progress Energy	10	5	50	3	30	2	20	5	50	3	30	4	40	
Proposal Quality	10	4	40	4	40	3	30	4	40	5	50	4	40	
COLA Schedule	5	4	20	5	25	5	25	5	25	5	25	4	20	

Evaluation Criteria: **Technical Plan**		COLA Preparer												Supporting Basis
		Bechtel		B&V		Enerc		S&L		Shaw		WGI		
	Weight	Score	WS	Score	WS	Score	WS	Score	WS	Score	WS	Score	WS	
Site Redress Plan	1	4	4	4	4	4	4	5	5	5	5	4	4	
Emergency Plan/Security Plan	1	4	4	4	4	4	4	4	4	5	5	4	4	
Plant Specific PRA	1	3	3	3	3	3	3	3	3	3	3	5	5	
Total Weighted Score for Technical Plan		401		386		286		457		448		403		

Attachment II – Financial Evaluation

Based on review of the Technical and Financial components of the information provided, Bechtel, Sargent and Lundy (S&L) and Shaw Stone and Webster were ask to meet in Raleigh and discuss the specifics of their proposals.

[redacted]

In addition to the lower price (backed by the highest Technical rating) S&L agreed to a more competitive pricing structure (Target Pricing) that will allow the S&L Team and the Progress Team to work together with others purchasing the same reactor technology, in order to achieve greater savings. The detailed review of the proposals, and the subsequent discussions in the follow-up meetings solidified our understanding of the offers. We have concluded that the S&L offer is in compliance with the COLA RFP, and has a significantly reduced price by comparison with the other bidders. In addition, S&L demonstrated the willingness to pursue more aggressive contractual terms to help lower the price.

S&L is clearly the best candidate from the financial point of view.

	Cost Proposal Summary	B&V	Bechtel	Enercon	S&L	Shaw S&W	Wash. Group
Phase1	AP1000						
	Delta Est: 1 GF & 1 Exist						
	Total Phase 1:						
Phase2	Labor						
	T&L						
	Total Phase 2:						
	AP1000 Total Cost						

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Enercon Proposed COLA Organization

PAGES 34 THROUGH 37
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Progress Energy CONFIDENTIAL

New Nuclear Baseload Generation Addition

Evaluation of Florida Sites

October 2007

Progress Energy Florida, Inc.
410 South Wilmington Street
Raleigh, North Carolina 27601

NGG Nuclear Generation Group

Table of Contents

Executive Summary & Recommendation

Based on detailed review/analysis of data collected and evaluated in accordance with EPRI Siting Guide, the review team recommends that the Levy 2 site in Levy County be selected as the location for a Combined Operation License (COL) application for the advanced reactor technology planned for deployment in Florida in 2015.

The graphical depiction provided later in this section shows how the Florida alternative sites ranked against the evaluation criteria, and the attachments in the following sections of this document provide detailed scoring and analysis that yielded the graphical summary results.

This recommendation is based on the bounding key assumptions described in the next section of this document, and takes into account the relative scoring results across criteria and considerations relevant to a new nuclear plant siting. Industry experts with knowledge of site suitability issues, experience with the NRC licensing processes, experience with NuStart's site selection process, and involvement with the development of the EPRI siting guidance, were contracted to complete the detailed analysis for site selection of a "region of interest" (the Florida service territory) provided by Progress Energy. This report provides the method of evaluation employed, key assumptions applied, and results achieved.

The EPRI Siting Guide as adopted for the Progress Energy siting study provides four steps in the site selection process whereby the "**regions of interest**" are initially subjected to exclusionary considerations. The resulting "**potential sites**" are further analyzed against avoidance considerations reducing to a small number of "**candidate sites**". A suitability evaluation of specific criteria then determines the highest ranked "**alternative sites**" best suited for a nuclear plant. These sites are finally subjected to business strategy considerations to determine the "**preferred site**".

Potential site locations under consideration included green field sites and an existing nuclear plant site. They were subjected to exclusionary and avoidance criteria such as identification of inadequate water supply, adverse environmental impacts, insufficient land area, or unavailable transmission lines. The potential site locations were thereby reduced to five "alternative sites" subjected to a detailed suitability evaluation. These locations included one site with an existing operating nuclear plant (Crystal River Nuclear Plant).

The **Levy 2 site is identified as the "preferred site"** with the highest composite scoring from the following evaluation areas: Technical Evaluation, Progress Energy Strategic Considerations, and Transmission System Compatibility.

The Crystal River site and Levy 2 site scored the highest and were considered statistically comparable in regard to technical evaluation criteria which address licensing and design requirements to construct and operate a new nuclear plant. Crystal River scored only slightly higher than Levy 2 due to location adjacent to an existing nuclear plant with the associated advantages of existing site characterization suitable for a nuclear plant and the infrastructure offered by the operating nuclear plant. [redacted] was found to be less favorable than Levy 2 because of numerous sinkholes and depressions observed during field reconnaissance and many voids and cavities encountered during rock coring. [redacted] demonstrated the least desirable conditions associated with deep soft sand, and [redacted] was further less suitable due to local intensive dairy farming. [redacted] has potential for tidal run-up from the Atlantic Ocean on the St Johns River, and [redacted] is susceptible to hurricane surge flooding. Levy 2 being located farther from the coast than Crystal River and of greater elevation provides additional protection from hurricane surge and probable maximum flooding. A major disadvantage for Crystal River is the resulting concentration of generation capacity subject to a single weather event with associated tornados and storm surge flooding. Additionally, the Crystal River Energy Complex is currently challenged due to thermal discharge limitations into the Gulf of Mexico requiring the use of helper cooling towers. Therefore, Levy 2 demonstrated significant reliability advantages over Crystal River, with respect to storm surge flooding, the potential for single weather event outages, and thermal discharge impact.

In regards to Progress Energy strategic considerations, the Levy 2 site ranked the highest. Although the NRC indicates preference to existing nuclear plant sites based on licensing reviews and detailed site characterization already completed to support the existing nuclear plant, Levy 2 scored better than Crystal River based on the location being a reasonable distance off the coast line and a higher elevation allowing additional protection from wind and flood damage. Adding new nuclear generating capacity to the Crystal River Energy Complex results in a significant concentration of Progress Energy Florida generating assets in one geographical location. This increases the likelihood of a significant generation loss from a single event and a resulting large scale impact on the Progress Energy system. Dixie, although ~20 miles inland from the Gulf coast, is within the department of Community Affairs Division of Emergency Management GIS Section surge zone for a Category 5 hurricane. The remote locations at Highlands and Putnam offered no opportunity for shared Progress Energy facilities or resources.

Transmission deliverability analysis has further concluded the Levy 2 site ranked the highest (along with Crystal River) with the transmission system requirements. Levy 2 and Crystal River scored the best due to lower estimated direct connect and upgrade costs. Levy 2 offers a significant advantage by not co-locating transmission lines in the same corridor with the Crystal River Energy Complex and thereby avoiding loss from a single event and a resulting large scale impact on the Progress Energy system. [redacted] was slightly higher in estimated cost than Levy 2. [redacted] resulted in significantly higher costs.

Considering the collective results of all these reviews and analysis, the **Levy 2 Site is recommended as the preferred location** for new reactor technology deployment in Florida. The next page graphically depicts the overall ranking of the five alternative sites and recommendation.

Summary Results

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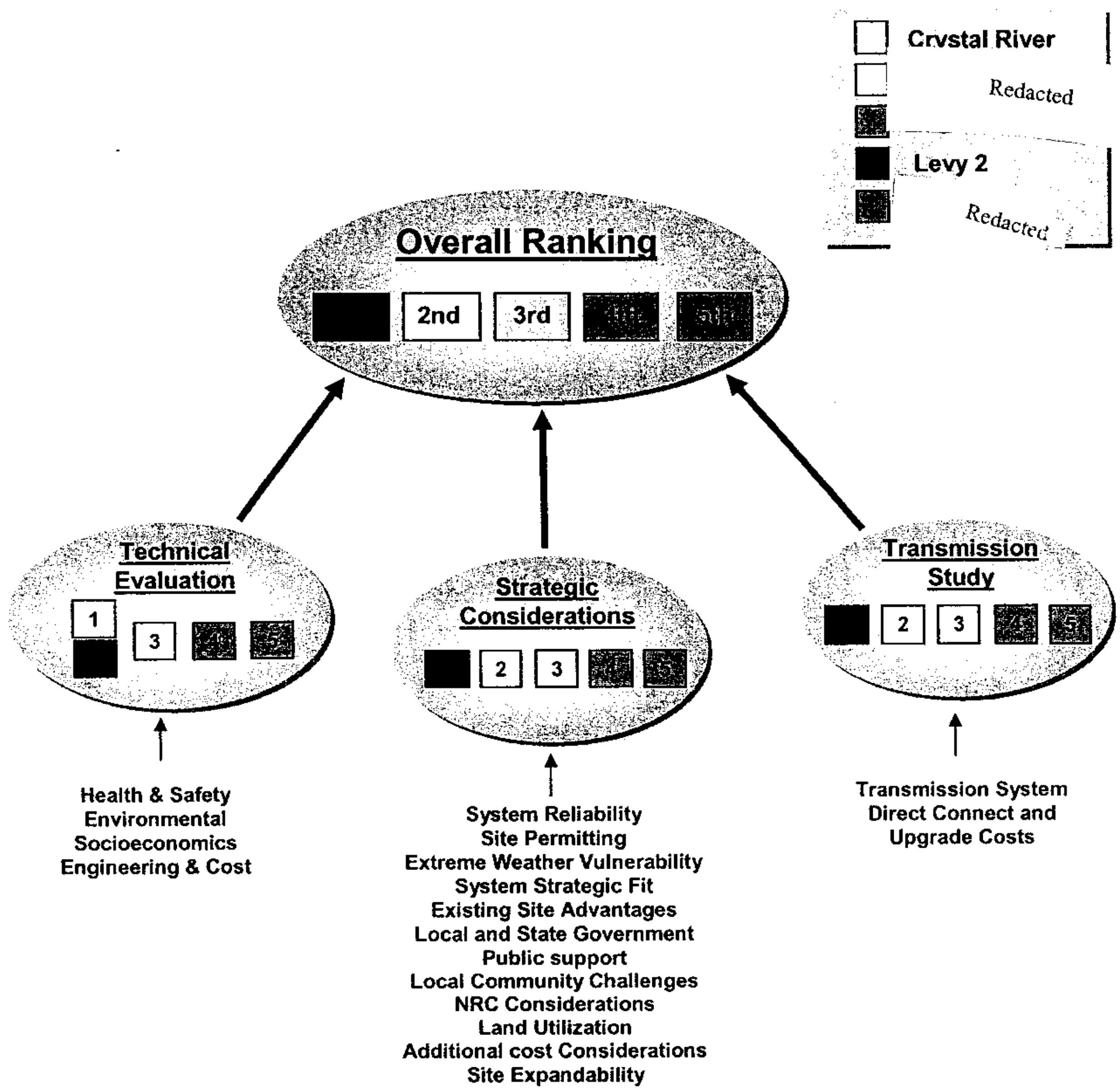

Key Assumptions and Evaluation Criteria

This document includes the results of the evaluation for locating an optimal site for building and operating an advanced reactor type for new nuclear baseload generation. During the evaluation process certain key assumptions and/or criteria were used as "bounding conditions" to aid in the evaluation process. By invoking these key assumptions and/or criteria, the relative scores for a particular attribute of the various siting locations, such as cooling water supply, were determined.

The following key assumptions and/or criteria were established for this evaluation:

- **The new nuclear baseload generation must reach commercial in-service status by mid 2015.**

- **The new nuclear plant siting location must be suitable to envelope the range of specific design parameters contemplated for deployment of a standard plant design as certified by the NRC.**

- **The location must be compatible with Progress Energy's System Operation and Transmission Delivery capabilities.**

- **The recommended site's expected licensing path and regulatory outlook must reduce Progress Energy's schedule and financial risk for establishing new nuclear baseload generation.**

- **The cost of the new nuclear generation as impacted by the location must be reasonable and fair, and methods to ensure greater certainty of the cost/schedule during the licensing, design engineering, and construction phases of the project must be included.**

- **Evaluation criteria and methodology established as part of the EPRI Early Site Permit Demonstration Program will be employed in the nuclear plant site selection process. Specifically, the EPRI Siting Guide: Site Selection and Evaluation Criteria for an Early Site Permit Application dated March 2002 will be utilized.**

- **The evaluation and selection process will include "greenfield" (e.g., locations with no current generation facilities), existing nuclear generation plant *locations, and other sites previously characterized by Progress Energy.***

- **Compliance with current NRC regulations and NRC guidance (as of November 2005), including 10 CFR Part 50 – "Domestic Licensing of Production and Utilization Facilities", 10 CFR Part 52- "Early Site Permits, Standard Design**

Certifications, and Combined Licenses for Nuclear Power Plants", SECY-05-0139, "Semi-annual Update of the Status of New Reactors Licensing Activities and Future Planning for New Reactors", dated August 4, 2005.

- **Compliance with NEPA – National Environmental Policy Act of 1969 requirements.**

Evaluation Methodology

Review Team

The siting technical evaluation, Progress Energy strategic considerations, transmission study, and population analysis were reviewed by a comprehensive team representing several disciplines as follows:

Executive Team Lead - Joe Donahue, VP- Nuclear Engineering & Services Department (NESD)

Management Lead - Garry Miller, Manager – License Renewal

Reviewers/ Disciplines - Cristina Ionescu (licensing)
James Nevill (engineering and construction)
Paul Snead (environmental)
McCallum-Turner Inc. (siting consultants)
Navigant Consulting (transmission consultants)

Progress Florida Team – Vinny Dolan (Executive Lead)
Gail Simpson (community relations)
Tom Trochek (real estate)
Brantley Tillis (transmission
Buddy Ellis (communications)
Mike Joyner (public affairs)
Gene Upchurch (public affairs & economic development)
Paul Lewis (regulatory affairs)
Alex Glenn (legal)
Rodney Carson (public affairs & economic development)
Jamie Hunter (environmental)

Detailed Evaluation Process

In accordance with the EPRI Siting Guide, the site selection process involved sequential application of exclusionary, avoidance, and suitability criteria evaluation (includes site reconnaissance, topographic data collection), and technical screening by application of scoring and associated weighting factors applied to the suitability criteria. The exclusionary, avoidance, and suitability criteria address a full range of considerations important in nuclear power facility siting, including health and safety, environmental, socioeconomic and land use, and engineering and cost aspects.

The evaluation and selection process involves a series of activities starting with identification of a "**region of interest**" or a geographic area within which a site must be located. For Florida, the region of interest became the Progress Energy service territory. This geographic area was derived from Progress Energy fundamental business decisions on the economic viability of a nuclear facility, the market for the facility's output, and the general geographic area where the facility should be deployed to serve the market.

The region of interest is screened using exclusionary criteria to identify the "**potential sites**" by eliminating areas in which it is not feasible to site a nuclear facility due to regulatory, institutional, facility design impediments, or environmental constraints. Further screening is performed using avoidance criteria to eliminate feasible but less favorable areas, thus reducing the areas remaining under consideration to an adequate and reasonable number of "**candidate sites**" for continued screening.

The candidate site list is further screened using refined exclusionary and avoidance criteria to identify optimum areas for a facility. Protected lands, population features, ecologically protected resources (e.g., wetlands), and resources set aside for cultural or historical reasons, result in reducing the potential site list to a fewer number of "**alternative sites**". The alternative sites for Florida are Crystal River, Redacted Levy 2, and Redacted

From the application of these exclusionary and avoidance features, alternative sites are identified as discrete parcels of land approximately the size of an actual nuclear site, thus eliminating large tracts of land that do not exhibit conditions suitable to a nuclear facility site. The process then becomes one of comparing the small number of alternative sites, and identifying a site that possesses the most favorable set of conditions for siting a nuclear power facility. The evaluation technique to this point ensures the remaining alternative sites have no fatal flaws which could result in extended licensing delays and increased costs.

Thus, the remaining alternative sites are evaluated against suitability criteria, resulting in a transition from the elimination approach to an evaluation approach of the suitable sites. The objective of evaluation against suitability criteria is to rank the small number of alternative sites for determination of the **preferred site**.

The suitability criteria are grouped into four categories listed below with features in each category relevant to the specific aspects of facility development that are weighted and scored to provide a relative comparison of the candidate sites. The multiple features of the suitability criteria are combined into one composite value for each of the alternative sites.

- Health and Safety
- Environmental
- Land Use and Socioeconomics
- Engineering and Cost-related

At the conclusion of the above **Technical Evaluation** process, the technically acceptable and ranked sites then undergo a final evaluation and verification to ensure compliance and compatibility with Progress Energy transmission and generation business strategy. This analysis allows the decision of site selection to consider tradeoffs in business requirements and identification of basis for differentiation among sites, thereby ensuring the optimal site is chosen.

The two components of this final step include a list of strategic considerations and transmission deliverability. **Strategic Considerations** address existing nuclear site advantages, proximity to load, NRC considerations, local and state government support, business planning, and public support. The ***Transmission Study*** *provides input for each* site regarding direct connection costs and system upgrade costs.

Summary Evaluation Results

Results of the Technical Evaluation, Strategic Considerations, and Transmission Study for the alternative sites in Florida are summarized below.

Technical Evaluation

The **Technical Evaluation** concluded that each of the five sites are technically suitable for a new nuclear power plant. Crystal River and Levy 2 were the highest ranked sites due primarily to geological conditions and water source. Crystal River and Levy 2 sites provide higher elevation of competent rock from the limestone formation approximately 30 to 75 feet below grade at these two sites. The limestone formation at the Redacted site was approximately 80 feet below grade, but numerous voids and cavities were discovered. Redacted and Redacted sites are considered deep soil sites with no rock encountered in the preliminary subsurface investigation. Crystal River and Levy 2 will utilize the Gulf of Mexico for cooling water makeup whereas the other sites would rely on river water. Each of the river water sources of the Suwannee, St Johns, and the Kissimmee Rivers had water management and environmental issues with potentially undesirable consequences associated with minimum flows, endangered species, and competing water usage demands. Due to limitation of thermal discharge into the Gulf of Mexico at the existing Crystal River Energy Complex. Levy 2 provided an advantage in avoidance of further impact to current discharge that required the use of helper cooling towers. Levy 2 at an elevation of 44 feet above sea level provided an advantage over Crystal River at 9 feet elevation due to higher ground elevation resulting in improved hurricane surge and flooding protection.

Refer to **Attachment I** for the Technical Evaluation screening and ranking results, and **Attachment IV** for the McCallum-Turner consultants siting study report.

Strategic Considerations

The evaluation of **Strategic Considerations** determined that the Levy 2 site demonstrates an advantage due to a location that yields a reduced vulnerability to the likelihood of a significant generation loss from a single event in a geographical location. Like Crystal River, Levy 2 make-up water is from the Gulf of Mexico and therefore provides a reliable source for long term consumption. Levy 2 is within the PEF Transmission footprint, with no significant impact to other grids, and no significant exposure to other critical assets.

Refer to ***Attachment II*** *for Strategic Considerations evaluation criteria ranking.*

Transmission Study

The preliminary **Transmission Study** results concluded that the Levy 2 site would experience slightly higher transmission upgrade related costs than Crystal River which has the lowest cost. Levy 2, Crystal River, and Redacted were closely comparable in transmission cost with Redacted and Redacted demonstrating significantly higher cost.

Refer to **Attachment III** for the Transmission Evaluation criteria ranking, and **Attachment V** for the Navigant Consultants Transmission System Impact Study report.

Based on these results, the **Levy 2 site would be the "preferred site"** for preparation of the Progress Energy Combined Operating License Application in Florida.

Results of the Technical Evaluation, Strategic Considerations, and Transmission Study composite ratings against the evaluation criteria summarized above are displayed in the following comparison tables.

Composite Rating Comparison:

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Siting Evaluation Criteria:		Alternative Site Compliance									
		Crystal River		Redacted		Redacted		Levy 2		Redacted	
	Weight	Score	Wgt'd Score	Score	Wgt'd Score	Score	Wgt'd Score	Score	Wgt'd Score	Score	Wgt'd Score
Site Comparison of Technical Evaluation											
Composite Score for Technical Evaluation of Suitability Criteria	40	100%	40	95.9%	38.4	91.0%	36.4	98.0%	39.2	96.1%	38.4
Normalized Scores			40		38.4		36.4		39.2		38.4

Siting Evaluation Criteria:		Alternative Site Compliance									
		Crystal River		Redacted		Redacted		Levy 2		Redacted	
	Weight	Score	Wgt'd Score	Score	Wgt'd Score	Score	Wgt'd Score	Score	Wgt'd Score	Score	Wgt'd Score
Site Comparison with Progress Energy Strategic Considerations											
Composite Score for Evaluation of Business Strategy	20	89.1%	17.8	80.5%	16.1	79.8%	16	100%	20	77.5%	15.5
Normalized Scores			17.8		16.1		16		20		15.5

Siting Evaluation Criteria:		Alternative Site Compliance									
		Crystal River		Redacted		Redacted		Levy 2		Redacted	
	Weight	Score	Wgt'd Score	Score	Wgt'd Score	Score	Wgt'd Score	Score	Wgt'd Score	Score	Wgt'd Score
Site Comparison of Transmission System Impacts											
Composite Score for Evaluation of Transmission System Impact	40	100%	40	95%	38	30%	12	100%	40	40%	16
Normalized Scores			40		38		12		40		16

Total Composite Scores	**97.8**	**92.5**	**64.4**	**99.2**	**69.9**

Attachment I - Technical Evaluation

The EPRI Siting Guide as adopted for the Progress Energy siting study provides guidance in the site selection process whereby the **"regions of interest"** are initially subjected to exclusionary considerations. The resulting **"potential sites"** are further analyzed against avoidance considerations reducing to a small number of **"candidate sites"**. A suitability evaluation of specific criteria then determines the highest ranked **"alternative sites"** best suited for a nuclear plant. These sites are finally subjected to business strategy considerations to determine the **"preferred site"**. Selection parameters in the evaluation and selection process are summarized below.

Exclusionary considerations for the preliminary screening of potential sites in the Region of Interest to down-select candidate sites:

- Lack of water
- Population Restrictions
- Federal or State Parks
- Geologic Features

Avoidance considerations for the screening of candidate sites to identify alternative sites:

- Water Use Moratoriums
- Cultural or Historical Limitations
- State or Local Governmental Restrictions
- Presence of Wetlands

Application of Suitability Criteria to score and rank alternative sites:

- *Health and Safety Criteria*
- Environmental Criteria
- Socioeconomic Criteria
- Engineering and Cost Related Criteria

Verification and confirmation whereby site differentiation draws conclusion to the preferred site for Progress Energy:

- Business Strategic Considerations
- Transmission Modeling and Analysis

Progress Energy identified the "region of interest" to include counties in the state of Florida that are adjacent to or within Progress Energy service territory. Locations subjected to review and evaluation included nineteen greenfield sites and one location with an operating nuclear plant as illustrated in Attachment I Figure 1. Google Earth® was used to scan the "region of interest" to locate sites that would be potentially suitable for a nuclear plant. Due to an acceptable number of potential sites identified, there was no need to search beyond the "region of interest" described above. The 20 sites were selected based on distance from transmission load centers, distance from populated areas, distance from industrial areas, existing cooling water source, topography, endangered species habitat, and transportation access. Each of the 20 potential sites covered an area approximately three miles in diameter (6000 acres) to ensure sufficient size to develop a nuclear plant along with support structures and facilities. Refer to Appendix A for aerial photos of the potential sites.

A technical evaluation of the "region of interest" potential sites was completed to develop the list of candidate sites with a subsequent increased level of detail for technical evaluation of the candidate sites resulting in selection of alternative sites. This evaluation phase applying exclusionary considerations is the primary basis for reduction in the number of potential sites to eight candidate sites. The sites eliminated displayed characteristics that indicated unsuitability for a nuclear plant. Specifically, [redacted] were excessively far from Progress energy load centers; [redacted] would require cooling water source from Florida Protected Waters; [redacted] were close to heavily populated areas; [redacted] and [redacted] would be located near sensitive estuaries.

In addition to following the EPRI Siting Guide, input was provided by a management committee within Progress Energy for local knowledge of five key parameters including transmission, environmental, community support, economic development, and legislative considerations.

Table 1 displays a summary of technical screening ranked order for the twenty potential sites based on the Progress Energy Florida Siting Management Team input to influence the down-select from twenty potential sites to eight candidate sites. From that input, two of the eight candidate sites [redacted] and [redacted] identified by the technical evaluation were replaced with two closely scored sites [redacted] and [redacted] to balance the location of candidate sites and ensure that no obviously superior site would be overlooked. The substitutions as based on input by the Progress Energy Florida Siting Management Team allowed at least one site to be considered for each of the potential sources of cooling water in the state of Florida. The St Johns River [redacted] and Kissimmee River [redacted] locations were rated only slightly below the down-select technical evaluation criteria threshold, and other water sources had two or more sites already selected. Therefore, one upper Suwannee River and one Gulf of Mexico location were replaced with one site to the East on the St Johns River and one to the south on the Kissimmee River. [redacted] offers no advantage over the other two Suwannee River sites ([redacted] and [redacted], and multiple sites in the down-select on the same water source could result in eliminating multiple sites with one water source issue. [redacted] is in close proximity to the Tampa-St Petersburg area with uncertain water supply plus concerns with providing effective transmission connections and public support.

Table 2 and Graph 1 provide the composite technical evaluation parameters and ranking to support the down-selection to eight candidate sites from the twenty potential sites. This information was utilized in combination with the Project Energy Florida Siting Management Team discussed above for determining the candidate sites for continued evaluation discussed below.

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REDACTED

During this continued screening evaluation process, data and information obtained by The Duncan Companies, Inc. under contract with Progress Energy Florida provided insight into land acquisition potential, local topography, future development plans, and parcel ownership. The Duncan Company, Inc. input to each of the potential and candidate sites was factored into technical evaluation process.

Knowledge gained by The Duncan Company, Inc. data resulted in a substitution of the [redacted] location for the Putnam 2 location. [redacted] ranked nearly identical with [redacted] being initially selected as a Candidate Site simply due to apparent higher ground elevation and slightly greater distance from populated areas. Input from The Duncan Company, Inc. resulted in a land parcel on the eastern edge of [redacted] that provided improved elevation and distance from population, industrial zoning, and improved potential for land acquisition. Therefore, [redacted] replaced [redacted] on the Alternate Site list.

The continued evaluation of the eight candidate sites utilized an additional set of criteria that included 40 parameters to refine suitability with an increased level of detail associated with water management, population profiles, reconnaissance level information, etc. to culminate in a small number of alternative sites considered suitable for a nuclear plant. This phase included literature research and specific weighted scoring for each candidate site against the 40 criteria. A few examples of the heaviest weighted parameters were geology/seismology, transmission access, accident effect related, and land use. Levy 2, [redacted] and Crystal River were three of the highest ranked sites.

REDACTED

Table 3 and Graph 2 provide a summary of the candidate sites general technical evaluation for selection of the alternative sites considered acceptable as a location for a nuclear plant.

The decision to continue further evaluation of [redacted] and [redacted] over [redacted] was to allow continued consideration of the Suwannee River and the Kissimmee River in lieu of having four alternative sites utilizing water resource from the Gulf of Mexico. [redacted] and [redacted] were only slightly better or equal to [redacted] and both are located near the Gulf of Mexico coastline which would require lengthy traverse of estuarine areas and shallow seabed for water intake and discharge conveyances. Extended pipelines in estuarine areas are a major consideration in permitting reviews and would produce considerable additional regulatory scrutiny. Combined with the vulnerability of these coastal sites to storm surge flooding and vacation home development on the shoreline, both sites were deferred from further consideration. [redacted] site indicated considerable recreational/residential development along both shores of the Suwannee River and a real estate analysis indicated a relatively high number of individual land owners.

From the exclusionary and avoidance criteria screening and evaluation reviews described above, the following five alternative sites were identified:

- Crystal River site located in Citrus County on the Gulf of Mexico

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- [redacted]site located in [redacted]County on the Suwannee River
- [redacted]site in [redacted]County on the Kissimmee River
- Levy 2 site located in Levy County on the Florida Barge Canal
- [redacted]ite located in [redacted]County on the St Johns River

Refer to Appendix B for plat maps of the alternative sites.

These five remaining alternative sites were subjected to a further evaluation of the 40 general criteria with additional research and "on the ground" surveillance by a senior environmental consultant and a senior geologist. Core borings were collected and reviewed by the senior geologist for foundation design suitability. Data from the existing nuclear plant at the Progress Energy Crystal River Complex was used for the Crystal River site. Table 4 contains the weighting and scoring results for the screening of alternative sites for the Technical Evaluation of the alternative sites.

From a combination of siting research data and in-field observations, Levy 2 and Crystal River were the two highest ranked sites. Crystal River utilized available site characterization data previously determined from the existing Crystal River Nuclear Plant. Levy 2 in close proximity of an approximate 8 miles separation from Crystal River provides strategic advantage due to increased distance from the Gulf coast for increased wind and flood protection allowing independence in generation and transmission from a single storm event.

[redacted] is susceptibility to karst and solution activity with numerous surface depressions observed. Core boring indicated very soft soil to a depth of approximately 80 feet. Use of cooling water from the Suwannee River would be excessively restricted due to Protected Waters of Florida designation. In addition, Manatee Springs, one of the largest surface discharges in Florida, is located directly across the Suwannee River for the [redacted]Site.

[redacted]consisted of loose, deep soil with no rock located down to approximately 185 feet. The St Johns River provided opportunity for adequate cooling water supply; however, there is potential for tidal run-up from the Atlantic Ocean.

[redacted]was challenged for cooling water due to efforts by Florida water management districts to convert the canal flow back to original stream beds. Water supply is highly regulated by the South Florida Water Management District.

The complete technical evaluation against suitability criterion for potential and candidate site evaluations are included in **Attachment IV,** the McCallum-Turner consultants siting study report.

[redacted]

Redacted

Table 1 - Potential Site Screening Evaluation Summary

Potential Sites	Composite Technical Screening Order	Final Ranking: Technical Screening Top 8	Final Ranking: PEF Down-Select Decision	Water Source	Progress Energy Florida Preliminary Input: Transmission	Community Support	Economic Development	Environment	Legislative
Redacted	1	[redacted]	[redacted]	Gulf of Mexico					
	2	[redacted]	[redacted]	Florida Barge Canal					
	3	[redacted]	[redacted]	Gulf of Mexico					
	4	[redacted]	[redacted]	Suwanee River					
	5	Crystal River	Crystal River	Gulf of Mexico					
	6	[redacted]	(Not Selected)	Suwannee/ Santa Fe					
	7	[redacted]	[redacted]	Suwanee River					
	8	[redacted]	(Not Selected)	Tampa Bay					
	9	(Not in Top 8)	(Not Selected)	St. Johns River					
	10	(Not in Top 8)	(Not Selected)	St. Johns River					
	11	(Not in Top 8)	[redacted]	St. Johns River					
	12	(Not in Top 8)	(Not Selected)	Manatee River					
	13	(Not in Top 8)	(Not Selected)	Suwanee River					
	14	(Not in Top 8)	[redacted]	Kissimmee River					
	15	(Not in Top 8)	(Not Selected)	St. Johns River					

Potential Sites	Composite Technical Screening Order	Final Ranking		Water Source	Progress Energy Florida Preliminary Input				
		Technical Screening Top 8	PEF Down-Select Decision		Transmission	Community Support	Economic Development	Environment	Legislative
Redacted	16	(Not in Top 8)	(Not Selected)	St. Johns River					
	17	(Not in Top 8)	(Not Selected)	Apalachicola River					
	18	(Not in Top 8)	(Not Selected)	Gulf of Mexico					
	19	(Not in Top 8)	(Not Selected)	Ochlockonee River					
	20	(Not in Top 8)	(Not Selected)	Chipola River					

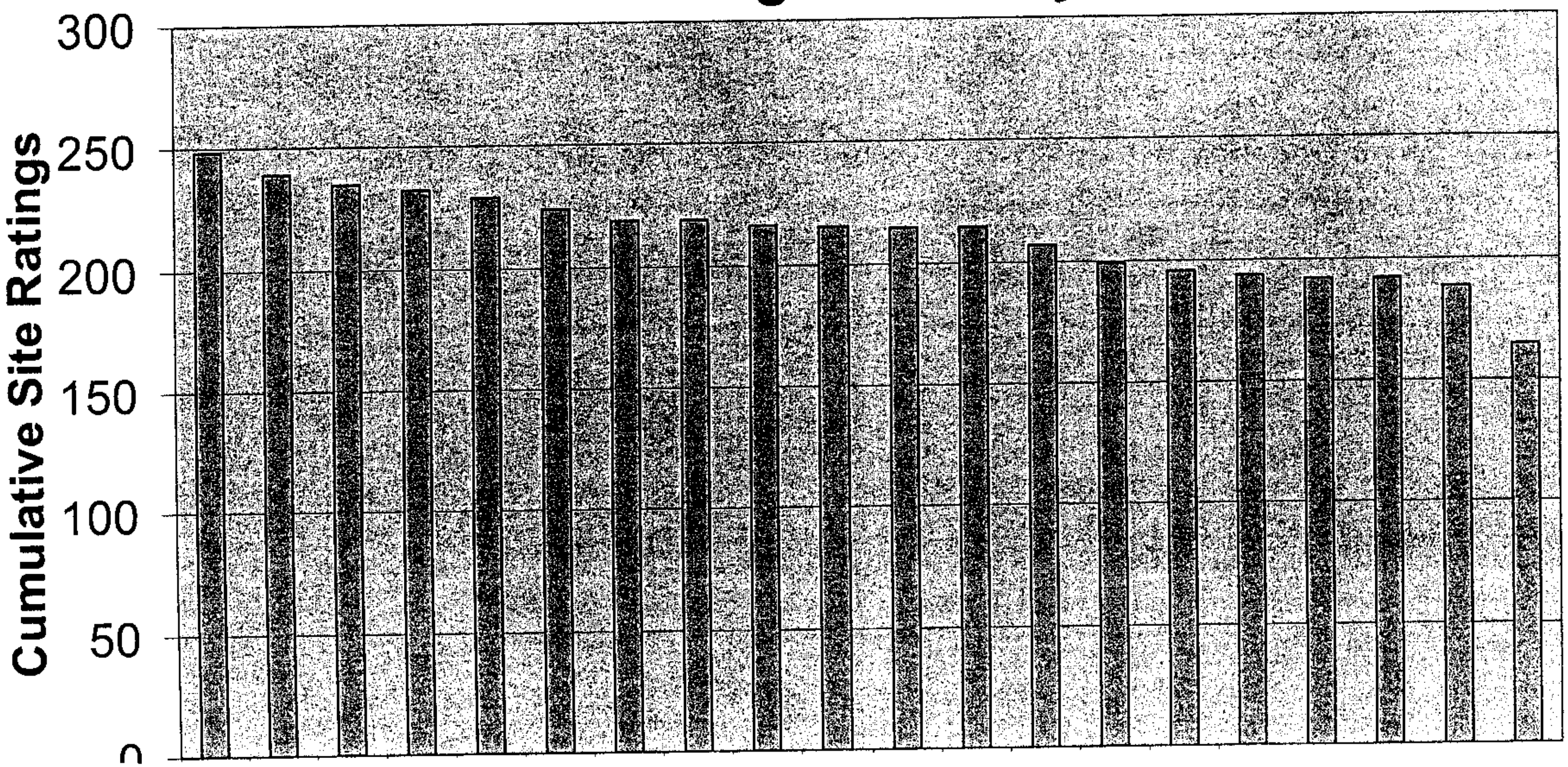
BLUE indicates the down-selected eight candidate sites based on technical evaluation and as amended by PEF input

RED = significant concerns with site **YELLOW** = proceed with caution
GREEN = not aware of any significant concerns **WHITE** = Neutral

Table 2 - Potential Site Preliminary Technical Evaluation Screening

Potential Site Name	Criterion									Composite Site Rating
	P1	P2	P3	P4	P5	P6	P7	P8	P9	
	Cooling Water Supply	Flooding	Population	Hazardous Land Uses	Ecology	Wetlands	Railroad Access	Transmission Access	Land Acquisition	
	Weight Factor									
	9.8	4.4	8.6	5.9	5.6	5.6	6.7	7.4	6.3	
	Site Ratings									
	4	5	4	2	1	1	4.9	1.3	5.0	192.3
	5	1	5	2	1	1	5.0	1.0	5.0	191.6
	2	1	4	2	2	2	4.8	1.1	5.0	164.8
	1	5	4	4	1	3	4.9	1.6	5.0	188.3
Redacted	5	4	5	3	2	5	4.4	2.9	5.0	248.8
[redacted]	3	5	4	2	4	3	4.9	3.1	5.0	224.0
Levy 1	3	4	3	2	2	4	4.9	3.3	5.0	206.6
Levy 2	5	4	4	2	2	4	4.9	3.9	5.0	239.2
Crystal River	5	3	4	1	2	4	4.9	3.9	5.0	229.1
	3	5	5	2	3	4	4.8	3.1	5.0	232.2
	3	4	4	2	2	5	4.7	3.1	5.0	218.8
	5	2	5	2	2	4	4.7	3.5	5.0	234.7
	5	4	1	2	2	5	5.0	3.7	5.0	218.4
Redacted	2	4	3	2	1	5	4.9	3.6	5.0	199.1
	2	5	2	3	2	5	4.9	4.6	5.0	214.0
	2	4	1	2	3	4	4.9	4.7	5.0	195.6
	2	3	2	3	1	4	4.8	4.6	5.0	193.4
	3	2	3	3	3	4	5.0	4.0	5.0	215.1
	3	3	4	2	3	3	4.9	3.9	5.0	215.9

Graph 1 - **Site Rating Summary**



Redacted

Table 3 - Candidate Site General Technical Evaluation

Criteria		Weight Factor	Crystal River		Redacted				Levy 2		Levy 3		Redacted			
			Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score
A.1.1	Geology / Seismology	3.77	5	18.85	5	18.85	5	18.85	5	18.85	5	18.85	5	18.85	5	18.85	5	18.85
A.1.2	Cooling System Requirements	3.27	4	13.08	3	9.81	2	6.54	3	9.81	3	9.81	4	13.08	3	9.81	4	13.08
A.1.3	Flooding	2.4	2	4.8	3	7.2	1	2.4	2	4.8	5	12	3	7.2	5	12	3	7.2
A.1.4	Nearby Hazardous Land Uses	3.35	1	3.35	3	10.05	3	10.05	3	10.05	2	6.7	3	10.05	2	6.7	3	10.05
A.1.5	Extreme Weather Conditions	2.36	2	4.72	3	7.08	3	7.08	3	7.08	3	7.08	1	2.36	3	7.08	2	4.72
A.2	Accident Effect Related	4.09	4	16.36	4	16.36	4	16.36	4	16.36	3	12.27	4	16.36	4	16.36	4	16.36
A.3.1	Surface Water – Radionuclide Pathway	2.5	5	12.5	4	10	4	10	4	10	5	12.5	5	12.5	4	10	5	12.5
A.3.2	Groundwater Radionuclide Pathway	2.55	2	5.10	2	5.10	3	7.65	2	5.10	2	5.10	2	5.10	2	5.10	1	2.55
A.3.3	Air Radionuclide Pathway B2+B2	2.5	5	12.5	4	10	4	10	4	10	4	10	5	12.5	4	10	5	12.5
A.3.4	Air-Food Ingestion Pathway	2.5	4	10	4	10	1	2.5	3	7.5	3	7.5	3	7.5	3	7.5	5	12.5
A.3.5	Surface Water-Food Radionuclide Pathway	2.41	5	12.05	4	9.64	3	7.23	4	9.64	5	12.05	5	12.05	4	9.64	5	12.05

Criteria		Weight Factor	Crystal River						Redacted		Levy 2		Levy 3		Redacted		r	
			Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score
A.3.6	Transportation Safety	**2.14**	3	6.42	3	6.42	3	6.42	3	6.42	3	6.42	3	6.42	3	6.42	3	6.42
B.1.1	Disruption of Important Species/Habitats	**2.64**	2	5.28	2	5.28	5	13.2	3	7.92	2	5.28	1	2.64	3	7.92	1	2.64
B.1.2	Bottom Sediment Disruption Effects	**2.14**	3	6.42	2	4.28	2	4.28	2	4.28	2	4.28	3	6.42	2	4.28	3	6.42
B.2.1	Disruption of Important Species/Habitats and Wetlands	**3.18**	3	9.54	4	12.72	3	9.54	3	9.54	3	9.54	2	6.36	3	9.54	3	9.54
B.2.2	Dewatering Effects on Adjacent Wetlands	**2.77**	3	8.31	4	11.08	4	11.08	3	8.31	4	11.08	2	5.54	3	8.31	4	11.08
B.3.1	Thermal Discharge Effects **	**3.64**	3	10.92	2	7.28	3	10.92	3	10.92	3	10.92	3	10.92	3	10.92	3	10.92
B.3.2	Entrainment/Impingement Effects	**3.23**	3	9.69	3	9.69	4	12.92	3	9.69	3	9.69	3	9.69	3	9.69	3	9.69
B.3.3	Dredging/Disposal Effects	**2.36**	3	7.08	2	4.72	2	4.72	2	4.72	2	4.72	3	7.08	2	4.72	3	7.08
B.4.1	Drift Effects on Surrounding Areas	**2.36**	2	4.72	3	7.08	3	7.08	3	7.08	2	4.72	2	4.72	3	7.08	2	4.72
C.1.1	Socioeconomics – Construction – Related Effects	**2**	4	8.0	3	6.0	5	10.0	3	6.0	4	8.0	4	8.0	5	10.0	3	6.0
C.3.1	Environmental Justice	**1.95**	5	9.75	5	9.75	5	9.75	5	9.75	5	9.75	5	9.75	5	9.75	5	9.75
C.4.1	Land Use	**3.8**	2	7.6	2	7.6	3	11.4	2	7.6	2	7.6	2	7.6	4	15.2	2	7.6

Criteria		Weight Factor	Crystal River		Redacted						Levy 2		Levy 3		Redacted			
			Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score
D.1.1	Water Supply	3.7	5	18.5	3	11.1	2	7.4	3	11.1	4	14.8	5	18.5	4	14.8	5	18.5
D.1.2	Pumping Distance	3.05	5	15.25	4	12.2	3	9.15	5	15.25	3	9.15	1	3.05	3	9.15	1	3.05
D.1.3	Flooding	2.9	2	5.8	3	8.7	2	5.8	2	5.8	5	14.5	3	8.7	5	14.5	3	8.7
D.1.5	Civil Works	3.4	3	10.2	3	10.2	3	10.2	4	13.6	3	10.2	3	10.2	3	10.2	3	10.2
D.2.1	Railroad Access	2.6	5	13.0	3	7.8	4	10.4	3	7.8	4	10.4	3	7.8	5	13.0	3	7.8
D.2.2	Highway Access	2.8	5	14.0	5	14.0	5	14.0	5	14.0	5	14.0	5	14.0	5	14.0	5	14.0
D.2.3	Barge Access	2.85	5	14.25	2	5.7	2	5.7	2	5.7	2	5.7	3	8.55	4	11.4	3	8.55
D.2.4	Transmission Access	4.8	3	14.4	4	19.2	4	19.2	4	19.2	5	24	4	19.2	4	19.2	4	19.2
D.3.1	Topography	2.55	5	12.75	5	12.75	5	12.75	4	10.2	5	12.75	5	12.75	3	7.65	4	10.2
D.3.2	Land Rights	2.75	5	13.75	4	11	3	8.25	1	2.75	2	5.5	1	2.75	3	8.25	4	11
D.3.3	Labor Rates	3.3	5	16.5	4	13.2	3	9.9	3	9.9	5	16.5	5	16.5	2	6.6	3	9.9
Composite Site Rating			355		332		323		317		343		325		346		335	

Graph 2 - Candidate Site General Technical Evaluation

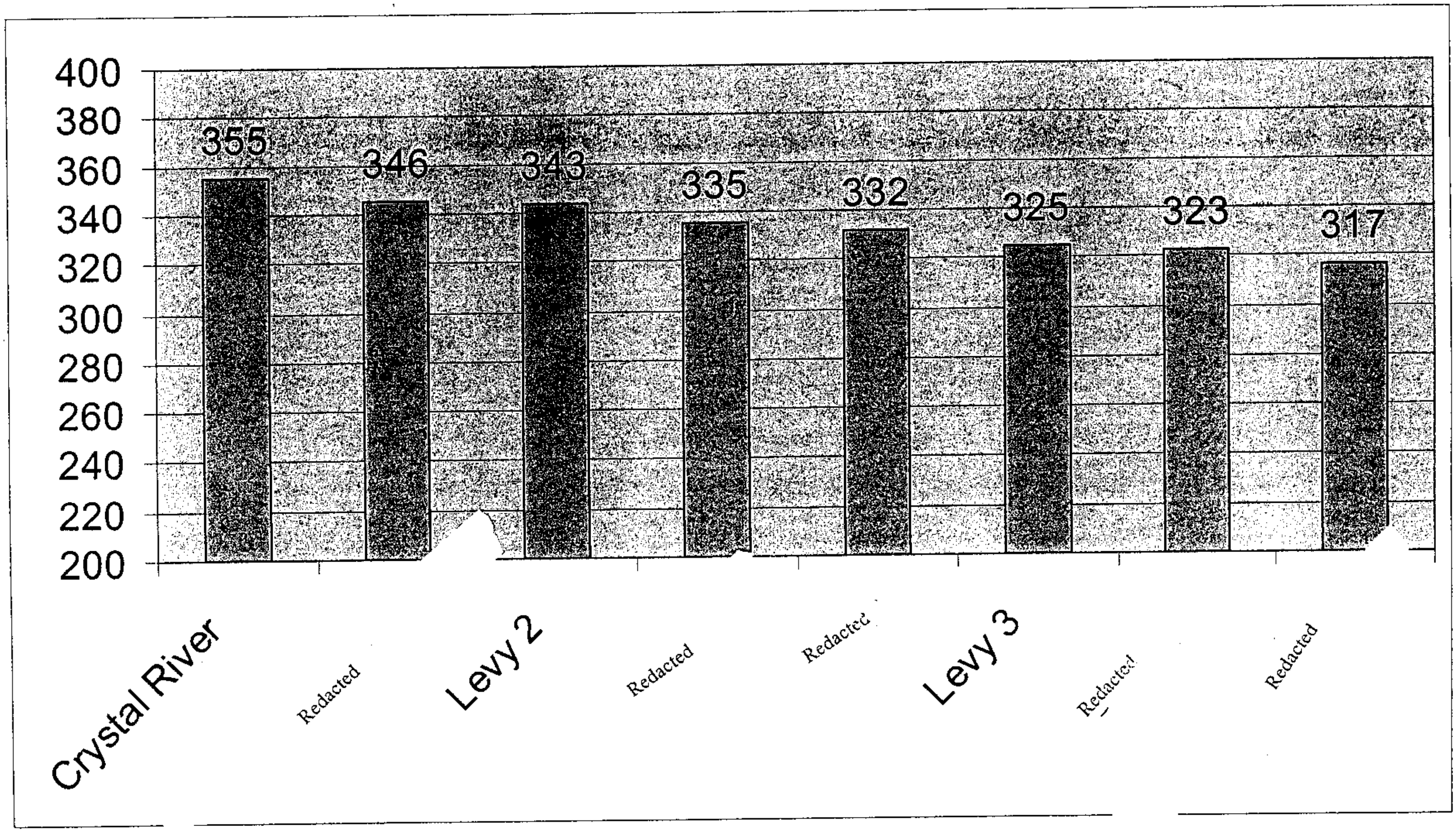


Table 4 - Screening Results for Technical Evaluation of Suitability Criterion:

Progress Energy Florida General Site Criteria Ratings												
EPRI Guide Section	Criteria	Weight Factor	Crystal River		Redacted				Levy 2		Redacted	
			Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score
A.1.1	Geology / Seismology	**3.77**	5	18.85	5	18.85	5	18.85	5	18.85	5	18.85
A.1.2	Cooling System Requirements	**3.27**	4	13.08	3	9.81	2	6.54	3	9.81	3	9.81
A.1.3	Flooding	**2.4**	2	4.8	3	7.2	1	2.4	5	12	5	12
A.1.4	Nearby Hazardous Land Uses	**3.35**	1	3.35	3	10.05	3	10.05	2	6.7	2	6.7
A.1.5	Extreme Weather Conditions	**2.36**	2	4.72	3	7.08	3	7.08	3	7.08	3	7.08
A.2	Accident Effect Related	**4.09**	4	16.36	4	16.36	4	16.36	3	12.27	4	16.36
A.3.1	Surface Water Radionuclide Pathway	**2.5**	5	12.5	4	10	4	10	5	12.5	4	10
A.3.2	Groundwater Radionuclide Pathway	**2.55**	2	5.10	2	5.10	3	7.65	2	5.10	2	5.10
A.3.3	Air Radionuclide Pathway	**2.5**	5	12.5	4	10	4	10	4	10	4	10
A.3.4	Air-Food Ingestion Pathway	**2.5**	4	10	4	10	1	2.5	3	7.5	3	7.5
A.3.5	Surface Water-Food Radionuclide Pathway	**2.41**	5	12.05	4	9.64	3	7.23	5	12.05	4	9.64
A.3.6	Transportation Safety	**2.14**	3	6.42	3	6.42	3	6.42	3	6.42	3	6.42
B.1.1	Disruption of Important Species / Habitats	**2.64**	2	5.28	2	5.28	5	13.2	3	7.92	3	7.92
B.1.2	Bottom Sediment Disruption Effects	**2.14**	3	6.42	2	4.28	2	4.28	2	4.28	2	4.28

Progress Energy Florida General Site Criteria Ratings

EPRI Guide Section	Criteria	Weight Factor	Crystal River		Redacted				Levy 2		Redacted	
			Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score
B.2.1	Disruption of Important Species/Habitats and Wetlands	**3.18**	3	9.54	4	12.72	3	9.54	3	9.54	3	9.54
B.2.2	Dewatering Effects on Adjacent Wetlands	**2.77**	3	8.31	4	11.08	4	11.08	4	11.08	3	8.31
B.3.1	Thermal Discharge Effects **	**3.64**	3	10.92	3	10.92	3	10.92	3	10.92	3	10.92
B.3.2	Entrainment/Impingement Effects	**3.23**	3	9.69	3	9.69	4	12.92	3	9.69	3	9.69
B.3.3	Dredging/Disposal Effects	**2.36**	3	7.08	2	4.72	2	4.72	2	4.72	2	4.72
B.4.1	Drift Effects on Surrounding Areas	**2.36**	2	4.72	3	7.08	3	7.08	3	7.08	3	7.08
C.1.1	Socio-economics Construction Related Effects	**2**	4	8.0	3	6.0	5	10.0	4	8.0	5	10.0
C.3.1	Environmental Justice	**1.95**	5	9.75	5	9.75	5	9.75	5	9.75	5	9.75
C.4.1	Land Use	**3.8**	2	7.6	2	7.6	3	11.4	2	7.6	4	15.2
D.1.1	Water Supply	**3.7**	5	18.5	4	14.8	2	7.4	4	14.8	4	14.8
D.1.2	Pumping Distance	**3.05**	5	15.25	4	12.2	3	9.15	3	9.15	3	9.15
D.1.3	Flooding	**2.9**	2	5.8	3	8.7	2	5.8	5	14.5	5	14.5
D.1.5	Civil Works	**3.4**	3	10.2	3	10.2	3	10.2	3	10.2	3	10.2
D.2.1	Railroad Access	**2.6**	5	13.0	3	7.8	4	10.4	4	10.4	5	13.0
D.2.2	Highway Access	**2.8**	5	14.0	5	14.0	5	14.0	5	14.0	5	14.0
D.2.3	Barge Access	**2.85**	5	14.25	2	5.7	2	5.7	2	5.7	4	11.4
D.2.4	Transmission Access	**4.8**	3	14.4	4	19.2	4	19.2	5	24	3	14.4

Progress Energy Florida General Site Criteria Ratings												
EPRI Guide Section	Criteria	Weight Factor	Crystal River		Redacted		Redacted		Levy 2		Redacted	
			Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score
D.3.1	Topography	**2.55**	5	12.75	5	12.75	5	12.75	5	12.75	3	7.65
D.3.2	Land Rights	**2.75**	5	13.75	4	11	3	8.25	2	5.5	3	8.25
D.3.3	Labor Rates	**3.3**	5	16.5	4	13.2	3	9.9	5	16.5	2	6.6
Composite Site Rating				355		339		323		348		341
Normalized Score			100%		95.9%		91.0%		98.0%		96.1%	

NOTE: Site ratings for each criterion are assigned in the range 1=least suitable to 5=most suitable

Attachment II – Strategic Considerations

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The following table provides alternative site compliance rating toward Progress Energy business strategy criteria.

Progress Energy Business Strategic Evaluation

Siting Evaluation Criteria: **Compliance with Progress Energy Business Strategic Considerations**		**Crystal River**		Redacted		Redacted		**Levy 2**		Redacted		**Basis of Evaluation Finding**
	Weight	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	
System Reliability Consideration - Evaluation of the generating station and transmission system vulnerability due to the concentration of generating stations at one location and/or the concentration of major transmission corridors in one location.	20	1	20	10	200	7	140	8	160	7	140	Adding new nuclear generating capacity to the Crystal River Energy Complex results in a significant concentration of Progress Energy Florida generating assets in one geographical location. This increases the likelihood of a significant generation loss from a single event and a resulting large scale impact on the Progress Energy system. Generating capacity at the Crystal River Energy Complex is currently ~ 3067 Net MWe and would increase by 73% with the addition of two 1125 MWe AP1000 Units, resulting in ~ 5317 MWe. The Levy 2 site is located ~10 miles northeast of the Crystal River Energy Complex and is ~ 8 miles from the Gulf coast. This yields a reduced vulnerability to the likelihood of a significant generation loss from a single event in a geographical location. Redacted and further reduces the vulnerability to the likelihood of a significant generation loss

Siting Evaluation Criteria: Compliance with Progress Energy Business Strategic Considerations		Crystal River		Redacted		Redacted		Levy 2		Redacted		Basis of Evaluation Finding
	Weight	Score	Wgt'd Score	Score	Wgt'd Score	Score	Wgt'd Score	Score	Wgt'd Score	Score	Wgt'd Score	
												from a single event. Redacted sites are of a sufficient distance from other PEF generating assets such that concentration of generating stations is less of a concern. However, these sites are much more dependent on the health of other utility/cooperative generating and transmission system reliability beyond the control of Progress Energy.

Siting Evaluation Criteria: **Compliance with Progress Energy Business Strategic Considerations**		**Crystal River**		Redacted		Redacted		**Levy 2**		Redacted		**Basis of Evaluation Finding**
	Weight	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	
Site permitting & Approval Challenges - Evaluation of the relative risk in developing a selected site based on known environmental permitting challenges (including groundwater and karst features), water resource issues, ability to acquire necessary state/local permits, difficulty in designing and constructing cooling water make-up and blowdown systems (and acquiring easements), and re-establishing rail access.	20	7	140	7	140	7	140	9	180	10	200	Levy 2 make-up water is from the Gulf of Mexico and therefore provides a reliable source for long term consumption. One challenge for this site is the distance required for cooling tower blowdown (which requires piping along the barge canal with minimal slope, and must pass under a four lane highway). The Withlacoochee River is fresh water at the headwaters of the lake by-pass canal, and there is some residential development along the river. Environmental considerations for this site relate to protecting threatened and endangered species, avoiding intrusion of salt water from the canal into fresh groundwater tables (if the level was significantly changed), and avoiding impact on shell fish harvesting at the coast. Redacted site on the Suwannee River will have minimal impact on the river minimum flow levels. There are environmental considerations associated with wetlands and aquatic life, and the location may require an assessment for Environmental Justice. Ecotourism is an important consideration for the Suwannee River Dixie site, and site development would require detailed planning/implementation to make the nuclear site transparent to the river environment. Redacted on the St Johns River will have minimal impact on minimum flow levels, but due to the low flow velocity in the St Johns, impact

Siting Evaluation Criteria: **Compliance with Progress Energy Business Strategic Considerations**		**Crystal River**		Redacted		Redacted		**Levy 2**		Redacted		**Basis of Evaluation Finding**
	Weight	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	
												on water quality is a consideration. Redacted The St Johns River is also undergoing a broad restoration and clean-up program that could result in additional permitting challenges. The Crystal River site water source from the Gulf of Mexico provides a reliable source for long term consumption. How, the site currently is challenged with return temperatures on the discharge canal to the Gulf that has resulted in de-rating fossil Units 1 and 2 during summer months. This would be further be aggravated by the addition of ~ 16 million gallons/day warm water blowdown from two new natural draft cooling towers. In the Crystal River site case, existing operational challenges with existing DEP limits would be significantly complicated by the addition of new generating units. Redacted site is considerably complicated based on existing plans by the pertinent water management district to convert the C-38 Kissimmee canal back to a meandering river, *and concurrently construct large reservoirs* (> 10,000 acres) for flood control. These reservoirs would likely be used by power plants when river flows are low, and then get refilled by diverting water from the Kissimmee when river flows are excessive.

Siting Evaluation Criteria: **Compliance with Progress Energy Business Strategic Considerations**		**Crystal River**		Redacted		Redacted		**Levy 2**		Redacted		**Basis of Evaluation Finding**
	Weight	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	
Hurricanes and other Extreme Weather Events Consideration – Evaluation of generating station vulnerability as it relates to extreme weather events, such as hurricanes, based on geographical siting location.	10	2	20	4	40	6	60	8	80	10	100	The Crystal River site is already most vulnerable to the direct impacts (wind and flooding) from a Gulf coast hurricane, based on its coastal siting. Therefore the addition of new nuclear units at this site would results in a significant PEF system vulnerability due to weather events. The addition of generating capacity at Crystal River also results in additional transmission system vulnerabilities from tornadoes impacting the north& south transmission corridors that emanate eastward from the site. Redacted Redacted Levy 2 and Redacted sites have less concentrated transmission system corridors than the Crystal River site, and are therefore less vulnerable to tornado impacts. Redacted 's comparable to Redacted with regard to hurricane wind effects based on siting distance from the coast, but is more susceptible to inland flooding from major hurricanes. Dikes

Siting Evaluation Criteria: **Compliance with Progress Energy Business Strategic Considerations**		**Crystal River**		Redacted		Redacted		**Levy 2**		Redacted		**Basis of Evaluation Finding**
	Weight	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	
												have previously been built around Lake Okeechobee to avoid major inland flooding from hurricane driven lake surges.
System Strategic Fit - Evaluation of how the plant siting impacts and/or supports strategic transmission and generation planning. Considered attributes include: (1) Relative location to PEF transmission grid, (2) Any impact to other electric grids, (3) Exposure to other PGN critical assets, and (4) Joint venture opportunities.	20	9	180	10	200	8	160	10	200	6	120	Crystal River is within the PEF Transmission footprint, with No significant impact to other grids, and some exposure to other critical assets (Crystal River Units 1 – 5). Redacted within the PEF Transmission footprint, with No significant impact to other grids, and No significant exposure to other critical assets. Levy 2 is within the PEF Transmission footprint, with No significant impact to other grids, and No significant exposure to other critical assets. Redacted is not within the PEF Transmission footprint, has significant impact to other grids (~ Redacted has No significant exposure to other critical assets. Redacted s on the edge the PEF Transmission footprint, with significant impact to other grids (~ Redacted), and has No significant exposure to other critical assets.

Siting Evaluation Criteria: **Compliance with Progress Energy Business Strategic Considerations**		**Crystal River**		Redacted		Redacted		**Levy 2**		Redacted		**Basis of Evaluation Finding**
	Weight	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	
Existing Site Advantages - Sharing of existing resources and facilities associated with security, maintenance, training, warehousing, and emergency planning.	10	10	100	7	70	1	10	8	80	1	10	An existing nuclear site would generally have an advantage for sharing facilities and certain support organizations. However in the case of the Crystal River Energy Complex, the site is already very complicated by the existence of a nuclear unit and four fossil units (and the associated coal storage and transport systems), the synergistic relationship to the adjacent mining company (mining ore on conveyer belts pass through the site to a barge loading facility). This site is therefore much more difficult from an engineering viewpoint, to integrate two additional nuclear units into the existing site layout. Further, this site is scheduled for significant fossil emission system upgrades in the same timeframe that would further complicate construction of new nuclear units. Redacted, Levy 2, , a Redacted are all greenfield sites with no existing facilities or developed resources. Levy 2 and are close enough to the Crystal River site to have the potential to more routinely leverage workforce and materials (spare parts). Redacted and Redacted are sufficiently far from the existing Crystal River nuclear site than no significant routine work leveraging would be practical.

Siting Evaluation Criteria: **Compliance with Progress Energy Business Strategic Considerations**		**Crystal River**		Redacted		Redacted		**Levy 2**		Redacted		**Basis of Evaluation Finding**
	Weight	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	
Local and State Government Support Incentives and support associated with infrastructure improvements, rate base impact, emergency planning, employment training, etc.	15	10	150	4	60	7	105	9	135	4	60	There is no significant differentiation between sites for state incentives or support. Support has been publicly expressed by both Citrus County and Redacted County which would likely bring financial support to the Crystal River and sites. Current infrastructure is in place in Crystal River which due to proximity would also be available to the Levy 2 site. Generally there is more infrastructure available to the sites closer to urban areas (CR, Redacted Levy). This is not the case for and Redacted It is probable that we would have less support for an off system county Redacted where we do not have relationships or customer base.
Public Support General public desire for safe and efficient nuclear power generation and avoidance of nonproductive intervention...	10	10	100	5	50	6	60	8	80	4	40	Without research on the local sites, this is difficult to gauge. Based on our experience in North Carolina and on public reaction to date, utilization of an existing site would draw far less opposition than a greenfield site. CR site ranked highest on this basis. It is also probable that we could expect less support for an off system community where we

Siting Evaluation Criteria: **Compliance with Progress Energy Business Strategic Considerations**		**Crystal River**		Redacted		Redacted		**Levy 2**		Redacted		**Basis of Evaluation Finding**
	Weight	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	
												have few relationships, no customer base, and no visibility. Redacted was ranked low on this basis. Also due to expected reaction by environmental groups to utilization of pristine/protected waterways Redacted and Redacted were ranked lower.
Local Community Challenges – Relative evaluation of challenges from the local community.	15	10	150	7	105	7	105	6	90	4	60	We anticipate few local challenges for Crystal River. We have received strong expressed support from county leadership and little reaction publicly to that. This is also true for Redacted We anticipate likely intervention by local environmental groups for the Redacted n and Redacted locations. Redacted may draw state and national attention from these groups; however, water level management through the implementation of reservoirs may be seen as a positive outcome for an ongoing flood control problem. It is anticipated that the impact in will be seen as positive due to increase in tax base, job opportunities and increased land values. There is some concern that the current site is a hunting preserve as well as the perception of impact to the Suwannee River. Levy 2 may negatively impact nearby land

Siting Evaluation Criteria: Compliance with Progress Energy Business Strategic Considerations		Crystal River		[redacted]		[redacted]		Levy 2		[redacted]		Basis of Evaluation Finding
	Weight	Score	Wgt'd Score	Score	Wgt'd Score	Score	Wgt'd Score	Score	Wgt'd Score	Score	Wgt'd Score	
												values as there are existing residential properties in close proximity as well as efforts for planned recreational and residential development. Transmission impact will need to be known and evaluated on the basis of specific impact to the site communities. There is estimated to be no additional transmission added to the Crystal River and Levy 2 site communities.
NRC Considerations - Preference of existing nuclear facility sites facilitating the COLA review process.	10	10	100	8	80	8	80	8	80	8	80	Crystal River, while providing advantage with prior licensing site geotechnical and meteorological characterization, is however complicated by the complexity of the existing site layout. Therefore this site does not benefit as much as other existing nuclear only sites (like Harris) for this strategic consideration. There was no preference or advantage between the various greenfield sites.
Land Utilization - Leverage of Progress Energy land for potential applications of public benefit.	5	6	30	10	50	9	45	10	50	7	35	The Crystal River site, based on the site configuration/complexity and public access, has fewer opportunities for increased public benefit with land utilization. Levy 2 and [redacted] are in the vicinity of local recreational and tourist areas, and have the most potential for application of land utilization planning for public benefit. [redacted] is located in an industrial area with a

REDACTED

Siting Evaluation Criteria: **Compliance with Progress Energy Business Strategic Considerations**		**Crystal River**		[redacted]		[redacted]		**Levy 2**		[redacted]		**Basis of Evaluation Finding**
	Weight	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	
												nearby large fossil station and pulp/paper plant, and has less favorable conditions for land utilization planning for public benefit. The [redacted] site could be used synergistically with the Water Management district to help with flood control by using the proposed reservoirs.
Additional Cost considerations – Consideration of additional costs unique to particular sites. Note that site transmission costs are specifically covered in the Transmission deliverability analysis evaluation rankings.	10	10	100	5	50	10	100	10	100	1	10	The [redacted] site has the most significant rail expansion needed to access the site during the construction period, and later on a much more infrequent basis for on-going maintenance/spent fuel shipping. [redacted] Redacted [redacted] Levy 2 also requires rail expansion to reach the site from Dunnellon, but the distance is ~ 10 miles. Crystal River and [redacted] have nearby rail access. [redacted] has rail in the area, and depending on the final siting location of the plant, the rail could be reasonably expanded to reach the site. Levy 2 has the longest cooling tower blowdown path requirement, and this will involve a higher cost to achieve (in the $ 10 of millions) Based on borings at the [redacted] site, the soil was determined to be soft down to at least ~ 220 feet, which would require significant

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Siting Evaluation Criteria: **Compliance with Progress Energy Business Strategic Considerations**		**Crystal River**		Redacted		Redacted		**Levy 2**		Redacted		**Basis of Evaluation Finding**
	Weight	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	Score	**Wgt'd Score**	
												excavation and repacking of the soil below the foundation of the plant. It is not clear how deep this soil exchange/re-packing would require, but it would be well below the water table, and therefore ground water intrusion (during excavation) would make this very difficult and costly. Pilings are not an option to reach the bedrock. This makes the Redacted te significantly more expensive to construct. (greater than $ 100 million range).
Site Expandability – Considers the capability of a given site location to be able to expand beyond two reactors, adding additional reactors and/or a co-located fossil station.	10	10	100	3	30	6	60	10	100	3	30	In general, the various sites are most limited by water resources as the sites are expanded beyond the original two reactor concept. In all cases there is sufficient undeveloped adjacent land to allow physical siting of additional reactors. In regards to water, the Crystal River and Levy 2 sites would be not limited by water, noting the endless supply of water from the Gulf of Mexico. While the water volume is large at Redacted the water movement is rather slow along the St. Johns River and this site would be more challenged. Redacted Both the Redacted Redacted ites would have the most difficulty in securing the additional water resources for additional reactors or fossil plants. This is based on there lower volumetric

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Siting Evaluation Criteria: Compliance with Progress Energy Business Strategic Considerations		**Crystal River**		Redacted		Redacted		**Levy 2**		Redacted		**Basis of Evaluation Finding**
	Weight	Score	Wgt'd Score	Score	Wgt'd Score	Score	Wgt'd Score	Score	Wgt'd Score	Score	Wgt'd Score	
												flow rates and anticipated increase in water management control.
Total Weighted Scores			1190		1075		1065		1335		1035	
Normalized Scores			89.1 %		80.5 %		79.8 %		100 %		77.5 %	

Attachment III – Transmission Study

The evaluation of transmission impact was based on analysis completed by Navigant Consulting to provide basis for differentiating each of the alternative sites in relation to transmission upgrade and tie-in costs, and other criteria to ensure best site was selected for the new nuclear plant location. Criteria included in the following matrix were weighted based on importance to Progress Energy generation and service territory requirements, and scored for each alternative site.

Siting Evaluation Criteria:		**Alternative Site Compliance**										**Basis of Evaluation Finding**
Comparison of Transmission System Impacts		**Crystal River**		Redacted		Redacted		**Levy 2**		Redacted		
	Weight	Score	Wgt'd Score	Score	Wgt'd Score	Score	Wgt'd Score	Score	Wgt'd Score	Score	Wgt'd Score	
Transmission system Direct Connect and Upgrade Costs Miles of transmission line to be constructed based on overloads and voltage violations. Interconnection availability, need for breaker bays and substations.	10	10	100	9	90	3	30	10	100	4	40	Transmission connection cost would be in range of [redacted] million at the northwestern sites (Crystal River, Levy 2, [redacted] and would be greater than $1 billion at [redacted] and [redacted] Much of the cost at [redacted] results from need to upgrade the transmission grid outside Progress service territory to address contingencies that could occur when power from two-unit nuclear plant is injected into the system.
Total Weighted Scores			100		90		30		100		40	
Normalized Scores			100 %		90%		30%		100 %		40%	

Refer to **Attachment VI** for details of the Navigant Consulting transmission system impact study.

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Attachment IV – McCallum-Turner Siting Study

Progress Energy
Florida Nuclear Power Plant
Siting Report

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November 2006

Table of Contents

1.0 Background & Introduction

Progress Energy (Progress) plans to prepare a Combined Operating License (COL) application for a new nuclear power plant in Florida. An early step in this process is selection of a site that will provide the geographic setting for the COL application. This *Siting Plan* provides a description of the bases, assumptions, and processes applied in selecting the Progress Florida COL site.

The overall objective of the siting process is to identify a nuclear power plant site that 1) meets Progress's business objectives for the COL project, 2) satisfies applicable Nuclear Regulatory Commission (NRC) site suitability requirements, and 3) is compliant with National Environmental Policy Act (NEPA) requirements regarding the consideration of alternative sites.

Definition of the Region of Interest (ROI) for the siting study began with the Progress (Florida) service territory, as depicted in Figure 1-1. In order to identify viable sites within reasonable distance of the service territory and to allow additional flexibility in consideration of siting trade-offs, the ROI was expanded one additional county around the periphery of the service territory in Florida. Counties added to the ROI in Florida include all or parts of Bay, Calhoun, Jackson, Suwannee, Columbia, Union, Bradford, Alachua, Clay, Putnam, Flagler, Volusia, Seminole, Brevard, Indian River, Okeechobee, St. Lucie, Glades, Highlands, DeSoto, Hardee, Manatee, Pasco, Polk and Hillsborough; the resulting ROI is shown in Figure 1-2.

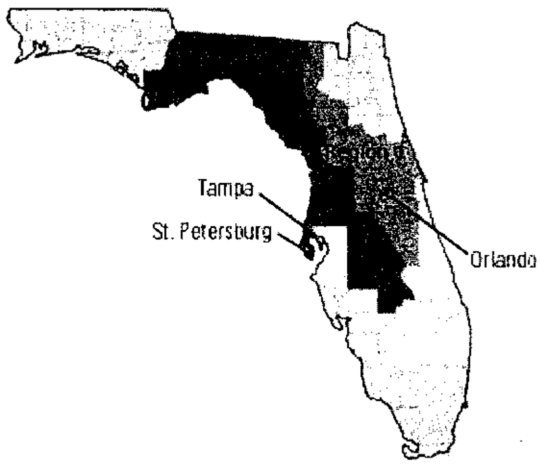

Figure 1-1 Progress Service Area - Florida

Figure 1-2 Florida Region of Interest

Prospective sites were evaluated based on the assumption that a twin-unit plant, AP1000 design will be built and operated; characteristics of the plant as they relate to site characteristics are documented in *AP1000 Siting Guide: Site Information for an Early Site Permit*, April 2003.

An overall description of the siting process appears in Section 2.0; additional detail on component steps in the site selection process and results of executing these steps is provided in succeeding sections. Additional technical detail on the site selection analysis appears in the Appendices.

2.0 Siting Process Overview

Site selection was conducted in accordance with the overall process outlined in the EPRI *Siting Guide: Site Selection and Evaluation Criteria for an Early Site Permit Application* (Siting Guide), March 2002. This process, as adapted for the Progress Florida site selection study, is depicted in Figure 2-1.

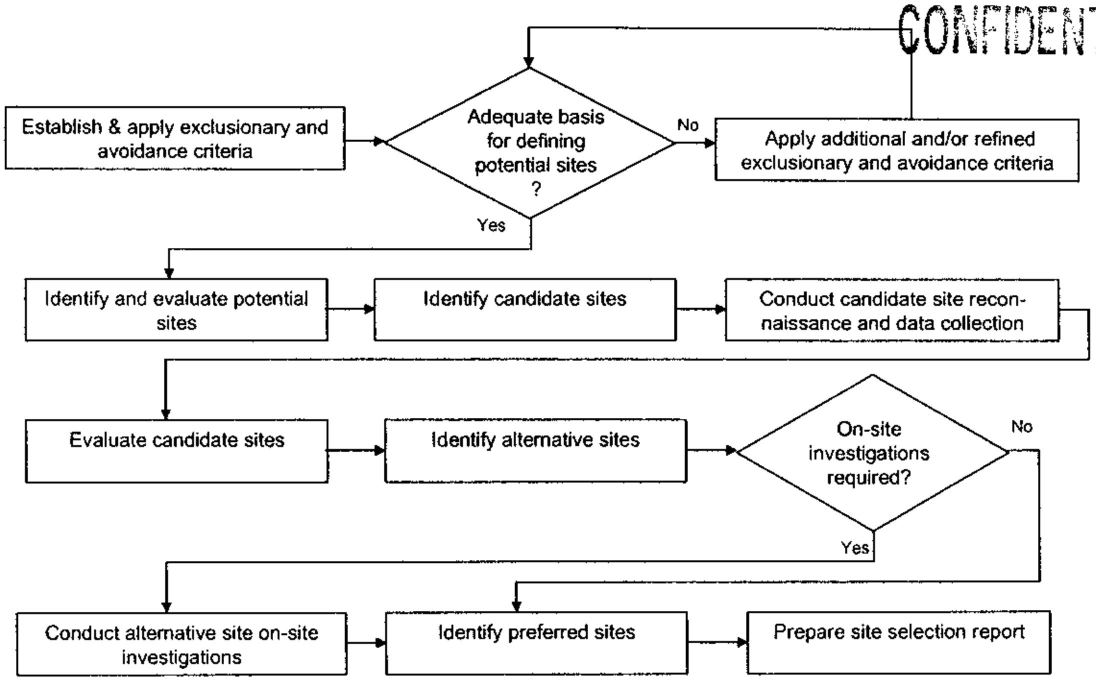

Figure 2-1 Site Selection Process Overview

The process begins with screening the ROI and then reducing the area under consideration in successive steps to potential sites (target number 18-20), candidate sites (6-8), alternative sites (3-4), and selection of the proposed site. Site suitability criteria listed in Chapter 3 of the Siting Guide were used as the overall framework for these evaluations. The proposed site was selected based on results of applying this process and consideration of how well the alternative sites satisfy Progress' business objectives for the Florida COL.

3.0 Regional Screening

Section 3.1 outlines the regional screening process. Section 3.2 describes the results of applying the process to the ROI and the identification of siting areas for identification of potential sites (Section 4.0).

3.1 Regional Screening Process

The first step in the site selection process was to screen the ROI to eliminate those areas that are either unsuitable or are significantly less suitable than other potential siting areas. Exclusionary and avoidance criteria identified in the Siting Guide were reviewed to identify those criteria and related physical features that provide insights into site suitability on an areal basis within the ROI.

Criteria applied to initial screening of the ROI are listed in Table 3-1. Additional information provided in Table 3-1 includes:

- Identification of data mapped
- Mapping criteria that define how suitability was determined based on mapped data (e.g., buffer zones)
- Suitability impact (i.e., identification of areas excluded from further study)
- Sources for identification and location of data to be mapped
- Comments and rationale for the application of mapped data in determining site suitability

Table 3-1 Process for ROI Screening

Data Category	Mapped Data	Screening Criteria	Suitability Impact	Data Source(s)	Comments/Rationale
Geology/ Seismic	None (see Comments)	Areas within 25 miles of capable faults	Excluded	USGS Records Crystal River SARs	No surface faults appear on the Fla. State Geologic Map, and no capable structures are identified in the USGS database for Florida. There are no Class A or B features in Fla. Accordingly, no mapping criteria for geologic/seismic issues were applied in regional screening.
		Areas within 5 miles of surface faults	Excluded		
Population	Population Density	Counties where population density > 300 persons/mi^2	Excluded	2000 Census	Counties with > 300 persons/mi^2 likely have multiple imbedded areas >500 persons/mi^2. Siting within these areas would place the plant within an unacceptable distance of high population density areas.
Water Availability	Water sources (large rivers, coastal areas)	River reaches for which the average flow >10 times the plant makeup water requirement.	Excluded areas greater than 5 miles from water bodies that meet the mapping criteria	USGS Records	Rivers for which more than 10% of the average flow will be required for makeup water may present permitting or operational water supply problems. Pumping makeup water more than 5 miles imposes significant construction and operational costs and can result in operational risks.
Dedicated Land Use	Federal & State parks, monuments, wildlife areas, wilderness areas, wild and scenic rivers	Five mile buffer around each mapped feature.	Excluded	Federal and State Land Use Maps	A 5 mile buffer is expected to provide mitigation for potential visual impacts of a plant located near dedicated land uses.
Regional Ecological Features	Known, mapped wetlands, estuaries, designated T&E species habitat	Map areal extent of identified features	Excluded		Development of a plant at the location of significant known areas of ecological importance could result in unacceptable environmental impacts and/or challenge as to whether obviously superior alternatives are available. Permitting may be significantly more difficult in marsh or estuarine areas of ecological sensitivity.
Transmission	None (see Comments)	N/A	N/A	N/A	Load conditions on the existing transmission grid are such that a new plant would be connected directly to load centers rather than being tied into the existing system. Accordingly, transmission was not evaluated directly in regional screening, but was taken into account in later stages of the site selection process as a site-specific cost issue in terms of distance to the load centers in the Orlando and Tampa-St. Petersburg areas.

Information defined for each of the Data Categories listed in Table 3-1 was displayed on separate maps of the ROI. These maps were combined using a simple overlaying technique to produce a composite screening map; Figure 3-1 provides a conceptual depiction of this process.

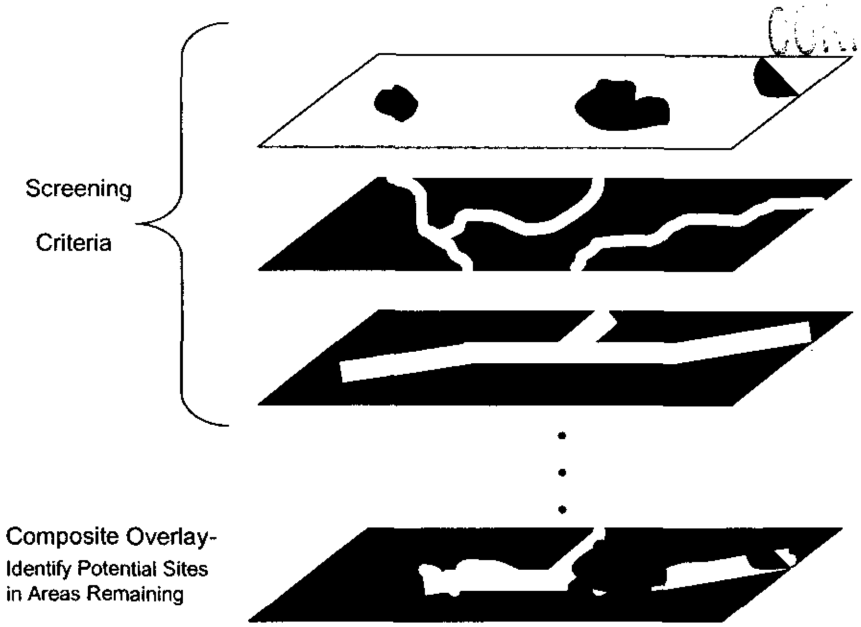

Figure 3-1 Conceptual Depiction of ROI Screening Process

Areas that remained eligible on the composite map (i.e., those not affected by any of the screening criteria) were reviewed to verify that the area remaining provided:

- Adequate land area for a reasonable number of potential sites
- Reasonable diversity in potential sites, in terms of alternative settings within the ROI
- Potential sites that are capable of satisfying Progress' business objectives for the Florida COL

Once this process was completed, the siting areas identified in the final composite screening result formed the basis for identification of potential sites.

3.2 Regional Screening Results

The regional screening process involved evaluation of the ROI against the criteria identified in Table 3-1. Results of this process are depicted in Figure 3-2; a series of maps depicting the geographic mapping of data applicable to individual criteria are provided in Appendix A.

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4.0 Identification of Potential Sites

Section 4.1 outlines the process used in identifying potential sites; Section 4.2 describes the results of applying of the process and the potential sites identified.

4.1 Potential Site Identification Process

Based on the composite ROI screening results, identification of potential sites was conducted in a two-phased process.

In the first phase, starting with the areas remaining after ROI screening, general siting areas were identified that allowed evaluation of siting trade-offs within the ROI. These siting areas were subdivisions of the areas identified in ROI screening and generally took the form of linear segments of land lying along water bodies that are candidate cooling water sources.

Considerations applied in selecting these areas were:

- At least one siting area for each major water source
- Proximity to transmission/load centers
- Avoidance of high population areas
- Consideration of ecologically sensitive and special designation areas, both along the coast and river corridors (e.g., Outstanding Florida waters, critical habitat of Federally protected gulf sturgeon).
- Proximity to transportation (e.g., rail lines, barge terminals)
- Diversity of siting areas within the large Florida ROI (e.g., coastal and inland waterways)
- Areas that are particularly compatible with the Progress business objectives

Siting areas having the above characteristics defined the geographic basis for identification of potential sites. Aerial photographs and other available geographic information were compiled for the siting areas and potential sites were identified. Potential sites were defined to be approximately 6000 acres in size, although favorable sites as small as 2000 acres were considered. Because the major siting trade-offs in the ROI were reflected in the siting areas selected (see paragraph above), the objective of this phase was to optimize potential sites within each area with respect to cost and environmental considerations. Additional factors taken into account in this process, as feasible, included:

- Flexibility to optimize site layout and design for cost minimization
- Flexibility to optimize site layout and design for avoidance or mitigation of environmental impacts
- Minimization of the number of land parcels contained within the site
- Optimization of site engineering factors, e.g., topography, foundation conditions, grading requirements

The output of this task was a list of potential sites to be evaluated with respect to the EPRI site suitability criteria, along with general boundaries of each site marked on aerial photos and/or maps of suitable scale.

4.2 Potential Site Identification Results

Functionally, potential site identification was conducted by a team comprised of Progress, McCallum-Turner, and Enercon personnel, who collaboratively identified potential sites within the siting areas

Geographic siting areas identified in the ROI screening were examined to identify sites that would be feasible for a new nuclear power plant, taking into account the considerations identified in Section 4.1. The following process was used:

1. 1:100,000-scale topographic maps (USGS) were examined to identify possible areas for potential sites within the previously screened siting areas; information on identified areas was supplemented using AAA Florida state map, 1998, and Florida County highway maps showing roads, towns, wetlands, dedicated lands, etc.
2. Low resolution aerial photographs of the areas were scanned using Google Earth® (http://earth.google.com/). Potential sites of approximately 6000 acres were identified by visually applying the criteria described below.
3. The latitude and longitude of the approximate center point of the potential site was noted.
4. Higher resolution USGS aerial photographs were inspected to confirm the location of nearby communities and the amount of development in the vicinity of the potential site as well as topography. (http://www.terraserver-usa.com). If a potential conflict was determined from information found on the USGS aerial photograph, the potential site was relocated, using the same resources and process.

The following criteria were applied, as feasible, in locating potential sites.

- Distance to existing transmission load centers in the Orlando and Tampa-St. Petersburg areas was minimized to the extent possible. (Load conditions on the existing grid are such that a new plant would likely be connected directly to load centers rather than being tied into the existing system.)
- Distance from towns, villages, and developed areas was maximized. Developed areas were identified from aerial photographs, county and topographic maps.
- Distance from industrial areas identifiable from the aerial photographs and topographic maps (e.g. airports, industrial complexes) was maximized.
- Whenever possible, land near existing water supply sources (rivers, lakes and coastal areas) was identified.
- The optimal topography was assumed to be a relatively flat area and above the 100-year floodplain for construction of the plant, adjacent to streams with surrounding topography showing some relief. Topographic maps and aerial photographs were qualitatively examined to find areas as close to this ideal as possible.
- Vehicle transportation access to the potential sites was qualitatively evaluated. Land areas around major highways were avoided; those within a reasonable distance of state highways were considered.

This process resulted in identification of 20 potential sites, identified on Figure 4-1.

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5.0 Evaluation of Potential Sites and Identification of Candidate Sites

5.1 Potential Site Evaluation

The 20 potential sites were evaluated in more detail to identify a smaller set of candidate sites (nominally 6 – 8) for more detailed evaluation. Criteria used in this evaluation are listed in Table 5-1, along with the methodology applied to developing site ratings for each criterion. Criteria presented in Table 5-1 are derived from the larger set of more detailed criteria listed in Chapter 3 of the Siting Guide. These criteria provided insights into the overall site suitability trade-offs inherent in the available sites within the Progress Florida ROI and were designed to take advantage of data available at this stage of the site selection process.

The overall process for potential site evaluation was comprised of the following elements, each of which is described in the following paragraphs; results from applying the process are described in Section 5.2.

- Develop criterion ratings for each site
- Develop weight factors reflecting the relative importance of each criterion
- Develop composite site suitability ratings

Criterion Ratings – Each site was assigned a rating of 1 to 5 (1 = least suitable, 5 = most suitable) for each of the potential site evaluation criteria, using the rationale listed in Table 5-1. Information sources for these evaluations included publicly available data, information available from Progress files and personnel, and large scale satellite photographs.

Weight Factors - Weight factors reflecting the relative importance of these criteria were synthesized from those developed for previous nuclear power plant siting studies. The weight factors were originally derived using methodology consistent with the modified Delphi process specified in the Siting Guide. The process used in weight factor development is described in Appendix B; weight factor results (1 = least important, 10 = most important) are listed in the table below.

Criterion Number	Criterion	Weight Factor
P1	Cooling Water Supply	9.8
P2	Flooding	4.4
P3	Population	8.6
P4	Hazardous Land Uses	5.9
P5	Ecology	5.6
P6	Wetlands	5.6
P7	Railroad Access	6.7
P8	Transmission Access	7.4
P9	Land Acquisition	6.3

Composite Suitability Ratings – Ratings reflecting the overall suitability of each site were developed by multiplying criterion ratings by the criterion weight factors and summing over all criteria for each site.

Table 5-1 Screening Criteria for Evaluation of Potential Sites

Criterion Number	Criterion	Measure of Suitability	
		Metric	Rating Rationale
P1	Water Supply	Low flow for period of record.	5 = no practical restriction 4 = > ~10 X requirement 3 = 2-10 X requirement 2 = 2 X requirement 1 = requirement near or below low flow
P2	Flooding	Difference between mean site elevation and mean water elevation from USGS topographic maps, USGS gaging station measurements.	5 = >20 feet 4 = <20 feet 3 = <10 feet 2 = <6 feet (or near swamp lands) 1 = <3 feet (or in swamp lands)
P3	Population	Composite ratings were based on an average of following two features: (1) Distance to nearest population center (high density based on screening map); and (2) population density of host county. In addition, a rating point was deducted or added, respectively, if the site is in a particularly densely populated area or not.	5 = no population centers within 20 miles 4 = population centers within 20miles 3 = population centers within 15 miles 2 = population centers within 10 miles 1= population centers within 5 miles County Population Density Ratings: 5 = < 50 persons per square mile 4 = < 100 psm 3 = < 250 psm 2 = < 500 psm 1 = > 500 psm Point added if no densely populated area is found within 40 miles of the site; point deducted if a densely populated area is found within 15 miles of the site or if a large grouping of densely populated areas are located within 15-40 miles of the site.
P4	Hazardous Land Uses	Number of airports, pipelines, and other known hazardous industrial facilities (including Air Force Bases and Kennedy Space Center/Cape	5 = No hazardous land uses within 10 miles 4 = No major or multiple hazardous land uses within 5 miles; minor hazardous land uses between 5 and 10 miles (e.g., small airport or pipeline). 3 = No hazardous land uses within 5 miles; major or multiple (minor) hazardous land uses between 5 and 10 miles.

Criterion Number	Criterion	Measure of Suitability	
		Metric	Rating Rationale
		Canaveral), as determined from publicly available data.	2 = Minor hazardous facilities within 5 miles. 1 = Major hazardous facilities within 5 miles.
P5	Ecology	Number of Federal Threatened, Endangered and Rare Species in County (aquatic and terrestrial)	5 = 0 species 4 = 1-5 species 3 = 6-10 species 2 = 11-15 species 1 = 16 or more species
P6	Wetlands	Number of acres or percentage of wetlands within site area (acreages based on nominal 6000 acres).	5 = < 60 acres (1 %) 4 = < 300 acres (5 %) 3 = < 600 acres (10%) 2 = < 1200 acres (15%) 1 = > 1200 acres
P7	Railroad Access	Estimated cost of constructing rail spur to the site, based on distance in miles to the nearest in-service rail line.	Ratings computed by scaling costs from lowest (rating = 5) to highest (rating = 1). Costs were estimated by applying an assumed unit cost of $ 2 million per mile to the distance measured to the nearest in-service rail line.
P8	Transmission Access	Load conditions on the existing grid are such that a new plant would be connected directly to load centers rather than being tied into the existing system. Transmission access is evaluated in terms of distance to the load centers in the Orlando and Tampa – St. Petersburg areas. Measurements taken from	Ratings computed by scaling costs from lowest (rating = 5) to highest (rating = 1). Costs were estimated by applying an assumed unit cost of $ 4 million per mile ($2 million per mile x 2 to reflect double-circuit connections) to the measured distance.

Criterion Number	Criterion	Measure of Suitability	
		Metric	Rating Rationale
		each potentials site to each area, as well as a point midway between the two. Shortest distance of the three was used in ratings determination.	
P9	Land Acquisition	Estimated cost of acquiring land (nominally 2000 acres) at the site, based on the following assumed cost/acre: Redacted per acre [based on 2002 average cost of farmland per acre by county, US Census of Agriculture] Redacted	Ratings computed by scaling costs from lowest (rating = 5) to highest (rating = 1)

Note: Ratings for Criteria P7, P8, and P9 were developed by normalizing ratings for individual cost criteria across the total cost differentials across all sites, so that differences in ratings are proportional to relative differences in cost across all three criteria.

5.2 Identification of Candidate Sites

Results of applying the evaluation process described in Section 5.1 to the 20 potential sites are summarized in Table 5-2 and Figure 5-1; the technical basis for the individual criterion ratings is detailed in Appendix C.

Based on these results, the top 8 ranked sites were as follows:

[redacted]	Crystal River
Levy 2	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

The next four highest rated sites ([redacted]) were all rated about the same and very close to the eighth site [redacted]. Finally, [redacted] and [redacted] followed closely behind [redacted]. Given the small difference in site suitability ratings between the top eight sites and the next four to six sites, additional issues were considered in the down-select process to ensure that important site suitability trade-offs could be evaluated in more detail. Additional considerations included in the final selection of candidate sites were:

- The value of further evaluating sites on additional water sources, (e.g. [redacted] sites on the St. Johns River and th[redacted] site on the Kissimmee River). Addition of sites using alternative water sources provides additional diversity in the decision process, especially given the large concentration of preliminary top-eight sites in the Suwannee River Basin (three).
- The possible advantages of sites with locations (e.g. [redacted] and [redacted] sites) that provide different transmission/system reliability trade-offs. Each of these sites provides a different direction of approach to the Progress load centers, as well as allowing connection routes that are remote from existing transmission corridors.

In addition, local knowledge of site issues was brought to bear to provide further insights into likely issues involved in plant development. This was accomplished by polling Progress personnel familiar with the public acceptance, environmental, transmission, economic development, and legislative issues in Florida. This group, through their ongoing involvement in dealing with these issues for current Progress operations, was able to provide characterizations of the difficulties such issues could raise at new power plant sites. Their characterizations were reported in the form of color "ratings" based on the potential for significant concerns in each of the five areas; these ratings were assigned based on the group's knowledge, experience, and best professional insights. Results of this analysis are shown in Table 5-3 (GREEN represents no known significant concerns, YELLOW represents potential concerns warranting caution, and RED represents potentially significant concerns with site development or approval).

As noted in Table 5-2, the potential sites were grouped in order of suitability, based on the composite suitability ratings and the overall level of concern identified for each; this grouping produced the following results:

Group 1 – Minimal Concerns	Crystal River, [redacted] Levy-2, [redacted] and [redacted]
Group 2 – Intermediate Concerns	[redacted]
Group 3 – One potential significant concern; favorable transmission	[redacted]
Group 4 – One or more potential significant concerns; no favorable transmission	[redacted]

Based on the composite site suitability ratings and the additional considerations noted above, the following eight sites were selected as candidate sites for more detailed evaluation. The full rationale for modification from the list of top eight sites above is provided below.

[redacted]	Crystal River
Levy 2	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

[redacted] – The [redacted] site was added to the candidate list based on the fact that it allowed evaluation of an additional alternative water source (St. Johns River) and because its location provides for connecting with the Progress load centers from a different direction (from the northeast versus the northwest) than the sites in western Florida. Also, transmission lines from this location would be less likely to be subject to single-event failures because they would be more distant from existing transmission corridors. Also, the [redacted] site composite ratings were only slightly lower than those for the seventh and eighth ranked sites [redacted] and [redacted]. [redacted] was selected from the three sites in the county, based on subsequently identified advantages in rail and transmission access, as well as real estate considerations.

[redacted] – The [redacted] site was added to the candidate list for similar reasons, i.e., it allows evaluation of an additional water source (Kissimmee River) and another transmission scenario (connection from the southeast, with similar advantages in distance from existing major corridors).

[redacted] – The [redacted] site is located on the [redacted] either river could provide the water source for a nuclear power plant at the site, though flows in the [redacted] are low enough such that a supplemental reservoir would be required. Because of this constraint in using the [redacted] because use of the [redacted] at the site would require long water supply lines, and because the site does not offer significant advantages over the other two Suwannee sites ([redacted] and [redacted] the [redacted] site was deferred from further consideration.

[redacted] – The [redacted] site was deferred from further consideration because of its [redacted] uncertainties about how water supply would be developed, and concerns about public support and the ability to provide effective transmission connections.

Table 5-2 Screening Criterion Ratings

Potential Site Name	Criterion									Composite Site Rating
	P1	P2	P3	P4	P5	P6	P7	P8	P9	
	Cooling Water Supply	Flooding	Population	Hazardous Land Uses	Ecology	Wetlands	Railroad Access	Transmission Access	Land Acquisition	
	Weight Factor									
	9.8	4.4	8.6	5.9	5.6	5.6	6.7	7.4	6.3	
	Site Ratings									
	4	5	4	2	1	1	4.9	1.3	5.0	192.3
	5	1	5	2	1	1	5.0	1.0	5.0	191.6
	2	1	4	2	2	2	4.8	1.1	5.0	164.8
	1	5	4	4	1	3	4.9	1.6	5.0	188.3
	5	4	5	3	2	5	4.4	2.9	5.0	248.8
	3	5	4	2	4	3	4.9	3.1	5.0	224.0
	3	4	3	2	2	4	4.9	3.3	5.0	206.6
	5	4	4	2	2	4	4.9	3.9	5.0	239.2
	5	3	4	1	2	4	4.9	3.9	5.0	229.1
	3	5	5	2	3	4	4.8	3.1	5.0	232.2
	3	4	4	2	2	5	4.7	3.1	5.0	218.8
	5	2	5	2	2	4	4.7	3.5	5.0	234.7
Redacted	5	4	1	2	2	5	5.0	3.7	5.0	218.4
	2	4	3	2	1	5	4.9	3.6	5.0	199.1
	2	5	2	3	2	5	4.9	4.6	5.0	214.0
	2	4	1	2	3	4	4.9	4.7	5.0	195.6
	2	3	2	3	1	4	4.8	4.6	5.0	193.4
	3	2	3	3	3	4	5.0	4.0	5.0	215.1
	3	3	4	2	3	3	4.9	3.9	5.0	215.9
	3	2	3	3	3	4	5.0	3.9	5.0	214.5

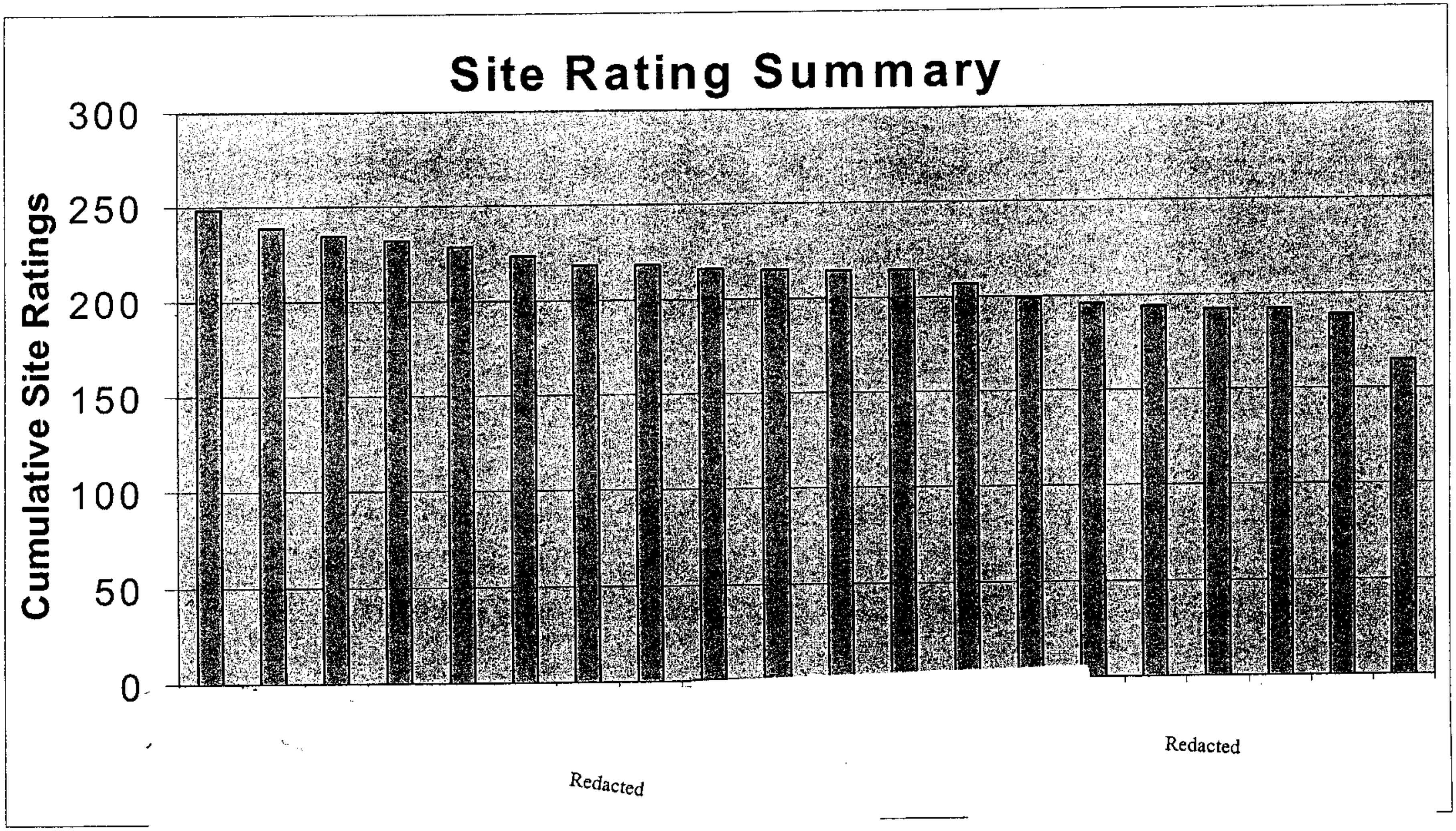

Figure 5-1 Summary of Potential Site Composite Ratings

Table 5-3 Potential Site Screening Evaluation Summary

Potential Site	Water Source	Composite Rating (Rank)	Transmission	Community Support	Economic Development	Environment	Legislative
Redacted	Chipola River						
	Gulf of Mexico						
	Suwanee River						
	Suwannee/Santa Fe						
	Gulf of Mexico						
	Kissimmee River						
	Tampa Bay						
	Suwanee River						
	Suwanee River						
	Florida Barge Canal						
	Gulf of Mexico						
	Apalachicola River						
	Ochlockonee River						
	Manatee River						
	St. Johns River						
	St. Johns River						
	St. Johns River						
	St. Johns River						
	Gulf of Mexico						
	St. Johns River						
		Green = top 8 Yellow = middle 6 Red = bottom 6	**GREEN** = not aware of any significant concerns YELLOW = some or potential concerns; proceed with caution RED = significant concerns with site				

Summary

1. No reds, several greens – Crystal River, [redacted] Levy 2, [redacted] (4 on Gulf of Mexico; 1 on Florida Barge Canal)
2. No reds, all yellow – [redacted] (3, all on St Johns River)
3. One Red with transmission green – [redacted] (all on Suwannee River [Gilchrist also on Santa Fe])
4. One or more significant concerns; no favorable transmission - Redacted

6.0 Evaluation of Candidate Sites and Identification of Alternative Sites

The objective of this component of the site selection process was to further evaluate the eight candidate sites and select a smaller set of alternative sites for detailed evaluation and ultimate selection of the preferred site for the Progress Florida COL. Section 6.1 outlines the process for evaluating candidate sites, while Section 6.2 describes process results and the selection of alternate sites.

6.1 Process for Evaluating Candidate Sites

General siting criteria used to evaluate the eight candidate sites were derived from those presented in Chapter 3.0 of the *Siting Guide: Site Selection and Evaluation Criteria for an Early Site Permit Application*, EPRI, Palo Alto, CA: 2002 (Siting Guide); criteria from the siting guide were tailored to reflect issues applicable to, and data available for, the Progress Florida candidate sites; a list of the criteria appears Table 6-1.

The overall process for applying the general site criteria was analogous to that described in Section 5.1 and was comprised of the following elements; results from applying the process are described in Section 6.2. Appendix D provides the detailed technical basis for the general site criteria ratings.

Criterion Ratings – Each site was assigned a rating of 1 to 5 (1 = least suitable, 5 = most suitable) for each of the potential site evaluation criteria, using the rationale described in Appendix D. Information sources for these evaluations included publicly available data, information available from Progress files and personnel, USGS topographic maps, information derived from site flyovers and from additional analyses conducted by Progress consultants/contractors.

Weight Factors - Weight factors reflecting the relative importance of these criteria were synthesized from those developed for previous nuclear power plant siting studies. The weight factors were originally derived using methodology consistent with the modified Delphi process specified in the Siting Guide and summarized in Appendix B. Weight factors used (1 = least important, 5 = most important) are listed Table 6-2.

Composite Suitability Ratings – Ratings reflecting the overall suitability of each site were developed by multiplying criterion ratings by the criterion weight factors and summing over all criteria for each site, as summarized in Table 6-2.

6.2 Candidate Sites Evaluation and Results

Results of applying the evaluation process described in Section 6.1 to the 8 candidate sites are summarized in Table 6-2 and Figure 6-1. Detailed discussions of the basis for site ratings for each of the criteria are provided in Appendix D.

Based on these results and on other considerations described below, a total of five alternative sites (Crystal River, Redacted Levy 2, Redacted and Redacted , were identified for further, more detailed evaluation and consideration. In addition to inclusion of several of the top-rated sites, this set of alternatives represents a good cross-section of siting trade-offs available within the ROI, including a variety of water sources, locations, and transmission connection strategies. In addition to the composite ratings (Figure 6-1), the alternative site selection decision was also informed by site inspections conducted via helicopter over-flights.

Bases for deferral of the three sites not included as alternatives[redacted] and [redacted] were as follows.

[redacted]- Both sites are located near the west coast of Florida, near the Gulf of Mexico. Site reconnaissance (including helicopter flyovers) indicated that, while the sites themselves are on relatively high ground, the areas between the sites and the Gulf (through which water intake and discharge conveyances would be installed) would require lengthy traverse of estuarine areas and of the shallow seabed (up to several miles) offshore from the sites. Extended pipelines in estuarine areas are a major consideration in permitting reviews and would produce considerable additional regulatory scrutiny. In addition, there is some vacation home development on the shoreline near where the [redacted] water lines would be installed. Combined with the vulnerability of these coastal sites to storm surge flooding, these appear to be significant drawbacks relative to the other candidate sites under consideration, and both sites were deferred from further consideration for these reasons.

[redacted]- Site reconnaissance indicated that there is considerable recreational/residential development along both shores of the Suwannee River near the [redacted] site, the site is characterized by farming land use, and a real estate analysis of land ownership patterns indicated a relatively high number of individual owners. By comparison, the [redacted] site (also on the Suwannee River) was found to have a lower expected number of land owners, land use of planted timber versus farmland, and a less recreational/residential development along the river banks. These factors, combined with the fact that the [redacted] site water flows are slightly lower, given its location upstream of the Suwannee-Santa Fe confluence, led to deferral of [redacted] in favor of [redacted] as an alternative site.

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Table 6-1 General Site Criteria

Siting Criteria	Siting Criteria
Health and Safety Criteria: Accident Cause-Related Criteria	**Environmental Criteria: Operational-Related Effects on Aquatic Ecology, cont'd.**
Geology and Seismology	Entrainment/Impingement effects
Cooling System Requirements: Cooling Water Supply	Dredging/Disposal Effects
Cooling Water System: Ambient Temperature Requirements	**Environmental Criteria: Operational-Related Effects on Terrestrial Ecology**
Flooding	Drift Effects on Surrounding Areas
Nearby Hazardous Land Uses	**Socioeconomic Criteria**
Health and Safety Criteria: Accident Effects-Related	Socioeconomic – Construction Related Effects
Extreme Weather Conditions	Socioeconomics – Operation
Population	Environmental Justice
Emergency Planning	Land Use
Atmospheric Dispersion	**Engineering and Cost Related Criteria: Health and Safety Related Criteria**
Health and Safety Criteria: Operational Effects-Related	Water Supply
Surface Water- Radionuclide Pathway	Pumping Distance
Groundwater Radionuclide Pathway	Flooding
Air Radionuclide Pathway	Civil Works
Air-Food ingestion pathway	Brownfield Site Remediation (if applicable)
Surface Water – food radionuclide pathway	Water Supply
Transportation Safety	**Engineering and Cost: Transportation or Transmission Related Criteria**
Environmental Criteria: Construction-Related Effects on Aquatic Ecology	Railroad Access
Disruption of Important Species/Habitats	*Highway Access*
Bottom Sediment Disruption Effects	Barge Access
Environmental Criteria: Construction-Related Effects on Terrestrial	Transmission Cost and Market Price Differentials
Disruption of Important Species/Habitats and Wetlands	**Engineering and Cost- Related Criteria: Related to Socioeconomic & Land Use**
Dewatering Effects on Adjacent Wetlands	Topography
Environmental Criteria: Operational-Related Effects on Aquatic Ecology	Land Rights
Thermal Discharge Effects	Labor Rates

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Table 6-2 General Site Criteria Ratings for Candidate Sites

Criteria		Weight Factor	Crystal River		Redacted		Redacted		Redacted		Levy 2		Redacted		Redacted		Redacted	
			Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score
1.1.1	Geology/Seismology	**3.77**	5	18.85	5	18.85	5	18.85	5	18.85	5	18.85	5	18.85	5	18.85	5	18.85
1.1.2	Cooling System Requirements	**3.27**	4	13.08	3	9.81	2	6.54	3	9.81	3	9.81	4	13.08	3	9.81	4	13.08
1.1.3	Flooding	**2.4**	2	4.8	3	7.2	1	2.4	2	4.8	5	12	3	7.2	5	12	3	7.2
1.1.4	Nearby Hazardous Land Uses	**3.35**	1	3.35	3	10.05	3	10.05	3	10.05	2	6.7	3	10.05	2	6.7	3	10.05
1.1.5	Extreme Weather Conditions	**2.36**	2	4.72	3	7.08	3	7.08	3	7.08	3	7.08	1	2.36	3	7.08	2	4.72
1.2	Accident Effect Related	**4.09**	4	16.36	4	16.36	4	16.36	4	16.36	3	12.27	4	16.36	4	16.36	4	16.36
1.3.1	Surface Water – Radionuclide Pathway	**2.5**	5	12.5	4	10	4	10	4	10	5	12.5	5	12.5	4	10	5	12.5
1.3.2	Groundwater Radionuclide Pathway	**2.55**	2	5.10	2	5.10	3	7.65	2	5.10	2	5.10	2	5.10	2	5.10	1	2.55
1.3.3	Air Radionuclide Pathway	**2.5**	5	12.5	4	10	4	10	4	10	4	10	5	12.5	4	10	5	12.5
1.3.4	Air-Food Ingestion Pathway	**2.5**	4	10	4	10	1	2.5	3	7.5	3	7.5	3	7.5	3	7.5	5	12.5
1.3.5	Surface Water-Food Radionuclide Pathway	**2.41**	5	12.05	4	9.64	3	7.23	4	9.64	5	12.05	5	12.05	4	9.64	5	12.05

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Criteria		Weight	Crystal River		Redacted		Redacted		Redacted		Levy 2		Redacted		Redacted		Redacted	
		Factor	Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score
1.3.6	Transportation Safety	**2.14**	3	6.42	3	6.42	3	6.42	3	6.42	3	6.42	3	6.42	3	6.42	3	6.42
2.1.1	Disruption of Important Species/Habitats	**2.64**	2	5.28	2	5.28	5	13.2	3	7.92	2	5.28	1	2.64	3	7.92	1	2.64
2.1.2	Bottom Sediment Disruption Effects	**2.14**	3	6.42	2	4.28	2	4.28	2	4.28	2	4.28	3	6.42	2	4.28	3	6.42
2.2.1	Disruption of Important Species/Habitats and Wetlands	**3.18**	3	9.54	4	12.72	3	9.54	3	9.54	3	9.54	2	6.36	3	9.54	3	9.54
2.2.2	Dewatering Effects on Adjacent Wetlands	**2.77**	3	8.31	4	11.08	4	11.08	3	8.31	4	11.08	2	5.54	3	8.31	4	11.08
2.3.1	Thermal Discharge Effects	**3.64**	3	10.92	2	7.28	3	10.92	3	10.92	3	10.92	3	10.92	3	10.92	3	10.92
2.3.2	Entrainment/Impingement Effects	**3.23**	3	9.69	3	9.69	4	12.92	3	9.69	3	9.69	3	9.69	3	9.69	3	9.69
2.3.3	Dredging/Disposal Effects	**2.36**	3	7.08	2	4.72	2	4.72	2	4.72	2	4.72	3	7.08	2	4.72	3	7.08
2.4.1	Drift Effects on Surrounding Areas	**2.36**	2	4.72	3	7.08	3	7.08	3	7.08	2	4.72	2	4.72	3	7.08	2	4.72
3.1.1	Socioeconomics – Construction – Related Effects	**2**	4	8.0	3	6.0	5	10.0	3	6.0	4	8.0	4	8.0	5	10.0	3	6.0
3.3.1	Environmental Justice	**1.95**	5	9.75	5	9.75	5	9.75	5	9.75	5	9.75	5	9.75	5	9.75	5	9.75
3.4.1	Land Use	**3.8**	2	7.6	2	7.6	3	11.4	2	7.6	2	7.6	2	7.6	4	15.2	2	7.6

Criteria		Weight Factor	Crystal River		Redacted		Redacted		Redacted		Levy 2		Redacted		Redacted		Redacted	
			Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score
4.1.1	Water Supply	**3.7**	5	18.5	3	11.1	2	7.4	3	11.1	4	14.8	5	18.5	4	14.8	5	18.5
4.1.2	Pumping Distance	**3.05**	5	15.25	4	12.2	3	9.15	5	15.25	3	9.15	1	3.05	3	9.15	1	3.05
4.1.3	Flooding	**2.9**	2	5.8	3	8.7	2	5.8	2	5.8	5	14.5	3	8.7	5	14.5	3	8.7
4.1.5	Civil Works	**3.4**	3	10.2	3	10.2	3	10.2	4	13.6	3	10.2	3	10.2	3	10.2	3	10.2
4.2.1	Railroad Access	**2.6**	5	13.0	3	7.8	4	10.4	3	7.8	4	10.4	3	7.8	5	13.0	3	7.8
4.2.2	Highway Access	**2.8**	5	14.0	5	14.0	5	14.0	5	14.0	5	14.0	5	14.0	5	14.0	5	14.0
4.2.3	Barge Access	**2.85**	5	14.25	2	5.7	2	5.7	2	5.7	2	5.7	3	8.55	4	11.4	3	8.55
4.2.4	Transmission Access	**4.8**	3	14.4	4	19.2	4	19.2	4	19.2	5	24	4	19.2	4	19.2	4	19.2
4.3..1	Topography	**2.55**	5	12.75	5	12.75	5	12.75	4	10.2	5	12.75	5	12.75	3	7.65	4	10.2
4.3.2	Land Rights	**2.75**	5	13.75	4	11	3	8.25	1	2.75	2	5.5	1	2.75	3	8.25	4	11
4.3.3	Labor Rates	**3.3**	5	16.5	4	13.2	3	9.9	3	9.9	5	16.5	5	16.5	2	6.6	3	9.9
	Composite Site Rating		355		332		323		317		343		325		346		335	

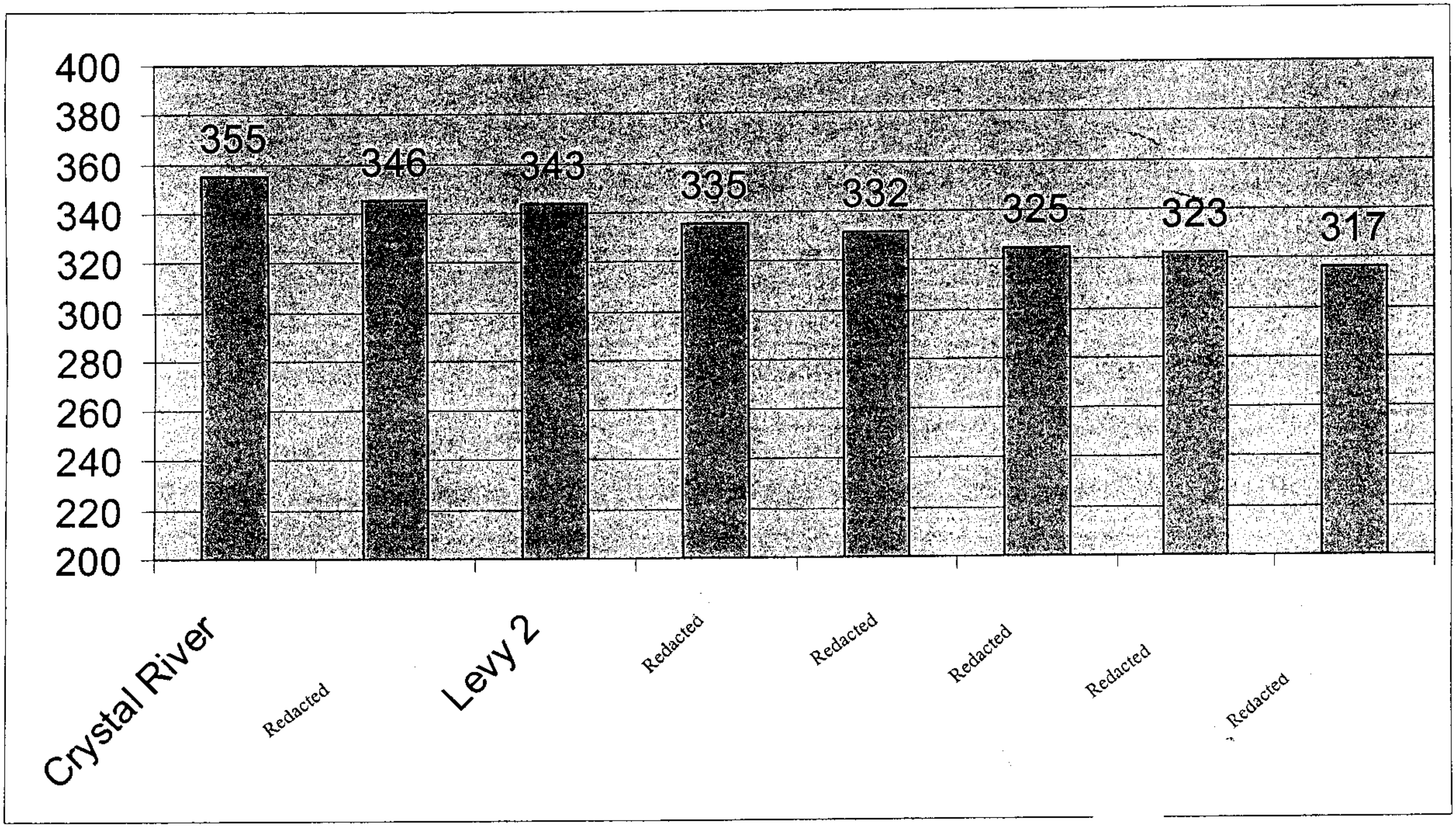

Figure 6-1 Composite General Site Suitability Ratings for Candidate Sites

7.0 **Selection of Preferred Site**

As discussed in Section 6.2, the Crystal River, [redacted] Levy and [redacted] sites were selected as alternative sites for the Progress COL. (Note: The numerical designator for Levy 2 and [redacted] is dropped for purposes of this discussion, so they become "Levy" and [redacted] respectively.) Based on the evaluations leading to this selection, all of these sites appear to be feasible locations for a new nuclear power plant.

To support selection of a proposed site for the COL from this set of alternatives, additional and more detailed studies of the alternative sites were conducted. Scope and results of these studies are described in Section 7.1. The rationale for selecting a proposed site from the alternatives considered is provided in Section 7.2.

7.1 Detailed Study of Alternative Sites

The objective of the more detailed studies for the five alternative sites studies was to provide additional insights into site conditions and/or to provide further confidence on specific issues that were viewed important to the COL site decision. Results of the detailed alternative site studies are summarized in Table 7-1 and are discussed in the paragraphs below.

Transmission Evaluations – Transmission analysis (*Transmission Impact Study in Support of Site Selection for a Florida Nuclear Power Plant*, Navigant Consulting, Inc., June 30, 2006) of the alternative sites involved the following:

- Establishing tentative interconnection points for each site on the existing Progress grid,
- Defining the new transmission lines required to carry power from a new two-unit nuclear plant to the connection points,
- Conducting load flow studies to identify contingencies that could occur with the new plant connected to the grid,
- Identifying system upgrades necessary to handle the additional new plant capacity on the grid, and
- Developing cost estimates for the new transmission lines and upgrades.

Results of these studies (summarized in Table 7-1) indicated that transmission connection cost would be in the range of [redacted] at the northwestern sites (Crystal River, [redacted] Levy) and would be greater than [redacted] at [redacted] and [redacted] Much of the additional cost at the latter two sites results from the need to upgrade the transmission grid outside the Progress service territory to address contingencies that could occur when power from a new two-unit nuclear plant is injected into the system.

Geotechnical Studies – Overall, the geotechnical studies conducted to further evaluate the alternative sites involved a review of existing geotechnical information (e.g., available near-site boring and geological information) and on-site borings at [redacted], Levy and [redacted] Geophysical studies were also conducted at Levy. Scope and results of these studies are reported in *Technical Memorandum: Geological and Geotechnical Evaluations and Recommendations for Siting of a Nuclear Power Plant in Florida*, CH2MHill, Inc., September 26, 2006.

Geotechnical characteristics at Crystal River were assumed to be acceptable for new nuclear units, because the site is located near the area investigated for the existing unit, and subsurface conditions are expected to be similar to those underlying the existing plant.

Based on the preliminary subsurface on-site investigations, the most suitable site among the five greenfield sites appears to be Levy. The [redacted] and [redacted] County Sites are considered least suitable for a nuclear power plant, because of the thick soil deposits underneath these sites and the depth to bedrock being greater than 100 feet, which make it very difficult and/or expensive to found the facilities on rock. The [redacted] site was found to be less favorable than Levy because of numerous sinkholes and depressions observed during field reconnaissance and many voids and cavities encountered during rock coring.

Environmental – On-site reconnaissance of the greenfield alternative sites [redacted] Levy, [redacted] was conducted to determine whether there were any ecological resources or conditions that would present significant impacts or that would indicate significant differences in the ecological suitability between the alternative sites. Going beyond the aerial reconnaissance conducted in support of the evaluation of candidate sites (Section 6.0), these surveys were conducted via vehicle drive-over and examination on foot.

All of the sites examined have been previously disturbed via farming or mining activity and/or are in the process of being logged. All sites appeared to contain some wetland areas (less than 5% of total site area), although very little standing water was actually observed during the site visits. The wetland areas were mostly characterized by depressed areas which tend to be wet (usually due to surface aquifer inflow) except during drought conditions and typically exhibit vegetation that is characteristic of wetlands. Except for [redacted], which is largely farmland (sod and dairy farming), all of the greenfield sites exhibit land cover typical of open forested pineland. There is considerable existing farming activity on and near the [redacted] site (i.e., dairy and cattle), very typical of the farming in [redacted] County (farming accounts for 88% of the total acreage in [redacted] County, with approximately 70% of the land on farms used as cropland and pasture (40%)); this local land use is considered to be less suitable for a nuclear plant than that at the other sites.

Crystal River is characterized by industrial development with both nuclear and fossil power plants and associated support facilities present, although areas that would be newly disturbed in adding to new units at Crystal River are ecologically similar to the greenfield sites.

All sites are located near special ecologically protected areas (1-5 miles) and all lie in the range of threatened or endangered species which could occur onsite (e.g., eastern indigo snake), although none were observed during the site visits

Overall, from an ecological perspective, Crystal River is judged to be slightly superior to the other sites as a result of existing land use and the [redacted] site less suitable because of the local intensive dairy and beef farming. The other three sites are considered to be similar and there is no compelling basis for differentiating among them from an ecological perspective.

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Reliability – Adding two nuclear units (nominal total power output of 2200 MW) to the existing units at Crystal River would result in the concentration of a large fraction of Progress' total generation capacity at one site subject to disruption by a single weather event (e.g., hurricane, tornado, storm surge flooding). Vulnerability of the site to such events extends to the transmission lines, because connections for the new units would be co-located with existing transmission lines. Because the loss of total generation at Crystal River would create a major electrical disaster for the Progress service territory, a qualitative reliability analysis of the alternative sites was conducted to determine their relative suitability – as compared to Crystal River – in mitigating this concern.

Two initiating weather events were considered in this analysis: storm surge flooding and hurricane or tornado wind damage. The potential for flooding was considered greatest at near-coastal and lower elevation sites, with sites farther inland and with higher elevations ranked higher. For outages initiated by a single weather event, the greater the distance from Crystal River, the less likely a single-event outage would be. Any separation from Crystal River would provide significant decrease in risk that all units could be taken off line by a single event, but additional distance provides additional risk mitigation.

Both [redacted] and [redacted] are located relatively far from the coast and are therefore expected to provide significant redundancy relative to the storm surge risk if the two new units are located at Crystal River. Of the two sites, [redacted] is considered more favorable due to its higher elevation and because of the potential for tidal run-up from the Atlantic Ocean on the St. Johns River at [redacted] Both [redacted] and Levy are located farther from the coast than Crystal River; site elevation at Levy is greater than that at [redacted] and therefore would be expected to provide additional protection from storm surge flooding.

Both [redacted] and Levy, because of their physical separation from Crystal River, have reduced risk of disturbance from other weather events; [redacted] rates slightly higher from this perspective because of its increased distance from the existing plant site. Both [redacted] and [redacted] are located far from Crystal River; siting the new units at either of these locations would minimize risk of outages from a single initiating weather event.

Land Acquisition – Because of the aggressive schedule for plant development mandated by the Progress business objectives for the new units, there is no potential for accommodating significant delays (e.g., condemnation process under eminent domain) in obtaining access to land for a new site. Accordingly, a land availability analysis was conducted through a third-party real estate agent to identify parcels of adequate size at each of the sites and to make initial contact with landowners to arrange for site access for the on-site geotechnical investigation and to assess availability of the property for sale.

Results of this analysis are summarized in Table 7-1. Overall, it appears that land would be available at Crystal River (adjacent to the existing site), Levy, [redacted] and [redacted] Initial contacts indicate that acquisition of land at the [redacted] site would not be feasible in the required time frame.

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Table 7-2 Summary Results of Alternative Site Studies

	Site Suitability Issue				
	Transmission	**Geotechnical**	**Environmental**	**Reliability**	**Land Acquisition**
Basis for Evaluation → **Site** ↓	Detailed transmission impact study (Navigant 2006)	On-site geotechnical investigations, including borings and geophysical studies (CH2MHill 2006) [Relative suitability scale of 1 to 5, with 5 representing most suitable and 1 the least suitable.]	On-site reconnaissance survey of greenfield sites, visual evaluation of plant communities; Crystal River characterization based on other existing data	Qualitative analysis of risk factors for reliable power production and supply (e.g., vulnerability to single-event failures)	Real estate analysis supplemented by preliminary third-party negotiations with landowners
Crystal River	Upgrade costs conservatively estimated to be similar to those for Levy 2 – Redacted	Geotechnical characteristics assumed to be acceptable; similar to those underlying existing plant.	Site is characterized by industrial development with both nuclear and fossil power plants and associated support facilities.	Site is subject to coastal storm surge flooding and concentration of additional units at the site would subject the entire service territory to a single weather event failure. Co-location of new units at the site does not allow for any physical separation of transmission lines from new units from existing corridors and would subject them to single weather event failures over several miles of co-located lines.	Additional land would be required. Early contacts indicate that acquisition of adjacent land would be feasible.
Redacted	Estimated total direct connect plus upgrade costs: Redacted	Recommended Suitability Index = 2. This site exhibits numerous sinkholes and depressions. The rock quality at this site is mostly very poor to poor with many voids and cavities.	Site is characterized primarily by open forested pineland with some evidence of timbering. Some wetlands indicator species apparent on relatively small fraction of site area.	Site would not be subject to storm surge flooding and would significantly reduce the possibility that new units would be affected by a single weather event with Crystal River. Location allows additional separation of transmission lines over that provided by Levy.	Acquisition of sufficient land for a nuclear power plant in the time frame necessary to meet the COL application schedule appears not to be feasible.

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	Site Suitability Issue				
	Transmission	**Geotechnical**	**Environmental**	**Reliability**	**Land Acquisition**
Redacted	Estimated total direct connect plus upgrade costs Redacted Includes significant Redacted upgrades due to contingencies in FPL service area required[2].	Recommended Suitability Index = 1. This site is assigned the lowest suitability index because of the thickness and variable consistency of soil deposits underneath it.	Mostly agricultural cleared land; significant sod farming on site and significant cattle and dairy farming near the site.	Site would not be subject to storm surge flooding and would almost eliminate the possibility that new units would be affected by a single weather event with Crystal River. Location provides for a different directional approach to load centers for transmission lines as compared to Crystal River, Dixie and Levy.	Acquisition appears to be feasible. However, coordination of water supply strategy with ongoing water resources plans of regional water management districts would likely preclude development of new units on the schedule required.
Levy	Estimated total direct connect plus upgrade costs: Redacted	<u>Location 1 (Rayonier property)</u>: Recommended Suitability Index = 3. This site has a small variation in the top of limestone bedrock elevation, although rock quality is not good, i.e., very poor to fair rock. <u>Location 2 (Lybass property)</u>: Recommended Suitability Index = 3. This site seems to have slightly better rock quality than Levy Location 1. However, the top of limestone bedrock elevation is erratic across this site, with a boring advanced to a depth of 100 feet without encountering bedrock.	Site is characterized primarily by forested pineland but has been heavily timbered with associated disturbance to site ecology. Some wetlands indicator species apparent on relatively small fraction of site area.	Site would not be subject to storm surge flooding and would reduce the possibility that new units would be affected by a single weather event with Crystal River. Location allows some separation of transmission lines as compared to Crystal River.	Preliminary agreements with landowners for future acquisition have been successfully negotiated.

	Site Suitability Issue				
	Transmission	**Geotechnical**	**Environmental**	**Reliability**	**Land Acquisition**
Redacted	Estimated total direct connect plus upgrade costs: Redacted Includes significant Redacted upgrades due to contingencies in FPL service area required[2].	Recommended Suitability Index = 1. This site is assigned the lowest suitability index because of the thickness and variable consistency of soil deposits underneath it.	The majority of the site area has been disturbed from previous mining activities and much of the land reclaimed. Currently characterized by mostly open canopied forest. Some wetland areas noted on relatively small fraction of site area.	Site would be less subject to storm surge flooding (tidal effects in St. Johns river from Atlantic storms) and would significantly reduce the possibility that new units would be affected by a single weather event with Crystal River. Location provides for a different directional approach to load centers for transmission lines as compared to Crystal River, Dixie and Levy 2.	Early negotiations with landowners indicate site acquisition is feasible.

1 – Connection to Crystal River East substation with 800MW assumed to be installed at the proposed Redacted y Complex.
2 – Upgrades in service areas other than the Progress service area are subject to additional schedule uncertainty because of the need to negotiate upgrade strategies with other transmission operator(s)

7.2 Selection of Proposed Site

Results of the detailed evaluations, as described in Section 7.1, indicate that:

- All five alternative sites may be viable locations for a nuclear power plant,
- There are significant differences in their suitability with regard to some siting issues, and
- Additional study would be required to confirm site suitability at several of the sites.

Specifically, additional study would be required to confirm whether geotechnical conditions at Redacted and Redacted are suitable, as well as to evaluate the issue of extensive dairy and cattle farming at Redacted. The level of effort and schedule required to complete the necessary confirmation studies are not compatible with schedule requirements for the Progress COL, especially since final resolution could result in additional licensing requirements (e.g., modified design certification to address deep foundations).

Accordingly, Crystal River and Levy were identified as the primary alternatives locations for the Progress COL. Given this result, selection of a preferred site for the Progress COL was based on:

1. Satisfying Progress's overall business objectives for the COL, and
2. Enhancing the ability of future nuclear units that would be built and operated at the site to provide Progress customers with reliable, cost-effective electric service.

Based on these considerations, Levy was selected as the proposed site for the Progress COL. Levy is characterized by:

- Transmission costs as low as any of the sites under consideration,
- Significant reliability advantages over Crystal River, both with respect to storm surge flooding and the potential for single weather event outages,
- Geotechnical conditions that allow design of plant foundations that will support deployment of a certified design without a requirement for deep foundations,
- Ecological conditions similar to those at other alternative sites, and
- Adequate water supply (from the Gulf of Mexico through the Florida Barge Canal), without impacting riverine surface water resources.

Although many of these characteristics also apply to Crystal River, the severe potential impact of single-event weather-related outages if all units were placed at that site drives the decision to select the Levy site. The significant additional reliability inherent in developing a new nuclear plant at Levy – versus Crystal River – is the primary reason for selecting Levy over the existing plant site for the Progress Florida COL.

Appendix A

Results of ROI Screening

Figures provided in this Appendix provide results of areal screening of the Progress Florida Region of Interest (ROI) in accordance with the screening criteria described in Section 3.0. The following information related to identification of candidate areas is contained in this appendix:

- Figure A-1, Dedicated Land Use (Land Use and Land Cover) – Includes lands designated by the Department of Defense (Navy, Air Force, and Army Corps of Engineers, National Seashores, Wilderness Areas, National Park Service, and National Forest Service, National Wildlife Refuges, and State Parks and Recreation Areas.
- Figure A-2, Hydrology – Includes the Gulf and Atlantic coasts and rivers whose annual average daily flow exceeds 1,300 cubic feet per second; a five mile buffer along these features was considered available for plant siting.
- Figure A-3, Population Density – Includes areas of population density less than 300 persons per square mile, measured on a census block basis.
- Figure A-4, Endangered Species – Mapped habitat for Gulf sturgeon, manatee, piping plovers, and snail kite.
- Figure A-6, Composite Map – Depicts the spatial relationship of the selected areas to the features (criteria) considered, with gulf sturgeon habitat eliminated.
- Figure A-7, Composite Map – Depicts the spatial relationship of the selected areas to the features (criteria) considered.

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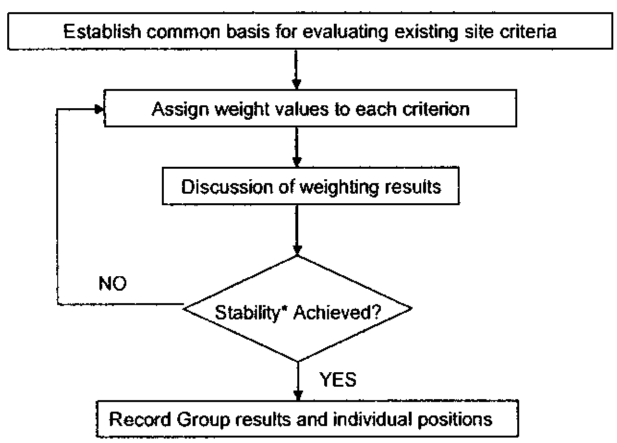
Appendix B
Weight Factor Development

For the potential and candidate site evaluation phases of the site selection process (Sections 5.0 and 6.0, respectively, weight factors were developed that reflect the relative importance of individual criteria in judging the overall suitability of nuclear power plant sites. As described in these sections, weight factors were used in developing overall composite suitability ratings for sites under consideration.

Methods used to develop weight factors for criteria applied at these phases of the site selection process are described below.

Weight factors reflecting the relative importance of both the screening and general site criteria used to evaluate potential sites were developed consistent with the modified Delphi method suggested in the EPRI Siting Guide. The process used for weight factor development is summarized in the diagram below.



*- Group average weights do not change significantly from one voting round to the next

An industry committee of multi-disciplinary experts in the areas of nuclear power plant site suitability issues met to execute this process; the committee was comprised of subject matter experts in water use and availability, real estate, ecology, transmission, land use, health & safety, socioeconomics and public relations.

A brief description of the screening site criteria, data inputs, and rating methodologies was provided. Weights were assigned on a 1 to 10 scale (or 1 to 5), with the highest numerical values being most important and the lowest being least. Individual weight scores were averaged to arrive at group composite criterion weighting factors.

After the first round of voting, a group discussion was held in which each committee member provided the rationale for their weight factor assignments. Following this discussion, another polling of the group was conducted and committee members modified their weights, as they deemed appropriate, based on the discussions and arguments presented after the first round. Additional discussions were held after each succeeding round of voting. When no member of the committee indicated that they had been persuaded to change their weight assignments from one round to the next, the Delphi session was terminated.

Weight factors resulting from this process are listed in Tables 5-2 and 6-2 for the screening criteria and general site criteria, respectively.

APPENDIX C

Technical Basis for Screening Criterion Ratings

Criterion P1 – Cooling Water Supply				
Site	Water Source	Low Flow[1]	Rating[3]	Comments and Notes
Redacted	Apalachicola River	5000 cfs	4	Near REDACTED
	Chipola River	300 cfs	2	Near
	Gulf of Mexico	OK	5	By inspection
	Ochlockonee River	150 cfs	1	
	Gulf of Mexico	OK	5	By inspection Redacted
	Suwannee River Santa Fe River	1050 cfs 450 cfs	3[4]	Near Near
	Suwannee River	1100 cfs	3	Near
Levy 2	Florida Barge Canal	OK	5	Source is Gulf of Mexico – OK by inspection.
Crystal River	Gulf of Mexico	OK	5	By inspection
	Suwannee River	1100 cfs	3	Near
	Suwannee River	1100 cfs	3	Near
	Gulf of Mexico	OK	5	By inspection
	Tampa Bay	OK	5	By inspection
Redacted	Kissimmee River	TBD	2*	Flow data not conclusive.
	St. Johns River	217[2]	2*	Flow data not conclusive in middle basin.
	St. Johns River	217[2]	2*	Flow data not conclusive in middle basin.
	St. Johns River	TBD[2]	3*	Flow data not conclusive in lower basin
	St. Johns River	TBD[2]	3*	Flow data not conclusive in lower basin
	St. Johns River	TBD[2]	3*	Flow data not conclusive in lower basin
	Manatee River	1 cfs	2*	Near.

Criterion P1 – Cooling Water Supply

Site	Water Source	Low Flow[1]	Rating[3]	Comments and Notes

1. USGS Daily Streamflow Data. Low Flow of record except as noted.
2. Flow in the St. Johns River System is complex and requires additional evaluation. A preliminary rating of 2 assigned to the [redacted] and [redacted] Sites due to a reported minimum flow of 217 at [redacted] A preliminary rating of 3 assigned to the [redacted] Sites due to a minimum flow of 1360 cfs indicated near Satsuma Fl.
3. Ratings are indicative of publicly available flow data only. Florida water policy dictates that consumptive water use be approved by the appropriate water management district. Relative difficulty of obtaining approvals has not been evaluated at this time.
4. [redacted] rating based on utilizing either Suwanee or Santa Fe Rivers, not both.

* indicates a preliminary rating, based on available data; additional information from water management districts will be required to fully characterize water source feasibility.

Criterion P2 – Flooding

Site	Rating	Comments and Discussion
[redacted]	5	[redacted] site elevation = 189 feet. Apalachicola River current water elevation = 35 feet, flood stage = 42 feet. Difference = 154 feet. Site is not located within 100-year flood zone.
[redacted]	1	[redacted] site elevation = 23 feet. Chipola River elevation ~ 20 feet (topo map). Difference = 3 feet. [redacted] site is located in swamp lands nea[redacted] Site is located within 100-year flood zone.
[redacted]	1	[redacted] elevation = 8 feet. Gulf of Mexico tidal influence ~ +/- 2 feet. Difference = 6 feet. Gulf 1 site is locate[redacted] Site is located within 100-year flood zone.
[redacted]	5	[redacted] site elevation = 73 feet. Lake Talquin water elevation = 68 feet, regulates Ochlockonee River. Ochlockonee River current water elevation = 32 feet, flood stage = 46 feet. Difference = 41 feet. Site is not located within 100-year flood zone.
[redacted]	4	[redacted] site elevation = 22 feet. Area slopes toward Gulf of Mexico (~ 4 miles to West and South). Gulf of Mexico tidal influence ~ +/- 2 feet. Difference ~ 20 feet. [redacted] site surrounded by swamp lands, but not located in swamp lands itself. Flood zone data not available.
[redacted]	5	[redacted] site elevation = 41 feet. Santa Fe River current elevation = 13 feet, flood stage = 19 feet. Difference = 28 feet. Flood zone data not available.

Criterion P2 – Flooding CONFIDENTIAL		
Site	Rating	Comments and Discussion
[redacted]	4	[redacted] site elevation = 16 feet, area is relatively flat. Suwannee River current elevation = 4 feet, flood stage = 10 feet. River elevation influenced by Gulf of Mexico tides. Difference = 12 feet. Site may be located in 100-year flood zone (difficult to determine, but site is near 100-year flood zone boundaries).
Levy 2 REDACTED	4	Levy 2 site elevation = 44 feet, area is relatively flat. Lake Rousseau elevation ~ 33 feet. Difference = 11 feet. Site may be located in 100-year flood zone (difficult to determine, but site is near 100-year flood zone boundaries).
Crystal river	3	Crystal River site elevation = 9 feet. Area is relatively flat. Gulf of Mexico tidal influence ~ +/- 2 feet. Difference = 7 feet. Site is located within 100-year flood zone.
[redacted]	5	[redacted] site elevation = 55 feet. Suwannee River current elevation = 14 feet, flood stage = 29 feet. Difference = 41 feet. Flood zone data not available.
[redacted]	4	[redacted] site elevation = 23 feet. Suwannee River current elevation = 4 feet, flood stage = 10 feet. River elevation influenced by Gulf of Mexico tides. Difference = 19 feet. Site may be located in 100-year flood zone (difficult to determine, but site is near 100-year flood zone boundaries).
[redacted]	2	[redacted] site elevation = 9 feet. Gulf of Mexico tidal influence ~ +/- 2 feet. Difference = 7 feet. [redacted] site is located [redacted] Site may be located in 100-year flood zone (difficult to determine, but site is near 100-year flood zone boundaries).
[redacted]	4	[redacted] site elevation = 17 feet. Area is [redacted] Little Manatee River current elevation = 4 feet. Difference = 13 feet. Site is not located in 100-year flood zone.

Criterion P2 – Flooding

Site	Rating	Comments and Discussion
[redacted]	4	[redacted] site elevation = 25 feet. Lake Okeechobee elevation = 14 feet. Difference = 11 feet. [redacted] site is located near [redacted] Site is located in 100-year flood zone.
[redacted]	4	[redacted] site elevation = 18 feet. St. Johns River current elevation = 6 feet, flood stage = 9 feet. Difference = 12 feet. Site is not located in 100-year flood zone.
[redacted]	3	[redacted] site elevation = 18 feet. Area is relative flat with swamp lands to the Northeast. Cow Creek elevation ~ 10 feet. Difference ~ 8 feet. Site may be located in 100-year flood zone (difficult to determine, but site is near 100-year flood zone boundaries).
[redacted]	2	[redacted] site elevation = 24 feet. Cross Florida Barge Canal and St. Johns River elevation ~ 10 feet. Difference ~ 14 feet. [redacted] Site may be located in 100-year flood zone (difficult to determine, but site is near 100-year flood zone boundaries).
[redacted]	3	[redacted] site elevation = 20 feet. St. Johns River ~ 10 feet. Difference ~ 10 feet. Site is not located in 100-year flood zone.
[redacted]	2	[redacted] site elevation = 16 feet. Area slopes down Eastward to St. Johns River elevation ~ 10 feet. Difference ~ 6 feet. Site is not located in 100-year flood zone.
[redacted]	5	[redacted] site elevation = 69 feet. Manatee River current elevation ~ 10 feet. River elevation under tidal influence of ~ +/- 2 feet. Difference ~ 59 feet. Site is not located in 100-year flood zone.

[redacted]

Criterion P2 – Flooding		
Site	Rating	Comments and Discussion
References: Google Earth, http://earth.google.com; NOAA Stream and Flood Data, http://www.weather.gov/ahps/. USGS Topographic Maps (1 x 100,000 metric); U.S. Flood Hazard Areas, http://www.esri.com/hazards/makemap.html.		

Criterion P3 – Population					
Site	Rating				Comments and Discussion
	County Density	Closest Pop Center	Average Rating*	Adjusted Rating**	
Redacted	5	1	4	4	[redacted] Redacted
	5	2	4	4	
	5	2	4	5	
	5	4	4	4	

Criterion P3 – Population

Site	Rating				Comments and Discussion
	County Density	Closest Pop Center	Average Rating*	Adjusted Rating**	
	5	4	5	5	[redacted]
Redacted	5	3	4	4	Redacted
	5	1	3	3	[redacted]
Levy 2 34,450; 30.8 psm	5	2	4	4	Population centers within 10 miles: Dunnellon (8 miles, 1898) Closest densely populated areas: Ocala (29 miles) [45,943; 1189.2 psm)]
Crystal River 118,085; 202.3 psm	3	4	4	4	Population centers within 20 miles Donnellon (16 miles, 1898) Closest densely populated areas: centers: Ocala (38 miles)
	5	5	5	5	[redacted]
	5	2	4	4	[redacted]
Redacted	5	4	5	5	Redacted [redacted]

Criterion P3 – Population

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Site	Rating				Comments and Discussion
	County Density	Closest Pop Center	Average Rating*	Adjusted Rating**	
	1	2	2	1	[redacted]
	4	2	3	3	
Redacted	1	3	2	1	
	2	3	3	2	
Redacted	4	1	3	3	Redacted
	4	3	4	4	[redacted]

Criterion P3 – Population

Site	Rating				
	County Density	Closest Pop Center	Average Rating*	Adjusted Rating**	[redacted]
Redacted	4	2	3	3	
	2	3	3	2	Redacted

* Average rating of rating based on host county population density and rating [redacted] population center (identified using screening map and USGS 100,000 scale topographic map).

References: US Census Bureau (2000 Census data); Enercon Screening Map; USGS 100,000 scale topographic maps; AAA Flordia State Map

Criterion P4 – Hazardous Land Uses

Site	Rating	Comments and Discussion
Redacted	2	[redacted]
	2	[redacted]
	2	[redacted]
	4	[redacted]
	3	[redacted]

Redacted

Criterion P4 – Hazardous Land Uses

	Rating	[redacted]
Redacted	2	[redacted] Redacted
	2	[redacted] Redacted
Levy 2	2	Airports: JRS landing strip 4.3 miles Southeast. Freight Rail: Seaboard Coast RR 5.3 miles Southeast and 8.6 miles East, no passenger service. Pipeline: None within 10 miles. Military Installation: None located near site. Other Potential Hazards: Power transmission line 3.4 miles West, Power Plant 5.0 miles Southwest, gas station 8.4 miles East, Crystal River Energy Complex 8.4 miles Southwest.
Crystal River	1	Airports: JRS landing strip 8.2 miles Northeast, Crystal River Homosassa Airport 9.9 miles Southeast. Freight Rail: Assumed immediate vicinity due to co-location with Crystal River Energy Compex. Pipeline: None within 10 miles. Military Installation: None located near site. Other Potential Hazards: Crystal River Energy Complex immediate vicinity, assumed power transmission line immediate vicinity, Power Plant 4.2 miles North.

Criterion P4 – Hazardous Land Uses		
Site	Rating	Comments and Discussion
Redacted	2	[redacted]
	2	[redacted]
	2	[redacted] Redacted
	2	[redacted]

Criterion P4 – Hazardous Land Uses CONFIDENTIAL

Site	Rating	Comments and Discussion
Redacted	2	[redacted]
	2	[redacted]
	3	[redacted] Redacted
	3	[redacted]

Criterion P4 – Hazardous Land Uses		
Site	Rating	Comments and Discussion
Redacted	2	[redacted]
	3	[redacted] Redacted
	3	[redacted]

References:

Google Earth, http://earth.google.com.

USGS Topographic Maps (1 x 100,000 metric)

Criterion P5 – Ecology/Federal RTE Species (by County)		
Site	Rating	Comments and Discussion

Criterion P5 – Ecology/Federal RTE Species (by County)		
Site	Rating	Comments and Discussion
Redacted	1	[redacted]
	2	
	1	
	1	
	2	
	4	
	2	

Criterion P5 – Ecology/Federal RTE Species (by County)		
Site	Rating	Comments and Discussion
Levy 2	2	12 T&E species, including 1 with critical habitat (Florida manatee) and Gulf Sturgeon Levy county seems to have CH for gulf sturgeon based on screening map and USFWS maps, but NOT near site location. T&E species include 1 fish, 4 sea turtles, no plants
Crystal River	2	12 T&E species including Gulf Sturgeon and 2 with critical habitat *(Florida manatee and everglade snail kite (bird); one candidate plant* species [redacted]
	3*	[redacted]
	2	[redacted]
Redacted	2	[redacted] Redacted
	2	[redacted]
	1	[redacted]
	3	[redacted]

Criterion P5 – Ecology/Federal RTE Species (by County)

Site	Rating	[redacted]
Redacted	1	[redacted]
	3	[redacted]
	3	[redacted]
	3	Redacted
	2	[redacted]

* Based on rating scale, site should receive a 4 rating; however, it is reduced an addition point because the site is within Gulf Sturgeon critical habitat.

Note: All six species of sea turtles occurring in the U.S. are protected under the Endangered Species Act of 1973. NOAA Fisheries and the U.S. Fish and Wildlife Service (USFWS) share jurisdiction for sea turtles, with NOAA Fisheries having lead responsibility for the conservation and recovery of sea turtles in the marine environment and USFWS on turtles on nesting beaches.

References:

US Fish and Wildlife Service, North Florida Field Office [www.fws.gov/northflorida/CountyList – data provided by county; supposed to be current through September or December 2005, depending on county, but no mention of critical habitat for Gulf Sturgeon even though it is found within this office's jurisdiction]. [Includes all counties in study area except as noted below.

US Fish and Wildlife Service, Panama City [www.fws.gov/panamacity/resources/specieslist.html] – for Calhoun, Gulf and Liberty Counties [pdf files; no date]

US Fish and Wildlife Service, Vero Beach/South Florida [www.fws.gov/verobeach/species_lists/countyfr.html] – for Highlands County; June 2000]

Criterion P6 – Wetlands

Site	Wetland Acres (within 6000-acre site area)	Rating	Comments and Discussion
	3842	1	
	927	2	
	4500	1	Could not search wetland polygon data. Estimated from local map.
Redacted	302	3	
	48	5	
	766	3	
	83	4	
Levy 2	61	4	
Crystal River	123	4	
	140	4	
	50	5	
	242	4	
	45	5	
	58	5	Could not compile local map. Wetland polygon data from radius search only.
Redacted	64	4	Could not compile local map. Wetland polygon data from radius search only.
	84	4	Could not compile local map. Wetland polygon data from radius search only.
	65	4	
	584	3	
	105	4	
	56	5	Could not compile local map. Wetland polygon data from radius search only.
Reference: From NWI Wetlands Mapper. Does not include riverine wetlands.			

Criterion P7 – Railroad Access

Site	Rating	Comments and Discussion
Redacted	See Table 2.	[redacted]
	See Table 2.	
	See Table 2.	
	See Table 2.	
	See Table 2.	Redacted
	See Table 2.	
	See Table 2.	Redacted
Levy 2	See Table 2.	Seaboard Coast RR located to East ~ 8.6 miles. Seaboard Coast RR located to Southeast ~ 5.3 miles, but would require major surface water crossing (Lake Rousseau). Seaboard Coast RR located to Northeast ~ 5.6 miles (abandoned).
Crystal River	See Table 2.	Seaboard Coast RR located to East ~ 7.8 miles (Citronelle, FL). Assume that rail is immediately accessible due to co-location with Crystal River Energy Complex.
Redacted	See Table 2.	[redacted]
	See Table 2.	
	See Table 2.	Redacted
	See Table 2.	

Criterion P7 – Railroad Access

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Site	Rating	Comments and Discussion
Redacted	See Table 2.	[redacted]
	See Table 2.	
	See Table 2.	
	See Table 2.	
	See Table 2.	
	See Table 2.	
	See Table 2.	

References:
North American Railroad Map, version 2.14, http://www.RailroadMap.com.
Tiger Map Server, http://tiger.census.gov/cgi-bin/mapbrowse-tbl.
USGS Topographic Maps (1 x 100,000 metric)

Criterion P8 – Transmission Access		
Load conditions on the existing grid are such that a new plant would be connected directly to load centers rather than being tied into the existing system. Transmission access is evaluated in terms of distance to the load centers in the Orlando and Tampa / St. Petersburg areas and to a center point between the two. Final rating was based on the shortest distance of the three.		
Site	**Rating**	**Comments and Discussion**
Redacted	See Table 2.	[redacted]
	See Table 2.	[redacted] Redacted
	See Table 2.	[redacted]
	See Table 2.	[redacted]
	See Table 2.	[redacted]
	See Table 2	[redacted] Redacted
	See Table 2	[redacted]
Levy 2	See Table 2.	~80 miles to Tampa/St. Petersburg Load Center. ~80 miles to Orlando Load Center. ~70 miles to Center Point.
Crystal River	See Table 2.	~80 miles to Tampa/St. Petersburg Load Center. ~80 miles to Orlando Load Center. ~70 miles to Center Point.
Redacted	See Table 2.	Redacted

Criterion P8 – Transmission Access		
Load conditions on the existing grid are such that a new plant would be connected directly to load centers rather than being tied into the existing system. Transmission access is evaluated in terms of distance to the load centers in the Orlando and Tampa / St. Petersburg areas and to a center point between the two. Final rating was based on the shortest distance of the three.		
Site	Rating	Comments and Discussion
	See Table 2.	[redacted]
	See Table 2.	[redacted]
Redacted	See Table 2.	[redacted]
	See Table 2.	[redacted]
	See Table 2.	[redacted]
	See Table 2.	[redacted]
	See Table 2.	[redacted] Redacted
	See Table 2.	[redacted]
Redacted	See Table 2.	[redacted]
	See Table 2.	[redacted]
References:		
Google Earth, http://earth.google.com		

Criterion P9 – Land Acquisition

Site	Rating	Comments and Discussion
	See Table 2.	
	See Table 2.	
	See Table 2.	
	See Table 2.	
Redacted	See Table 2.	Redacted
	See Table 2.	
	See Table 2.	
Levy 2	See Table 2.	
Crystal River	See Table 2.	Assume nominal cost since Crystal River Plant site [otherwise, county average is
	See Table 2.	
	See Table 2.	Redacted
	See Table 2.	
	See Table 2.	
	See Table 2.	
	See Table 2.	
	See Table 2.	
	See Table 2.	
	See Table 2.	Redacted
Redacted	See Table 2.	
	See Table 2.	

Reference: U.S. Census of Agriculture – 2002 average farm value by county

APPENDIX D

Technical Basis for General Site Criteria Evaluations

General siting criteria used in the Progress nuclear power plant siting study were derived from those presented in Chapter 3.0 of the *Siting Guide: Site Selection and Evaluation Criteria for an Early Site Permit Application*, EPRI, Palo Alto, CA: 2002 (Siting Guide).

The following information is provided in this appendix for each criterion:

- Objective – what aspect of site suitability is being measured
- Evaluation approach – technical basis/methodology used to develop site ratings from available data
- Discussion – Data and information available for the eight sites under consideration
- Results – Ratings results and rationale

The following candidate nuclear plant (NP) sites were evaluated for the Progress Combined Operating License (COL) application in Florida: Crystal River (Citrus County), Redacted Levy 2, Redacted

Note that the sites were evaluated with respect to the following siting criteria during the initial screening phase: cooling water supply, flooding, population, hazardous land uses, ecology, wetlands, railroad access, transmission access, and land acquisition; the evaluation and results of this phase are presented in the screening criteria report. For several of these criteria (e.g., transmission access), the screening criteria evaluations are used in the general site criteria evaluations reported in this appendix. For these criteria, a brief summary and the final ratings are presented in this appendix for completeness. For other screening criteria (e.g., flooding, population and ecology), additional data were evaluated or additional detail are provided in this appendix, as appropriate, to provide a more comprehensive analysis of the full suite of EPRI siting general site criteria and sub-criteria.

Technical bases for site ratings developed for each of the general site criteria are provided in the following sections. Criterion/section numbering is designed to reflect section numbers in Chapter 3 of the EPRI Siting Guide where the criteria is discussed, e.g., Criterion 1.1.1 - Geology/ Seismology appears in Section 3.1.1.1 of the Siting Guide.

1. HEALTH AND SAFETY CRITERIA

1.1 ACCIDENT CAUSE-RELATED

1.1.1 Geology/Seismology

Objective - The objective of this criterion is to rank the suitability of the eight candidate sites with respect to the geologic and seismic setting, using to the extent possible the same or similar criteria previously utilized to rank other potential sites.

Evaluation approach - A numerical system of weights and ratings based upon suitability criteria were assigned to each geologic/seismic category, including vibratory ground motion, capable tectonic sources, surface faulting and deformation, geologic hazards, and soil stability (Sections 1.1.1.1 through 1.1.1.8) and used to compute (i.e., rate times weight) an index number for each category. (To enable the comparative evaluation of sites, the weights and rating schemes adopted herein are the same for all eight sites. The index numbers for each site were summed to compute a GEOL Index (Tables 1.1-1 through 1.1-8). The range of GEOL indexes was then used to develop a rating system for candidate sites (Section 1.1.1.6). The sites were rated on a scale of 1 to 5, based on the GEOL scale, with the most suitable sites receiving an overall rating of 5. Weights and the basis for deriving correlating site ratings from the GEOL scale are discussed with respect to each of the sub-criteria in the sections below. NOTE: Within the GOEL index sub-criteria an inverse rating basis is used, with lower numbers indicating most suitable and 5 the least suitable; for the composite GEOL index, higher numbers indicate less suitable sites.

1.1.1.1 Vibratory Ground Motion

Objective – The purpose of this sub-criterion is to rate sites according to the expected magnitude of ground motion that may be expected. As long as expected peak ground accelerations do not exceed that for the certified designs under consideration there are no exclusionary or avoidance components to this sub-criterion.

Evaluation approach – Peak ground acceleration (PGA) is a measure of the maximum force experienced by a small mass located at the surface of the ground during an earthquake and it is an index of hazard for some structures. The units for PGA are in percent of gravity (%g); i.e. an acceleration of 0.30g is expressed as 30%g. PGA provided herein, as for other sites, is for a probability of exceedance (PE) of 2% in 50 years (once in 2500 years). PGA data for eight Progress Florida sites were obtained from the USGS National Seismic Hazards Mapping Project, 2002 (http://eqint.cr.usgs.gov/eq/html/lookup-2002-interp.html).

Discussion/Results – The locations evaluated for each of the eight candidate sites have PGA values as shown in the table below.

Probabilistic ground motion values in %g

Site	PGA (%g) with 2% PE in 50 years
Crystal River	3.87
	4.20
	3.58
	4.68
Redacted	4.02
	3.89
	5.29
	4.08

The following table shows the assigned weight and rating scheme for vibratory ground motion.

Weight	Range	Rating	Index Range
	PGA (%g)		
5	0 – 3	1	0 - 50
	3 – 6	2	
	6 – 9	3	
	9 – 12	4	
	12 – 15	5	
	15 – 18	6	
	18 – 21	7	
	21 – 24	8	
	24 – 27	9	
	27 – 30	10	

Based upon the information provided in Tables 1.1-1 through 1.1-8 each candidate site receives the following ratings based on the computed index numbers for vibratory ground motion.

Site	Rating	Index No.
Crystal River	2	10
	2	10
Redacted	2	10
	2	10
Levy 2	2	10
	2	10
	2	10
Redacted	2	10

1.1.1.2 Capable Tectonic Structure or Source

Objective – No absolute exclusionary criteria have been identified. Capable tectonic structures are addressed as avoidance criteria, therefore, the objective of this sub-criterion is to identify the existence of capable or potentially capable tectonic structures within 200 miles of each site. Candidate sites that are furthest from capable or potentially capable tectonic structures are considered more suitable.

Evaluation Approach – A database compiled by USGS (Quaternary Fault and Fold Database, 2003; http://qfaults.cr.usgs.gov/) and Crone and Wheeler (2000) were utilized to identify capable and potentially capable tectonic sources within 200 miles of each of the four candidate sites. It was assumed that capable and potential capable tectonic sources, which are Quaternary features that may generate strong ground motion, fall into two categories as defined by Crone and Wheeler (2000, p5):

> Class A features have good geologic evidence of tectonic origin and are potentially seismogenic; and
>
> Class B features have geologic evidence that supports the existence of a seismogenic fault or suggests Quaternary deformation, but the currently available geologic evidence for Quaternary tectonic activity is less compelling than for a Class A feature.

Discussion/Results – There are no Class A, B, or C features within 200 miles of the candidate sites. There is one minor Class D feature located approximately 120 miles south of Highlands, however, it appears to be sufficiently small and would not affect the site rating. The following table shows the assigned weight and the rating scheme for capable tectonic sources.

Weight	Range (miles)	Rating	Index Range
Class A 2	None within 200 mi radius	0	0 – 10
	greater than 100 to 200 mi	2	
	greater than 50 to 100 mi	3	
	greater than 25 to 50 mi	4	
	0 to 25 mi	5	
Class B 1	None within 200 mi radius	0	0 – 5
	greater than 100 to 200 mi	2	
	greater than 50 to 100 mi	3	
	greater than 25 to 50 mi	4	
	0 to 25 mi	5	

Based on the information provided in Tables 1.1-1 through 1.1-8, each candidate site receives the following ratings and computed index numbers.

Class A

Site	Rating	Index No.
Crystal River	0	0
	0	0
Redacted	0	0
	0	0
Levy 2	0	0
	0	0
	0	0
Redacted	0	0

Class B

Site	Rating	Index No.
Crystal River	0	0
	0	0
Redacted	0	0
	0	0
Levy 2	0	0
	0	0
Redacted	0	0
	0	0

Class A Features
No Class A features are identified within 200 miles of the Crystal River, [redacted] Levy 2, Levy 3, [redacted]

Class B Features
No Class B features are identified within 200 miles of the Crystal River, [redacted] Levy 2, [redacted]

Crone and Wheeler (2000) and the USGS Fault Database (2003) also identify Class C and D features. Class C features are defined by Crone and Wheeler (2000) as features where:

> *Geologic evidence is insufficient to demonstrate (1) the existence of a tectonic fault, or (2) Quaternary slip or deformation associated with the feature.*

No Class C features are known to occur within 200 miles of the Crystal River, [redacted] Levy 2, [redacted]

Class D features are defined by Crone and Wheeler (2000) as features where:

> Geologic evidence demonstrates that the feature is not a tectonic fault or feature; this category includes features such as demonstrated joints or joint zones, landslides, erosional or fluvial scarps, or landforms resembling fault scarps, but of demonstrable non-tectonic origin.

No Class D features are known to occur within 200 miles of the Crystal River, [redacted], Levy 2, [redacted] One Class D feature occurs within 200 miles of the [redacted] site.

[redacted] Site- Class D Feature
The following Class D feature occurs within 200 miles of the [redacted] site, and is considered non-capable.

Grossman's Hammock Rock Reef. The Grossman's Hammock rock reef is located approximately 120 miles south of the Redacted site. Following a tentative inference of Quaternary displacement at Grossman's Hammock, investigation by drilling and ground penetrating radar showed no evidence of Quaternary faulting. (USGS Fault Database, 2003; Crone and Wheeler, 2000).

1.1.1.3 Surface Faulting and Deformation

Objective – Develop site ratings for site suitability relative to surface faulting and deformation in the site vicinity.

Evaluation approach – No absolute exclusionary criteria have been identified with regard to surface faulting and deformation. Suitability criteria have been established based on the occurrence of surface faulting and tectonic and non-tectonic structures within a 25-mi and 5-mi radius of the candidate sites, as follows (EPRI 2000, p.3-7):

Within 25 miles
- No such structures altogether (Most Suitable)
- Potential non-capable structures
- Potential capable structures (Least Suitable)

Within 5 miles
- No such structures altogether (Most Suitable)
- Potential non-capable structures
- Potential capable structures
- Fault exceeding 1,000 feet in length (Least Suitable)

The potential for surface faulting or deformation primarily concerns plant design, therefore features identified within 5 miles of a candidate site receive a higher weight. Following are the assigned weights and ratings for surface faulting and deformation.

Weight	Range	Rating	GEOL Index Range
Five miles to within 25 mi–1	No structures Potential non-capable structures Potential capable structures	0 1 5	0–5
within 5 mi–2	No structures Potential non-capable structures Potential capable structures Fault exceeding 1,000 feet in length Capable fault exceeding 1,000 feet in length	0 2 3 4 5	0–10

Discussion/Results

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Over several decades, various faults have been proposed across Florida. Communications with the Florida Geologic Survey confirm that many of these have since been discounted, and conclusive proof is lacking for others. The current Geologic Map of Florida does not show faulting, and various structural maps of the State show deep-seated basins, platforms, and other structures, but no faulting. Therefore, it is not apparent that significant faulting occurs within 25 miles of any of the Progress sites. Based upon this information, the Crystal River, [redacted] Levy 2, [redacted] sites receive the following ratings and computed index numbers for surface faulting and deformation.

REDACTED

Within 25 miles

Site	Rating	Index No.
Crystal River	0	0
	0	0
Redacted	0	0
	0	0
Levy 2	0	0
	0	0
Redacted	0	0
	0	0

Within 5 miles

Site	Rating	Index No.
Crystal River	0	0
	0	0
	0	0
Redacted	0	0
Levy 2	0	0
	0	0
	0	0
Redacted	0	0

1.1.1.4 Geologic Hazards

Objective – Based on EPRI guidance (2000, p. 3-7) sites having the following geologic and man-made conditions should be avoided:

- Areas of active (and dormant) volcanic activity,
- Subsidence areas caused by withdrawal of subsurface fluids such as oil or groundwater, including areas which may be affected by future withdrawals,
- Potential unstable slope areas, including areas demonstrating paleolandslide characteristics,
- Areas of potential collapse (e.g. karst areas, salt, or other soluble formations),
- Mined areas, such as near-surface coal mined-out areas, as well as areas where resources are present and may be exploited in the future,
- Areas subject to seismic and other induced water waves and floods.

Evaluation approach – Sites furthest away from these features would be considered the most suitable sites; sites were rated in accordance with the presence of and distance from these features. Following are the assigned weight and rating used for geologic hazards:

Weight	Range	Rating	GEOL Index Range
1	Geologic hazard(s) present	1	0–1

Discussion/Results

The following Geologic Hazards apply to the Crystal River site:

1. The site is underlain by the Ocala Limestone and the Avon Park Limestone, both of which are subject to solution activity and the formation of surface and subsurface sinkholes (karst areas). Maps of the site vicinity exhibit surface depressions indicative sinkhole formation.
2. The site is located adjacent to the Gulf of Mexico, and is subject to seismic and other induced water waves and floods.

The following Geologic Hazards apply to the Redacted:

1. The site is underlain by the Ocala Limestone and the Avon Park Limestone, both of which are subject to solution activity and the formation of surface and subsurface sinkholes (karst areas). Maps of the site vicinity exhibit surface depressions indicative sinkhole formation.

The following Geologic Hazards apply to the Redacted site:

The Geologic Map of Florida indicates that the site area is underlain by approximately 50 feet of undifferentiated sediments consisting primarily of sands to silty clays, which are underlain by approximately 450 feet of Hawthorn Group sediments consisting predominately of sands, clays, limestone and dolostone. The Hawthorn Formation is underlain by the Suwannee and Ocala Limestones. Topographic maps of the general site vicinity exhibit some evidence of sinkhole formation.

The following Geologic Hazards apply to the Redacted Levy 2, Redacted and Redacted sites:

The site is underlain by the Ocala Limestone and the Avon Park Limestone, both of which are subject to solution activity and the formation of surface and subsurface sinkholes (karst areas). Maps of the site vicinity exhibit surface depressions indicative sinkhole formation.

The following Geologic Hazards apply to the Redacted site:

The site is underlain by undifferentiated sediments in excess of 20 feet in thickness consisting primarily of sands to silty clays, which are underlain by Hawthorn Group sediments consisting predominately of sands, clays, limestone and dolostone. The Hawthorn Formation is underlain by the Ocala Limestone. Topographic maps of the general site vicinity exhibit some evidence of sinkhole formation.

Design specifications for a new nuclear facility must address the possibility of limestone solutioning and sinkhole formation, and large water waves and floods. The eight candidate sites receive the following computed rating and index number for geologic hazards.

Site	Rating	Index No.
Crystal River	1	1
	1	1
Redacted	1	1
	1	1
Levy 2	1	1
	1	1
	1	1
Redacted	1	1

1.1.1.5 Soil Stability

Objective – Evaluate the sites with respect to the difficulty of soil conditions expected at each site.

Evaluation approach – No absolute exclusionary criteria have been identified with respect to soil stability. Soil stability is addressed as an avoidance criterion. Certain soil properties have unfavorable characteristics in association with vibratory ground motion. These soil properties include poor mineralogy, low density soil (lack of compaction), and high water content (or high water table). Sites with the highest values of PGA in combination with deleterious site soils would receive a relatively lower rating. Sites having rock foundations or more suitable soil conditions are considered to be better sites.

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Following are the assigned weights and ratings for soil stability:

Weight	Range	Rating	Index Range
2	Rock site	0	0 – 4
	Deep soil site, no known deleterious soil conditions	1	
	Deep soil site with potential stability issues, or insufficient information available to assign a rating of 1	2	

Discussion/Results –

REDACTED

The Geologic Map of Florida indicates that the Crystal River, [redacted], Levy 2, [redacted] and [redacted] site areas are underlain by less than 20 feet of unconsolidated sediments (sand, silt, clay) followed by the Ocala Limestone. Therefore, these sites are considered to be rock sites. However, the limestone rock is of variable quality and some is poorly indurated, and is subject to solutioning and sinkhole formation. These six sites will require extensive investigation and study for these reasons.

According to the Geologic Map of Florida, the [redacted] and [redacted] sites are underlain by hundreds of feet of predominately unconsolidated sediments (sands and clays) with some possible limestone or dolostone. The [redacted] and [redacted] sites are deep soil sites. Deep soil sites will require specific site investigations to determine if deleterious soil conditions occur.

Based upon this information the eight sites receive the following rating and computed index number for soil stability.

Site	Rating	Index No.
Crystal River	0	0
	0	0
Redacted	1	2
	0	0
Levy 2	0	0
	0	0
Redacted	1	2
	0	0

1.1.1.6 Overall Rating for Geology/Seismology

The index numbers for this ranking scheme range from 5 to 85. This range of indexes was used to develop a ranking system to compare the suitability of sites as follows.

Index Range	Rating
5 – 21	5
22 – 37	4
38 – 53	3
54 – 69	2
70 – 85	1

The index numbers for each site were summed. The resulting index was compared to the index ranges in the above table to determine the overall rating for each site. Based upon this evaluation, the candidate sites are ranked as follows.

Site	Index Number	Rating
Crystal River	11	5
	11	5
Redacted	13	5
	11	5
Levy 2	11	5
	11	5
	13	5
Redacted	11	5

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Table 1.1-1 Ratings for Progress Crystal River Site

Feature	Source	Weight	Rating	Index No.
Vibratory Ground Motion	PGA 3.87 %g with 2% PE in 50 years (USGS National Seismic Hazards Mapping Project, 2002).	5	2	10
Capable Tectonic Source (Class A)	No Class A features occur within 200 miles of the Crystal River site (USGS Fault and Fold Database, 2003. Crone & Wheeler, 2000).	2	0	0
Capable Tectonic Source (Class B)	No Class B features occur within 200 miles of the Crystal River site (USGS Fault and Fold Database, 2003. Crone & Wheeler, 2000).	1	0	0
Surface Faulting & Deformation within 25 miles	No surface faulting or deformation is known to occur near the site.	1	0	0
Surface Faulting & Deformation within 5 miles	No surface faulting or deformation is known to occur at the site.	2	0	0
Geologic Hazards	The site is located in an area of potential karst activity. The site is subject to seismic and other induced water waves and floods.	1	1	1
Soil Stability	The Crystal River site is presumed to be a rock site.	2	0	0
			Total Index	**11**

Table 1.1-1 Ratings for Progress Redacted Site

Feature	Source	Weight	Rating	Index No.
Vibratory Ground Motion	PGA 4.20 %g with 2% PE in 50 years (USGS National Seismic Hazards Mapping Project, 2002).	5	2	10
Capable Tectonic Source (Class A)	No Class A features occur within 200 miles of th Redacted te (USGS Fault and Fold Database, 2003. Crone & Wheeler, 2000).	2	0	0
Capable Tectonic Source (Class B)	No Class B features occur within 200 miles of the Redacted site (USGS Fault and Fold Database, 2003. Crone & Wheeler, 2000).	1	0	0
Surface Faulting & Deformation within 25 miles	No surface faulting or deformation is known to occur near the site.	1	0	0
Surface Faulting & Deformation within 5 miles	No surface faulting or deformation is known to occur near the site.	2	0	0
Geologic Hazards	The site is located in an area of potential karst activity.	1	1	1
Soil Stability	The Redacted site is presumed to be a rock site.	2	0	0
			Total Index	**11**

Table 1.1-1 Ratings for Progress
Redacted

Feature	Source	Weight	Rating	Index No.
Vibratory Ground Motion	PGA 3.58 %g with 2% PE in 50 years (USGS National Seismic Hazards Mapping Project, 2002).	5	2	10
Capable Tectonic Source (Class A)	No Class A features occur within 200 miles of the Redacted site (USGS Fault and Fold Database, 2003. Crone & Wheeler, 2000).	2	0	0
Capable Tectonic Source (Class B)	No Class B features occur within 200 miles of the Redacted site (USGS Fault and Fold Database, 2003. Crone & Wheeler, 2000).	1	0	0
Surface Faulting & Deformation within 25 miles	No surface faulting or deformation is known to occur near the site.	1	0	0
Surface Faulting & Deformation within 5 miles	No surface faulting or deformation is known to occur at the site.	2	0	0
Geologic Hazards	The site is located in an area of potential solutioning and sinkhole formation.	1	1	1
Soil Stability	The Redacted site is presumed to be a deep soil site.	2	1	2
			Total Index	**13**

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Table 1.1-1 Ratings for Progress
Redacted **Site**

Feature	Source	Weight	Rating	Index No.
Vibratory Ground Motion	PGA 4.68 %g with 2% PE in 50 years (USGS National Seismic Hazards Mapping Project, 2002).	5	2	10
Capable Tectonic Source (Class A)	No Class A features occur within 200 miles of the Redacted site (USGS Fault and Fold Database, 2003. Crone & Wheeler, 2000).	2	0	0
Capable Tectonic Source (Class B)	No Class B features occur within 200 miles of the Redacted site (USGS Fault and Fold Database, 2003. Crone & Wheeler, 2000).	1	0	0
Surface Faulting & Deformation within 25 miles	No surface faulting or deformation is known to occur near the site.	1	0	0
Surface Faulting & Deformation within 5 miles	No surface faulting or deformation is known to occur at the site.	2	0	0
Geologic Hazards	The site is located in an area of potential karst activity.	1	1	1
Soil Stability	The Redacted site is presumed to be a rock site.	2	0	0
			Total Index	**11**

Table 1.1-1 Ratings for Progress Levy 2 Site

Feature	Source	Weight	Rating	Index No.
Vibratory Ground Motion	PGA 4.02 %g with 2% PE in 50 years (USGS National Seismic Hazards Mapping Project, 2002).	5	2	10
Capable Tectonic Source (Class A)	No Class A features occur within 200 miles of the Levy 2 site (USGS Fault and Fold Database, 2003. Crone & Wheeler, 2000).	2	0	0
Capable Tectonic Source (Class B)	No Class B features occur within 200 miles of the Levy 2 site (USGS Fault and Fold Database, 2003. Crone & Wheeler, 2000).	1	0	0
Surface Faulting & Deformation within 25 miles	No surface faulting or deformation is known to occur near the site.	1	0	0
Surface Faulting & Deformation within 5 miles	No surface faulting or deformation is known to occur at the site.	2	0	0
Geologic Hazards	The site is located in an area of potential karst activity.	1	1	1
Soil Stability	The Levy 2 site is presumed to be a rock site.	2	0	0
			Total Index	**11**

**Table 1.1-1 Ratings for Progress
Levy 3 Site**

Feature	Source	Weight	Rating	Index No.
Vibratory Ground Motion	PGA 3.89 %g with 2% PE in 50 years (USGS National Seismic Hazards Mapping Project, 2002).	5	2	10
Capable Tectonic Source (Class A)	No Class A features occur within 200 miles of the Levy 3 site (USGS Fault and Fold Database, 2003. Crone & Wheeler, 2000).	2	0	0
Capable Tectonic Source (Class B)	No Class B features occur within 200 miles of the Levy 3 site (USGS Fault and Fold Database, 2003. Crone & Wheeler, 2000).	1	0	0
Surface Faulting & Deformation within 25 miles	No surface faulting or deformation is known to occur near the site.	1	0	0
Surface Faulting & Deformation within 5 miles	No surface faulting or deformation is known to occur at the site.	2	0	0
Geologic Hazards	The site is located in an area of potential karst activity.	1	1	1
Soil Stability	The Levy 3 site is presumed to be a rock site.	2	0	0
			Total Index	**11**

Table 1.1-1 Ratings for Progress Redacted Site

Feature	Source	Weight	Rating	Index No.
Vibratory Ground Motion	PGA 5.29 %g with 2% PE in 50 years (USGS National Seismic Hazards Mapping Project, 2002).	5	2	10
Capable Tectonic Source (Class A)	No Class A features occur within 200 miles of the Redacted site (USGS Fault and Fold Database, 2003. Crone & Wheeler, 2000).	2	0	0
Capable Tectonic Source (Class B)	No Class B features occur within 200 miles of the Redacted site (USGS Fault and Fold Database, 2003. Crone & Wheeler, 2000).	1	0	0
Surface Faulting & Deformation within 25 miles	No surface faulting or deformation is known to occur near the site.	1	0	0
Surface Faulting & Deformation within 5 miles	No surface faulting or deformation is known to occur at the site.	2	0	0
Geologic Hazards	The site is located in an area of potential limestone solutioning and sinkhole formation (karst activity).	1	1	1
Soil Stability	The Redacted site is presumed to be a deep soil site.	2	1	2
			Total Index	**13**

Table 1.1-1 Ratings for Progress Redacted Site

Feature	Source	Weight	Rating	Index No.
Vibratory Ground Motion	PGA 4.08 %g with 2% PE in 50 years (USGS National Seismic Hazards Mapping Project, 2002).	5	2	10
Capable Tectonic Source (Class A)	No Class A features occur within 200 miles of the Redacted site (USGS Fault and Fold Database, 2003. Crone & Wheeler, 2000).	2	0	0
Capable Tectonic Source (Class B)	No Class B features occur within 200 miles of the Redacted site (USGS Fault and Fold Database, 2003. Crone & Wheeler, 2000).	1	0	0
Surface Faulting & Deformation within 25 miles	No surface faulting or deformation is known to occur near the site.	1	0	0
Surface Faulting & Deformation within 5 miles	No surface faulting or deformation is known to occur at the site.	2	0	0
Geologic Hazards	The site is located in an area of potential karst activity.	1	1	1
Soil Stability	The Redacted site is presumed to be a rock site.	2	0	0
			Total Index	**11**

References

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1.1.2 Cooling System Requirements

Objective - Cooling system requirements are important siting considerations for new power generating facilities. The objective of this criterion is to rate the candidate sites with respect to specific cooling system requirements, using to the extent possible the same or similar criteria previously utilized to evaluate other potential nuclear power plant sites.

Evaluation approach - The principle requirements of interest are the quantity of cooling water available and the ambient air temperature (EPRI, 2001, Section 3.1.1.2.1). Exclusionary and avoidance conditions apply to the evaluation of candidate sites with respect to these cooling system requirements. AP1000 cooling water supply requirements for units with closed-cycle cooling systems are summarized below.

Cooling System Type	AP1000 Two-Unit Requirement
Closed-cycle	Make up flow rate (gpm) – 42,000
Closed-cycle	Maximum Water Consumption (gpm) – 60,000
Closed-cycle	Monthly Average Water Consumption (gpm) – 42,000

Ambient air temperature characteristics of a potential site affect the design of heat removal systems. The candidate sites were compared to determine which site has the most suitable ambient air characteristics with respect to the PPE values outlined in EPRI 2001, Section 3.1.1.2.2. With the exception of extreme low temperature values, sites with the lowest temperatures are considered to be the most suitable.

Discussion/Results – Site data and results are presented for each of the sub-criteria in Sections 1.1.2.1 and 1.1.2.2, below. Overall ratings for the Cooling System Requirements criterion are provided in Section 1.1.2.3.

1.1.2.1 Cooling Water

The eight sites were evaluated with respect to the cooling water criterion during the initial screening phase (P1 criterion) and all were found to have an adequate flow or reservoir volume to support the requirements of a closed cycle cooling water system. The rating approach used in this evaluation, as well as the site data and screening results, were described previously in the screening criteria report (Criterion P1). To summarize:

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Criterion P1 – Cooling Water Supply				
Site	Water Source	Low Flow[1]	Rating[3]	Comments and Notes
Crystal River	Gulf of Mexico	OK	5	By inspection.
[redacted]	Suwannee River	1100 cfs	3	Near Wilcox (upstream)
[redacted]	Kissimmee River	TBD	2*	Flow data not conclusive.
[redacted]	Suwannee River	1100 cfs	3	Near Wilcox (upstream)
Levy 2	Florida Barge Canal	OK	3	Gulf of Mexico/Barge canal/Withlacoochee River; access potentially problematic (so given rating of 3).
[redacted]	Gulf of Mexico	OK	5	By inspection
[redacted]	St. Johns River	1360 cfs[2]	3*	Flow data not conclusive in lower basin
[redacted]	Gulf of Mexico	OK	5	By inspection. Note new Taylor Energy Center (800MW) near Perry.

5. USGS Daily Streamflow Data. Low Flow of record except as noted.
6. Flow in the St. Johns River System is complex and requires additional evaluation. A preliminary rating of 3 assigned to the [redacted] Sites due to a minimum flow of 1360 cfs indicated near Satsuma Fl.
7. Ratings are indicative of publicly available flow data only. Florida water policy dictates that consumptive water use be approved by the appropriate water management district. Relative difficulty of obtaining approvals has not been evaluated at this time.
8. Gilchrist located on smaller Santa Fe River, however, rating based on utilizing nearby higher flow Suwannee River.

* indicates a preliminary rating, based on available data; additional information from water management districts will be required to fully characterize water source feasibility.

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This evaluation has been performed in the absence of agency contact using publicly available flow data (e.g., USGS Daily Streamflow Data and low flow of record data were used when appropriate data were available). Flow in some of the source water systems is complex and requires further investigation, notably at the [redacted] and Levy 2 sites (although Levy 2 is given a slightly higher rating than [redacted] given its potential access to two water sources: the expansive Gulf of Mexico via the cross Florida barge canal and possibly the Withlacoochee River, depending on final site location). Water access difficulties are anticipated at [redacted] due to a planned restoration project for the Kissimmee River that includes conversion of the channelized C-38 canal back to a good portion of the original Kissimmee River bed and creation of approximately 27,000 acres of wetlands. [redacted] and [redacted] are also given a rating of "3" to account for regulatory complexities on the Suwannee River; and [redacted] receives a conservative rating of "3" to be consistent with the other sites and in light of the regulatory unknowns associated with the St. Johns River. For these source waters, indicative flows were obtained from available data and preliminary ratings were assigned as follows:

Cooling Water	Crystal River	[redacted]			Levy 2	[redacted]		
Rating	5	3	2	3	3	5	3	5

Note that sites using the Gulf of Mexico as the source water were each given a rating of 5 because of the Gulf's expansive water supply. Site attributes associated with pipeline routing or pumping are reflected in section 4.1.

Water usage in all source waters is governed by individual water management districts in Florida. REDACTED Approval for proposed water usage by the cognizant water management district will be required. It will be necessary to meet with the appropriate agencies to obtain preliminary confirmation of available water and to define requirements for obtaining final approval of any proposed water use. This criterion will continue to be refined as additional river flow and water availability information becomes available from the relevant water management districts within the State of Florida. However, in the interim, for those sites located on rivers, additional water supply evaluations have been conducted for the Suwannee River ([redacted]) and Kissimmee River ([redacted]) sites (Hopping Green & Sams, 2006); and a review of environmental concerns also has been conducted for the St. Johns River ([redacted]) and Barge Canal (Levy 2) sites (CH2MHILL 2006). Findings from both evaluations are summarized below.

<u>Suwannee River</u>

Minimum flow levels (MFLs for the Lower Suwannee River, potentially relevant to the Dixie and Lafayette sites, have been recently completed by the Suwannee River Water Management District (District or SRWMD). Public notice of the proposed rule language was published by SRWMD in the Florida Administrative Law Weekly on Friday, April 21st. Within 21 days from the date of publication, substantially affected parties may file a petition to challenge the rule. Rule challenges can last several months to more than a year and are often appealed which often adds another year delay to the rule becoming effective. If no challenges are filed, the rulemaking process is complete within approximately 90 days barring procedural delays.

Specifically, the governing board of the SRWMD approved rule language to amend the District's Rule 40B-8, Fla. Admin. Code, to adopt minimum flows and levels (MFLs) for Manatee Spring, Fanning and Little Fanning Spring and the Lower Suwannee River (Wilcox gauge to Gulf). The flow numbers include a flow duration frequency of 50%. According to SRWMD staff, the flow duration frequency means that, over the long term, and considering only withdrawal effects, the seasonal median flow statistics cannot drop below the specified values. In this case, continued monitoring should demonstrate that, over the long term, 50% of the mean daily flows at the Wilcox Gauge must be 6,600 cfs or greater from May 1 through October 31, and that 50% of the mean daily flow at the Wilcox Gauge must be 7,600 cfs, or greater, from November 1 through April 30.

Looking at gross numbers comparing MFL flows to historical flows, it appears that sufficient water is potentially available from the Lower Suwannee to accommodate two nuclear units (i.e., an estimated 1000 cfs (646 mgd) could be taken from the Suwannee River without causing an

MFL violation). While these figures do not reflect existing withdrawals or available capacity, they do show that on a gross scale the proposed plant could potentially be accommodated. The actual post-MFL yield available for consumption will be determined by the District.

At this stage, while the effect, if any, the MFLs adopted with a flow duration frequency will have on post-MFL yield, it would seem that yield would increase since the MFL flow values must be met only 50% of the time rather than continuously.

Kissimmee River

Redacted This portion of the river lies north of the S-65E structure on the C-38 canal which is adjacent to the S-84 structure that regulates the flow of the C-41A canal into the Kissimmee River (C-38) and assists in maintaining adopted minimum levels in Lake Istokpoga to the northwest. This stretch of the river is also immediately below, and will be affected by, the ongoing Kissimmee River restoration project. The restoration project will convert the channelized C-38 canal back to a good portion of the original Kissimmee River river bed and create approximately 27,000 acres of wetlands.

The South Florida Water Management District (SFWMD or District) published a Kissimmee Basin Water Supply Plan in April of 2000 (KBWSP). The District is currently updating the KBWSP and a draft of that update was provided by the District, available online, in 2005. Based upon these documents, related documents describing the Kissimmee River Restoration Plan, and various maps and supporting information available from the District and the Army Corps of Engineers (COE), the following matters are relevant to the Highland County site and the potential use of the Lower Kissimmee River for water supply and discharge.

1. *The Lower Kissimmee River Is Regulated By the SFWMD and COE.* While not necessarily an obstacle to drawing water from the lower Kissimmee, any such water use would have to be coordinated with the COE and District and be consistent with each agency's efforts in implementing the Comprehensive Everglades Restoration Plan (CERP) as well as the Kissimmee River Restoration Plan. Additionally, the District is a party to an intergovernmental agreement with the Seminole Tribe to assure water entitlements to the Brighton Reservation south of the Highlands County site in Glades County.

2. *Water Supply Is Highly Regulated In The Vicinity of the Proposed Site.* The District's 2000 Water Supply Plan identifies a large area northwest of Lake Okeechobee as a "Water Resource Caution Area" and "Restricted Allocation Area." In a Water Resource Caution Area, reclaimed water must be used unless shown not to be economically, environmentally or technologically feasible. The area to the northwest of Lake Okeechobee, and southeast of Lake Istokpoga, has been declared a Restricted Allocation Area due to water shortages limiting the availability of surface water from Lake Istokpoga for use within the Indian Prairie Agricultural Area. By definition, Restricted Allocation Areas are linked to water availability from a specific water body. See Rule 40E-23.021(4), Florida Administrative Code (F.A.C.). The Restricted Allocation Area status means that water is not available from the canals connecting Lake

Istokpoga to the Kissimmee River and Lake Okeechobee but does not appear linked to the availability of water from the Lower Kissimmee River (C-38). Additionally, under Rule 40E-23.021(2), F.A.C., the District defines "Critical Water Supply Problem Areas" as those which have experienced water supply problems or are expected to have water supply problems in the next 20 years. The definition incorporates the area northwest of Lake Okeechobee, and encompassing the general vicinity of the proposed Highlands County site, as part of the Critical Water Supply Problem Area.

While the site does fall in an area where water supply is an issue, the District seems to take the position that power plants—which fall into the District's water use category of "Thermoelectric Self-Supplied" in the plan—are not problematic from a water supply perspective. Additionally, as noted above, water supply issues in this area are related to local sources and not the Kissimmee River itself.

3. *Minimum Flows And Levels Are Pending.* A minimum flow is that flow at which further withdrawals would cause significant harm to the water resources or ecology of the area. MFLs for the Kissimmee River have not been adopted to date but are anticipated for 2008, and the 2005 draft KBWSP update notes that a pending "Long Term Management Plan" for the lakes in the upper Kissimmee chain must be completed to determine the volume and timing of water availability in the Kissimmee River.

In summary, while there is nothing absolutely precluding the Lower Kissimmee River as a source of water, and point of discharge, the regulatory intricacies and potential costs need to be weighed. At this point it is still unknown what effect, if any, the Kissimmee Restoration River Project might have on water availability and whether the project would limit water supply or provide an opportunity for collaboration with the District and COE.

This criterion will continue to be refined as additional river flow and water availability information becomes available from the relevant water management districts within the State of Florida.

<u>St. Johns River</u>

The St. Johns River Alliance in coordination with the District and the Florida Department of Environmental Protection is developing a 4.6 billion dollar restoration plan for the entire river. Some of this money is to go to the purchasing of thousands of acres of land along the river for conservation purposes.

<u>Gulf, Barge Canal, Withlacoochee River</u>

Withlacoochee Creek is dammed where the canal begins, and flows into the Gulf of Mexico after going through a series of locks along the canal (see attached Figure B). The lower reaches of the river are tidally influenced (Gulf of Mexico) and therefore assumed to be brackish. However, the saline extent is unknown at this time.

Direct and indirect affects associated with water withdrawal and discharge would require extensive hydrological modeling.

References

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Hopping Green & Sams 2006. Memoranda dated March 28, 2006 and April 20, 2006.

US Geological Survey

1.1.2.2 Ambient Temperature Requirements

Temperature data were obtained from local weather stations as compiled by the Southeast Regional Climate Center – historical climate summaries and normals – which is part of the National Oceanic and Atmospheric Administration's National Climate Data Center (NOAA NCDC). Closest daily weather stations with a reasonable period of record (e.g., more than 20 years) were selected for each site. Data indicate that each site meets the ambient temperature exclusionary and avoidance criteria addressed in EPRI 2001 (Section 3.1.1.2.2). Maximum and minimum annual temperature values (dry bulb), as well as the highest and lowest average monthly temperatures values, and the annual average monthly mean values, were compared between sites. Actual meteorological conditions at the eight sites, however, may vary from the data collected and evaluated for the closest reporting (representative) weather stations: Inverness for Crystal River; Cross City for Dixie; Okeechobee for Highlands; Mayo for Lafayette; Ocala for Levy 2; Cedar Keys for Levy 3; Palatka for Putnam 3; and Perry for Taylor. The period of record for all sites is 1948 to 2005.

Ambient Temperatures (degrees F)	Highest temp. of record	Highest monthly average	Lowest temp. of record	Lowest monthly average	Annual Monthly Average Mean	Rating
Crystal River	105 (9/7/55) Inverness	91.6 (July)	15 (1/21/85)	44.8 (January)	70.7	**3**
	103 (6/26/50) Cross City	90.6 (July/ August)	10 (1/13/81)	40.4 (January)	68	**3**
REDACTED	99 (8/7/72) Okee-chobee	93 (August)	31 12/28/72	47.7 (Feb)	72.7	**3**
	104 (6/5/85) Mayo	91.6 (July)	7 1/21/85	40.1 (January)	68.2	**3**

Ambient Temperatures (degrees F)	Highest temp. of record	Highest monthly average	Lowest temp. of record	Lowest monthly average	Annual Monthly Average Mean	Rating
Levy 2	105 (6/4/85) Ocala	9 91.8 (August)	11 (1/13/81)	46 (January)	71	3
Redacted	100 (6/226/52) Cedar Keys	89.7 (July and August)	15 (12/13/62)	49.1 (January)	70.8	3
	Palatka 105, 6/25/50	92.4 (July)	11 1/21/85	45.1 Jan	70.9	3
	Perry 104 7/15/80 1948-2005	92 (July)	7 1/21/85	41.29 (January)	68.6	3

Source: www.sercc.net/climateinfo/historical/historical.html [for Florida]
NOAA National Climatic Data Center, Ashville, NC: 2005 Local Climatological Data, Annual Summary with Comparative Data for the following Florida cities: Inverness, Cross City, Okeechobee, Mayo, Ocala, Cedar Keys, Palatka, and Perry, FL.

Discussion/Results – The candidate sites were compared to one another to assess their relative suitability with respect to selected temperature extremes and frequency values.

With the exception of extreme low temperature values, sites with the lowest dry bulb temperatures are considered to be the most suitable. Based on a comparison of highest and lowest temperature (daily extremes), average high and low temperature records, annual average monthly mean temperatures, and consideration of general climate conditions at the sites, the variation in temperatures between site was very small. This is not surprising given that they are located in the same geographic area of central Florida. The differences were small enough such that identical ratings were assigned to each site. In addition, because the temperatures in Florida are, in general, higher than other parts of the country, and the maximum temperatures exceeded 100 in all cases except Highlands at 99, a conservative rating of 3 was given to all sites.

1.1.2.3 Cooling System Summary Rating

The sites were assigned relative ratings for the suitability of the cooling system based on the average of the ratings for cooling water supply and the ambient air temperature characteristics.

Cooling Water	Crystal River	Redacted			Levy 2	Redacted		
Cooling Water Supply	5	3	2	3	3	5	3	5
Ambient Temperature	3	3	3	3	3	3	3	3
Composite Rating	4	3	2	3	3	4	3	4

1.1.3 Flooding

Objective – The objective of this criterion is to evaluate the suitability of the candidate sites with respect to potential flooding. Some potential sites are located within the 100-year floodplain and may not meet the exclusionary and avoidance criteria outlined in EPRI 2001 (Section 3.1.1.3). These criteria exclude potential sites within major wetlands and areas less than one foot above the maximum flood elevation.

Evaluation Approach – The relative suitability of the candidate sites was evaluated with respect to flooding in the Preliminary Screening Evaluation, but was limited to a comparison of existing surface water elevations and anticipated (and approximate) plant elevations. A further comparison was conducted in this detailed evaluation, between site grade elevation and the 100-year flood elevation for the major river on which the plant is located. The 100-year flood elevations were based on Flood Insurance Rate Maps (FIRM) from FEMA for the respective counties in which the sites are located. Primary emphasis was on flood elevations for the main water bodies (rivers and reservoirs) and their major tributaries where flood elevations were identified. Finally, other potential flooding sources (e.g., upstream dam failure concerns) were also considered.

Because of the more accurate floodplain data and consideration of upstream dam failure concerns, the rating scale was modified from that used in the Preliminary Screening Evaluation. The revised scale is as follows:

5 if site is not located within 100-year floodplain, and no potential upstream flooding concerns exist (e.g., dam failure).
4 if site is not located within 100-year floodplain, but potential upstream flooding concerns exist.
3 if site is on border of 100-year floodplain.
2 if site is located within 100-year floodplain, but no potential upstream flooding concerns exist.
1 if site is located within 100-year floodplain, and potential upstream flooding concerns exist.

The relative suitability of the eight sites with respect to flooding was evaluated during the previous screening phase in the screening criteria report (Criterion P2).

Discussion/Results – Additional pertinent flood related information for the candidate sites is shown in the following table, followed by the site ratings.

Site	Evaluation
Crystal River	Crystal River site elevation = 9 feet. 100-year flood elevation 13 feet (Gulf of Mexico). Site is located within 100-year floodplain (4 feet below flood elevation, zone A12).
[redacted]	[redacted]
Levy 2	[redacted] Lake Rousseau elevation ~ 33 feet. Site is not located within 100-year floodplain (zone C). The dam on Lake Rousseau (Inglis Dam) is located ~ 3 miles south of the site. The site would not likely be compromised in the event of failure of the dam.
[redacted]	[redacted]

Flooding	Crystal River	Redacted			Levy 2	Redacted		
Rating	2	3	1	2	5	3	5	3

References

FEMA Digital Flood Insurance Rate Maps, http://www.msc.fema.gov/.

USGS Topographic Maps.

1.1.4 Nearby Hazardous Land Uses

1.1.4.1 Existing Facilities

1.1.4.2 Projected Facilities

Objective – The objective of this criterion is to include NRC guidance on considerations regarding the nature and proximity of man-related hazards (dams, airports, transportation routes, and military and chemical manufacturing and storage facilities).

Evaluation approach – For the purpose of this evaluation, it was assumed that all eight sites can be developed to meet the exclusionary criteria outlined in 10 CFR 100. The suitability of the candidate sites was, therefore, evaluated based on the relative number and distance of the following off-site man-made hazards that could be identified on USGS topographic maps, supplemented by information found in existing environmental reports for each site. The evaluation was limited to only existing hazards within a 5- to 10-mile radius of each site, to the extent such information was available. This included primarily airports, pipelines, and rail. Note that information relating to projected man-made hazards was not readily available and could not be evaluated during this phase of the siting process.

The relative suitability of the eight sites with respect to nearby hazardous land uses was evaluated in the screening criteria report (Criterion P4), although the rating approach was revised slightly to better reflect a comparison of the eight candidate sites (as compared to the 20 sites evaluated previously). The following revised scale was used:

5 = No major or minor hazardous land uses within 10 miles
4 = No major hazardous land uses within 10 miles, but minor hazardous land uses within 10 miles (single or multiple, e.g., landing strips or small airports)
3 =No major hazardous land use within 10 miles but minor hazardous land use within 5 miles (single or multiple)
2 = Major hazardous land use within 10 miles or multiple minor hazardous land use within 5 miles (multiple).
1 = Major hazardous land use within 5 miles.

Discussion – To summarize from the screening evaluation, identified hazards at each of the sites are as follows:

Crystal River

Airports: JRS landing strip 8.2 miles Northeast, Crystal River Homosassa Airport 9.9 miles Southeast.

Freight Rail: Assumed immediate vicinity due to co-location with Crystal River Energy Complex.

Pipeline: None within 10 miles.

Military Installation: None located near site.

Other Potential Hazards: Crystal River Energy Complex immediate vicinity, assumed power transmission line immediate vicinity, Power Plant 4.2 miles North; Quarry/mining operations immediately north of the site.

[redacted]

Redacted

Levy 2

Airports: JRS landing strip 4.3 miles Southeast.

Freight Rail: Seaboard Coast RR 5.3 miles Southeast and 8.6 miles East, no passenger service.

Pipeline: None within 10 miles.

Military Installation: None located near site.

Other Potential Hazards: Power transmission line 3.4 miles West, Power Plant 5.0 miles Southwest, gas station 8.4 miles East, Crystal River Energy Complex 8.4 miles Southwest.

Military Installation: None located near site.

Other Potential Hazards: Electrical substation 9.8 miles Northeast.

[redacted]

Redacted

Nearby Hazardous Land Uses	Crystal River	Redacted			Levy 2	Redacted		
Rating	1	3	3	3	2	3	2	3

References

Google Earth, http://earth.google.com.

USGS Topographic Maps

1.1.5 Extreme Weather Conditions

1.1.5.1 Winds

1.1.5.2 Precipitation

Objective – The objective of this criterion is to rate the suitability of the eight candidate sites with respect to extreme weather conditions. Extreme weather conditions of interest are related to specific PPE criteria regarding tornado design, wind and precipitation (EPRI Siting Guide, Section 3.1.1.5).

Evaluation approach – During the review of available meteorological information on the sites, no information was found that indicated the eight sites could not meet the exclusionary and avoidance criteria specified for the PPE values. Extreme weather readily available for the eight sites included fastest mile speed (available for selected cities – although not necessarily the most representative of site conditions); number of tornadoes and violent tornadoes per 10,000 square miles (state average); and maximum 24-hour precipitation values. The number of hurricanes making landfall in Florida was also considered. Available extreme weather data were obtained from government sources (National Climate Data Center and Southeast Regional Climate Center), including NCDC Climatic Wind Data for US [ncdc.noaa.gov/documentlibrary/pdf/wind1996.pdf.].

Discussion/Results – Rating of the sites was performed based on a comparison of fastest mile (wind) speeds, maximum 24-hour precipitation and severe storm records, although greater emphasis was placed on the most distinguishing site feature – site location in relation to the coast – as an indicator of greater probability of hurricane threat – and the number of hurricanes to hit Florida (broken up into four geographic quadrants) as follows:

Hurricane direct hits on the mainland U.S. coastline and for individual states 1851-2004 by Saffir/Simpson category.

Area	Category Number					All (1-5)	Major (3-5)
	1	2	3	4	5		
U.S. (Texas to Maine)	109	72	71	18	3	273	92
Florida	43	32	27	6	2	110	35
(Northwest)*	27	16	12	0	0	55	12
(Northeast)*	13	8	1	0	0	22	1
(Southwest)*	16	8	7	4	1	36	12
(Southeast)*	13	13	11	3	1	41	15

- Assume Southeast area includes Highlands site; Northeast area includes Putnam 3 site; and remaining 6 sites are all located in the Northwest area of Florida.
- Hurricane that may strike more than one region in Florida would be counted separately for each region (i.e., individual regional totals may exceed state totals)

Source: National Hurricane Center at http://www.nhc.noaa.gov/paststate.shtml

Site	Fastest Mile (1970-2001)	Tornado Frequency/ Strong violent tornadoes Average per 10,000 sq mi/ [state average]	Proximity to Coast/ Hurricane Threat	Hurricane direct hits on Florida region (1851-2004)	Maximum 24-hr precis.
Crystal River	67 (Tampa)	8.4/1.2	Coast	55 (12 major)	9.54 (Inverness)

Redacted

Levy 2	67 Tampa	8.4/1.2	Semi -Coast	55 (12 major)	11.72 (Ocala)

Redacted

In general, the sites were fairly similar and were assigned equally conservative ratings of 3 (given the narrow width of Florida, even inland sites can be affected by hurricanes), with the exception of the three coastal sites: Crystal River, Redacted nd Redacted Given their proximity to the coast and higher potential for extreme storm events (precipitation, winds, and number of hurricanes) compared to the other sites, they were given ratings of 2. Redacted was further reduced to a 1 since it is close to the coast on two sides (west and south) and also Redacted which had the highest 24-hour maximum rainfall of the sites.

Extreme Weather Conditions	Crys Ri	Redacted			Levy 2	Redacted		
Rating	2	3	3	3	3	1	3	2

1.2 ACCIDENT EFFECTS-RELATED

Objective – The overall objective of this criterion is to evaluate sites with respect to the evaluation of design-related accident evaluations and potential effects of accidents.

Evaluation approach – Site ratings for this criterion are developed as a composite of three sub-criteria that address site characteristics relevant to consideration of accidents: Population, Emergency Planning Considerations, and Atmospheric Dispersion.

Discussion/Results – A discussion of each of the sub-criteria appears in the following sections 1.2.1, 1.2.2, and 1.2.3. A discussion of the roll-up of the sub-criterion ratings into a single rating for the Accident-Effects-Related criterion appears in Section 1.2.4.

1.2.1 Population

Objective - The objective of this criterion is to evaluate the relative suitability of the candidate sites with respect to the population density in the vicinity of the sites. For the purposes of this evaluation, it was assumed the existing licensed units at three of the candidate sites meet the population density conditions codified in 10CFR100.21. These conditions are:

- the sites have exclusion area authority,
- a low population zone exists beyond the exclusion area, and
- sufficient distance exists to high population centers.

Evaluation approach - As outlined in Regulatory Guide 4.7, low population areas are preferred and low population zones should have densities less than 500 people per square mile (EPRI 2001) (equivalent to less than 25,000 persons within 4 miles).

All sites meet population density exclusion criteria since population density was a criterion in the regional screening process. Available census data regarding the nearest population centers and area population densities were reviewed for the candidate sites in the screening criteria report

(Criterion P3), and confirmed that each met the exclusion criteria. On-line data were obtained from the US Census Bureau.

Discussion/Results

Ratings and the population data and distance to population centers that drive the ratings are presented for each site in the following table; additional detail on population data for each site is provided in the succeeding tables.

Florida's seasonal population was also factored in as follows:

- Total population calculated based on Census Bureau year-round population data plus tourist population.
- Assume increase due to seasonal/tourist population is directly related to the percentage of housing units classified for seasonal, recreational or occasional use.

Nearest Population Center (2000 Population)	Distance (miles)	Population and Population Density (By County)	Notes
		Crystal River (Citrus County)	
Donnellon (1898) Ocala (45,943)	16 miles 38 miles	Population - 118,085 Pop. Density - 202.3 persons per square mile (psm) Population with tourist population included (8.3% increase to 127,886)	1 population center within 20 miles 1 densely populated area within 40 miles Ocala (pop density of 1189.2 psm)

[redacted]

Redacted

Redacted

Nearest Population Center (2000 Population)	Distance (miles)	Population and Population Density (By County)	Notes

Redacted

Levy 2 (Levy County)			
Donnellon (1898) Ocala (45,943)	8 miles 29 miles	Population – 34,450 Pop. Density – 30.8 psm Population with tourist population included *(6.5% increase to* 36,689)	1 population center within 10 miles 1 densely populated area within 30 miles Ocala (pop density of 1189.2 psm)

[redacted]

Redacted

Based on the above information, the following site ratings were assigned:

Population	Crystal River	Redacted			Levy 2	Redacted		
County population	3	5	4	5	5	5	4	5
Distance to Pop Center	4	2	2	5	2	4	2	5
Number of/proximity to densely populated area	4	4	4	4	3	5	3	5
Rating	4	4	3	5	3	5	3	5

1.2.2 Emergency Planning

Objective – The objective of this criterion is to evaluate the relative suitability of the eight candidate sites with respect to emergency planning characteristics of the general area around each site. (No exclusionary or avoidance criteria apply to this issue.) In particular, this evaluation relied on information pertaining to general population in surrounding area, road conditions near site, access to major traffic networks, terrain features, and climatic conditions.

Evaluation approach – Sites with the least constrained evacuation planning issues (low population, good access from site to major traffic networks and no terrain or climate limitations) were considered the most suitable and were assigned a score of 5. Ratings are based on review of county websites (transportation information), USGS topographic maps, and best professional judgment. Ratings relate to extent of development in the general area, the number of roads providing egress from the site area, and proximity to major US highway systems. In general, the areas with lower population are found in more rural areas with less developed traffic networks, so the two factors balanced one another out.

Discussion/Results – A summary of information for each site is shown in the table below. In general, the sites with lower population were found in the more rural areas with less developed traffic networks, so the two factors balanced one another out. In general, given Florida's flat topography, no limiting terrain features were identified. Limiting climate conditions identified for the coastal sites included the potential for hurricanes. Site ratings follow the table.

Site	Evaluation
Crystal River	Site is located ~ 3 miles west of Red Level, FL and ~ 8 miles northwest of Crystal River, FL. U.S. Highway 19 is located ~ 3 miles east of the site and provides the main access to the area. Interstate 75 is located ~ 35 miles east of the site. Area evacuation is possible in three directions, being limited to the west by the Gulf of Mexico. Florida is prone to impact by hurricanes, and site evacuations coinciding with such climatic conditions would be hampered. The site is adjacent to the Crystal River Energy Complex, and brings the advantage of already having an Emergency Plan that could easily be adapted to include the new site. However, both sites would require evacuation under emergency conditions.

REDACTED

[redacted]

Redacted

[redacted]

REDACTED

Levy 2	Site is located within 4 miles north of State Highway 40, which runs along the northern shore of Lake Rousseau. Site is located within 4 miles east of U.S. Highway 19/98 at Inglis, FL, and ~ 9 miles west of U.S. Highway 41 at Dunnellon, FL. Interstate 75 is located ~ 30 miles northeast of the site at Ocala, FL. Area evacuation is possible in three directions, being limited to the west by the Gulf of Mexico. Florida is prone to impact by hurricanes, and site evacuations coinciding with such climatic conditions would be hampered.

REDACTED

Site	Evaluation
[redacted]	[redacted] Redacted [redacted]

Emergency Planning	Crystal River		Redacted		Levy 2		Redacted	
Rating	3	3	4	4	3	3	4	3

References

Rand McNally Road Atlas.

USGS Topographic Maps.

1.2.3 Atmospheric Dispersion

Objective – The objective of this criterion is to evaluate the suitability of the eight candidate sites with respect to short-term atmospheric dispersion characteristics, as a measure of the relative level of concentrations that could occur during accident conditions at the sites.

Evaluation Approach – The efficiency of atmospheric diffusion is primarily dependent on wind speed, wind direction, and the change in air temperature with height which affects atmospheric stability. These factors are used to calculate an atmospheric dispersion function referred to X/Q.

Discussion/Results – The best way to calculate atmospheric dispersion (X/Q) is using on-site meteorological data; however, no such data were readily available for all candidate sites. Sites near the coast would generally experience windier conditions, and were given a rating of 5. Inland locations would generally experience less wind, and were given a rating of 4. Should atmospheric dispersion become a sensitive criterion for site selection, site-specific meteorological data should be obtained to calculate an atmospheric dispersion function (X/Q) for more accurate site comparison.

Site	Evaluation
Crystal River	Site is located in Gulf of Mexico coastal region
	Redacted
Levy 2	Site is located ~ 10 miles inland from the Gulf of Mexico.

Redacted

Redacted

Atmospheric Dispersion	Crystal River	Redacted			Levy 2	Redacted		
Rating	5	4	4	4	4	5	4	5

Finally, composite ratings for this criterion (Accident Effects) are a composite of those for sub-criteria 1.2.1, 1.2.2, and 1.2.3; the ratings for these sub-criteria, along with the summary rating for this criterion, are provided in the following table.

Sub-criterion	Crystal River	Redacted			Levy 2	Redacted		
Population	4	4	3	5	3	5	3	5
Emergency Planning	3	3	4	4	3	3	4	3
Atmospheric Dispersion	5	4	4	4	4	5	4	5
Overall Rating	4	4	4	4	3	4	4	4

1.3 <u>OPERATIONAL EFFECTS-RELATED</u>

1.3.1 Surface Water – Radionuclide Pathway

1.3.1.1 <u>Dilution Capacity</u>
1.3.1.2 <u>Baseline Loadings</u>
1.3.1.3 <u>Proximity to Consumptive Users</u>

<u>Objective</u> – The purpose of this criterion is to evaluate candidate sites with respect to potential liquid pathway dose consequences. (No site exclusionary or avoidance criteria apply to this issue.) Besides potential source terms, dilution in the receiving surface water body is of primary importance. Three factors considered in evaluating the potential dilution for a receiving water body are dilution capacity, baseline loadings, and proximity to consumptive users.

Evaluation Approach – Site ratings for this criterion are developed as a composite of three sub-criteria that address site characteristics relevant to consideration of operation: Dilution Capacity, Baseline Loadings, and Proximity to consumptive users.

- Dilution Capacity - The purpose of this sub-criterion is to rate sites based on the overall capacity of the receiving water body to dilute effluents from a nuclear power plant. Information on the radioactive source term dilution at a new power plant will be site specific. For siting consideration where such information is not available, however, surrogate parameters, representing the dilution capacity of a stream, can be used. The greater the dilution capacity of the receiving water body, the shorter will be the mixing length downstream defined as the zone within which complete mixing of a discharge contaminant occurs. Sites with higher dilution capacity are rated higher.

- Baseline Loadings – The capacity of a stream to impact health and safety of downstream consumers is related to the existing, or baseline loadings of, radionuclides that are present in the system or can be anticipated in the future. The purpose of this sub-criterion is to characterize sites in accordance with existing levels of radioactive contamination in the receiving water body. Sites are given a rating of 5 for no baseline loadings; proportionally lower ratings are assigned as higher existing levels of radionuclide contamination are identified.

- Proximity to consumptive users - The purpose of this sub-criterion is to rate sites in accordance with the proximity of plant effluent release point to the location(s) public water supply withdrawal(s). More proximal withdrawals present higher potential for dose impacts from the surface water ingestion pathway and can require additional design and licensing efforts. Downstream locations of public water supply withdrawals and recreational contact were identified for each site. Sites with greater pathway lengths to users were more suitable and were assigned a score of 5.

Discussion/Results – An evaluation of each site and a summary of the sub-criterion and overall ratings for the surface water-radionuclide pathway criterion are presented in the following tables.

Site	Evaluation
Crystal River	Dilution Capacity: The Gulf of Mexico is the receiving body of water from the site and is sufficiently large to easily dilute effluents from a nuclear power plant. Baseline Loading: While an existing nuclear power plant is located near the site, the receiving body of water is sufficiently large to render any baseline radionuclide loadings negligible. Proximity to Consumptive Users: No downstream locations of public water supply withdrawals were identified for the site.

Site	Evaluation
[redacted] Redacted [redacted]	
Levy 2	Dilution Capacity: Lake Rousseau, the Withlacoochee River, and the Barge Canal are the receiving bodies of water from the site. These receiving bodies enter the Gulf of Mexico within 10 miles. The receiving bodies of water from the site are sufficiently large to easily dilute effluents from a nuclear power plant. Baseline Loading: No sources of baseline radionuclide loadings were identified for the site. Proximity to Consumptive Users: No downstream locations of public water supply withdrawals (either on the Withlacoochee River or on the Barge Canal) were identified for the site – nearby communities use groundwater sources.

Redacted

Site	Evaluation
[redacted]	[redacted]

Redacted

Site	Dilution Capacity	Baseline Loadings	Proximity to Downstream public water supply	Composite Rating
Crystal River	5	5	5	5
	3	5	5	4
	2	5	3	4
	3	5	5	4
Redacted	4	5	5	5
	5	5	5	5
	3	5	3	4
	5	5	5	5

Ratings for dilution capacity are directly related to average annual river flow.

Dilution Capacity

- The receiving body of water for the Crystal River, Levy 2 [redacted], and [redacted] sites (Gulf of Mexico) is large enough to efficiently dilute effects from a nuclear power plant; Levy 2 rating is slightly lower since its discharge will enter the Gulf through a short distance along the barge canal or lower reaches of the Withlacoochee River.
- The receiving body of water for the [redacted] and [redacted] sites (Suwannee River) and the [redacted] site (Kissimmee River) will dilute effects from a nuclear power plant, but are not as large as the receiving bodies of water at other sites. [redacted] receives a slightly lower rating since flow is the Kissimmee is variable and flow data are unavailable.

Baseline Loadings

- All sites but the Crystal River site are located in an area where no current radiological operations exist. Crystal River would discharge to the Gulf of Mexico, a receiving body large enough to render any baseline loadings as negligible.

Proximity to Consumptive Users

- Preliminary information indicated that essentially all drinking water in western Florida comes from groundwater (e.g., this is true for the Suwannee Water Management District) such that there would be no surface water withdrawals (intakes) for public drinking water downstream of the following sites – Crystal River, [redacted] Levy 2 and 3, and [redacted] Also, Crystal River, [redacted] and [redacted] sites are coastal sites and so are unlikely to be located upstream from public drinking water users. There do appear to be public drinking water supply users downstream from the [redacted] and [redacted] sites, although these counties also obtain drinking water from groundwater.

References

REDACTED

Estimated Water Use 2002, Southwest Florida Water Management District.

Florida Department of Environmental Protection, Outstanding Florida Waters Fact Sheet [http://www.dep.state.fl.us/water/wqssp/ofwfs.htm]

Florida Department of Environmental Protection, Section 303(d) List [http://www.dep.state.fl.us/water/tmdl/303drule.htm]

Florida Department of Environmental Protection, 2004. Integrated Water Quality Assessment for Florida, 2005 305(b) Report and 303(d) List Update. Division of Water Resource Management, Bureau of Watershed Management, Tallahassee, FL

USGS Topographic Maps

Water Use in the St. Johns River Water Management District, Technical Fact Sheet SJ2004-FS1, 2000.

1.3.2 Groundwater Radionuclide Pathway

Objective – The purpose of this section is to evaluate the candidate sites with respect to the relative vulnerability of shallow groundwater resources to potential contamination.

Evaluation Approach – All candidate sites overlie aquifers that have not been designated by EPA's (1986) classification scheme. EPA guidelines were, however, used to assign a designation to candidate site aquifers. In addition, the relative vulnerability of these aquifers to groundwater pollution was evaluated using a standard numerical ranking system called DRASTIC (Aller et al. 1987). Sites considered most suitable are those that are least vulnerable to groundwater contamination within a 2-mile radius of a site.

Discussion/Results – Class I groundwater is addressed as an avoidance criteria (EPRI 2000). This classification includes groundwater resources of unusually high value. They are highly vulnerable to contamination and are irreplaceable sources of drinking water and or ecologically vital. Groundwater underlying the candidate sites are either currently used or are potential sources of drinking water, hence, they would be considered Class II aquifers according to the EPA classification guidelines. There are no sole source aquifers at the six Progress sites. One site, Highlands, is located in the recharge zone for the Biscayne Aquifer in south Florida. EPA has designated the Biscayne Aquifer a sole source aquifer. The Redacted site, while not located above the Biscayne Aquifer, would have a potential for contamination since it is located within the aquifer's recharge zone. Projects that receive Federal financial assistance and have the potential to contaminate a sole source aquifer are subject to EPA review.

The DRASTIC evaluation was completed using site-specific data, where available, or data from published sources. The most important variables that control the groundwater pollution potential are:

- D–Depth to water,
- R–Recharge (net),
- A–Aquifer media,
- S–Soil media,
- T–Topography (slope),
- I–Impact of the vadose zone,
- C–Conductivity (hydraulic) of the groundwater flow system.

DRASTIC assigns a weighted numeric value to each characteristic, depending on its relative contribution to risk of groundwater contamination. This results in a numeric ranking for each site, allowing the sites to then be ranked in order of suitability. The higher an area scores on the DRASTIC index, the more susceptible a site is to groundwater contamination. Following is a summary of the DRASTIC evaluations.

Crystal River				
DRASTIC Variable	**Range and Source of Information**	**Weight**	**Rating**	**Number**
Depth to water	10 ft bgs (Crystal River FSAR)	5	9	45
Net Recharge	10^+ in/yr (Crystal River FSAR)	4	9	36
Aquifer Media	Karst Limestone (Crystal River FSAR)	3	9	27
Soil Media	Sandy Loam (Crystal River FSAR)	2	6	12
Topography	Less than 1% (USGS site topographic maps)	1	10	10
Impact Vadose Zone	Sand with significant silt and clay (Crystal River FSAR)	5	6	30
Hydraulic Conductivity	1000 - 2000 gpd/ft^2 (Driscoll, 1986; DRASTIC, 1987)	3	8	24
			INDEX	**184**

[redacted]

Redacted

[redacted]

Redacted

[redacted]

Redacted

[redacted]

Levy 2				
DRASTIC Variable	**Range and Source of Information**	**Weight**	**Rating**	**Number**
Depth to water	10 ft bgs (USGS topographic maps)	5	9	45
Net Recharge	10^{+} in/yr (Crystal River FSAR)	4	9	36
Aquifer Media	Karst Limestone (Crystal River FSAR)	3	9	27
Soil Media	Sandy Loam (Crystal River FSAR)	2	6	12
Topography	Less than 1% (USGS topographic maps)	1	10	10
Impact Vadose Zone	Sand with significant silt and clay (Crystal River FSAR)	5	6	30
Hydraulic Conductivity	1000 - 2000 gpd/ft^2 (Driscoll, 1986; DRASTIC, 1987)	3	8	24
			INDEX	**184**

[redacted]

Redacted

[redacted]

Redacted

[redacted]

DRASTIC indexes for all typical hydrogeologic settings range from 65 to 223 (Aller et al. 1987, p. 82). This range of indexes was used to develop a ranking system to compare vulnerability of candidate sites, as follows:

DRASTIC Index Range	Relative Vulnerability	Rating
65–98	Low	5
98–132	Low to Moderate	4
132–166	Moderate	3
166–199	High	2
199–233	Very High	1

Based on these DRASTIC Index Ranges for qualitative vulnerability, candidate sites were ranked as follows:

Candidate Site	DRASTIC Index	Rating
Crystal River	184	2
	190	2
Redacted	163	3
	190	2
Levy 2	184	2
	184	2
Redacted	184	2
	200	1

References:

Aller, L., Bennett, T., Lehr, J., Petty, R. and G. Hackett. 1987. DRASTIC: A Standardized System for Evaluating Ground Water Pollution Potential Using Hydrogeologic Settings. EPA/600/2-87/035, June 1987.

DRASTIC: A Standardized System for Evaluating Ground Water Pollution Potential Using Hydrogeologic Settings; EPA Manual, 1987.

Driscoll, Fletcher G., Groundwater and Wells, 1986.

EPA, 1986. Guidelines for Groundwater Classification Under the EPA Groundwater Protection Strategy, Office of Groundwater Protection.

EPA, 2005. Source Water Protection. Sole Source Aquifer Program.

Florida Environment Online, Southeastern Geological Society, Hydrogeological Units of Florida.

Florida Geological Survey, Data and Maps, County Geologic Maps.

Florida Geological Survey, Florida's Geological History and Geological Resources, Special Publication No. 35, 1994.

Florida Geological Survey, Geologic Framework of the Lower Floridan Aquifer System, Brevard County, Florida, Bulletin No. 64, 1994.

Florida Geological Survey, Geologic Map of Florida, 2001.

Florida Geological Survey, Text to Accompany the Geologic Map of Florida, open-file report 80, 2001.

Florida Power, A Progress Energy Company. FSAR – Crystal River, Revision 29.

USGS, 1985. Sinkhole Type, Development, and Distribution in Florida.

USGS. South Florida Information Access. Lithostratigraphic Units.

USGS. Topographic Maps of Florida, various.

1.3.3 Air Radionuclide Pathway

1.3.3.1 Topographic Effects

1.3.3.2 Atmospheric Dispersion

Objective – The purpose of this criterion is to address the relative suitability of sites with respect to the potential for exposure to the public from routine airborne releases from a nuclear power plant.

Evaluation approach – The criterion is comprised of two suitability characteristics:

> Topographic Effects – Site ratings are based on whether there are any significant topographic features that would materially affect dispersion of the plume from plant releases (e.g., channeling of releases from a site located low in a high-banked river valley).
>
> Atmospheric Dispersion – Measured in terms of long term (e.g., annual average X/Q) dispersion characteristics. Sites with lower X/Q values are rated higher than those with less favorable dispersion conditions.

Discussion/Results – None of the sites are believed to have significant potential for negative topographic effects on long-term dispersion; however, final site locations have not been identified for several of the sites. Annual average X/Q values were unavailable for candidate sites. Sites near the coast would generally experience windier conditions, and were given a rating of 5. Inland locations would generally experience less wind, and were given a rating of 4. Should atmospheric dispersion become a sensitive criterion for site selection, site-specific meteorological data should be obtained to calculate an atmospheric dispersion function (X/Q) for more accurate site comparison.

Site	Evaluation	Ranking
Crystal River	Site is located in Gulf of Mexico coastal region	5
	Redacted	4
		4

Site	Evaluation	Ranking
	Redacted	
Levy 2	Site is located ~ 10 miles inland from the Gulf of Mexico.	4
		5
	Redacted	4
		5

The proposed site ratings with respect to radionuclide exposure via airborne releases are as follows:

Air Radionuclide Pathway	Crystal River	Redacted			Levy 2	Redacted		
Rating	**5**	**4**	**4**	**4**	**4**	**5**	**4**	**5**

References

USGS Topographic Maps.

1.3.4 Air-Food Ingestion Pathway

Objective – The objective of this criterion is to rate candidate sites in terms of the relative potential for exposure of humans to radioactive emissions through deposition of radioactive materials on food crops with subsequent consumption of foodstuffs by exposed individuals.

Evaluation approach – A potential exposure pathway for nuclear power plants is the emission of radionuclides into the food chain on local crops and pastures. Radiological doses and dose commitments resulting from a nuclear plant are well and known and documented. While the operational impacts on the public through food pathway exposures are negligible, sites with lower amounts of crop and pasture land uses are considered to be more suitable. No exclusionary or avoidance criteria apply to this issue. Sites with less crop production nearby are rated higher than those with larger agricultural industries.

Discussion/Results - General information regarding crop lands and pastures near the sites is summarized in the table below.

Site	Evaluation	Ranking
Florida (entire state)	Agriculture (farmland) represents 10,414,877 acres out of 34,513,280 acres in Florida (30%). Out of total farmland, **3,715,257** acres are planted in crop (36%).	N/A
Crystal River	Agriculture (farmland) represents 47,209 acres out of 373,760 acres in Citrus County (13%). Out of total farmland, **12,331** acres are planted in crop (26%). Other farmland is used for cattle (6,882 head), hogs and pigs (210 head), and poultry (1,094 layers).	4

Site	Evaluation	Ranking
[redacted]		4
		1
		3
Levy 2	Agriculture (farmland) represents 180,314 acres out of 715,520 acres in Levy County (25%). Out of total farmland, **69,859** acres are planted in crop (39%). Other farmland is used for cattle (48,691 head), hogs and pigs (1,078 head), sheep (105 head), and poultry (430 layers).	3
[redacted]		3
		3
		5

Air-Food Ingestion Radionuclide Pathway	**Crystal River**	Redacted					
Rating	**4**	**4**	**1**	**3**	**3**	**3**	**3**	**5**

References

Florida MapStats, http://www.fedstats.gov/qf/states/12000.html.

National Agricultures Statistics Service (2002 Census of Agriculture) for Florida, http://151.121.3.33:8080/Census/Create_Census_US_CNTY.jsp.

1.3.5 Surface Water – Food Radionuclide Pathway

Objective – The purpose of this criterion is to evaluate the relative suitability of sites in terms of the specific use of irrigation water by downstream locations as a potential pathway for potential exposure.

Evaluation approach – Sites with the fewest number of downstream irrigation uses are more suitable and are rated higher than sites with a large number of downstream irrigation withdrawals. No exclusionary or avoidance criteria apply to this issue (EPRI 2001).

Discussion/Results – General information regarding irrigated lands near the sites is summarized in the table below.

Site	Evaluation	Ranking
Florida (entire state)	Total irrigated land represents 1,815,174 acres out of 10,414,877 acres of farmland in Florida (17%).	N/A
Crystal River	Total irrigated land represents 867 acres out of 47,209 acres of farmland in Citrus County (2%). Withdrawals of water for irrigation downstream of the site are not expected as the [redacted]	5
[redacted]		4
		3
		4
Levy 2	Total irrigated land represents 19,501 acres out of 180,314 acres of farmland in Levy County (11%). Withdrawals of water for irrigation downstream of the site are not expected as the site is located very near the Gulf of Mexico.	5
Redacted		5
		4

Site	Evaluation	Ranking
	Redacted	5

Surface Water-Food Radionuclide Pathway	Crystal River	Redacted			Levy 2	Redacted		
Rating	5	4	3	4	5	5	4	5

References

National Agricultures Statistics Service (2002 Census of Agriculture) for Florida, http://151.121.3.33:8080/Census/Create_Census_US_CNTY.jsp.

1.3.6 Transportation Safety

Objective - The objective of this criterion is to evaluate the suitability of the eight candidate sites with respect to potential to create fog and ice hazards to local transportation. No exclusionary or avoidance criteria apply to this issue.

Evaluation approach – Potential impacts from plant operations on transportation safety could occur as a result of increased hazards from cooling towers. Both natural draft and mechanical cooling towers can increase area fogging conditions ice formation on local roads and highways. Sites with high frequencies of naturally-occurring fog and ice events will likely be more adversely affected by cooling tower operations.

Discussion/Results - Relative information regarding existing fog and ice conditions was not readily available for candidate sites; however, cooling tower fogging or icing is not expected to be a major issue at any of the sites, given their general weather patterns, nor is it expected to be a major site discriminator. Accordingly, and in the absence of site specific data, all sites are given a conservative rating of 3 with respect to this criterion.

Transportation Safety	Crystal River	Redacted			Levy 2	Redacted		
Rating	3	3	3	3	3	3	3	3

Of additional concern is the construction of tall facilities in the vicinity of airports. The Florida Department of Transportation (FDOT) is responsible for governing construction of tall structures within a 10 nautical-mile radius of military or public-use aviation facilities. Structures that would require approval include those more than 200 feet above ground level and those exceeding a 100:1 slope within 20,000 feet (3.8 miles) of such facilities. While application for Airspace Obstruction Permits would be required, agency approvals are expected to be easily granted.

References

Airspace Obstructions, http://www.dot.state.fl.us/aviation/pdfs/Airspace_Obstructions.pdf

Airport Obstructions Standards Committee Decision Document #02b, September 2004. http://www.aosc.faa.gov/documents/DRAFT_AOSC_DecisionDocument_02b_Sep13_2004.pdf

2. ENVIRONMENTAL CRITERIA

2.1 CONSTRUCTION-RELATED EFFECTS ON AQUATIC ECOLOGY

2.1.1 Disruption of Important Species/Habitats

Objective – The objective of this criterion is to evaluate the candidate sites with respect to potential construction related impacts on aquatic or marine ecology. Regulatory Guide 4.7 defines important plant and animal species if one or more of the following conditions apply.

- the species is commercially or recreationally valuable,
- the species is officially listed as endangered (E) or threatened (T),
- the species effects the well being of another species within (1) or (2) above,
- the species is a critical component of the structure and function of a valuable ecosystem, or
- the species is a biological indicator of radionuclides in the environment.

Of particular concern are potential impacts to habitat areas used by important species. These areas include those used for:

- breeding and nursery,
- nesting and spawning,
- wintering, and
- feeding.

Evaluation approach – The following siting criteria were used to evaluate the eight candidate sites.

- Exclusionary – Designated critical habitat of endangered species
- Avoidance – Areas where threatened and endangered species are known to occur.
- Suitability – Areas where limited potential impact is expected

No information was obtained which would indicate that any of the sites under consideration would exceed the exclusionary or avoidance criteria relative to ecology. Therefore, the evaluation focused on the relative suitability of the site based on the number of areas where limited potential impact is expected. The number of potential impact areas was directly correlated to the number of rare, threatened and endangered (RTE) aquatic species that may occur in the host county, their habitat (based on existing reports and professional judgment of the amount and quality of habitat available for species), and flexibility (professional judgment of the amount of space within the site circle to avoid known locations of protected species during construction of the facility). Note that the evaluation was limited to the plant site and not existing or potential (future) transmission corridors.

The suitability of the candidate sites with respect to ecology (rare, threatened and endangered aquatic and terrestrial species, and critical habitat) was initially evaluated in the screening criteria report (Criterion P5, which included Federally protected aquatic and terrestrial species combined). Additional site ecological information specific to aquatic resources at each site is included in the full discussion below. In the context of this discussion, vicinity refers to the county in which the candidate site is located.

Discussion

Crystal River

Six Federally listed protected aquatic species are found in Citrus County and have the potential to occur in the vicinity of the Crystal River Nuclear Plant 2 site (Citrus County): one mammal species, four reptile (turtle) species, and one fish species. They are identified in the table below.

Scientific Name	Common Name	Federal Status
Trichechus manatus latirostris	West Indian (Florida) Manatee	E Critical habitat
Chelonia mydas	Green Sea Turtle	E
Dermochelys coriacea	Leatherback Sea Turtle	E
Caretta caretta	Loggerhead Sea Turtle	T
Lepidochelys kempii	Kemp's ridley Sea Turtle	E
Acipenser oxyrhynchus desotoi	Gulf Sturgeon	T

Citrus County is one of four counties called the Nature Coast, the most accessible part of the Gulf Coast in Central Florida. The floodplain forests and feeder lakes of the Withlacoochee River define the interior of the region, while vast estuaries along the coast fringe its western border. According to the Citrus County profile, Citrus County is home to the largest herd of wintering manatees in the nation – 380 as of January 10, 2006, and record numbers were recorded in 2005. A permanent population resides in rehab at the Homosassa Springs State Wildlife Park to the south of the site. Thirty springs protected by the Crystal River National Wildlife Refuge (NWR) in Crystal River serve as critical wintering grounds for nearly 20 percent of the nation's manatee population. In addition, 14 endangered whopping cranes were recently flown down from Wisconsin to make Citrus County their winter home – at the Chassahowitzka National Wildlife Refuge, also south of the site.

Crystal River and Kings Bay, just south of the Crystal River site, form a unique hydrologic system. The tidally influenced Kings Bay is the headwater of Crystal River which forms at the northwest corner of the bay. Six miles west of the Kings Bay, the river ends at the Gulf of Mexico. Crystal River and Kings Bay are classified as Class III waters (Chapter 62-302 of the Florida Administrative Code). Mounting public concern about the environmental sensitivity of the Crystal River/Kings Bay system prompted the Florida Department of Environmental Protection to make Crystal River an Outstanding Florida Water (OFW). The intent of this designation is not to change the designated uses, to prevent further degradation of ambient water quality using certain regulatory restrictions. Changes in water chemistry, particularly water clarity, and nuisance aquatic vegetation are the major management issues for the Crystal River/Kings Bay system with the primary concern being a reduction in water clarity. (Crystal River SWIM (Surface Water Improvement and Management Act) Plan, 2000).

All waters of the state fall into one of five surface water classifications, with specific criteria applicable to each class of water. In addition to its surface water classification, a water may be designated as an Outstanding Florida Water (62-302.700 F.A.C.). An Outstanding Florida Water, (OFW), is a water body designated worthy of special protection because of its natural attributes. This special designation is applied to certain waters, and is intended to protect existing good water quality. Most OFWs are areas managed by the state or federal government as parks, including wildlife refuges, preserves, marine sanctuaries, estuarine research reserves, certain waters within state or national forests, scenic and wild rivers, or aquatic preserves. Generally, the waters within these managed areas are OFWs because the managing agency has requested this special protection.

[redacted]

Redacted

Redacted

Levy 2 and Levy 3

Six Federally listed protected aquatic species are found in Levy County and have the potential to occur in the vicinity of the sites, particularly the Levy 3 site which is near the coast: one mammal species, four reptile (turtle) species, and one fish species. They are identified in the table below.

Scientific Name	Common Name	Federal Status
Trichechus manatus latirostris	West Indian (Florida) Manatee	E Critical habitat
Chelonia mydas	Green Sea Turtle	E
Dermochelys coriacea	Leatherback Sea Turtle	E
Caretta caretta	Loggerhead Sea Turtle	T
Lepidochelys kempii	Kemp's ridley Sea Turtle	E
Acipenser oxyrhynchus desotoi	Gulf Sturgeon	T

The area is commonly known as Florida's "Nature Coast"; the Marjorie Harris Carr Cross Florida Greenway, previously known as the Cross Florida Barge Canal, is a protected green belt corridor surrounded by a public park system. At the mouth of the waterway (Withlacoochee River near Levy 2 site), the Florida Bureau of Watershed Management has designated the waters as a shellfish harvesting/propagation area, and is also considered "Outstanding Florida Waters".

Redacted

[redacted]

Redacted

Results

The threatened gulf sturgeon is potential concern at several of the sites. The National Marine Fisheries Service and US Fish and Wildlife Service listed the Gulf sturgeon as a threatened species in 1991. They share jurisdiction for this species under the Endangered Species Act. Also known as the Gulf of Mexico sturgeon, it is a subspecies of the Atlantic sturgeon. It is a large fish with an extended snout, vertical mouth, chin barbells, and adults are 71-95 inches in length. Adult fish are bottom feeders, eating primarily invertebrates, including brachiopods, insect larvae, mollusks, worms and crustaceans. Gulf sturgeon are anadromous, with reproduction occurring in fresh water. Most adult feeding takes place in the Gulf of Mexico and its estuaries. The fish return to breed in the river system in which they hatched. Spawning occurs in areas of deeper water with clean (rock and rubble) bottoms.

Historically, the Gulf sturgeon occurred from the Mississippi River to Charlotte Harbor, Florida. It still occurs, at least occasionally, throughout this range, but in greatly reduced numbers. The fish is essentially confined to the Gulf of Mexico. River systems where the Gulf sturgeon is known to be viable today at or near the candidate sites include the Suwannee River

Dams have been a big factor in their decline as they prevent Gulf sturgeon from reaching many spawning areas. In addition, dredging, desnagging and spoil deposition carried out in connection with channel improvement and maintenance represent a threat to the Gulf Sturgeon.

A Recovery and Management Plan for the Gulf Sturgeon was completed in 1995. In June 2002, NMFS and FWS published a proposed critical habitat designation for Gulf sturgeon, which was finalized in March 2003. Critical habitat includes the Suwannee River (Dixie and Lafayette sites), as well as coastal areas along the Gulf in the vicinity of the Taylor, Levy 2 and Levy 3 sites.

The significance of the coastal areas along the Gulf to the manatee, particularly at Crystal River, is another potential issue with the Gulf coast candidate sites. Site ratings below are based on the number of aquatic species in a given site area (i.e., county), as well as whether or not the potentially affected species include the Gulf sturgeon, manatee and their critical habitat.

Site	Crystal River		Redacted		Levy 2		Redacted	
T&E Species (aquatic)	2	2	5	4	2	2	3	2
Habitat	2	2	5	2	2	1	3	1
Flexibility	2	2	5	2	3	1	3	1
Overall rating	**2**	**2**	**5**	**3**	**2**	**1**	**3**	**1**

2.1.2 Bottom Sediment Disruption Effects

2.1.2.1 Contamination

2.1.2.2 Grain Size

Objective – The objective of the criterion is to evaluate the potential short-term impacts to aquatic/marine resources resulting from construction related dredging activities at the candidate sites.

Evaluation approach – The evaluation sought available data on the amount of contaminated sediments near the candidate sites and the grain size of sediments in the area. In general, sites with the lowest concentration of heavy metals and toxic organic compounds and the highest sediment grain size are considered to be the most suitable.

Little information exists regarding the site specific level of sediment contamination that exists in water bodies near the candidate sites. The majority of the available information was obtained from the EPA's National Sediment Quality Survey (2001 and 2004). Information in the EPA report addresses sediment contamination levels as Tier I (adverse impacts to aquatic life are probable) and Tier II (adverse impacts to aquatic life are possible but infrequent). Using best professional judgment, the following evaluation considered the results of the EPA's Tier I/Tier II study results to determine the relative contamination potential for the candidate sites.

No information regarding sediment grain size was obtained for this evaluation. Because sediment grain size is highly variable, even within a small area of coastline or river reach, the following evaluation of potential bottom sediment disruption effects was limited to available information regarding sediment contamination levels in principle water bodies at the eight sites.

Discussion/Results

An updated EPA study (EPA 2004) evaluated 2,874 sampling stations in the Southeast, and identified 12 water bodies as having the most significant sediment contamination in EPA Region 4. No water bodies on which the Progress candidate sites are located were identified in the EPA study, although the Lower St. Johns River was identified in the first report (to Congress) as a watershed containing 32 areas of probable concern, but has fewer than 10 stations (9) classified as Tier 1 in the current report [Tier 1 is defined by EPA as category where associated adverse effects on aquatic life and human health are probable.] A review of water quality data from the Department of Environmental Protection and the various water management districts within the state, including Section 303(d) listings (impaired waterbodies) and monitoring of benthic activity, indicated that one of the biggest water quality impacts in the Progress service area is from increasing nutrients (i.e., nitrate-nitrogen), or nutrient loading, found in the Suwannee Redacted and Redacted sites), Kissimmee Redacted), St. Johns Rivers Redacted , and even the Withlacoochee River at Lake Rousseau (Levy 2) . In addition, individual discharges into the Lower St. Johns River have introduced potentially toxic contaminants into the river sediments (e.g., river is impaired for lead, copper, and silver as well as nutrients) and, in combination with urban development, have reduced water quality in this river to sufficiently low levels to make river restoration and protection a high priority today.

Because dredging is not one of the parameters considered for this particular evaluation, and information on grain size was not readily available for most of the sites, the estimated potential for contaminated sediments to affect the cost and schedule of any construction related dredging operations was based on the limited information available and professional judgment. Based on the EPA study and information provided by the Water Management Districts in Florida, and because the presence of contaminated sediments in the immediate vicinity of the candidate sites including any onsite streams cannot be confirmed, the following conservative ratings are given to the candidate sites. The coastal sites are given a slightly higher rating because their receiving body of water is so expansive (Gulf of Mexico).

Bottom Sediment Disruption Effects	Crystal River	Redacted			Levy 2	Redacted		
Rating	3	2	2	2	2	3	2	3

References

The Incidence and Severity of Sediment Contamination in Surface Waters of the United States. National Sediment Quality Survey. Office of Science and Technology. EPA 823-R-04-007. November.

Florida Department of Environmental Protection, Section 303(d) List [http://www.dep.state.fl.us/water/tmdl/303drule.htm]

Florida Department of Environmental Protection, 2004. Integrated Water Quality Assessment for Florida, 2005 305(b) Report and 303(d) List Update. Division of Water Resource Management, Bureau of Watershed Management, Tallahassee, FL

2.2 CONSTRUCTION-RELATED EFFECTS ON TERRESTRIAL ECOLOGY

2.2.1 Disruption of Important Species/Habitats and Wetlands

2.2.1.1 Important Species/Habitats
2.2.1.2 Groundcover/Habitat
2.2.1.3 Wetlands

Objective – The objective of this criterion is to evaluate the candidate sites with respect to potential construction related impacts on important species and terrestrial ecology. Regulatory Guide 4.7 defines important plant and animal species if one or more of the following conditions apply.

- the species is commercially or recreationally valuable,
- the species is officially listed as endangered or threatened,
- the species effects the well being of another species within (1) or (2) above,
- the species is a critical component of the structure and function of a valuable ecosystem, or
- the species is a biological indicator of radionuclides in the environment.

Of particular concern are potential impacts to habitat areas used by important species. These areas include those used for:

- breeding and nursery,
- nesting and spawning,
- wintering, and
- feeding.

Evaluation approach – The following siting criteria were used to evaluate the eight candidate sites.

- Exclusionary – Designated critical habitat of endangered species
- Avoidance – Areas where threatened and endangered species are known to occur.
- Suitability – Areas where limited potential impact is expected

No information was obtained which would indicate that any of the sites under consideration would exceed the exclusionary or avoidance criteria relative to ecology. Therefore, the evaluation focused on the relative suitability of the site based on the number of areas where limited potential impact is expected. The number of potential impact areas was directly correlated to the number of rare, threatened, and endangered terrestrial species that may occur in the host county, their habitat (based on existing reports and professional judgment of the amount and quality of habitat available for species), and flexibility (professional judgment of the amount of space within the site circle to avoid known locations of protected species during construction of the facility). Note that the evaluation was limited to the plant site and not existing or potential (future) transmission corridors.

Another sub-criteria evaluated was the total acreage of wetland within the 6000 acres, not including the lake or reservoir that would be the primary source of cooling water. This was also broken out into three components: total wetlands (acres), total acreage of higher quality wetlands, and flexibility, or the ability to avoid wetlands during construction.

The relative suitability of the candidate sites with respect to ecology (rare, threatened and endangered aquatic and terrestrial species, and critical habitat) and wetlands was evaluated in the screening criteria report (Criterion P5, aquatic and terrestrial species combined; and P6). Additional site ecological information specific to terrestrial resources at each site is included in the full discussion below.

Discussion/Results

Crystal River

Seven Federally listed terrestrial species, including five bird, one reptile and one plant species, have the potential to occur in Citrus County and therefore in the vicinity of the Crystal River site. The Federally listed species are identified in the table below. .

Scientific Name	Common Name	Federal Status
Haliaeetus leucocephalus	Bald Eagle	T
Rostrhamus sociabilis plumbeus	Everglade Snail Kite	E (critical habitat)
Aphelocoma coeruluscens	Florida Scrub-jay	T
Mycteria Americana	Wood Stork	E
Picoides borealis	Red-cockaded Woodpecker	E
Dymarchon corais couperi	Eastern Indigo Snake	T

Redacted

[redacted]

Redacted

[redacted]

Redacted

Levy 2 and 3

Six Federally listed terrestrial species, including one mammal, four bird, and one reptile species, have the potential to occur in Levy County and therefore in the vicinity of the proposed Levy 2 and 3 site. The Federally listed species are identified in the table below.

Scientific Name	Common Name	Federal Status
Microtus pennsylvanicus dukecampbelli	Florida Salt Marsh Vole	E
Haliaeetus leucocephalus	Bald Eagle	T
Aphelocoma coeruluscens	Florida Scrub-jay	T
Mycteria Americana	Wood Stork	E
Picoides borealis	Red-cockaded Woodpecker	E
Dymarchon corais couperi	Eastern Indigo Snake	T

[redacted]

Redacted

Site ratings based on Important Terrestrial Species/Habitat

Site	Crystal River	Redacted			Levy 2	Redacted		
T&E species	3	3	1	4	3	3	3	3
Habitat	3	3	3	4	3	2	3	2
Flexibility	3	4	3	4	4	2	4	2
Overall Rating	**3**	**3**	**2**	**4**	**3**	**2**	**3**	**2**

The flexibility associated with the final location of the plant area and the presence of higher quality wetlands such as forested wetlands were considered in addition to the overall acreage of mapped wetlands indicated by NWI.

Site wetland information

Site	Crystal River	Redacted			Levy 2	Redacted		
% of wetland polygons mapped over 6000 acre area	2%	1%	1%	2%	1%	4%++	5%	1%
Number of acres of high quality wetlands* within site area	82 acres	11 acres	34 acres	127 acres	51 acres	138 acres	273 acres	36 acres

++ = map indicates substantially more wetland area.
* = # acres forested/scrub-shrub wetland polygons mapped

Taking into account the above terrestrial species and wetland ratings, the sites were given the following composite ratings:

Site ratings based on Wetlands

Site	Crystal River	Redacted			Levy 2	Redacted		
Total Acres	4	5	5	4	5	3	3	5
Acres of High quality wetlands	3	4	4	2	4	2	2	4
Flexibility (based on % wetland polygons mapped over 6000 acres)	4	5	5	4	4	3	3	3
Overall Rating	**4**	**5**	**5**	**3**	**4**	**2**	**3**	**4**

Taking into account the above terrestrial species and wetland ratings, the sites were given the following composite ratings:

Composite Site Ratings

Site	Crystal River	Redacted						
Species	**3**	**3**	**2**	**4**	**3**	**2**	**3**	**2**
Wetlands	**4**	**5**	**5**	**3**	**4**	**2**	**3**	**4**
Avg. Score	**3**	**4**	**3**	**3**	**3**	**2**	**3**	**3**

2.2.2 Dewatering Effects on Adjacent Wetlands

2.2.2.1 Depth to Water Table

2.2.2.2 Proximal Wetlands

Objective – The objective of this criterion is to evaluate the sites with respect to potential impacts from construction related dewatering activities on area wetlands.

Evaluation approach – The evaluation included a review of information related to the depth of the water table and the distance to nearby wetlands. A determination of the extent of wetland acreage within the study area was limited. National Wetland Inventory maps were used for some sites as the basis for determining wetland acreage. Those maps include numerous areas that do not represent jurisdictional wetlands under Section 404 of the Clean Water Act, which contributed to the difficulty in making an estimate of wetland acreage. Moreover, those maps were based primarily on interpretation of aerial photography, and the amount of field validation that was performed varies according to region of the country and local terrain. Overall site elevation is being used as an indicator of depth to groundwater.

Discussion/Results – Wetlands have been evaluated previously (Section 2.2.1 of this appendix); depth to groundwater for each site is being evaluated by proxy using site elevation as an indicator. Potential hydraulic connections among wetlands via groundwater are not known.

In light of the previous ratings and groundwater information, the site ratings are as follows:

Site	**Crystal River**	Redacted			**Levy 2**	Redacted		
Total wetland acreage	4	5	5	4	5	3	3	5
Acreage of Forested wetlands	3	4	4	2	4	2	3	4
Depth to Groundwater	3	3	3	4	3	2	4	2
Overall Rating	3	**4**	**4**	**3**	**4**	**2**	**3**	**4**

2.3 OPERATIONAL-RELATED EFFECTS ON AQUATIC ECOLOGY

2.3.1 Thermal Discharge Effects

2.3.1.1 Migratory Species Effects
2.3.1.2 Disruption of Important Species/Habitats
2.3.1.3 Water Quality

Objective – No exclusionary or avoidance criteria apply to condenser cooling water system thermal discharges on receiving water bodies (EPRI 2001, Section 3.2.3.1). The objective of this criterion is to address the relative suitability of the eight candidate sites with respect to potential thermal impacts. Two specific thermal impact issues were considered:

- disruption of important species and habitats, and
- impact on water quality of the receiving water body.

Information on migratory species (also identified in EPRI criteria) was not collected at each site and therefore is not evaluated as part of this criterion.

Evaluation approach – In December 2001, the EPA published a final regulation, which affects the location, design, construction, and capacity of intake structures for new power plants (EPA 2001). The EPA rule will strongly encourage the use of closed-cycle designs to reduce adverse cooling water system impacts, and it is assumed that new nuclear reactors at the eight candidate sites would include closed-cycle cooling water systems.

Discussion/Results – No additional site specific data are available for the sites except for the existing plant at Crystal River. Ratings are therefore based on limited flow and water quality data for the cooling water sources and on site ratings for disruption of aquatic species/habitat. In addition, ratings were based on the use of the source waterbody as the receiving water for this evaluation.

In summary, the final set of ratings consisted of two composite ratings: the disruption of important species (based on number of Federally protected aquatic species), as brought forward from Section 2.1.1 of this appendix; and existing water quality of the receiving water, based primarily on cooling water supply information, as it relates to flow and volume, where the size of the receiving water body (heat sink) was the primary factor in assigning ratings (highest rating given to the largest heat sink). The presence of an existing nuclear plant in the immediate site area (Crystal River) also was taken into account, although given the heat sink at Crystal River (Gulf of Mexico), this location is not expected to be a problem for locating a second plant. The resulting ratings are provided below.

Thermal Discharge Effects	Crystal River	Redacted			Levy 2	Redacted		
Presence of important aquatic species	2	2	5	3	2	1	3	1
Cooling water source	5	3	2	3	3	5	3	5
Overall rating	**3**	**2**	**3**	**3**	**2**	**3**	**3**	**3**

2.3.2 Entrainment/Impingement Effects

2.3.2.1 Entrainable Organisms

2.3.2.2 Impingable Organisms

Objective – No exclusionary or avoidance criteria apply to entrainment and impingement impacts from the operation of condenser cooling water systems (EPRI 2001, Section 3.2.3.1). The objective of this criterion is to address the relative suitability of the candidate sites with respect to potential entrainment and impingement impacts.

When cooling water is pumped from water bodies, several environmental impacts can occur. Entrainment refers to the removal of small, drifting organisms with the cooling water. Small fish, fish eggs, phytoplankton, zooplankton, and other aquatic/marine organisms experience high mortality rates as they pass through cooling water pumps and heat exchangers. Impingement refers to larger organisms that are screened out of the cooling water at the intake structure. Impinged organisms can include large fish, crustaceans, turtles, and other aquatic/marine organisms that can not avoid high intake velocities near the intake structure and are trapped on the intake screens.

Evaluation approach – Concerns about entrainment and impingement losses are resource dependent and vary on a site-to-site basis. Typically, power plants with once-through cooling water systems have higher entrainment and impingement impacts than power plants with closed-cycle cooling water systems. The EPA issued a final rule in December 2001 affecting the design of intake structures for new power plants (EPA 2001). These rules encourage the use of closed-cycle systems, which is the type of system assumed to be used by Progress at these sites. Developers of new power plants who choose certainty and faster permitting over greater design flexibility, will be encouraged to limit intake water capacities and velocities and incorporate specific intake screen designs to reduce entrainment and impingement losses.

Discussion/Results – The eight candidate sites were evaluated with respect to relative potential for entrainment and impingement impacts for the closed-cycle cooling water system. Proposed facilities at each site will include cooling towers that will reduce the amount of cooling water withdrawal required for plant operation. In addition, proper design of the water intake structure would minimize the potential adverse impacts. In NUREG 1437, NRC concludes that, with cooling towers and appropriate intake design, potential adverse impacts due to entrainment or impingement of aquatic organism are minor and do not significantly disrupt existing populations. Assuming a two unit closed-cycle plant at the site, and 100 percent of the local plankton passing through the plant, it appears that there would be no discernible effect on the plankton population in existing rivers and reservoirs at each site. This is due to the very small volume of water used by the plant relative to the total volume in the river or reservoir at the site. Because of the low flow velocities of a closed cycle plant at the site, impingement of adult fish would be expected to be minimal. Use of a deep water intake would have a minimal effect on entrainment of larval fish.

Results – Given the above information, all sites are given the same conservative rating of 3, except for Redacted which is given a slightly higher rating since it has no federally protected species (i.e., sturgeon).

Entrainment/Impingement Potential Impact (Closed cycle cooling system design)	Crystal River	Redacted			Levy 2	Redacted		
Rating	3	3	4	3	3	3	3	3

2.3.3 Dredging/Disposal Effects

2.3.3.1 <u>Upstream Contamination Sources</u>

2.3.3.2 <u>Sedimentation Rates</u>

<u>Objective</u> – The purpose of the section is to evaluate the sites for potential environmental impacts related to maintenance dredging at the intake structure. No specific exclusionary or avoidance criteria apply to this issue. The following evaluation, therefore, is a summary of available information related to the relative suitability of the sites.

<u>Evaluation approach</u> – Sites with high levels of contaminated sediment deposition at the intake structure will experience higher maintenance costs for the removal and disposal of the dredged material. Two factors were considered in performing the evaluation:

- The level of upstream contamination, and
- The rate of sedimentation at the site.

As addressed in Section 2.1.2 (Contaminated Sediments), no site-specific information about the level of sediment contamination at the sites was identified. Results in Section 2.1.2 were based on EPA data, which addressed general trends in levels of contamination in the water bodies at the candidate sites, and general water quality information for the major water bodies on which the candidate sites are located. All sites are assumed to have relatively low fine sediment deposition rates (which are preferred), and the coastal sites are expected to have even better deposition rates given their proximity to the sandy beaches.

Based on available information, the sites were rated according to the expected levels of contamination and sedimentation rates for the general area of the eight sites. Sites with the lowest concentration of heavy metals and toxic organic compounds and the lowest sediment rates are the most suitable and were assigned a score of 5.

<u>Discussion/Results</u> – The results are summarized in the table below.

Dredging/Disposal Effects	Crystal River	Redacted			Levy 2	Redacted		
Upstream Contamination Sources	3	2	2	2	2	3	2	3
Sedimentation Rates	4	3	3	3	3	4	3	4
Rating	**3**	**2**	**2**	**2**	**2**	**3**	**2**	**3**

2.4 OPERATIONAL-RELATED EFFECTS ON TERRESTRIAL ECOLOGY

2.4.1 Drift Effects on Surrounding Areas

2.4.1.1 Important Species/Habitat Areas

2.4.1.2 Source Water Suitability

Objective – The objective of this criterion is to evaluate the relative suitability of the candidate sites with respect to potential concerns with cooling tower drift effects. This evaluation considered the potential effects on surrounding areas and the suitability of the cooling water source (EPRI 2001). This issue does not apply to sites for which once-through cooling water systems are selected.

Cooling Tower Drift

In every cooling tower, there is a loss of water to the environment in the form of pure water, which results from the evaporative cooling process. This evaporated water leaves the tower in a pure vapor state, and thus presents no threat to the environment. Drift, however, is the undesirable loss of liquid water to the environment, via small unevaporated droplets that become entrained in the exhaust air stream of a cooling tower. These water droplets carry with them minerals, debris and microorganisms and water treatment chemicals from the circulating water, thus potentially impacting the environment. High drift losses are typically caused by fouled, inefficient or damaged drift eliminators, excessive exit velocities or imbalances in water chemistry.

Minimizing drift losses in a cooling tower reduces the risk of impacting the environment. The principle environmental concern with cooling tower drift impacts are related to the emission and downwind deposition of cooling water salts (EPA 1987). Salt deposition can adversely affect sensitive plant and animal communities through changes in water and soil chemistry.

Evaluation approach – Sites considered with the most sensitive environments were assigned lower rating values. Sites with highest concentrations of dissolved solids and other potential contaminants in cooling tower makeup were also assigned lower rating values.

Discussion/Results – Information regarding important terrestrial and aquatic plant and animal communities, habitats, and wetlands in the vicinity of the candidate sites were previously addressed in Section 2.1.1 (Disruption of Important Species/Habitats) and Section 2.2.1 (Disruption of Important Species/Habitats and Wetlands). Cooling water makeup water quality is also taken into account. The coastal sites were given lower ratings due to their proximity to the ocean and greater likelihood of their cooling water being brackish and containing more salt.

Given all the above information, the following ratings were assigned:

Drift Effects on Surrounding Area	Crystal River	Redacted			Levy 2	Redacted		
Important Species Habitat Areas – aquatic	2	2	5	3	2	1	3	1
Important Species Habitat Areas – terrestrial	3	3	2	4	3	2	3	2
Source water suitability	2	3	3	3	2	2	3	2
Rating	**2**	**3**	**3**	**3**	**2**	**2**	**3**	**2**

SOCIOECONOMICS CRITERIA

3.1. SOCIOECONOMICS - CONSTRUCTION RELATED EFFECTS

Objective – The objective of this criterion is to evaluate the relative suitability of the site with respect to the number of construction workers who will move into the plant site vicinity with their families; and the capacity of the communities surrounding the plant site to absorb this new temporary (in-migrant) population.

Evaluation approach – The number of in-migrant workers is dependent on labor availability within commuting distance of the plant site. If an adequate supply of workers is available within reasonable commuting distance, few, if any workers, would choose to relocate to the site. The capacity of communities to absorb an increase in population depends on the availability of sufficient resources, such as adequate housing and community services to support the influx.

Steps 1 and 2 (Exclusionary and Avoidance criteria) are not applicable to this criterion. The plant construction workforce is likely to be available at any of the sites under consideration. The issue in siting, therefore, is the potential socioeconomic impact associated with any temporary influx of construction workers who live too far away to commute daily from their residence. With respect to suitability of the sites under consideration by Progress, socioeconomic impacts of nuclear power plant construction are directly related to two factors:

- number of construction workers who will move into the plant site vicinity with their families; and
- capacity of the communities surrounding the plant site to absorb this new temporary (in-migrant) population.

The number of in-migrant workers is dependent on labor availability within commuting distance of the plant site. If an adequate supply of workers is available within reasonable commuting distance, few (if any) workers would choose to relocate to the site vicinity. The capacity of communities to absorb an increase in population depends on the availability of sufficient resources, such as adequate housing and community services (e.g., schools, hospitals, police, transportation systems, and fire protection) to support the influx without straining existing services. Impacts to a small community located along the commuter route(s) (e.g., food, lodging, gas, and congestion) can also be significant and should be considered. The information that should be considered in rating sites from the perspective of construction impacts includes labor requirements, location of labor pool, number of immigrants, and the economic structure of affected communities.

Before the data could be compared between sites and the sites rated, certain assumptions were made regarding the construction labor requirements and construction schedule, labor pool, and affected area. Many of these assumptions were made without the benefit of site-specific information and may warrant future revision when site-specific data become available (i.e., full NEPA documentation for original plant construction and operation can be reviewed, and/or site-specific plant personnel can be interviewed regarding actual impacts from original plant construction). For purposes of this report, assumptions are based on professional judgment, the AP 1000 Siting Guide, and information contained in the U.S. Nuclear Regulatory Commission's

Generic Environmental Impact Statement for License Renewal for Nuclear Plants (NUREG 1437) (May 1996).

ASSUMPTIONS
According to the AP 1000 Siting Guide, the plant workforce (construction) includes a monthly maximum construction workforce requirement of 1000 persons per unit. Construction of a nuclear power plant is very labor-intensive and for the AP 1000, skilled and unskilled construction workers would likely be needed over a 4 to 5 year period. The following assumptions were used in this analysis.

- Ratings are based on the assumption that two units would be constructed at a given site.
- Construction would require a peak construction work force of 2000 workers (1000 per unit); this estimate is not necessarily the "worst-case" but assumed to be a "realistic" estimate for purposes of site comparison.
- Analysis assumes that no other major construction project would occur in the site vicinity concurrently with the plant construction and operation. Thus, sites were rated without consideration of potential cumulative impacts of other potential demands for labor.

Available population and economic data were obtained from the US Census Bureau for each site. The data were collected by county to determine availability of an adequate labor force within commuting distance (based on an assumed location of the labor pool). Data relating to population and labor force (primarily construction industry) were compared with the construction labor requirement to determine availability of labor.

The study of economic structure examines employment because of its pre-eminent role in determining economic well-being of an area. Specifically, impacts are determined by comparing the number of direct and indirect jobs created by plant's construction with total employment of the local study area at the time of construction. Sites were rated according to economic impacts based on the following criteria: economic effects were considered small if peak construction related employment accounted for less than 5 percent of total study area employment; moderate if it accounted for 5 to 10 percent of total study area employment; and large if it accounted for more than 10 percent of total study area employment.

Note that the study area for evaluating socioeconomic impacts from construction included the host county, adjacent counties and any other nearby counties with a major population center within a reasonable commuting distance from the site.

<u>Discussion.</u>- The available population and work force data are presented in the following tables. Projected growth rates from 2000-2010 are assumed to be the same as growth rates found between 1990 and 2000, based on U.S. Census data.

[redacted]

Redacted

Crystal River 2 Site Population and Work Force

County (Projected Growth 2000-2010)	Total Pop (2000)	Total Pop (2010)	Total Employed Work Force (2000)	Total Construction Workforce (2000)
Citrus	118,085 (26.3%)	149,141	38,827	4,441
Levy	34,450 (32.9%)	45,784	12,935	1,397
Marion (Ocala)	258,916 (32.9)	344,099	98,248	8,803
Hernando	130,802 (29.4)	169,374	44,071	4,858
Sumter	53,345(68.9)	90,099	15,109	1,354
Pasco	344,765 (22.6)	422,682	134,184	12,780
Total	**940,363**	**1,221,179**	**343,374**	**33,633**

Source: U.S.Census Bureau, http://quickfacts.census.gov/qfd/ for FL

[redacted]

[redacted]

Levy 2 Site Population and Work Force

County (Projected Growth 2000-2010)	Total Pop (2000)	Total Pop (2010)	Total Employed Work Force (2000)	Total Construction Workforce (2000)
Levy	34,450 (32.9%)	45,784	12,935	1,397
Citrus	118,085 (26.3%)	149,141	38,827	4,441
Marion	25,8916 (32.9)	344,099	98,248	8,803
Gilchrist	14,437 (49.3)	21,554	5,756	682
Dixie	13,827 (30.6)	18,058	4,612	492
Alachua	217,955 (20%)	261,546	105,293	5,234
Total	**657,670**	**840,182**	**265,671**	**21,049**

Source: U.S.Census Bureau, http://quickfacts.census.gov/qfd/ for FL

[redacted]

Redacted

[redacted]

[redacted]

Redacted

REDACTED

Results

Although the results show higher population and workforce numbers available at [redacted] and [redacted] the overall population levels for all eight sites in 2010 when construction is anticipated to start, are sufficiently large that the impact on study area employment from construction of two new units would be low at each site. This is based on conservative workforce levels using 2000 Census Bureau data (without expected increases in 2010), although such increases might be used to support other large (non-nuclear) construction projects at that time). All sites show a percentage increase less than 5% when compared to **total study area workforce** (less than 1% for all but [redacted] and [redacted] sites); and all but three of the sites show a percentage increase less than 10% when compared to the **total construction workforce;** [redacted] and [redacted] show a 21.3%, 11%, and 21% increase, respectively.

Because of the large population projections and available workforce at [redacted] and [redacted] it was assumed that 100% of the workforce at each site would commute from within the area and there would be no in-migrant workforce population. As such, there would be no demands on housing and community services. Based on this information alone, [redacted] and [redacted] would receive a rating of 5.

Site	Major population centers within commuting distance of site	Percent increase in total workforce	Percent increase in total construction workforce
Crystal River	Ocala, Tampa suburbs in Pasco County	0.5%	5.9%
[redacted]			

Redacted

Given the lower general population estimates and the lower (existing) construction workforce to draw from at th Redacted Redacted, an Redacted sites, an additional analysis was conducted for these three sites to consider the impacts of workers in-migrating to these two areas. We have identified the following assumptions to help address potential impacts on local community services and housing:

- 50% of workers will in-migrate (1000 workers)
- 50% of these workers bring their families (2.5 additional persons per family) (1250 family members)
- Influx of direct workers also brings in influx of indirect workers (0.4 ratio of direct to indirect workers – in absence of site-specific information - pertaining to the Regional Industrial Multiplier System direct/indirect ratios calculated for each plant (as found in NUREG/CR-2749) (400 indirect workers)
- 50% of these indirect workers bring their families (2.5 additional persons per family) (500 family members)

Thus an influx of 1000 workers is predicted to results in a total population influx of 3150 persons.

When this population influx is compared to the total population projections in 2010 for the Redacted Redacted and Redacted site areas, the increase is less than 1%. Therefore, the impact on housing and community services would be expected to be negligible.

In general, all eight sites are within reasonable commuting distance from at least one large city or metropolitan area. Each study area appears to have sufficient population centers within commuting distance and/or has experienced tremendous growth since 1990 such that its public services sector would be able to absorb the population in-migration associated with plant construction with minimal impact.

Finally, this evaluation also incorporates more recent findings from a study conducted by Dominion Energy Inc., Bechtel Power Corporation, TLG, Inc., and MPR Associates for the US Department of Energy (2004) entitled: *Study of Construction Technologies and Schedules, O&M Staffing and Cost, Decommissioning Costs and Funding Requirements for Advanced Reactor Designs*. This report includes a more accurate and up-to-date assessment of labor availability that takes into account a U.S. labor pool that is aging and diminishing in number and skill level (with retirement of the baby boom generation that constructed the first set of nuclear power plants). It recognizes that attracting craft with the high skill levels and regulatory employment criteria for new nuclear plant construction is expected to be difficult given that the group of craft currently doing nuclear work is significantly smaller than the total construction craft population, and is in higher demand because of the higher skill levels and greater capability to meet strict employment standards (e.g., scrutiny of NRC background check). However, in an effort to reduce or minimize the labor supply concerns associated with new nuclear plant construction projects, a new strategy has been identified that would shift portions of the work force to areas of the country where skills and craft are available in sufficient quantity (national workforce). This would most effectively be done through modularizing portions of the plants to be built, and providing aggressive training of craftsmen before and during the construction phase of the project. Modularization is anticipated to become an important aspect of new nuclear construction.

Although based on the results above, this latest information and using best professional judgment, a comparison of socioeconomic conditions between the eight candidate sites reveals minimal differences, a set of more conservative ratings has been assigned based on the primary differentiator between sites: total population (host county), percent increase in existing workforce and percent increase in existing construction workforce at each site. As such, the ratings are assigned as follows:

Socioeconomic Construction	**Crystal River**	Redacted			**Levy 2**	Redacted		
Rating	**4**	**3**	**5**	**3**	**4**	**4**	**5**	**3**

3.2 SOCIOECONOMICS – OPERATION

Socioeconomic impacts of operation relate primarily to the benefits afforded to local communities as a result of the plant's presence (e.g., tax plans, local emergency planning support, educational program support). These benefits tend to be a function of negotiations between the plant owner and local government; they are not indicative of inherent site conditions that affect relative suitability between sites. In addition, three of the eight sites have previously demonstrated that their local economies can support existing plant operations, and an additional unit will not adversely affect an area that has already shown its ability to support existing units. This criterion is not applicable to a comparison of the eight candidate sites, and in accordance with guidance in the Siting Guide, suitability scores were not developed.

3.3 ENVIRONMENTAL JUSTICE

Objective – The objective of this criterion is to ensure that the effects of proposed actions do not result in disproportionate adverse impacts to minority and low-income communities. In comparing sites, this principle is evaluated on the basis of whether any disproportionate impacts to these communities are significantly different when comparing one site to another.

Evaluation approach – The first step in this evaluation is to collect and compare population data for minorities and low-income populations across sites.

However, two additional questions comprising this evaluation also are relevant:

1. Does the proposed action result in significant adverse impacts?
2. Are impacts to minority or low-income populations significantly different between sites?

If the answer to the first question is "no" for all sites (i.e., no significant health and safety impacts are identified), then there would be no environmental justice concerns, regardless of the percentage of minority or low-income populations found within the surrounding communities of a site(s). If the answer to the first question is "yes" (i.e., significant health and safety impacts are expected), environmental justice concerns are relevant to site selection only if the answer to the second question is also "yes" (i.e., disproportionate adverse impacts on minority or low-income populations are identified at one or more sites, thereby resulting in significant differences between sites).

Note that the study area for evaluating environmental justice concerns included the host county and immediately surrounding counties.

Discussion – With regard to the sites under consideration, related environmental justice information is summarized for each candidate site below:

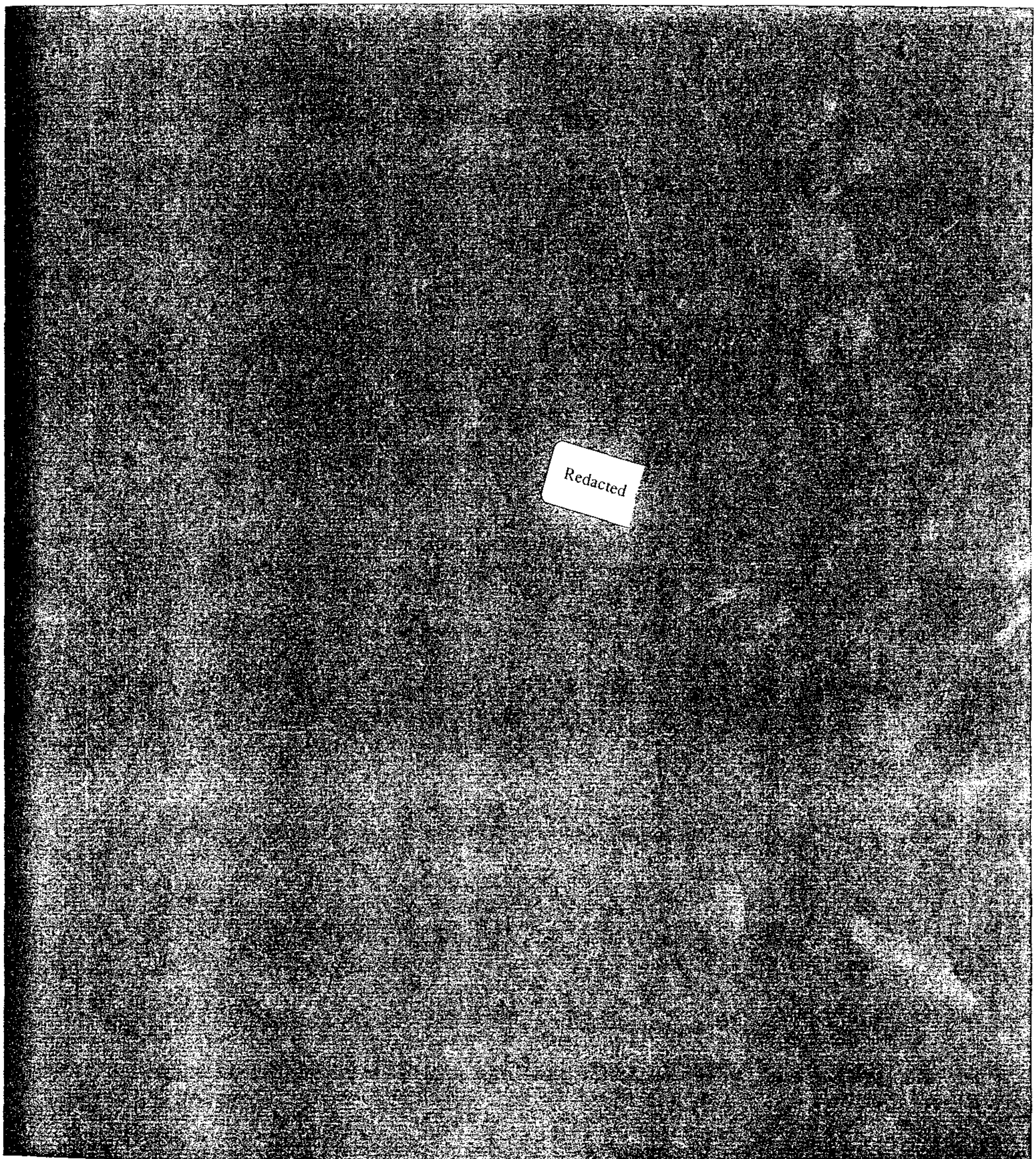
Crystal River Site Minority and Low Income Population/Percentages

County	Population (2000)	White	Black (%)	Hispanic (%)	Low Income (population)
Citrus	118,085	95% (112236)	2.4 (2791)	2.7 (3141)	11.7% (13,820)
Levy	34,450	85.9 (29,586)	11 (3778)	3.9 (1339)	18.6 (6410)
Marion (Ocala)	258,916	84.2 (217909)	11.5 (29900)	6.0 (15616)	13.1 (33,920)
Hernando	130,802	92.9 (121453)	4.1 (5330)	5.0 (6587)	10.3 (13,470)
Sumter	53,345	82.6 (44061)	13.8 (7351)	6.3 (3356)	13.7 (7310)
Total	**595,598**	**88.2 (525,245)**	**11.8%**		**12.6 (74,930)**

Source: U.S.Census Bureau, http://quickfacts.census.gov/qfd/ for FL

[redacted]

Redacted

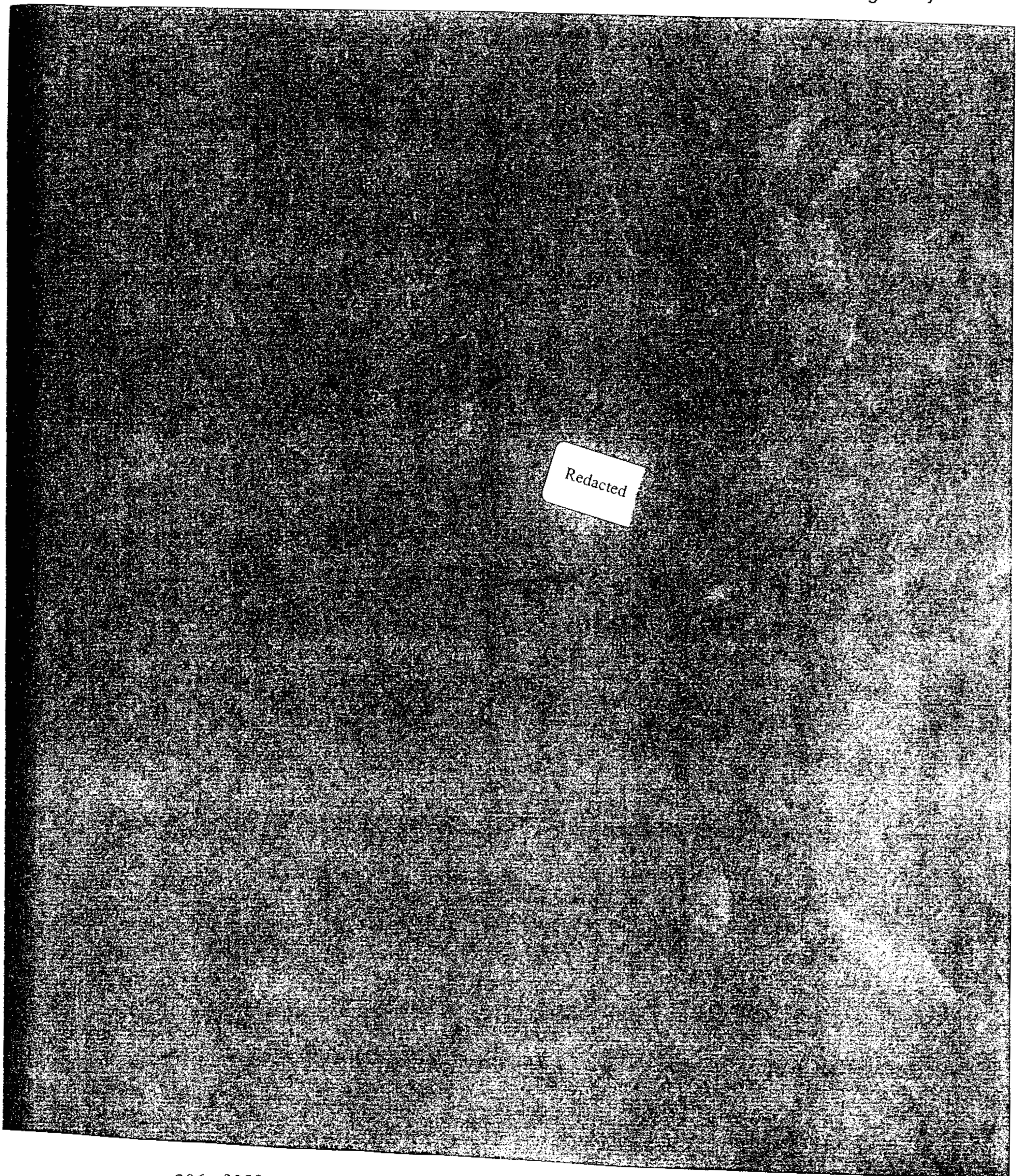

Redacted

Levy 2 Site Minority and Low Income Population/Percentages

County	Population (2000)	White	Black (%)	Hispanic (%)	Low Income
Levy	34,450	85.9 (29,586)	11 (3778)	3.9 (1339)	18.6
Citrus	118,085	95% (112236)	2.4 (2791)	2.7 (3141)	11.7% ( )
Marion	258,916	84.2 (217909)	11.5 (29900)	6.0 (15616)	13.1
Gilchrist	14,437	90.5 (13068)	7.0 (1010)	2.8 (404)	14.1
Dixie	13,827	88.8 (12279)	9.0 (1241)	1.7 (249)	19.1
Alachua	217,955	73.5 (160,128)	19.3 (42,062)	5.7% (12,493)	22.8
Total	**657,670**	**82.9% (545,206)**	**17.1%**		**16.5% 108,520**

Source: U.S.Census Bureau, http://quickfacts.census.gov/qfd/ for FL

[redacted]


Redacted

Results

Environmental justice data for the eight sites are summarized below.

Site	Population (2000)	White (%)	Minority (%)	Low Income (%)
Crystal River	595,598	88.2 (525,245)	11.8%	12.6 (74,930)
Levy 2	657,670	82.9% (545,206)	17.1%	16.5% 108,520
Redacted				

*State Average for FL is 78% white (22% minority) and 12.5% below poverty line.

- Large minority populations (20% or higher) are found at three sites: Redacted Redacted and Redacted, although note that the state average minority population for Florida is 22%. Large minority populations (20% or higher) are also found at Redacted .d Redacted
- Low income populations higher than the state average are found at all but one site, Redacted
- No significant health impacts to human populations were identified at any of the sites under consideration.
- Low-income population in Citrus County has directly benefited from economic impacts of the existing plant at Crystal River. Similar beneficial economic impacts are expected to occur for additional units at Crystal River and at the other sites with large minority populations as well.

Based on professional judgment in factoring in the above percentages alone, the initial site ratings are as follows:

Environmental Justice	Crystal River	Redacted			Levy 2	Redacted		
Provisional Rating	**4**	**2**	**3**	**2**	**3**	**3**	**3**	**1**

However, given that no significant impacts to any human populations are expected to occur at any of the sites under consideration, there cannot be significant disproportionate impacts to minority or low-income populations; and based on actual employment experience, positive economic benefits have been shown to be available to all members of the population, without regard to income or ethnicity.

While disproportionate adverse impacts could be expected to occur to minority or low-income populations at both sites, if significant health and safety impacts were expected from a new nuclear reactor, no significant health and safety impacts are expected to human populations from reactor operations. Therefore, if no significant health and safety impacts are identified from reactor construction and operation, then there would be no environmental justice concerns, regardless of the percentage of minority or low-income populations found within the surrounding communities. Therefore, no significant differences in environmental justice impacts are expected between the candidate sites and both should receive a final comparative rating of 5.

Based on this analysis, there is no basis for differentiation between sites from an environmental justice perspective, despite differences in the percentages of minority and low-income populations found within the surrounding communities of each site. All sites are found to be equally and highly suitable. Therefore, the site ratings are as follows:

Environmental Justice	Crystal River	Redacted						
Rating	5	5	5	5	5	5	5	5

3.4 LAND USE

3.4.1 Construction- and Operation-Related Effects

Objective - The objective of this criterion is to evaluate the suitability of the eight candidate sites with respect to potential conflicts in existing land uses at each site. No exclusionary or avoidance criteria apply to this issue.

Evaluation Approach – The evaluation is based on the compatibility of a new nuclear station with existing land uses, including existing and future land uses and zoning ordinances, as well as any significant historic resources. Historic resources include those currently listed on the National Register of Historic Places (NRHP), or known (active) archaeological sites or Native American lands.

This analysis is based on publicly available data, been updated with more site-specific information from site flyovers and land analysis conducted by Progress Real Estate.

Discussion/Results – Relevant land use data are provided in the table below. All sites have similar land use currently and ratings based primarily on perceived difficulties in changing current rural and agricultural land use to industrial zoning – with less issues expected at Highlands and Putnam 3 sites (Putnam 3 most favorable since industrial activities occurring on-site).

Site	Special Land Use Features in Vicinity of Site
Crystal River	Existing nuclear unit at Crystal is already owned by Progress and is zoned for uses compatible with development of a new unit; existing units are integrated into the surrounding land use patterns. However, there are many special public ownership features around the site, including: Withlacoochee State Forest Crystal River and Chassahowitchka National Wildlife Refuges Fort Cooper State Park Homosassa Springs State Park Withlacoochee State Trail Historic Sites (NRHP): Citrus County Courthouse, Old Building, and the Fort Cooper site in Inverness; the Yulee Sugar mill Historic Site in Homosassa; Mullet Key Sit, and the Crystal River State Archaeological Site/Indian Mounds (2 mi NW of Crystal River on US 19-98), a paved interpretive trail around a ceremonial mount complex built more than 2,500 years ago, encompassing four cultural periods in Florida's History.

Site	Special Land Use Features in Vicinity of Site
[redacted] Redacted	
Levy 2	Remote and rural; characterized by planted timberland and/or scrub vegetation Some farming and associated housing and outbuildings in the area. Current land use is agricultural and forestry; also would allow for rural residential. However, siting of nuclear plant would likely require significant land use change and amendment to comprehensive plan. Development along the Withlacoochee River below Lake Rousseau. The Marjorie Harris Carr Cross Florida Greenway, previously known as the Cross Florida Barge Canal, is a protected green belt corridor surrounded by a public park system. There are a number of boat launches, public and private parks and resorts in the vicinity. Lightly populated agrarian county Large public ownerships in Levy County include Cedar Keys NWR; Goethe State Forest; Manatee Springs State Park; Cedar Key Scrub State Preserve (Cedar Key closer to Levy 3 *site)* NRHP Sites: None in vicinity of Levy 2.

[redacted]

Redacted

Land Use	Crystal River	Redacted			Levy 2	Redacted		
Rating	2	2	3	2	2	2	4	2

References

Florida County Profile websites [Enterprise Florida - click on appropriate county]
[http://www.eflorida.com/profiles/CountyReport.asp?CountyID=9&Display=all]

National Register of Historic Places, State Listings by County
[http://www.nationalregisterofhistoricplaces.com/FL/state.html [click on county of interest]

The Duncan Company 2006

ENGINEERING AND COST-RELATED CRITERIA

4.1 HEALTH AND SAFETY RELATED CRITERIA

4.1.1 Water Supply

Objective – The purpose of this criterion is to evaluate relative differences in the design and construction cost of developing water supply facilities.

Evaluation approach – Sites with local conditions that would require additional engineering costs to develop water supply capability (e.g., reservoirs to address water supply limitations or reliability issues (e.g., low flow constraints)) are rated lower than sites with no such requirements. Because topography in the vicinity of the candidate sites does not provide natural drainages that can easily be developed for reservoirs, actual construction of reservoirs would likely be very expensive, if feasible at all. Sites are characterized below in terms of the likelihood that a reservoir would be required to augment water from the source during low-flow periods; this reflects the relative difficulty and expense of dealing with low-flow conditions at the sites, regardless of whether a reservoir or some other means of addressing drought conditions is adopted.

Discussion/Results – Because water flows vary between the sites, particularly during periods of low flow, reservoir requirements also will differ. Site ratings are based on professional judgment – taking into account major river body flows (average annual and low flow/drought conditions) (see section 1.1.2), as well as the size and extent of on-site tributaries. Sites with no anticipated low-flow constraints received a 5; other ratings relate to the likelihood that a reservoir or other means to address low-flow conditions would be required.

Site	Evaluation
Crystal River	Due to the proximity of the Gulf of Mexico, an abundant water supply is available, and reservoir construction is not anticipated.

Redacted

Levy 2	Due to the proximity of the Cross Florida Barge Canal, an abundant water supply is available, and reservoir construction is not anticipated; however still much uncertainty with storage volume requirements as well as plant connections to the water supply. Additionally, hydrological monitoring may be required to demonstrate effects of water withdrawals/discharges.

Redacted

Site	Evaluation
Redacted	Redacted

Water Supply	Crystal River	Redacted			Levy 2	Redacted		
Rating	5	3	2	3	4	5	4	5

References

USGS Topographic Maps

4.1.2 Pumping Distance

Objective – The purpose of this criterion is to evaluate relative differences in the operational costs associated with pumping makeup water from the source water body to the plant.

Evaluation approach – Sites located large distances from their makeup water supply source are rated lower than those located adjacent to the source. In general, the cost differential is expected to be a linear function of distance from the water source. Site-specific information based on site flyovers was also considered.

Discussion/Results – Precise intake and discharge locations have not yet been determined for candidate sites as final plant locations and reservoir requirements/locations have yet to be determined. It is assumed that cooling facilities will be located as close to the water supply as possible; sites are given a rating between 1 and 5 based on the estimated distance between the site location and the water supply.

The Redacted and Redacted sites were further downgraded based on additional study and findings from site flyovers. For Redacted and Redacted installation of cooling water intake and discharge pipelines (canals would likely not be feasible) at these sites would require lengthy traverse of estuarine areas and of the shallow seabed (up to several miles) offshore from the sites. In addition, there is some vacation home development on the shoreline near where the Redacted water lines would be installed. Installation to a depth of 30 feet or greater in the Gulf would require a pipeline distance of over 25 miles at both sites. A similar situation is found at the Crystal River site plant, but it is assumed that the new plant discharge would be mixed with the existing once-through stream and would use the existing pipeline and discharge. Therefore, the line would be short and not require new construction through the estuarine areas.

At Levy 2, it was determined that Lake Rousseau is too shallow to provide an adequate cooling lake or dilution basin for plant blowdown. Because of isolation from the Cross Florida Barge Canal by the locks, it is also a fresh water lake, and would not likely be permitted as a receiving body for brackish water taken from the canal. Use of the barge canal (as cooling water supply) and the Withlacoochee River (below the locks) as a receiving body is currently under investigation; this configuration was the basis for site ratings at Levy 2.

Site	Evaluation
Crystal River	The site is located ~ 3 miles east of the Gulf of Mexico and ~ 1.5 miles northeast of an inlet channel near the Crystal River Energy Complex.
Redacted	
Levy 2	The site is located within 4 miles north of the Cross Florida Barge Canal.
Redacted	

Pumping Distance	Crystal River	Redacted			Levy 2	Redacted		
Rating	5	4	3	5	3	1	3	1

References

USGS Topographic Maps

4.1.3 Flooding

Objective – The purpose of this criterion is to rate sites with respect to differential costs associated with construction of flood protection structures necessary to address probable maximum floods at the sites under consideration.

Evaluation approach – Sites with the largest differences between site grade elevation and likely flood elevations are rated highest; sites with plant grade at or near flood level are rated lowest.

Discussion/Results – Although final plant layout locations have not been set for candidate sites, an initial comparison of potential site locations with floodplain information indicate that some proposed plant facilities may require protection from flooding.

Site	Evaluation
Crystal River	The site is located in the 100-year floodplain ~ 4 feet below flood elevation. Therefore, construction of flood protection structures is likely to be necessary.

Site	Evaluation
Redacted	
Levy 2	The site is not located in the 100-year floodplain. Therefore, construction of flood protection structures is not likely to be necessary.
Redacted	

Flooding	Crystal River	Redacted			Levy 2	Redacted		
Rating	2	3	2	2	5	3	5	3

References

FEMA Digital Flood Insurance Rate Maps, http://www.fema.gov/fhm/.

USGS Topographic Maps.

4.1.4 Vibratory Ground Motion – *Deleted from evaluation*

The objective of this criterion is to provide a relative measure of cost associated with designing to different seismic requirements at different sites. Because all of the sites under consideration are expected to meet the site parameters for seismic design of the standardized designs under consideration, this criterion is not applicable to the Progress Florida service territory site selection process.

4.1.5 Civil Works

Objective – The objective of this criterion (formerly titled "soil stability") is to rate sites according to differences in the cost of civil works (e.g., non-flood related berms, stabilizing of graded slopes and banks) necessary to prepare the site for nuclear plant development.

Evaluation approach – Sites are rated highest to lowest according to the estimated level of cost of civil works required at each site.

Discussion/Results

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The existing candidate site (Crystal River) is located at an operating plant that has been previously developed and has been shown to be capable of supporting conventional foundation designs. Accordingly, the existing site is assigned a median rating of 3.

Given the general lack of site specific geotechnical information on the seven remaining sites, consideration was allotted to the overall elevation above sea level as a potential indicator of dewatering needs and overall site relief as an indicator of potential grading and excavation. All sites except Levy 2, Redacted and Redacted will require excavation below MSL to accommodate reactor construction because of their lower elevations. Therefore these five sites receive conservative ratings of 3 in consideration of the potential dewatering and stability concerns, along with the general lack of site specific geotechnical information. Redacted Levy 2, and Redacted and Levy 2 receive an initial rating of 4, however, because Levy 2 and Redacted Redacted are located in an area of greater relief (greater than 10 feet) than the other sites, which would lead to greater excavation costs, their ratings are further reduced to a 3. Finally, all sites except Redacted and Redacted are considered to be within areas where karst terrain will be a factor in foundation design. Due to the regional nature of the karst data available at this stage of the evaluation, no adjustment is reflected in the ratings for Redacted and Redacted

Civil Works	Crystal River	Redacted			Levy 2	Redacted		
Rating	3	3	3	4	3	3	3	3

4.2 TRANSPORTATION OR TRANSMISSION-RELATED CRITERIA

4.2.1 Railroad Access

Objective – The purpose of this criterion is to rate sites according to the relative costs associated with providing rail access.

Evaluation approach – Sites are rated from highest to lowest in accordance with the length of additional or new rail spur construction required to provide rail access, scaled from those discussed in the screening criteria report, Criterion P7. Sites having rail access within 3 miles or less receive a rating of 5; sites with rail access between 3 and 10 miles away receive a rating of 4, and sites with rail access greater than 5 miles away receive a rating of 3.

Some sites are located near abandoned rail lines. The site-specific condition of abandoned rail lines is unknown and could range from removed/revegetated to present and operable with minimal upgrade. Therefore, distances used in this analysis are to the nearest rail line in service. Specific conditions of abandoned rail lines are included when available. Should rail access become a sensitive criterion for site selection, site-specific conditions of abandoned rail lines should be more fully evaluated and field verified.

Discussion/Results – Distances to rail service at each of the sites were measured in the Preliminary Screening Evaluation (based on USGS topographic maps and summarized in the screening criteria report). Assuming that (1) passenger lines may be used for a one-time delivery of plant equipment to the site, (2) abandoned lines status is as noted below, and (3) costs are based on a straight linear scale of costs for construction of rail spurs to the sites from these lines, ratings for the sites are assigned in the table below.

Site	Evaluation
Crystal River	Local rail is located ~ 1.1 miles south of the site (co-located with Crystal River Energy Complex). Local rail connects to Seaboard Coast RR ~ 7.8 miles east of site (Citronelle, FL).

[redacted]

Redacted

Site	Evaluation
Levy 2	Seaboard Coast RR located to East ~ 8.6 miles. Seaboard Coast RR located to Southeast ~ 5.3 miles, but would require major surface water crossing (Lake Rousseau). Seaboard Coast RR located to Northeast ~ 5.6 miles (abandoned). The rail line formerly known as the Perry Cut-Off (running from Perry, FL southeast to Dunnellon, FL) was abandoned in the late 1970s. The rails/ties have been removed from the entire stretch. Aerial photography shows that the right-of-way appears to be intact from Chiefland FL, southeast to Dunnellon, FL. However, one source shows the right-of-way segment located closest to the active rail line as part of the Marjorie Harris Carr Cross Florida Greenway. The right-of-way in this area may no longer be available, and construction of other access routes to the active rail line may be required.

Redacted

Railroad Access	Crystal River	Redacted			Levy 2	Redacted		
Rating	5	3	4	3	4	3	5	3

References

Environmental Resource Analysis Online, http://eraonline.dep.state.fl.us.

North American Railroad Map, version 2.14, http://www.RailroadMap.com.

Status of North Florida Rights-of-Way, http://www.greenspun.com/bboard/q-and-a-fetch-msg.tcl?msg_id=008NWG

USGS Topographic Maps.

4.2.2 Highway Access

Objective – The purpose of this criterion is to rate sites according to the relative costs associated with providing highway access.

Evaluation approach – Sites are rated from highest to lowest in accordance with the length of additional or new highway construction required to provide car and truck access.

Discussion/Results – The following table evaluates the existing roads serving the site areas. All sites are located near existing roads, and construction of site access is predicted to be minimal. Therefore, each site has been assigned a rating of 5.

Site	Evaluation
Crystal River	U.S. Highway 19 is located ~ 3 miles east of the site and provides the main access to the area. Local roads provide access to the Crystal River Energy Complex, co-located with the proposed site. New road construction is expected to be minimal.

Redacted

Levy 2	State Highway 40 is located ~ 1 mile south of the site and provides main access to the area. Construction of local access from State Highway 40 would be required, but should be minimal. U.S. Highway 19/98 is located ~ 4 miles west of the site.

Redacted

Highway Access	Crystal River	Dixie	High-lands	Lafay-ette	Levy 2	Levy 3	Putnam 3	Taylor
Rating	5	5	5	5	5	5	5	5

References

Rand McNally Road Atlas.

USGS Topographic Maps.

4.2.3 Barge Access

Objective – The purpose of this criterion is to rate sites according to the relative costs associated with providing barge access.

Evaluation approach – Sites are rated from highest to lowest in accordance with estimated cost of facilities construction required to provide barge access.

Discussion/Results – The following table evaluates the area geography permitting barge access to the candidate sites.

Site	Evaluation
Crystal River	The site is located ~ 3 miles east of the Gulf of Mexico and ~ 1.5 miles northeast of an inlet channel near the Crystal River Energy Complex. Barge access is available in the immediate vicinity.
[redacted]	
Levy 2	The site is located ~ 12 miles east of the Gulf of Mexico. Use of Crystal River offloading facilities and construction of rail infrastructure to proposed site is a possibility. The Cross Florida Barge Canal (constructed to Lake Rousseau) was re-designated as the Marjorie Harris Carr Cross Florida Greenway. The canal is open to barge traffic up to the Inglis lock, which is no longer operational. However, the potential to construct a barge bulk offloading facility within the Greenway is unlikely.,

Site	Evaluation
	Redacted

Barge Access	Crystal River	Redacted			Levy 2	Redacted		
Rating	**5**	**2**	**2**	**2**	**2**	**3**	**4**	**3**

References

Florida Intracoastal and Inland Waterway Study, Final Report, May 2003.

USGS Topographic Maps.

Waterborne Commerce of the United States, Calendar Year 2003.

4.2.4 Transmission Cost Differentials

4.2.4.1 Transmission-Construction
4.2.4.2 Electricity Market Price Differentials

Objective – The purpose of this criterion is to rate sites according to the relative costs associated with construction of power transmission systems and issues related to market price differentials.

Evaluation approach – Ratings for this criterion are based on the straight line distances from each site to the closest transmission line, scaled from those discussed in the screening criteria report, Criterion P8. Additional transmission information from Progress, including an overall assessment of suitability with respect to transmission connections, was also considered. Because all eight sites are located within the Progress Florida service area, no electricity market price differentials are expected between the sites, and this sub-criterion was not evaluated.

Discussion/Results – Transmission access is evaluated in terms of distance to the load centers in the Orlando and Tampa – St. Petersburg areas. Measurements were taken from each potential site to each area, as well as a point midway between the two. The shortest distance of the three was used in the rating determination. In addition, any site-specific conditions that may present reliability concerns are noted and reflected in the rating determination.

Site	Evaluation
Crystal River	~80 miles to Tampa/St. Petersburg Load Center. ~80 miles to Orlando Load Center. ~70 miles to Center Point. Site is located in the vicinity of load centers, and due to co-location with Crystal River Energy Complex, construction of power transmission in existing corridors may be possible. Co-location with Crystal River Energy Complex is a reliability concern due to potential impacts caused by single climatic event.

Redacted

Levy 2	~80 miles to Tampa/St. Petersburg Load Center. ~80 miles to Orlando Load Center. ~70 miles to Center Point. Construction of power transmission in existing corridors may be possible.

Redacted

Transmission	Crystal River	Redacted			Levy 2	Redacted		
Rating	3	3	4	3	5	4	4	2

References

Google Earth, http://earth.google.com.

USGS Topographic Maps

4.3 CRITERIA RELATED TO LAND USE AND SITE PREPARATION

4.3.1 Topography

Objective – The purpose of this criterion is to rate sites according to the relative costs associated with site grading and earth-moving necessary to prepare the site for construction of a nuclear power plant.

Evaluation approach – Ratings are based on the amount of topographic relief currently found at the site, with the most severe relief resulting in the highest estimated grading costs and therefore the poorest rating. Sites are rated from highest to lowest in accordance with estimated grading costs.

Discussion/Results – Ratings are based on the amount of topographic relief currently found at the site, with the most severe relief resulting in the poorest rating. Given the general flat topography found in central Florida, ratings were favorable across all sites.

Site	Evaluation
Crystal River	The proposed site is located in a relatively flat area, with a general slope to the west (toward the Gulf of Mexico). Costs associated with site grading are expected to be relatively low.
	The proposed site is located in a relatively flat area, with minor relief (+/- ~ 2 feet). Costs associated with site grading are expected to be relatively low.
Redacted	The proposed site is located in a relatively flat area, with minor relief (+/- ~ 1 foot). Costs associated with site grading are expected to be relatively low.
	The proposed site is located in an area with minor relief (+/- ~ 10 feet). Costs associated with site grading are expected to be moderately low.
Levy 2	The proposed site is located in a relatively flat area with minor relief (+/- ~ 3 feet). Costs associated with site grading are expected to be relatively low.
	The proposed site is located in an area with minor relief (+/- ~ 7 feet). A relatively flat area is located immediately to the northeast and could provide a site with less relief. Costs associated with site grading are expected to be relatively low.
Redacted	The proposed site is located in a relatively flat area [upland area] with greater relief (+/- ~ 20 feet). Costs associated with site grading are expected to be relatively low.
	The proposed site is located in an area with minor relief (+/- ~ 7 feet). Costs associated with site grading are expected to be moderately low.

Topography	Crystal River	Redacted			Levy 2	Redacted		
Rating	5	5	5	4	5	5	3	4

References

USGS Topographic Maps.

4.3.2 Land Rights

Objective – The purpose of this criterion is to rate sites according to the relative costs associated with purchasing land required to construct and operate a nuclear station on the site.

Evaluation approach –Sites are rated from highest to lowest in accordance with estimated local land costs.

Discussion/Results – This criterion was evaluated previously in the screening criteria report (Criterion P9). Results are provided below. New information from a recent land analysis conducted by The Duncan Companies, Inc. (TDC) for Progress was also evaluated and incorporated into the analysis; new information included the average assessment cost per acre and the number of parcels/owners for a 2000+ tract of land within the site area. It is assumed that Progress already owns all the land required for a new plant at Crystal River since it is an existing plant. As such it is rated higher than the other sites, at which land for a new plant would have to be purchased.

Assessed land values for each site were averaged among alternate locations within a given site areas, where appropriate, and multiplied by ten to derive an estimate of the market value. In the case of the more heavily forested Levy 2 and Levy 3 sites, land costs per acre were further increased by $1000 per acre to account for the value of timber crops currently planted. Note that the value of timber can be $3000 to $5000 per acre, however, Levy 2 and 3 land values were increased by the factor of $1000 per acre, assuming that the balance would be offset by the sale price of the timber.

Site	Comments and Discussion
Crystal River	Nominal cost since Crystal River Plant site [county average isRedacted

Redacted

Site	Comments and Discussion
Levy 2	Redacted 6-8 parcels; 1-4 owners (depending on actual location within site area)

Redacted

Land Rights	Crystal River	Redacted			Levy 2	Redacted		
Rating	**5**	**4**	**3**	**1**	**2**	**1**	**3**	**4**

Reference

Census of Agriculture – 2002 average farm value by county

The Duncan Company 2006

4.3.3 Labor Rates

Objective – The purpose of this criterion is to rate sites according to the relative costs associated with local labor costs that would be incurred during plant construction.

Evaluation approach – Sites are rated from highest to lowest in accordance with estimated local labor costs, with the lower cost resulting in higher ratings.

Discussion/Results – Economic data are typically available by county, but were found to be provided in a variety of forms (e.g., by hour, by week, by year; by job type) that were not necessarily consistent between counties. For purposes of consistency, this evaluation relied on data from U.S. Department of Labor, Bureau of Labor Statistics – November 2004 Metropolitan Area Occupational Employment and Wage Estimates. Average hourly rates were provided for construction and extraction workers (e.g., structural iron and steel workers; sheet metal workers; and plumbers, pipefitters and steamfitters) for the following representative MSAs:

Redacted (for Crystal River, Levy 2 and Redacted average construction overall (mean hourly) \$13.53; and of plumber/pipefitter, sheet metal worker and an electrician (mean hourly – average between the three categories): \$13.12

Redacted : average construction overall (mean hourly) Redacted and of plumber/pipefitter, sheet metal worker and an electrician (mean hourly – average between the three categories): Redacted

Redacted): average construction overall (mean hourly) Redacted and of plumber/pipefitter, sheet metal worker and an electrician (mean hourly – average between the three categories): Redacted

Redacted average construction overall (mean hourly) Redacted and of plumber/pipetitter, sheet metal worker and an electrician (mean hourly – average between the three categories): Redacted

Redacted average construction overall (mean hourly Redacted and of plumber/pipefitter, sheet metal worker and an electrician (mean hourly – average between the three categories): Redacted

Comparisons of the above construction labor category rates, including the average construction worker roll up rate (across all construction labor categories), reveals the highest rates in the Redacted), the lowest rates in the Redacted area (Crystal River, Levy 2 and 3), and the rest of the sites falling somewhere in between. The slight differences are noted in the rankings. Finally, it should be noted that a significant portion of the construction workforce is expected to come from a national workforce of journeymen, whose rates will be set based on supply and demand within the overall nuclear industry, rather than by local workforce rates or skill sets. While the ratings below are based solely on current and local wage differentials, this additional factor could mitigate differences in labor costs between the sites

Labor Rates	Crystal River	Redacted			Levy 2	Redacted		
Rating	5	4	3	3	5	5	2	3

Attachment V – Navigant Transmission Impact Study

NAVIGANT
CONSULTING

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TRANSMISSION SYSTEM IMPACT STUDY IN SUPPORT OF SITE SELECTION FOR A FLORIDA NUCLEAR PLANT

Prepared for

Progress Energy

June 30, 2006

DRAFT

Prepared by

Navigant Consulting, Inc.
1400 Old Country Road, Suite 402
Westbury, New York 11590
516.876.0066

www.navigantconsulting.com

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Appendix A
Aerial Photographs of the 20 Potential Sites

Note that Progress Energy could potentially consider one or more of these Florida land parcels for future generation expansion (nuclear, coal and/or gas), and therefore this information is considered as proprietary and confidential.

This appendix contains aerial photographs of each "region of interest" potential site selected for evaluation. The yellow line on each aerial photo indicates the three mile diameter area selected as potential suitable for siting a nuclear plant. The name of the site, water source, and approximate distance from the nearest populated city is include in a text box on each photo.

Graphics for potential sites follow:

[redacted]

Redacted

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Levy 2 near the Cross Florida Barge Canal in Levy County

Redacted

Redacted

Crystal River near the existing Crystal River # 3 Nuclear Plant in Citrus County

[redacted]

Redacted

[redacted]

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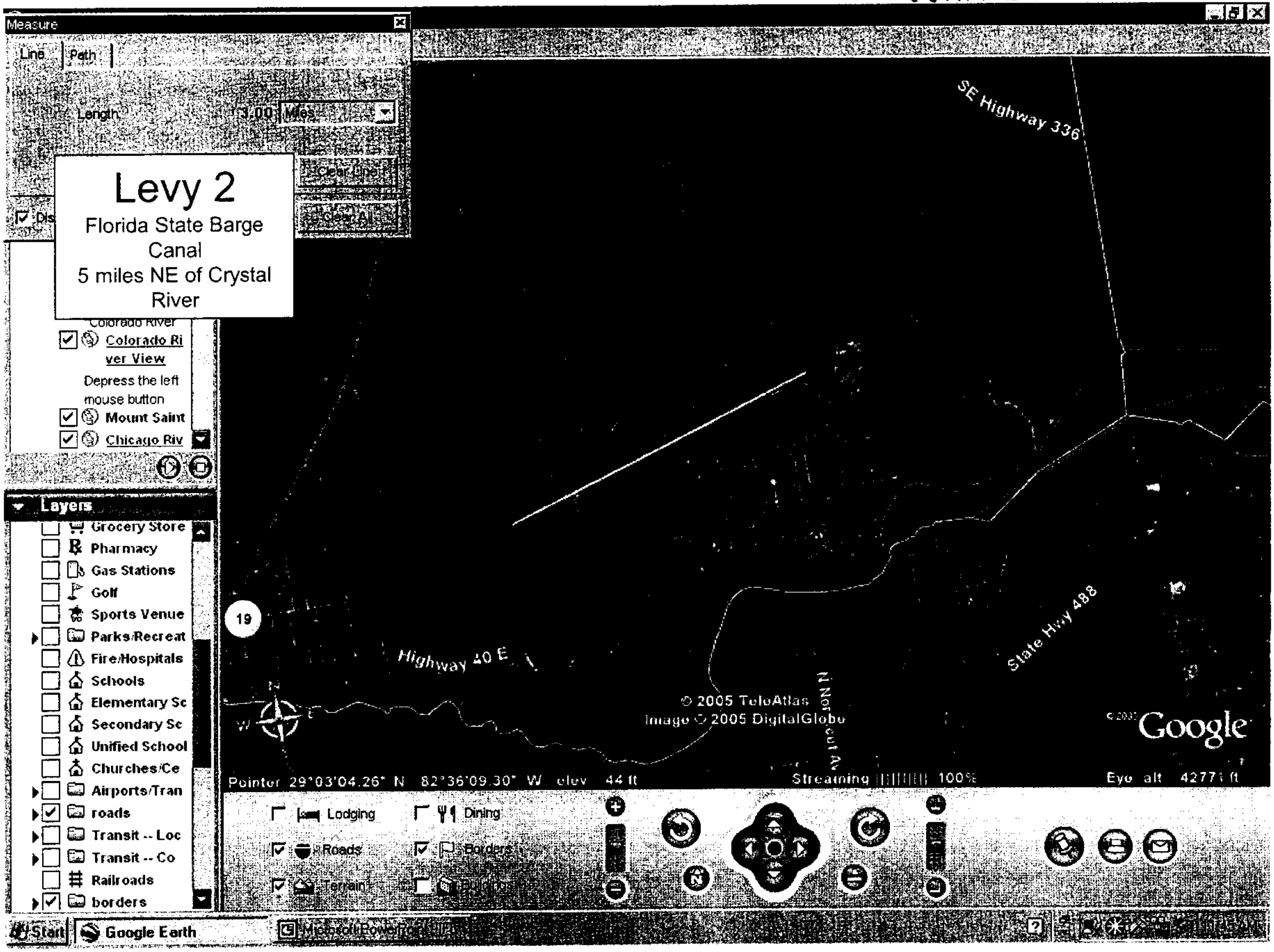
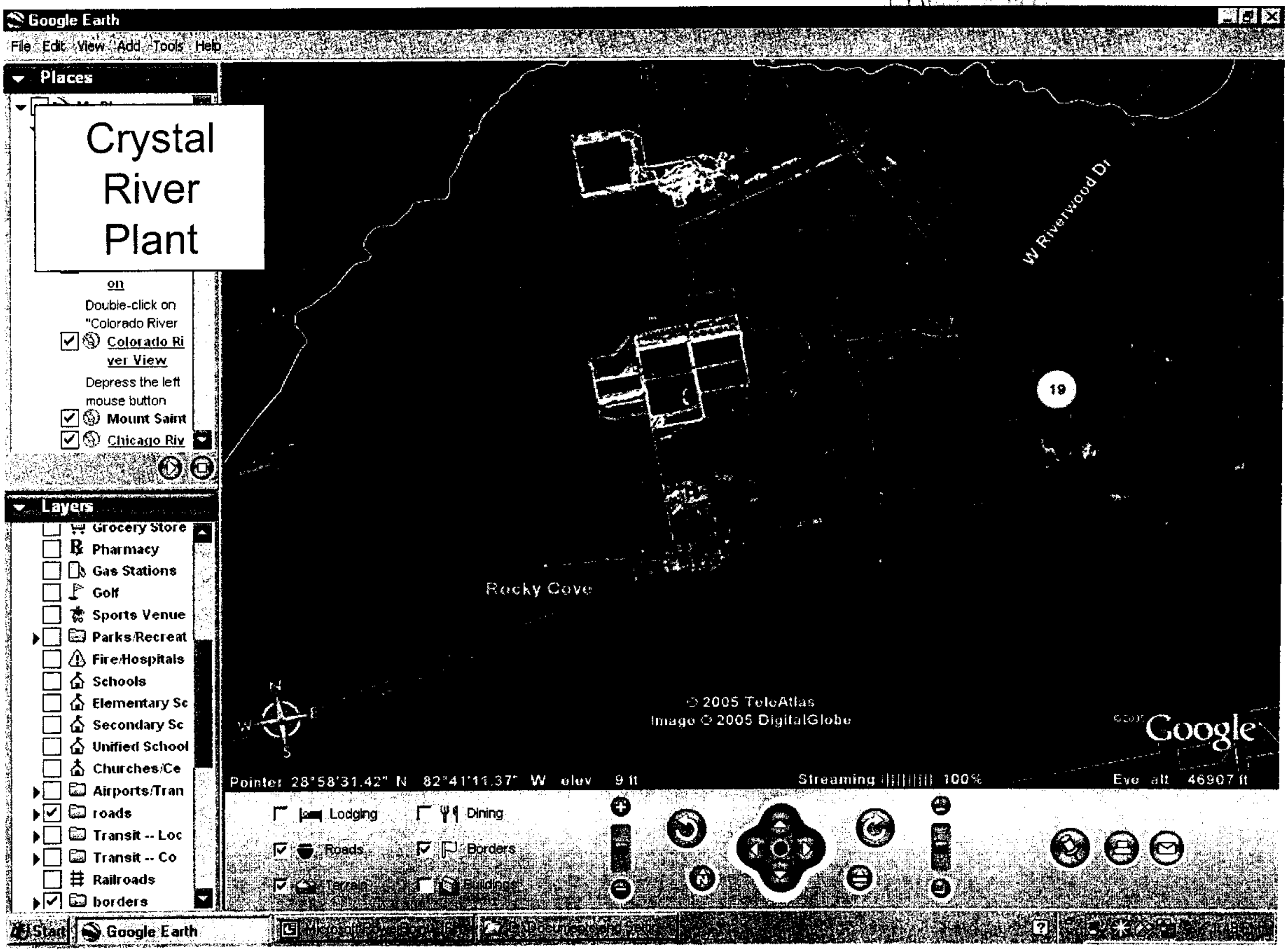

Measure
Line
Path
Length
3.00
Miles
Clear Line
Clear All
Levy 2
Florida State Barge Canal
5 miles NE of Crystal River
Colorado River
Colorado River View
Depress the left mouse button
Mount Saint
Chicago Riv
Layers
Grocery Store
Pharmacy
Gas Stations
Golf
Sports Venue
Parks/Recreat
Fire/Hospitals
Schools
Elementary Sc
Secondary Sc
Unified School
Churches/Ce
Airports/Tran
roads
Transit -- Loc
Transit -- Co
Railroads
borders
SE Highway 336
19
Highway 40 E
State Hwy 488
N Norcut Av
© 2005 TeleAtlas
Image © 2005 DigitalGlobe
Google
Pointer 29°03'04.26" N 82°36'09.30" W elev 44 ft
Streaming 100%
Lodging
Dining
Roads
Borders
Terrain
Start
Google Earth


Google Earth
File Edit View Add Tools Help
Places
Crystal
River
Plant
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Double-click on
"Colorado River
Colorado River View
Depress the left
mouse button
Mount Saint
Chicago Riv
Layers
Grocery Store
Pharmacy
Gas Stations
Golf
Sports Venue
Parks/Recreat
Fire/Hospitals
Schools
Elementary Sc
Secondary Sc
Unified School
Churches/Ce
Airports/Tran
roads
Transit -- Loc
Transit -- Co
Railroads
borders
W Riverwood Dr
19
Rocky Cove
© 2005 TeleAtlas
Image © 2005 DigitalGlobe
Google
Pointer 28°58'31.42" N 82°41'11.37" W elev 9 ft
Streaming 100%
Eye alt 46907 ft
Lodging
Dining
Roads
Borders
Terrain
Buildings
Start
Google Earth

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Appendix B
Land Plat Maps of the 5 Alternative Sites

Note that Progress Energy could potentially consider one or more of these Florida land parcels for future generation expansion (nuclear, coal and/or gas), and therefore this information is considered as proprietary and confidential.

The plat maps for each Alternative site contain more than one land owner identified for possible purchase of the eventual selected preferred site. Each of the parcels were based on recommendations from real estate land brokers, and were reasonably within the initial 3 miles diameter area selected from the technical evaluation detailed in Attachment I.

Graphics for alternative sites follow:

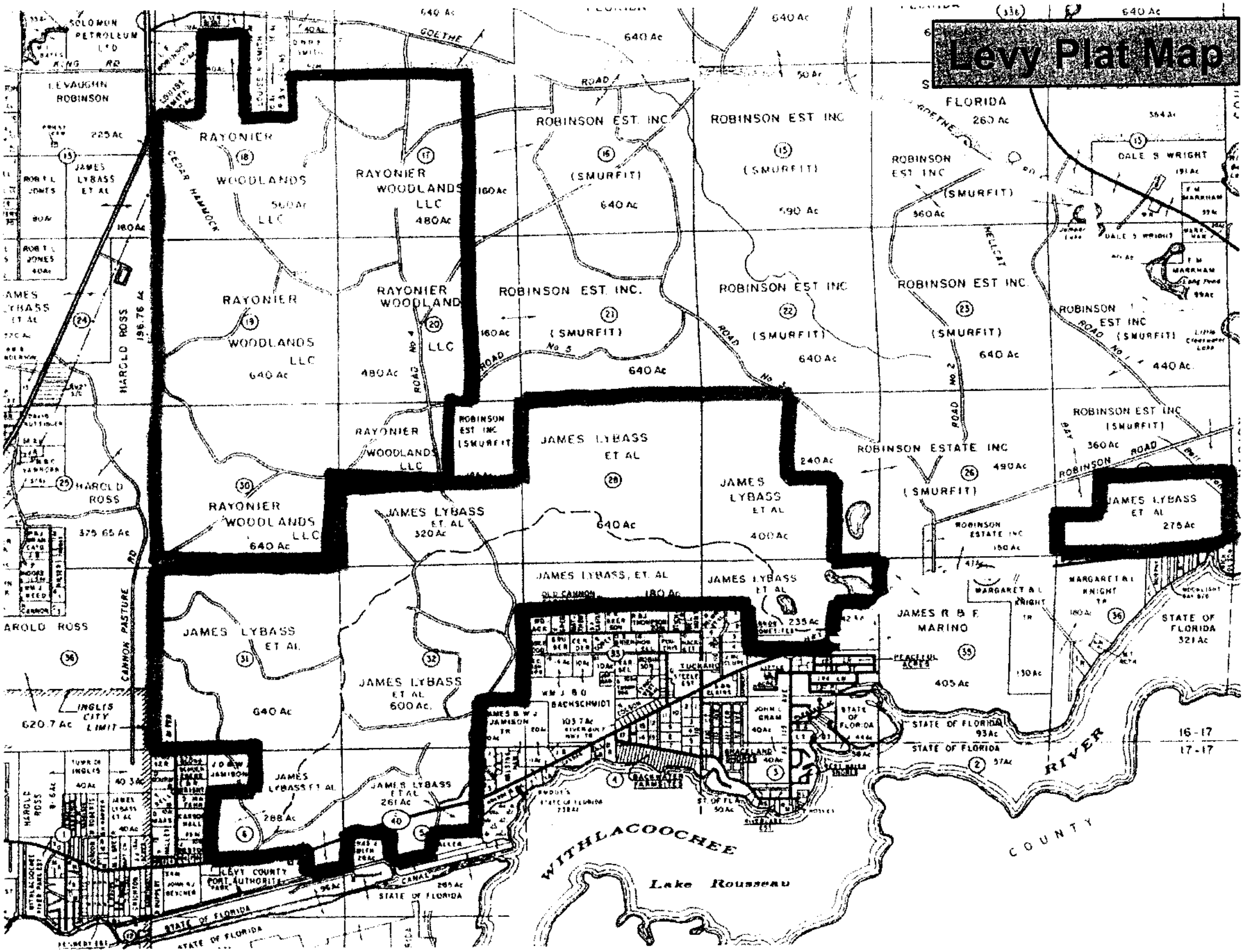
Levy 2 referred to as the "**Rayonier**" site

Crystal River referred to as the "**HCR Limestone**" site

referred to as the " site

referred to as the Redacted site

Redacted referred to as the " site



Levy Plat Map
SOLOMON PETROLEUM LTD
LEVAUGHN ROBINSON
GOETHE
ROAD
RAYONIER WOODLANDS LLC
560 Ac
480 Ac
RAYONIER WOODLAND LLC
RAYONIER WOODLANDS LLC 640 Ac
RAYONIER WOODLANDS LLC
RAYONIER WOODLANDS LLC 640 Ac
CEDAR HAMMOCK
ROBINSON EST. INC.
(SMURFIT)
640 Ac
590 Ac
FLORIDA 260 Ac
ROBINSON EST INC (SMURFIT) 560 Ac
DALE S WRIGHT
ROBINSON EST. INC. (SMURFIT) 640 Ac
ROBINSON EST INC (SMURFIT) 640 Ac
ROBINSON EST INC. (SMURFIT) 640 Ac
ROBINSON EST INC (SMURFIT) 440 Ac
HELLCAT
ROAD No 5
ROBINSON EST INC (SMURFIT)
JAMES LYBASS ET AL
JAMES LYBASS ET AL 320 Ac
640 Ac
JAMES LYBASS ET AL 400 Ac
ROBINSON ESTATE INC (SMURFIT) 490 Ac
ROBINSON EST INC (SMURFIT) 360 Ac
ROBINSON ROAD
JAMES LYBASS ET AL 275 Ac
JAMES LYBASS ET AL
JAMES LYBASS, ET. AL 180 Ac
JAMES LYBASS ET AL
JAMES LYBASS ET AL 640 Ac
JAMES LYBASS ET AL 600 Ac
JAMES R B F MARINO 405 Ac
MARGARET & L KNIGHT
STATE OF FLORIDA 321 Ac
PEACEFUL ACRES
HAROLD ROSS
HAROLD ROSS 375.65 Ac
HAROLD ROSS 196.76 Ac
CANNON PASTURE RD
INGLIS CITY LIMIT
620.7 Ac
JAMES LYBASS ET AL 288 Ac
JAMES LYBASS ET AL 261 Ac
WM J & D BACHSCHMIDT 103.7 Ac
LEVY COUNTY PORT AUTHORITY
STATE OF FLORIDA
CANAL
STATE OF FLORIDA 93 Ac
STATE OF FLORIDA
WITHLACOOCHEE
Lake Rousseau
RIVER
COUNTY
16-17
17-17

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Progress Energy

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New Nuclear Plant Development

Evaluation of Owner's Engineers

Progress Energy Carolinas Inc.
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Raleigh, North Carolina 27601

NGG Nuclear Generation Group

Table of Contents

Executive Summary & Recommendation

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Based on detailed review/analysis of the vendors' responses to the Progress Energy (PGN) Request for Proposal for Owner's Engineer services, the review team recommends that the joint venture organization of Sargent & Lundy LLC (S&L) collaborating with Worley Parsons (WP) be selected to provide engineering services, as needed, supporting the potential deployment of Westinghouse AP1000 advanced reactor units planned in the Carolina(s) and Florida.

The Request for Proposal went to the following companies, in alphabetical order: Bechtel, Black & Veatch Corporation, Burns and Roe Enterprises, ENERCON Services, Inc., Joint Venture Team (comprised of S&L, WP, and CH2MHill), S&L LLC, Washington Group International, and WP. Bechtel and Black & Veatch each declined the opportunity to provide a bid. S&L collaborated with WP to provide a combined bid to support the new nuclear units. Individually, S&L proposed to support the existing fleet under its existing Master Services Agreement with PGN, and WP's individual bid was specifically to support the existing fleet.

The graphical depiction provided later in this section shows how the potential Owner's Engineers ranked against the evaluation criteria. While the RFP also specified that the bidders describe how they could support the existing nuclear generation fleet, the primary emphasis for selection is based on supporting the new nuclear units. Attachment I provides detailed scoring and analysis that yielded the graphical summary results.

This recommendation is based on the bounding key assumptions described in the next section of this document, and takes into account the relative scoring results across criteria and considerations relevant to providing high quality engineering services. This report describes the method of evaluation employed, key assumptions/criteria applied, and results achieved.

The S&L / WP team is recommended as the Owner's Engineer. This team leads scoring in the technical evaluation areas encompassing Corporate Experience (including experience with previous licensing, design, and construction; new plant licensing experience, working to the New Plant Quality Assurance Program, etc), Team Personnel, and Technical Plan. The S&L / WP team also leads the scoring in the financial evaluation area.

WGI also has high technical scores. However, they do not have experience with the Westinghouse AP1000 reactor technology. S&L / WP team has extensive knowledge and experience with the AP1000 reactor technology based on their development of the FSARs for the Harris and Levy site COLAs. S&L / WP leadership has also been instrumental in driving changes to the Design Certification Document (DCD) to support siting the AP1000 in Florida.

The S&L / WP team is considered the best choice for Owner's Engineer considering the technical evaluation criteria to support the Owner during the early stages of new nuclear plant development. These activities require an in-depth knowledge of the Westinghouse AP1000 reactor technology, the selected PGN sites, and the new plant COLA application and licensing process.

The team offered by S&L / WP has the knowledge, experience, and capability to provide design reviews of engineering drawings and specifications, overview of EPC contract related activities, and continual alignment with COLA submittal details.

The S&L / WP team also ranks the highest from a financial perspective. A detailed evaluation of rate and fee structures along with policies related to labor, expenses, per diem, and escalation factors was performed. A model project cost estimation was also developed. S&L / WP has one of the lower rate structures and among the lowest model project total cost results. By utilizing this team, the project would also realize cost efficiencies due to their COLA involvement and familiarity with the selected plant sites.

Considering the collective results of all these reviews and analysis, the proposed Sargent & Lundy /Worley Parsons team is recommended to provide Owner's Engineer services supporting new nuclear plant development efforts.

The following graphical illustration depicts the ranking in the various evaluation categories and also depicts the overall ranking.

Summary Results in Graphical Form

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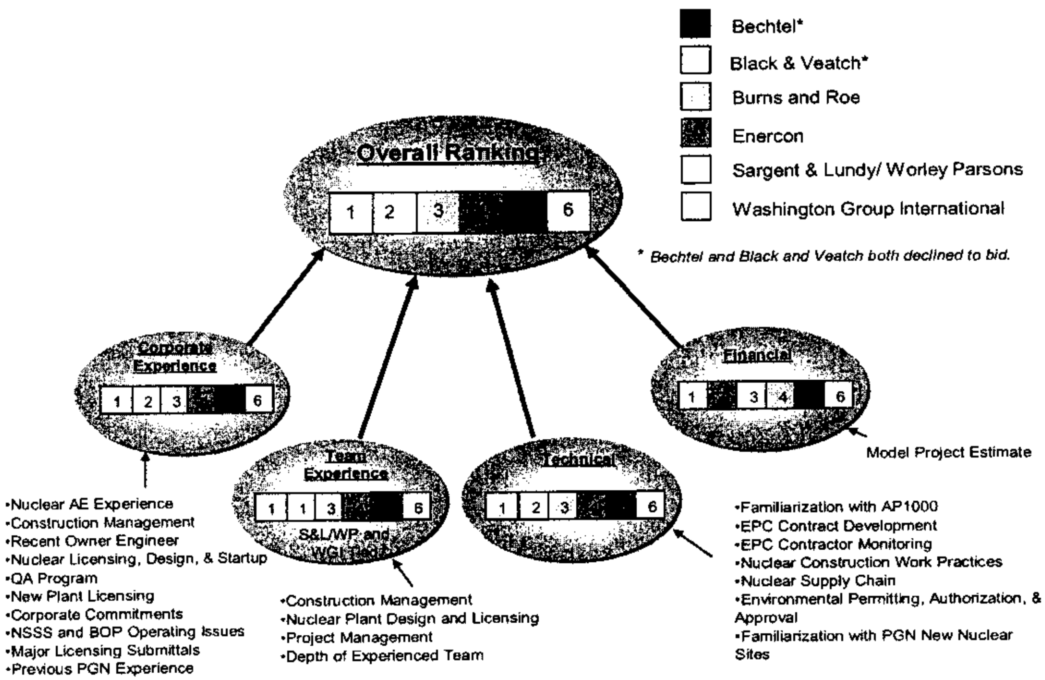

Key Assumptions and Evaluation Criteria

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This document includes the results of the evaluation for selecting an Owner's Engineer to support the Nuclear Plant Development Project as the project work scope evolves and expands.

During the evaluation process certain key assumptions and/or criteria were used as "bounding conditions" to aid in the evaluation process. By invoking these key assumptions and/or criteria, the relative scores for a particular attribute of a COLA Preparer, such as Corporate Experience, Team Personnel, and Technical Plan, were determined.

The following key assumptions and/or criteria were established for this evaluation:

- **The new nuclear baseload generation must reach commercial in-service status by 2016.**
- **Planning, design, procurement, and construction activities will be performed in parallel with COLA submittal review and approval, as possible, depending on permitting and authorized funding.**
- **Selecting an Owner's Engineer is the basis for establishing a Master Services Agreement and does not constitute defining or authorizing any specific work scopes or dollars.**
- **It is anticipated that the selected vendor will primarily be involved with supporting the Owner, as requested, over the next few years. This is not intended to be the selection of a Contractor to perform exclusively in an Owner's Engineer role for the entire duration of design and construction of the new nuclear plants.**
- **Establishing a Master Services Agreement Contract with the selected bidder does not prevent the Owner from establishing separate contract(s) for services that this vendor has proposed to do.**
- **Selecting a vendor does not commit the Owner to awarding all, or any, portions of the work to be performed exactly as proposed. The proposals convey Contractor capabilities and capacity to support the Owner. Each work scope and associated methods will be mutually defined and agreed upon as work is authorized.**

- For the purpose of the scope of work, the term "Existing" plants refers to the four Progress Energy existing nuclear sites in the Carolinas and Florida.

- Involvement with Owner's COLA development work will be quite valuable as planning, licensing, procurement, and design activities must be aligned with the COLA. Existing familiarity with the selected new nuclear sites is also an advantage for an Owner's Engineer.

- It is essential that the Owner's Engineer have an approved Quality Assurance plan which complies with the requirements of NQA-1 (1994 Edition). A Contractor must have such a QA Program, and the Contractor's approved program must be reflected on NGG's Approved Supplier's List before a Contract can be awarded for performing Quality Related activities.

- It is important that the Owner's Engineer has industry engagement in new plant licensing activities.

Evaluation Methodology

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Review Team

The potential preparers' Corporate Experience, Team Personnel, and Technical Plan for developing the COLAs, were reviewed by a comprehensive team representing several disciplines as follows:

Executive Team Lead - Joe Donahue, VP- Nuclear Engineering & Services Department (NESD)

Management Lead - Garry Miller, General Manager – Nuclear Plant Development and License Renewal

Reviewers/ Disciplines - Lewis Spragins (Project Controls)
Debbie Doyle (Project Controls)
Tony Owen (Strategic Sourcing)

Detailed Evaluation Process

The review and evaluation process addressing the selection criteria for the Owner's Engineer was separated into a two tier methodology. The first tier addressed the following attributes: Corporate Experience, Team Personnel, and Technical Plan, and are accumulated in a summary level table. Each of these attributes contains items that are important in facilitating the selection of the most suitable Owner's Engineer for Progress Energy. These items have been weighted and scored, based on the potential Owner's Engineer proposals.

Following the technical evaluations, the proposals were evaluated from a financial perspective. The results of the detailed evaluation for the first tier, and the basis for scoring each item, are documented in Attachment I. The second tier methodology evaluated financial considerations, and results are shown in Attachment II.

Summary Evaluation Results

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Composite Rating Comparison

Owner's Engineer Evaluation Criteria:	Owner's Engineer			
	Burns and Roe	S&L / WP	Enercon	WGI
Corporate Experience				
Composite Score for Evaluation of Corporate Experience	515	815	125	710

Owner's Engineer Evaluation Criteria:	Owner's Engineer			
	Burns and Roe	S&L / WP	Enercon	WGI
Team Personnel				
Composite Score for Evaluation of Team Personnel	285	435	185	435

Owner's Engineer Evaluation Criteria:	Owner's Engineer			
	Burns and Roe	**S&L / WP**	**Enercon**	**WGI**
Technical Plan				
Composite Score for Evaluation of Technical	280	450	230	365

Owner's Engineer Evaluation Criteria:	Owner's Engineer			
	Burns and Roe	**S&L / WP**	**Enercon**	**WGI**
Financial Evaluation				
Composite Score for Financial Evaluation	20	50	40	40

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Attachment I – Technical Evaluation

Evaluation Criteria: Corporate Experience	Owner's Engineer									Supporting Basis
		Burns and Roe		S&L / WP		Enercon		WGI		
	Weight	Score	WS	Score	WS	Score	WS	Score	WS	
Nuclear Power Plant Design Experience as an AE	10	5	50	10	100	0	0	10	100	[redacted]
Recent Construction Management Experience	10	2	20	8	80	0	0	10	100	[redacted]
Recent Owner Engineer Experience	10	9	90	10	100	0	0	8	80	[redacted]

Redacted

Evaluation Criteria: Corporate Experience		Owner's Engineer								Supporting Basis
		Burns and Roe		S&L / WP		Enercon		WGI		
	Weight	Score	WS	Score	WS	Score	WS	Score	WS	
Previous Experience with Licensing, Design, Construction, and Startup of Prior Nuclear Plants	10	6	60	10	100	1	10	9	90	[redacted]
New Plant QA Program – NQA-1 (1994 Edition)	10	8	80	10	100	0	0	8	80	[redacted]
New Plant Licensing Experience	10	5	50	9	90	9	90	10	100	[redacted] Redacted

Evaluation Criteria: *Corporate Experience*	Owner's Engineer									Supporting Basis
		Burns and Roe		S&L / WP		Enercon		WGI		
	Weight	Score	WS	Score	WS	Score	WS	Score	WS	
Corporate Commitments That Challenge the Focus on PGN Support	10	6	60	8	80	5	50	2	20	[redacted]
Experience with NSSS and BOP Operating Issues	5	5	25	5	25	5	25	5	25	[redacted]
Recent Licensing Experience (Major submittals: Power Uprate, License Renewal)	5	4	20	10	50	4	20	10	50	[redacted]
QA Program Meeting 10CFR50 Appendix B	5	8	40	10	50	10	50	8	40	[redacted]

Redacted.

Evaluation Criteria: Corporate Experience	Weight	Owner's Engineer: Burns and Roe Score	Burns and Roe WS	S&L / WP Score	S&L / WP WS	Enercon Score	Enercon WS	WGI Score	WGI WS	Supporting Basis
Previous PGN Experience with Vendor	5	4	20	8	40	3	5	25	25	[redacted]
Total Weighted Score for Corporate Experience			515		815		125		710	

Redacted

Evaluation Criteria: ***Team Personnel***		**Owner's Engineer**								**Supporting Basis**
		Burns and Roe		**S&L / WP**		**Enercon**		**WGI**		
	Weight	**Score**	**WS**	**Score**	**WS**	**Score**	**WS**	**Score**	**WS**	
Experienced in Construction Management	10	6	60	10	100	2	20	10	100	[redacted]
Experienced in Nuclear Power Plant Design	10	5	50	10	100	7	70	10	100	
Experienced in New Nuclear Power Plant Licensing	5	9	45	9	45	5	25	9	45	
Experienced in Project Management	10	6	60	10	100	3	30	9	90	Redacted

Evaluation Criteria: Team Personnel		Owner's Engineer								Supporting Basis
		Burns and Roe		S&L / WP		Enercon		WGI		
	Weight	Score	WS	Score	WS	Score	WS	Score	WS	
Depth of Experienced Team Available	10	7	70	9	90	4	40	10	100	[redacted] Redacted
Total Weighted Score for Team Personnel			285		435		185		435	

Evaluation Criteria: *Technical Plan*		**Owner's Engineer**								**Supporting Basis**
		Burns and Roe		**S&L / WP**		**Enercon**		**WGI**		
	Weight	**Score**	**WS**	**Score**	**WS**	**Score**	**WS**	**Score**	**WS**	
Familiarization with AP1000 Technology	10	5	50	10	100	10	100	7	70	[redacted]
EPC Contract Development Support	5	3	15	9	45	0	0	8	40	[redacted]

Evaluation Criteria: ***Technical Plan***		**Owner's Engineer**								**Supporting Basis**
		Burns and Roe		**S&L / WP**		**Enercon**		**WGI**		
	Weight	**Score**	**WS**	**Score**	**WS**	**Score**	**WS**	**Score**	**WS**	
EPC Contractor Cost and Production Performance Monitoring	5	10	50	10	50	4	20	10	50	[redacted]
Nuclear Construction Methods and Work Practices	10	7	70	8	80	4	40	8	80	[redacted]
Nuclear Supply Chain	10	8	80	10	100	3	30	10	100	[redacted] Redacted
Environmental Permitting, Authorization, and Approval	5	3	15	5	25	3	15	5	25	[redacted]

Evaluation Criteria: *Technical Plan*	Weight	Owner's Engineer: Burns and Roe Score	Burns and Roe WS	S&L / WP Score	S&L / WP WS	Ehercon Score	Ehercon WS	WGI Score	WGI WS	Supporting Basis
Familiarization with PGN New Nuclear Plant Sites	5	0	0	10	50	5	25	0	0	[redacted]
Total Weighted Score for Technical			280		450		230		365	

Redacted

Attachment II – Financial Evaluation

The Owner's Engineer bids included various proposed commercial terms and conditions. This included detailed rate structures and policies related to labor, management fees, expenses, per diem, subcontractor and material fees, and escalation factors. Based on a detailed evaluation and model project cost estimation, the S&L / WP joint venture team is recommended from a financial perspective. They have one of the lower rate structures, and were among the lowest of the model project total cost results. By utilizing this team, the project would realize cost efficiencies due to their COLA involvement and familiarity with the selected plant sites. .

The following tables summarize the proposed commercial details and the results of the model project estimate.

Comparison of Straight Time Labor Hourly Bill Rates and Expenses						
Title	**Enercon**	**JV - S&L and Worley Parsons**	**S&L (Sargent & Lundy)**	**Worley Parsons***	**Burns & Roe****	**Washington Grp *Int'l***
[redacted]						

Redacted

Title	Enercon	JV - S&L and Worley Parsons	S&L (Sargent & Lundy)	Worley Parsons*	Burns & Roe**	Washington Grp Int'l
Redacted						

Escalation Factors

Title	Enercon	JV - S&L and Worley Parsons	S&L (Sargent & Lundy)	Worley Parsons	Burns & Roe	Washington Grp Int'l
Redacted						

Subcontractor and Material Fees

Title	Enercon	JV - S&L and Worley Parsons	S&L (Sargent & Lundy)	Worley Parsons	Burns & Roe	Washington Grp Int'l
Subcontractor fee	Redacted					
Materials						

Contract/Terms and Conditions

Title	Enercon	JV - S&L and Worley Parsons	S&L (Sargent & Lundy)	Worley Parsons	Burns & Roe	Washington Grp Int'l
Master Contract						
Terms & Conditions - Exceptions						

Redacted

Table of Conformance

Enercon	JV - S&L and Worley Parsons	S&L (Sargent & Lundy)	Worley Parsons	Burns & Roe	Washington Grp Int'l

Redacted

Model 600 Hour Project Estimation

The following is cost estimation for a 600 hour job taking 10 weeks. Project team will consist of 1 manager, 1 supervisor, 6 engineers and 4 designers for a total of 12 FTEs. Per diem is calculated for 5 days per week with an assumed 5 weeks out of 10 in the field. Cost estimation also includes $20k of subcontracting costs, $5k of material, and $5k of travel.

Straight Time Calculation

Position	Number of Employees	Enercon	Joint Venture - S&L and Worley Parsons	S&L (Sargent & Lundy)	Worley Parsons *	Burns & Roe**	Washington Grp Int'l
Manager	1						
Supervisor	1						
Engineer	6						

Redacted

Designer	4	
Total per Hour:	12	$

Redacted

Redacted

Overtime Calculation for Employees

	Enercon	Joint Venture - S&L and Worley Parsons	S&L (Sargent & Lundy)	Worley Parsons	Burns & Roe	Washington Grp Int'l
Straight Time Hour:						
Overtime Hour						

Redacted

Weekly Labor Cost Calculation

	Enercon	**Joint Venture - S&L and Worley**	**S&L (Sargent & Lundy)**	**Worley Parsons**	**Burns & Roe**	**Washington Grp Int'l**
40 Hours Straight Time						
10 Hours Over Time						
Total Labor Cost per Week						

Redacted

Per Diem Calculation*

	Enercon	**Joint Venture - S&L and Worley Parsons****	**S&L (Sargent & Lundy)****	**Worley Parsons**	**Burns & Roe**	**Washington Grp Int'l**
Daily Lodging						
Daily Food						
Total Daily Per Diem						
Total Weekly Per Diem						
Weekly Per Diem for 12						

Redacted

FTEs						

*Per diem is calculated at 5 days per week
** Federal Per Diem Rates have been used when companies rates are unavailable

Subcontractor, Material and Travel Calculation

	Enercon	Joint Venture - S&L and Worley Parsons	S&L (Sargent & Lundy)	Worley Parsons	Burns & Roe	Washington Grp Int'l

Redacted

Total Cost for Model 600 Hour Project Requiring 10 Weeks

	Enercon	Joint Venture - S&L and Worley Parsons	S&L (Sargent & Lundy)	Worley Parsons	Burns & Roe	Washington Grp Int'l

Redacted

NEXT 5 PAGES

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Progress Energy

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New Nuclear Baseload Generation Addition

Evaluation of Advanced Reactor Technologies

Progress Energy Carolinas, Inc.
Progress Energy Florida, Inc.
410 South Wilmington Street
Raleigh, North Carolina 27601

NGG Nuclear Generation Group

Table of Contents

Executive Summary & Recommendation

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Based on detailed review/analysis of the RFP responses and additional information provided by the vendors during follow-up meetings, the review team recommends that the Westinghouse AP-1000 be selected as the reactor technology for deployment in 2015.

The graphical depiction in this section shows how the various technologies ranked in the major categories, and the tables in the following sections of this document provide detailed scoring and analysis that yielded the graphical summary results.

This recommendation is based on the bounding key assumptions provided in the next section of this document, and considers the relative scoring results across all considerations for the new reactor technologies.

Westinghouse had considerable strength over GE and AREVA in regard to design certification and licensing assurance, which represents the paramount consideration for meeting the required in-service date. The Combined Operating License (COL) regulatory paths for the GE and AREVA designs have much uncertainty, particularly noting the difference between the vendor's schedules and those quoted by the US Nuclear Regulatory Commission (NRC). The Westinghouse AP-1000 advanced reactor design is certified (i.e., on December 30, 2005, the NRC Commission approved a final rule amending 10 CFR Part 52 to certify the AP-1000 standard plant design). COL applications which reference a certified design are viewed favorably by the NRC. GE submitted a design certification application for the ESBWR in August 2005, which was not accepted by the NRC until GE had provided additional information to address the deficiencies identified by the staff. On December 1, 2005, the NRC informed GE that they have accepted for docketing the design certification application for the ESBWR, including the supplemental information. The NRC staff expects to issue a safety evaluation report with open items in October 2007, followed by a final design approval of the ESBWR approximately 15 months later (i.e., January 2009), and a full certification rulemaking 12 months later (i.e., January 2010). A COL application for an ESBWR plant would refer to a design which is not certified by the NRC, and will have to be amended after the original submittal. First, the COL application will be revised to include additional design items following the final design certification. Immediately after COL issuance by the NRC (e.g., during plant construction), a COL amendment request will have to be submitted to include the GNF4 fuel design (the new fuel design is expected to be approved generically by the NRC in 2012). This process would increase the probability for intervention each time a COL amendment request is submitted for NRC review and approval, therefore, causing potentially significant delays in schedule. The AREVA design certification application will not even be submitted until late 2007. The NRC predicts a nominal 42 to 60 months for final design certification once the application is docketed.

In the broad technical areas that encompass design engineering, construction planning, capabilities and partnering strengths, Westinghouse leads GE and AREVA. This is a result of the fact that Westinghouse is furthest along in design engineering completeness in a ready to use status for the United States. Note that while AREVA has significant design engineering completed to support the construction of a plant in Finland, it is in European codes and standards format that needs to be translated for use in the United States. GE has the least amount of design engineering complete at this time. AREVA had the strongest construction planning efforts at this point, and has the strongest construction partner being Bechtel. Westinghouse has selected Shaw Stone & Webster as its construction partner, which also results in a strong partnered team. GE has yet to select its prime construction partner, and selected an A/E (Black & Veatch) for the balance of nuclear island design. From an experience viewpoint, it should be noted that Black & Veatch did not design any of the operating 103 nuclear reactors in the US fleet.

In regards to Progress Energy strategic considerations, Westinghouse also ranks the highest. The AP-1000 can be sited with less difficulty than the GE and AREVA designs (based on its lower MWth output and associated cooling water needs), and also can be integrated into the PGN transmission and system operation with less difficulty (based on its lower MWe output). Transmission upgrade costs are expected to be higher for the GE and AREVA reactors for any selected Carolinas or Florida site, based on the additional MWe capacity output to transmit.

The Westinghouse and GE designs represent the latest revolutionary advancement in the use of passive technologies that fundamentally simplify the plant and reduce the number of overall components, including the elimination of safety-related AC power.

Redacted

In regards to new technology risks that could be revealed during start-up and initial operations,

Redacted

GE scores the highest in the financial analysis, with the lowest predicted busbar cost, followed by Westinghouse. The levelized busbar cost was first analyzed solely using the RFP response data provided by the vendors, and GE had the lowest predicted cost.

Redacted

have . Sensitivity analyses of the levelized busbar cost were also completed (presented in Attachment IV) that considered the confidence in the precision of the overnight capital costs.

Redacted

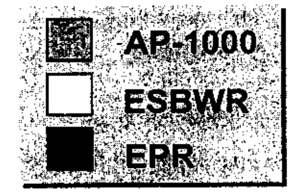
Sensitivity analysis that considered the Energy Policy Act of 2005 (EPACT) production tax credits probabilities for the various technologies were also completed. These probabilities considered the likelihood of the reactor technology being one of the first new plants in-service (all other things being considered equal) under a potential "first in service allocation" approach by the Department of Treasury.

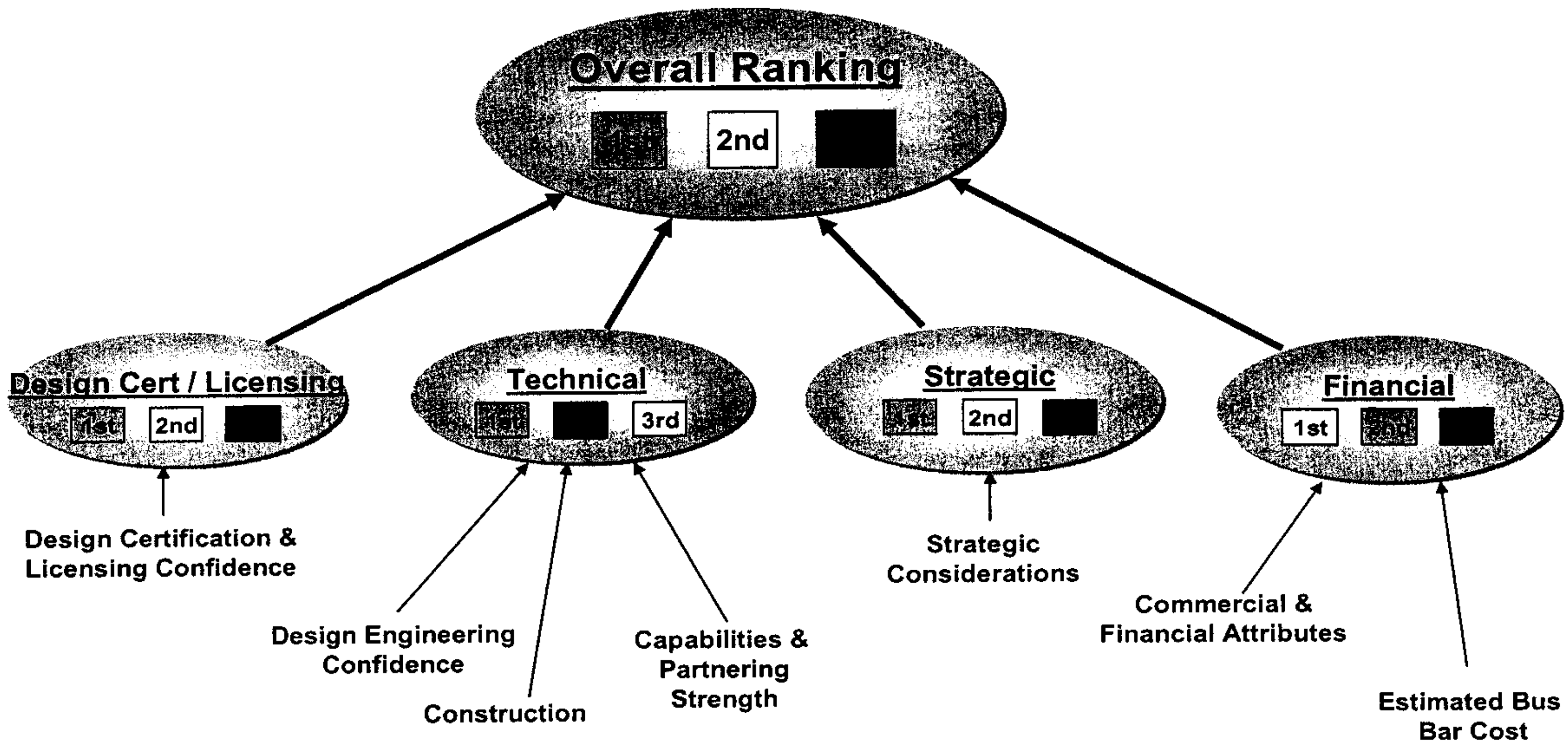
In summary, the Westinghouse AP-1000 design lead scoring in the following areas: design certification / licensing; the broad technical areas that encompass design engineering, construction planning, capabilities and partnering; and Progress Energy strategic considerations. Westinghouse scored second in the *financial analysis*. Redacted

and EPACT production tax credit allocation probabilities.

Considering all these reviews, results, and analysis in the collective for Progress Energy, the Westinghouse AP-1000 is recommended as the new reactor technology of choice. The next page graphically depicts the ranking and overall recommendation.

Summary Results





Key Assumptions and Evaluation Criteria

This document includes the results of the evaluation for three advanced reactor types considered for new nuclear baseload generation. During the evaluation process certain key assumptions and/or criteria were used as "bounding conditions" to aid in the evaluation process. By invoking these key assumptions and/or criteria, the relative scores of the various technologies for a particular attribute, such as licensing confidence, were determined.

The following key assumptions and/or criteria were established for this evaluation:

- **The new nuclear baseload generation must reach commercial in-service status by mid 2015. Refer to Attachment X for Environmental & Resource Planning supporting information.**
- **The expected licensing path and regulatory outlook for the recommended reactor technology must minimize Progress Energy's schedule and financial risk for this project.**
  - **Current NRC regulations and NRC guidance including 10 CFR Part 50 – "Domestic Licensing of Production and Utilization Facilities", 10 CFR Part 52- "Early Site Permits, Standard Design Certifications, and Combined Licenses for Nuclear Power Plants", and SECY-05-0139, "Semi-annual Update of the Status of New Reactors Licensing Activities and Future Planning for New Reactors", dated August 4, 2005, are used in evaluations related to vendor design certifications, COL preparation, and NRC review processes.**
  - **NRC Commission approval of the final rule amending 10 CFR Part 52 to certify the AP-1000 standard plant design, dated December 30, 2005, and SECY-05-0227, "Final Rule-AP1000 Design Certification".**
  - **NRC letter to GE, dated December 1, 2005, "Acceptance of the General Electric Company Application for Final Design Approval and Standard Design Certification for the Economic Simplified Boiling Water Reactor (ESBWR) Design".**
- **The new nuclear plant must be compatible with Progress Energy's System Operation and transmission delivery capabilities.**
- **The cost of the new nuclear generation must be reasonable and fair, and methods to ensure greater certainty of the cost/schedule during the licensing, design engineering, and construction phases of the project must be included.**

- **For the selected reactor technology, we must be able to agree upon an EPC (engineering, procurement, construction) contract arrangement that shares risk fairly between Progress Energy and the vendor, with the appropriate accountability clearly established.**

- **Progress Energy would not choose an advanced reactor technology type that no other United States utility was considering.**

[redacted]

Redacted

Redacted

[redacted]

- As part of the detailed financial comparisons for the various reactor technologies, financial impacts associated with transmission reserve costs, spinning reserve costs, and transmission upgrade costs (for system import capabilities), were all considered. These PEC/PEF impacts are based on required changes for transmission system reliability reserve requirements, required changes for spinning reserve requirements, and required upgrades to the transmission system to increase import capabilities, all above the existing values as of January 2006. These system changes are required because of the higher electrical output of the advanced reactor technology plants as compared to the existing largest generating plants in the PEC and PEF fleets.

Evaluation Methodology

Review Team

The request-for-proposal (RFP) responses and associated follow-up information provided by the reactor technology vendors were reviewed by a comprehensive team representing several disciplines as follows:

Executive Team Lead - Joe Donahue, VP- Nuclear Engineering & Services Department (NESD)

Management Lead - Garry Miller, Manager – License Renewal

Reviewers/ Disciplines - Talmage Clements (engineering and nuclear fuels)
Cristina Ionescu (licensing)
James Nevill (engineering and construction)
Roland Parsons (construction management)
Jeff Colborn (IT and digital controls)
Mike Brennan (financial)
Gerry Dowd (financial)
Kenric England (nuclear fuel)
Tony Owen (contract management)

Reactor Technology Vendor RFP Response Detailed Evaluation

A systemic process was employed to ensure a thorough and equitable assessment of the reactor technologies under consideration. The vendor responses to 165 RFP questions were grouped in a side-by-side comparison table to facilitate the review. Seven topical categories of decision criteria were selected for the evaluation process. The165 RFP question responses were grouped into the seven categories to ensure requirements stipulated by Progress Energy were thoroughly reviewed, evaluated, and individually scored, with the basis for decisions documented.

The review and evaluation process addressing the seven categories of decision criteria was separated into a three tier methodology with the realization that each tier feeds into the next tier and iteration was expected for reconsideration as additional data and information was evaluated. The first tier addressed technical attributes of proposals, the second tier covered Progress Energy strategic criteria and considerations, and the third tier evaluated financial considerations. The third tier included an evaluation, including sensitivity analysis, of Progress Energy's estimated busbar costs for each of the reactor technologies, which were based on the vendor's response to specific RFP questions.

Each of these critical area evaluations were accumulated in a summary level table that provided a level of importance (or weighting) to each of the three tiers. This summation resulted in an overall rating of relative comparison between each of the reactor technology vendors.

The final activity, after determination and selection of the best fit vendor, was identification of risk related adverse consequences and subsequent contingency plans to mitigate negative impacts on the licensing, design, construction, startup, and long-term operation and maintenance of the chosen reactor technology.

The following weighted percentages for an overall selection of the reactor technology were applied to the technological, strategic, and financial portions of the evaluation process.

First Tier:

- Design Certification & Licensing
- Design Completeness & Final Design Accomplishment
- Construction, Project & Start-up
- Capability/Partnering Strengths

Second Tier:

- Strategic Considerations

Third Tier:

- Commercial and Financial Attributes
- Estimated Busbar Costs

The **1st Tier** completed a thorough and extensive evaluation of the vendor proposal responses associated with technical and operational requirements for licensing, design, construction, and capability input by the vendors. A methodology was applied for a structured review of each RFP question followed by each vendor rated on their response with a level of importance applied to each question. **Attachment I** contains the first tier criteria developed for evaluation of the vendor responses, the weighting applied to each question, and the basis for the score applied to each vendor for each question. Weighting was scaled from one to ten with the most important questions weighted ten, moderately important weighted five, least important one, and those not requiring scoring were weighted zero. The scoring range of one to ten provided the relative level of compliance and/or strength/weakness to the questions asked in the RFP. The questions not weighted or scored had an intended purpose for obtaining relationship information or a level of confidence in other areas providing scored input. Multiplication resulting in a weighted score for each vendor for each question was then summarized for the each of the four areas of design certification/licensing, design completeness, construction, and capabilities/partnerships.

The basis for scoring each question was documented based on the vendor input provided in the RFP responses and from other information provided by each vendor in bid presentation meetings, or in response to follow-up questions by Progress Energy.

The summarized results were normalized in a percentage of conformances to each of the four areas of design certification/licensing, design completeness, construction, and capabilities/partnerships, and transferred to the Summary Evaluation Results Table. The vendor with the highest overall weighted score yielded the initial choice for the reactor technology selection. **Attachment I** contains the question weighting, scoring results, and basis, associated with the first tier.

The **2nd Tier** provided an evaluation of each vendor design conformance to specific strategic considerations, including specific considerations regarding Progress Energy generation and transmission system fit. The vendors were evaluated for compatibility and conformance with plant site parameters, transmission system deliverability, new technology risks, vendor financial strength, and fleet coordination. This tier validated that vendors will provide a completion schedule, licensable plant design, and operational specifications that satisfy the Progress Energy business model. **Attachment II** contains the question weighting, scoring results, and basis, associated with the second tier. Attributes of this tier were weighted, scored, and normalized like the first tier and transferred to the Summary Evaluation Results Table.

The **3rd Tier** was an evaluation of the commercial and financial aspects of the vendor proposal responses. Commercial and financial attributes under review included commercial considerations, financial analysis, and the estimated bus bar costs in support of the final decision for a reactor technology vendor that would fully satisfy regulatory requirements, environmental stewardship, Progress Energy Stakeholders, and the customer needs. The RFP questions associated with financial considerations were weighted, scored, and normalized like the first tier and transferred to the Summary Evaluation Results Table. Specific consideration and evaluation was applied to busbar cost. **Attachment III** includes the financial evaluation details and basis documentation. Again, attributes of this tier were weighted, scored, and normalized like the first and second tier and transferred to the Summary Evaluation Results Table.

A **Final Step** identified potential risks associated with the recommended vendor to ensure success of the project from contract release to beyond commercial operation. Each adverse consequence associated with formulation of any risk, was followed with recommended contingency plans to mitigate problems from impacting schedule, cost, quality, or safety issues. **Attachment IX** provides issues of risk and recommendations.

Critical Review of Vendor Licensing Schedules:

A histogram of regulatory timeline logic was developed for each reactor technology vendor to establish a confidence level associated with the vendors proposed accomplishment of Design Certification and technical support in obtaining a Combined Operating License (COL). The vendor communicated schedule milestones were overlaid with the NRC schedule expectations published in SECY-05-0139, "Semi-annual Update of the Status of New Reactors Licensing Activities and Future Planning for New Reactors", dated August 4, 2005, and further confirmed through public meetings held between the NRC and Progress Energy on November 1st, 2005. These critical activities reflect the vendor's ability, or inability, to satisfy Progress Energy business strategy of Commercial Operation in 2015. **Attachment IV** contains these timelines, and they were used in the scoring of certain specific Tier 1 RFP question/answers related to design certification and license assurance.

Progress Energy Senior Management Reviews:

Upon completion of the reactor technology proposal evaluation and recommendation of a prime contractor, the evaluation methodology, key assumptions, logic applied, and decision basis documentation were subjected to management oversight reviews by Progress Energy management. The first senior management review and concurrence was completed by the Vice President – NESD, who was the executive sponsor of the team.

The recommendation of this document requires concurrence by the Nuclear Baseload Steering Committee, comprised of Progress Energy senior management members representing Nuclear Generation, Financial, State/Federal Regulatory, Communication, Transmission, Legal, Energy Delivery, and Corporate Relations. Following the concurrence by this committee, the recommendation would then go to the Progress Energy President and Chief Operating Officer (COO), and finally the Progress Energy Chairman and Chief Executive Officer (CEO).

This critical review sequence was intended to identify weakness in review considerations, confirm soundness of financial positions, ensure compliance with Company strategies and business goals, provide input for contractual requirements, agree to and identify additional risk potentials, and reach consensus that the decision is in the best interest of Progress Energy customers and stakeholders.

Summary Evaluation Results

Evaluation Criteria		Alternative Compliance						Summary Basis of Evaluation Conclusion
		W		GE		Areva		
	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
Technical Evaluation (Refer to Attachment I)								[redacted]
Design Certification and Licensing Confidence	**30**	100%	30	69%	20.7	54%	16.2	

Evaluation Criteria		Alternative Compliance						Summary Basis of Evaluation Conclusion
		W		GE		Areva		
	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
Total Normalized Score For DC / Licensing			30		20.7		16.2	
Design Completeness and Assurance of Final Design Accomplishment	20	100%	20	85%	17	92%	18.4	[redacted] Redacted
Confidence in Construction Approach, Project Completion, and Startup Success	15	98.6%	14.8	91.2%	13.7	100%	15	
Capabilities and Partnering Strengths	5	100%	5	73.5%	3.7	91.9%	4.6	
Total Normalized Score For Other Technical			39.8		34.4		38	

Evaluation Criteria		Alternative Compliance						Summary Basis of Evaluation Conclusion
		W		GE		Areva		
	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
Strategic Considerations (refer to Attachment II)								[redacted]
Strategic Considerations	**10**	100%	10	75.4%	7.5	66.6%	6.7	
Total Normalized Score for Strategic Considerations			10		7.5		6.7	
Financial Evaluation (refer to Attachment III)								
Commercial & Financial Attributes	**5**	65.2%	3.3	100%	5	57%	2.9	

Evaluation Criteria		Alternative Compliance						Summary Basis of Evaluation Conclusion
		W		GE		Areva		
	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
Estimated Bus Bar Cost	15	78.6%	11.8	100%	15	71.4%	10.7	[redacted]
Total Normalized Score for Financial			15.1		20		13.6	

Attachment I - Technical Evaluation Details

Decision Analysis Data for Category: *Design Certification and Licensing Confidence*

RFP Evaluation Criteria: Design Certification and Licensing Confidence		Alternative Compliance						Basis of Evaluation Finding and Input to Risk Mitigation Strategies
		W		GE		Areva		
RFP Question (simplified)	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
D8 - Meeting applicable US Codes and Standards	10	10	100	8	80	8	80	[redacted]
G10 - Certainty for DC by 3rd Qtr 2007	10	10	100	6	60	0	0	

RFP Evaluation Criteria: Design Certification and Licensing Confidence		**Alternative Compliance**						**Basis of Evaluation Finding and Input to Risk Mitigation Strategies**
		W		**GE**		**Areva**		
RFP Question (simplified)	**Weight**	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**	
L1 - Bidder position for COLA submission by 4th Qtr 2007	10	10	100	4	40	2	20	[redacted]
L2 - Current % complete of engineering for Design Certification application and issuance, and COLA	10	8	80	6	60	4	40	

RFP Evaluation Criteria: Design Certification and Licensing Confidence		Alternative Compliance						Basis of Evaluation Finding and Input to Risk Mitigation Strategies
		W		GE		Areva		
RFP Question (simplified)	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
L3 - Schedule for completing Design Certification, Engineering Design, Component Specifications, Construction Design	10	10	100	8	80	7	70	[redacted]
L5 - Current NRC schedule for review and approval of DC	10	10	100	4	40	2	20	
L6 - Comparison of Bidder and NRC DC and COL schedules	10	10	100	4	40	2	20	
L9 - Approach to ITAAC to minimize regulatory hearings	10	10	100	6	60	4	40	

Redacted

RFP Evaluation Criteria: Design Certification and Licensing Confidence		Alternative Compliance					
		W		GE		Areva	
RFP Question (simplified)	**Weight**	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**
C31 - Construction and inspection procedures developed before COL or negotiated with NRC after COL	5	10	50	10	50	8	40
D17 - Assessment of future NRC security requirements	5	8	40	10	50	10	50
L4 - Major issues in Design Certification that need resolution	5	10	50	7	35	6	30

Basis of Evaluation Finding and Input to Risk Mitigation Strategies

[redacted]

RFP Evaluation Criteria: Design Certification and Licensing Confidence		**Alternative Compliance**						**Basis of Evaluation Finding and Input to Risk Mitigation Strategies**
		W		**GE**		**Areva**		
RFP Question (simplified)	**Weight**	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**	
D24 - Incorporation of Regulatory Risk for leak before break, snubbers, recirc sumps, seismic, CR habitability	5	10	50	10	50	9	45	[redacted]
D41 - Effort, schedule, and strategy for design acceptance criteria (DAC) development	5	10	50	9	45	9	45	
D7 - Compliance with RG 1.165 seismic response spectra	5	9	45	9	45	9	45	

RFP Evaluation Criteria: Design Certification and Licensing Confidence		Alternative Compliance					
		W		GE		Areva	
RFP Question (simplified)	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score
E7 - Schedule for testing and qualification of first-of-a-kind components	5	9	45	7	35	10	50
L11 - Status of NRC computer code approval for engineering and safety analysis	5	10	50	9	45	8	40

Basis of Evaluation Finding and Input to Risk Mitigation Strategies:

[redacted]

Redacted

RFP Evaluation Criteria: Design Certification and Licensing Confidence		Alternative Compliance						Basis of Evaluation Finding and Input to Risk Mitigation Strategies
		W		GE		Areva		
RFP Question (simplified)	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
L7 - Interface plan with NRC for Design Certification review	5	10	50	4	20	2	10	[redacted]
L8 - Will licensing activities have to be accelerated	5	10	50	6	30	5	25	[redacted]

RFP Evaluation Criteria: Design Certification and Licensing Confidence		**Alternative Compliance**					
		W		**GE**		**Areva**	
RFP Question (simplified)	**Weight**	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**
C12 - Permits required for the Owner to obtain	1	5	5	5	5	5	5
G7 - Describe QA, CAP, and Configuration Mgmt, and Self Assessment programs	1	10	10	10	10	10	10
L10 - Negotiation with NRC on testing of Distributed Control System	1	10	10	5	5	7	7
C14 - Acknowledgement of on site NRC Resident Inspector with full access to all quality and licensing information	0	0	0	0	0	0	0
Total Weighted Scores			1285		885		692
Normalized Scores			100%		69%		54%

Basis of Evaluation Finding and Input to Risk Mitigation Strategies

[redacted]

Redacted

Decision Analysis Data for Category: *Design Completeness*

RFP Evaluation Criteria: Design Completeness and Assurance of Final Design Accomplishment		Alternative Compliance						Basis of Evaluation Finding and Input to Risk Mitigation Strategies
		W		GE		Areva		
RFP Question (simplified)	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
D1 - NSSS and BOP design percent complete	10	10	100	2	20	8	80	[redacted]

RFP Evaluation Criteria: Design Completeness and Assurance of Final Design Accomplishment		Alternative Compliance						Basis of Evaluation Finding and Input to Risk Mitigation Strategies
		W		GE		Areva		
RFP Question (simplified)	**Weight**	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**	
D11 - Nuclear fuel core design, loading, and debris resistance	10	10	100	7	70	10	100	[redacted]
D22 - Existing plant OE reflected in component selection, reactor trips, ISI, and material selection	10	10	100	9	90	10	100	

RFP Evaluation Criteria: Design Completeness and Assurance of Final Design Accomplishment		**Alternative Compliance**						**Basis of Evaluation Finding and Input to Risk Mitigation Strategies**
		W		**GE**		**Areva**		
RFP Question (simplified)	**Weight**	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**	
D30 - Design for digital hardware and software with upgrades due to obsolescence	10	10	100	5	50	9	90	[redacted]
D5 - Identify BOP operational issues, correction in advanced design, and PRA reliability concerns (17 questions on BOP reliability)	10	10	100	9	90	10	100	

RFP Evaluation Criteria: Design Completeness and Assurance of Final Design Accomplishment		Alternative Compliance						Basis of Evaluation Finding and Input to Risk Mitigation Strategies
		W		GE		Areva		
RFP Question (simplified)	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
D25 - Incorporation of fire protection considerations	5	8	40	8	40	7	35	[redacted]
C23 - Identify overseas outsourced engineering, and responsibilities for rework if detailed design is outsourced overseas	5	7	35	5	25	7	35	

Redacted

RFP Evaluation Criteria: Design Completeness and Assurance of Final Design Accomplishment		Alternative Compliance						Basis of Evaluation Finding and Input to Risk Mitigation Strategies
		W		GE		Areva		
RFP Question (simplified)	**Weight**	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**	
D10 - Status of control room and simulator design completion	5	4	20	2	10	4	20	[redacted]
D12 - Refueling machinery speed and fuel sipping capabilities	5	10	50	7	35	10	50	[redacted]

RFP Evaluation Criteria: Design Completeness and Assurance of Final Design Accomplishment		**Alternative Compliance**						**Basis of Evaluation Finding and Input to Risk Mitigation Strategies**
		W		**GE**		**Areva**		
RFP Question (simplified)	**Weight**	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**	
D13 - Spent fuel wet pool storage design and capacity	5	8	40	8	40	8	40	[redacted]
D19 - Rigorous configuration control for total life cycle	5	9	45	9	45	9	45	
D21 - OE, INPO, and EPRI use in improving plant reliability	5	10	50	9	45	9	45	
D23 - Ability to test and inspect to Tech Specs	5	9	45	9	45	10	50	
D31 - Design for robust predictive monitoring and remote monitoring	5	10	50	10	50	5	25	

RFP Evaluation Criteria: Design Completeness and Assurance of Final Design Accomplishment		Alternative Compliance						Basis of Evaluation Finding and Input to Risk Mitigation Strategies
		W		GE		Areva		
RFP Question (simplified)	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
D33 - Issues in the use of natural draft cooling towers	5	10	50	10	50	10	50	[redacted]
D36 - Design of electrical bus for EDG, SBO, batteries, and transformers	5	10	50	10	50	3	15	[redacted]
D37 - Transmission requirements for grid stability and tolerances of plant equipment	5	10	50	8	40	8	40	Redacted
D42 - Providing DBDs for future training, modification, and procedure development	5	10	50	10	50	10	50	[redacted]

RFP Evaluation Criteria: Design Completeness and Assurance of Final Design Accomplishment		Alternative Compliance						Basis of Evaluation Finding and Input to Risk Mitigation Strategies
		W		GE		Areva		
RFP Question (simplified)	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
E10 - Types and quantities of spare parts	5	8	40	10	50	8	40	[redacted]
E5 - Design specifications provide allowance for maintenance and equipment replacement equivalencies	5	10	50	10	50	10	50	
E6 - BOP and non-safety standards meet ISO standards or Appendix B standards	5	7	35	10	50	7	35	
G9 - Deviation from Utilities Requirements Document (URD)	5	8	40	8	40	6	30	
O4 - Does design deal with all classes of radwaste, and mitigate amount generated	5	9	45	10	50	10	50	
C32 - Codes that govern safety related piping and containment vessel fabrication	1	10	10	10	10	10	10	

RFP Evaluation Criteria: Design Completeness and Assurance of Final Design Accomplishment		**Alternative Compliance**						**Basis of Evaluation Finding and Input to Risk Mitigation Strategies**
		W		**GE**		**Areva**		
RFP Question (simplified)	**Weight**	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**	
C33 - Completion stage of pipe support design at COL approval	1	9	9	6	6	10	10	[redacted]
D14 - Future provisions for dry fuel storage	1	10	10	10	10	8	8	
D16 - Features to minimize security guard staffing	1	10	10	10	10	10	10	
D20 - Estimate and technical basis for refueling radiation dose	1	10	10	8	8	10	10	
D26 - Philosophy on technology and equipment obsolescence	1	8	8	10	10	8	8	

RFP Evaluation Criteria: **Design Completeness and Assurance of Final Design Accomplishment**		**Alternative Compliance**						**Basis of Evaluation Finding and Input to Risk Mitigation Strategies**
		W		**GE**		**Areva**		
RFP Question (simplified)	**Weight**	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**	
D27 - Use of cyber security	1	10	10	5	5	8	8	[redacted]
D28 - Use of wireless network	1	10	10	2	2	5	5	
D29 - Use of fiber network	1	10	10	8	8	10	10	
D32 - Design of plant communication system	1	10	10	10	10	10	10	
D34 - Natural draft cooling tower capacity to meet BOP design	1	10	10	10	10	10	10	

RFP Evaluation Criteria: ***Design Completeness and Assurance of Final Design Accomplishment***		**Alternative Compliance**						**Basis of Evaluation Finding and Input to Risk Mitigation Strategies**
		W		**GE**		**Areva**		
RFP Question (simplified)	**Weight**	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**	
D35 - Provisions for large component access for future replacement	1	8	8	10	10	10	10	[redacted]
D38 - Sizing of overhead cranes for equipment change out and dry fuel cask movement	1	10	10	10	10	10	10	[redacted]
D39 – Assumption that buildings adjoining Nuclear Island buildings will be seismically designed	1	10	10	10	10	10	10	[redacted]
D40 - Scope of building painting and coatings	1	10	10	10	10	10	10	[redacted]
D43 - Equipment hatches and paths allow for all equipment replacement	1	8	8	10	10	10	10	[redacted]
D6 - Owner's Group involvement in advanced design	1	10	10	8	8	9	9	[redacted]
D9 - Quality and Safety Classifications	1	10	10	10	10	10	10	[redacted]

RFP Evaluation Criteria: Design Completeness and Assurance of Final Design Accomplishment		Alternative Compliance						Basis of Evaluation Finding and Input to Risk Mitigation Strategies
		W		GE		Areva		
RFP Question (simplified)	**Weight**	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**	
E1 - Schedule for equipment specifications for procurement	1	8	8	2	2	8	8	[redacted]
G1 - Description of overall design	0	0	0	0	0	0	0	[redacted]
C18 - Containment vessel thickness, stress relief, and polar crane support	0	0	0	0	0	0	0	[redacted]
D18 - Nuclear proliferation issues	0	0	0	0	0	0	0	[redacted]
Total Weighted Scores			1466		1244		1351	[redacted]
Normalized Scores			100%		84.9%		92.2%	[redacted]

Decision Analysis Data for Category: Construction, Project, Startup Confidence

RFP Evaluation Criteria: Confidence in Construction Approach, Project Completion, and Startup Success		**Alternative Compliance**						**Basis of Evaluation Finding and Input to Risk Mitigation Strategies**
		W		**GE**		**Areva**		
RFP Question (simplified)	**Weight**	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**	
C1 - Recent construction experience	10	4	40	7	70	8	80	[redacted]
C2 - Predicted Construction time from first pour to fuel load and to commercial operation	10	8	80	8	80	8	80	
C3 - Construction philosophy and techniques to be applied and including partners experience	10	8	80	5	50	8	80	
C54 - Incorporation of ITAAC into construction plan	10	8	80	5	50	5	50	

RFP Evaluation Criteria: Confidence in Construction Approach, Project Completion, and Startup Success		**Alternative Compliance**						**Basis of Evaluation Finding and Input to Risk Mitigation Strategies**
		W		**GE**		**Areva**		
RFP Question (simplified)	**Weight**	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**	
E4 - Effective supply chain for qualified code suppliers as well as commercial grade equipment	10	8	80	8	80	8	80	[redacted]
C13 - Handling of safety related allegations from workers	5	7	35	4	20	8	40	[redacted]
C25 - Basis and documentation to certify design, construct, and test to ITAAC conformance	5	7	35	7	35	5	25	[redacted]
C28. Construction progress and cost documentation to be furnished including earned value	5	1	5	2	10	2	10	[redacted]

RFP Evaluation Criteria: Confidence in Construction Approach, Project Completion, and Startup Success		Alternative Compliance					
		W		GE		Areva	
RFP Question (simplified)	**Weight**	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**
C34 - Scope of as-built documentation to control recalculation efforts due to changes	5	5	25	4	20	2	10
C36 - Confirm that Progress Energy will have access to manufacturer facilities	5	9	45	9	45	9	45
C37 - Define direct and indirect labor	5	10	50	10	50	10	50
C40 - Achieving manufacturing tolerance to ensure field fit-up of modular assemblies	5	5	25	5	25	5	25
C5 - Proposed model for construction management	5	10	50	6	30	10	50

Basis of Evaluation Finding and Input to Risk Mitigation Strategies

[redacted]

Redacted

RFP Evaluation Criteria: Confidence in Construction Approach, Project Completion, and Startup Success		**Alternative Compliance**						**Basis of Evaluation Finding and Input to Risk Mitigation Strategies**
		W		**GE**		**Areva**		
RFP Question (simplified)	**Weight**	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**	
C6 - Construction and startup organization with staffing basis	5	8	40	5	25	10	50	[redacted]
L12 - Progress Energy support and outsourcing to support bidder's construction schedule	5	9	45	10	50	10	50	
C26 - Timeline for simulator design, fabrication, and availability for training	5	7	35	7	35	7	35	
C10 - Activities expected to be by Progress Energy for construction security, public relations, field engineering, start-up, etc	1	10	10	10	10	10	10	
C11 - Describe expected construction security at existing plant	1	8	8	7	7	8	8	

RFP Evaluation Criteria: Confidence in Construction Approach, Project Completion, and Startup Success		**Alternative Compliance**					
		W		**GE**		**Areva**	
RFP Question (simplified)	**Weight**	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**
C16 - Assumptions on weather and labor availability impact on construction operations	1	10	10	10	10	10	10
C19 - Concrete placement duration for containment vessel considering curing, joint prep, and shrinkage	1	10	10	10	10	10	10
C20 - Schedule impact due to grouting under containment vessel	1	10	10	10	10	10	10
C21 - Schedule impact due to sandblasting and coating inside containment	1	5	5	5	5	5	5
C24 - Laydown, prefabrication, warehouse, construction infrastructure requirements	1	10	10	10	10	10	10

Basis of Evaluation Finding and Input to Risk Mitigation Strategies

[redacted]

Redacted

RFP Evaluation Criteria: Confidence in Construction Approach, Project Completion, and Startup Success		**Alternative Compliance**						**Basis of Evaluation Finding and Input to Risk Mitigation Strategies**
		<u>W</u>		GE		Areva		
RFP Question (simplified)	**Weight**	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**	
C27 - Who will provide Construction Inspectors with QC and QA responsibilities	1	10	10	10	10	10	10	[redacted] Redacted
C29 - On site help with startup, spares procurement, procedures, and training	1	10	10	10	10	10	10	
C30 - Procedures and software used in construction for weld rod control, cleanliness, rigging, etc will be furnished to Owner	1	10	10	10	10	10	10	
C38 - Proposal for site preparation work	1	10	10	10	10	10	10	
C39 - Design/construction criteria when not modularizing work packages	1	10	10	10	10	10	10	

RFP Evaluation Criteria: Confidence in Construction Approach, Project Completion, and Startup Success		**Alternative Compliance**						**Basis of Evaluation Finding and Input to Risk Mitigation Strategies**
		W		**GE**		**Areva**		
RFP Question (simplified)	**Weight**	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**	
C4 - Defend construction modularization, if applicable	1	10	10	10	10	10	10	[redacted]
C41 - Plans for very small modules like 2 inch and under pipe	1	10	10	10	10	10	10	[redacted]
C42 - Consideration of "Risk Informed" regulation of construction and inspection	1	5	5	5	5	0	0	[redacted]
C47 - Describe seismic isolation joints, how filled and cleaned	1	10	10	10	10	10	10	[redacted]
C48 - Owner information required prior to beginning actual construction	1	10	10	10	10	10	10	[redacted]

Redacted

RFP Evaluation Criteria: Confidence in Construction Approach, Project Completion, and Startup Success		Alternative Compliance						Basis of Evaluation Finding and Input to Risk Mitigation Strategies
		W		GE		Areva		
RFP Question (simplified)	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
C49 - Will IMS monitor total plant construction as individual installed quantities progress	1	5	5	5	5	10	10	[redacted]
C51 - Craft worker awareness of safety related and non-safety activities	1	10	10	10	10	10	10	
C52 - Communicating tolerances to iron workers	1	0	0	0	0	0	0	
C7 - What work will be direct hired labor and plans for subcontractors	1	10	10	10	10	10	10	
C8 - How much Construction management does bidder expect to be furnished by Progress Energy resources	1	7	7	10	10	10	10	
C9 - Procurement management located on site and coordination with international suppliers	1	10	10	10	10	10	10	

RFP Evaluation Criteria: **Confidence in Construction Approach, Project Completion, and Startup Success**		**Alternative Compliance**					
		W		**GE**		**Areva**	
RFP Question (simplified)	**Weight**	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**
E8 - Longest lead time component and those to be ordered prior to COL approval	1	10	10	10	10	10	10
C15 - Construction work week to meet schedule	0	0	0	0	0	0	0
C17. Anticipation of union or open shop craft labor	0	0	0	0	0	0	0
C22 - Use of slip forming for containment shield building	0	0	0	0	0	0	0
C46 - Define limits of features like neat line	0	0	0	0	0	0	0
Total Weighted Scores			960		887		973
Normalized Scores			98.6%		91.2%		100%

Basis of Evaluation Finding and Input to Risk Mitigation Strategies

[redacted]

Redacted

Decision Analysis Data for Category: *Capabilities and Partnering Strengths*

RFP Evaluation Criteria: Capabilities and Partnering Strengths		Alternative Compliance						Basis of Evaluation Finding and Input to Risk Mitigation Strategies
		W		GE		Areva		
RFP Question (simplified)	**Weight**	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
F17 - Limitations in transfer of all design information to Progress Energy	10	10	100	10	100	10	100	[redacted]
G11 - Identify partners and relationships	10	9	90	4	40	10	100	
G3 - Capability to support multiple orders	10	10	100	10	100	10	100	

RFP Evaluation Criteria: Capabilities and Partnering Strengths		Alternative Compliance						Basis of Evaluation Finding and Input to Risk Mitigation Strategies
		W		GE		Areva		
RFP Question (simplified)	**Weight**	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**	
G4 - Identify major companies participating in engineering, procurement, construction, and startup	10	9	90	4	40	10	100	[redacted] Redacted
G5 - Full scope power plant or just NSSS	10	10	100	10	100	10	100	
G6 - Who are A/E and constructor partners	10	9	90	4	40	10	100	
E2 - Status of supply chain for suppliers of entire plant design	5	4	20	4	20	5	25	

RFP Evaluation Criteria: Capabilities and Partnering Strengths		Alternative Compliance						Basis of Evaluation Finding and Input to Risk Mitigation Strategies
		W		GE		Areva		
RFP Question (simplified)	**Weight**	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**	
G2 - Other utility interest in design, not one-of-a-kind, currently being built	5	10	50	10	50	2	10	[redacted]
L13 - Deployment schedule for reactor technology	5	10	50	4	20	6	30	
L14 - Dependency on DOE funding for Design Certification	5	10	50	5	25	10	50	
O2 - Scope of Operations and Maintenance procedures to be included	5	10	50	7	35	7	35	

RFP Evaluation Criteria: Capabilities and Partnering Strengths		Alternative Compliance						Basis of Evaluation Finding and Input to Risk Mitigation Strategies
		W		GE		Areva		
RFP Question (simplified)	**Weight**	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**	
O3 - Development of "generic" procedures or programs for a family of advanced designs; like EOP, TS, ISI, chemistry, etc	5	10	50	2	10	5	25	[redacted]
OS1 - Organizational set up to interface and support Progress Energy during design, licensing, construction, startup, and operations	5	10	50	8	40	10	50	
OS2 - Level of Progress Energy management oversight expected	5	9	45	8	40	10	50	

RFP Evaluation Criteria: Capabilities and Partnering Strengths		**Alternative Compliance**						**Basis of Evaluation Finding and Input to Risk Mitigation Strategies**
		W		**GE**		**Areva**		
RFP Question (simplified)	**Weight**	Score	**Weighted Score**	Score	**Weighted Score**	Score	**Weighted Score**	
OS3 - Interface and control of major A/E to assist in design and implementation	5	10	50	8	40	6	30	[redacted]
OS4 - Interface with work outside of scope	5	10	50	10	50	10	50	
C35 - Quality control and construction documentation transfer to Owner	1	10	10	10	10	10	10	
D15 - Initiatives with long term packaging of Low Level Waste	1	2	2	4	4	2	2	
OS5 - Interface with NuStart in delivery of a new plant	1	10	10	10	10	4	4	
G8 - 3rd party and subcontractor oversight program	1	10	10	10	10	10	10	

RFP Evaluation Criteria: Capabilities and Partnering Strengths		Alternative Compliance					
		W		GE		Areva	
RFP Question (simplified)	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score
Total Weighted Scores			1067		784		981
Normalized Scores			100%		73.5%		91.9%

Basis of Evaluation Finding and Input to Risk Mitigation Strategies

Attachment II – Strategic Considerations Evaluation

Note this table represents evaluations of additional Progress Energy strategic considerations that are not addressed by the RFP questions and the associated vendor responses.

[redacted]

[redacted]

RFP Evaluation Criteria		Alternative Compliance						Basis of Evaluation Finding and Input to Risk Mitigation Strategies
Compliance with Progress Energy Business Considerations	Weight	W		GE		Areva		
		Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
New Technology Risks – reflects the potential risks for identification of unanticipated design / operational problems that may be revealed during the initial start-up and power ascension for the new technologies.	10	9	90	2	20	10	100	[redacted] Redacted

RFP Evaluation Criteria		Alternative Compliance						Basis of Evaluation/Ranking and Input to Risk Mitigation Strategies
Compliance with Progress Energy Business Considerations	Weight	W		GE		Areva		
		Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
Siting Physical Limitations – reflects the ability to actually site at least two units of the technology, considering limitations with cooling capacity, hydrology for cooling tower make-up, and geotechnical, *environmental, etc.*	10	10	100	6	60	5	50	[redacted]
Transmission Deliverability and System Operations limitations – *reflects the ability to site the* technology, considering its MWe output, and the impact on system operations with respect to spinning reserve and unexpected shutdowns.	10	10	100	6	60	6	60	[redacted]

Redacted

RFP Evaluation Criteria		Alternative Compliance						Basis of Evaluation Finding and Input to Risk Mitigation Strategies
		W		GE		Areva		
Compliance with Progress Energy Business Considerations	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
Long Term Technology Approach Investment – reflects PGN's strategy for adopting the latest simplified advanced passive designs for new reactors deployed in the fleet considering that these reactor would enter service in ~2015 and operate for 60 years, as opposed to continuing with an evolutionary design using redundant active safety systems similar to 30 year old reactor technology.	10	9	90	10	100	2	20	[redacted]
NGG Fleet Compatibility - reflects the technical compatibility with the existing PGN nuclear fleet of Westinghouse and GE reactor types.	5	10	50	7	35	10	50	Redacted

RFP Evaluation Criteria		Alternative Compliance					
		W		GE		Areva	
Compliance with Progress Energy Business Considerations	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score
NuStart Participation Compatibility – reflects the technical compatibility with the AP-1000 and GE ESBWR chosen for the NuStart demonstration projects that PGN participates in.	5	10	50	10	50	0	0
Evaluation of Company Strength – reflects PGN's evaluation of the financial strength and depth of the advanced reactor technology vendor	5	8	40	10	50	10	50
Progress Energy Previous Experience with the Vendor – reflects our ongoing business experience with the advanced reactor technology vendor (and principle partner if applicable)	5	10	50	10	50	10	50
Total Weighted Scores			570		425		380
Normalized Scores			100%		75.4%		66.6%

Basis of Evaluation Finding and Input to Risk Mitigation Strategies
[redacted]

Redacted

Attachment III - Financial Evaluation Details

This Attachment includes two evaluations that compare the financial aspects of deploying the reactor technologies.

The 1st financial analysis is associated with commercial and financial attributes that were derived from specific RFP responses, and immediately follows this introduction.

The 2nd financial analysis calculates an effective busbar cost for the various reactor technologies, incorporating estimated transmission system operating impacts associated the advanced technologies that are related to transmission reserves, spinning reserves, and transmission import capabilities. These transmission impacts are relevant in determining the overall cost at the enterprise level for deploying these technologies into our existing fleet. The larger MWe output of these reactor technologies, as compared to the existing generating plants in both PEC and PEF, requires these transmission system upgrades. This 2nd analysis is the most important (and higher weighted consideration) of these two analysis in evaluating the financial aspects of the reactor technologies.

In order to provide a more balanced comparison that considers the varying MWe sizes of the plant in the 2nd analysis, four specific cases are considered:

Redacted

This is included in the comparison, as the industry has typically focused on either a single unit GE or AREVA station, or a dual unit AP-1000 station as an initial optimum size for a generating station. NuStart for example in their site selection process only considered sites that were suitable for either a 1550 MWe ESBWR or a 2200 MWe dual unit AP-1000 station.

For Westinghouse, overnight capital costs were provided for both the 1st and 2nd units at a dual unit station (for both Florida and the Carolinas), thereby providing a mechanism to compare the various MWe station relative busbar cost. The sensitivity "tornado" charts reflect the dual unit AP-1000 station for comparison purposes against the single unit large GE and AREVA units. Based on the large electrical output of the GE and AREVA designs, it is less likely that a 2nd unit would be added at the station in the timeframe required to receive the economies/efficiencies of a dual unit station construction, as compared to the Westinghouse AP-1000 design.

Decision Analysis Data for Category: *Commercial & Financial Attributes*

RFP Evaluation Criteria: Financial Attributes		Alternative Compliance						Basis of Evaluation Finding and Input to Risk Mitigation Strategies
		W		GE		Areva		
RFP Question (simplified)	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
D2 - Engineering Design to minimize Operations and Maintenance staffing levels	10	10	100	2	20	4	40	[redacted]
D4 - Standardized design for NSSS and BOP for cost savings and efficiencies	10	4	40	10	100	0	0	
F16 - Schedule warranties by reactor vendor	10	2	20	4	40	2	20	
F20 - Limitations to transfer of all design information by reactor vendor or partners	10	4	40	8	80	8	80	
F24 - Provide sample contract of terms and conditions	10	0	0	7	70	0	0	

RFP Evaluation Criteria: Financial Attributes		Alternative Compliance					
		W		GE		Areva	
RFP Question (simplified)	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score
F9 - Degree of firmness in pricing from reactor vendor	10	2	20	10	100	2	20
F14 - Additional cost of simulator if included	5	10	50	10	50	10	50
F2 - Willingness for equity interest in the plant	5	1	5	5	25	0	0
D3 - Assessment of advanced design to reduce component and commodity quantities	5	8	40	10	50	1	5
F7 - Offer contingent on DOE funding or NuStart support	5	5	25	5	25	10	50
O1 - Estimated number of personnel to operate the plant	5	5	25	5	25	5	25
F19. What costs are in Vendor scope and in Progress Energy scope for mech systems, buildings, BOP, site work, Owner cost, spares	5	4	20	3	15	4	20

Basis of Evaluation Finding and Input to Risk Mitigation Strategies

[redacted]

Redacted

RFP Evaluation Criteria: Financial Attributes		Alternative Compliance						Basis of Evaluation Finding and Input to Risk Mitigation Strategies
		W		GE		Areva		
RFP Question (simplified)	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
F21 - Impact of duration from COL application to COL approval on terms and conditions	5	0	0	5	25	0	0	[redacted]
F22 - Fix price for site construction labor	5	5	25	2	10	2	10	
F23 - Provide major milestones and payment expected	5	0	0	1	5	1	5	
F5 - Provide curve of accrued financial obligations for termination	5	2	10	1	5	2	10	

RFP Evaluation Criteria: Financial Attributes		**Alternative Compliance**					
		W		**GE**		**Areva**	
RFP Question (simplified)	**Weight**	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score
F8 - Offer based on first-of-a-kind or average plant cost	5	4	20	5	25	3	15
F3 - Guarantees relative to capacity factor, forced outage, fuel burn-up, O&M costs, etc	1	0	0	2	2	1	1
F6 - Burden to Progress Energy for reactor vendor costs in COL preparation and NRC response	1	0	0	8	8	9	9
E3 - Fraction of large equipment budget for US manufacturers	1	2	2	2	2	8	8
F11 - Utility obligations in event COL cannot be obtained or if delayed or terminated	1	3	3	5	5	5	5
F25 - Provide value earned milestone schedule	1	1	1	3	3	1	1

Basis of Evaluation Finding and Input to Risk Mitigation Strategies
[redacted]

RFP Evaluation Criteria: Financial Attributes		Alternative Compliance						Basis of Evaluation Finding and Input to Risk Mitigation Strategies
		W		GE		Areva		
RFP Question (simplified)	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
C45 - Commitments by the Owner prior to COL for RV, SG, TG, RC Piping, etc	1	4	4	10	10	10	10	[redacted]
C44 - At top level schedule, what milestone releases cable pulling	1	1	1	1	1	3	3	[redacted]
C50. Avoidance of surprise indirect labor staffing - clerks, drivers, inspectors, janitors, field engineers, etc	1	8	8	5	5	8	8	[redacted]
C53 - Cost code accounts for tax reporting and rate making	1	3	3	5	5	5	5	[redacted]
E11 - Design life and options to extend life, and power uprate	1	8	8	10	10	9	9	[redacted]

RFP Evaluation Criteria: Financial Attributes		Alternative Compliance						Basis of Evaluation Finding and Input to Risk Mitigation Strategies
		W		GE		Areva		
RFP Question (simplified)	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	
F10 - Is time between order and COL a pricing factor	1	1	1	1	1	1	1	[redacted]
F12 - Address construction start delays associated with COL	1	1	1	5	5	3	3	
F13 - Address NSSS or BOP scope changes to obtain COL	1	1	1	1	1	1	1	
F18 - Estimate and basis for O&M costs	1	2	2	1	1	1	1	
F4 - Provide a capital spending curve	1	1	1	1	1	1	1	
C43 - Construction reimbursed by Owner on cost plus basis	0	0	0	0	0	0	0	

RFP Evaluation Criteria: Financial Attributes		Alternative Compliance					
		W		GE		Areva	
RFP Question (simplified)	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score
E9 - Vendor warranties and avoidance of expiration before startup and initial operation	0	0	0	0	0	0	0
Total Weighted Scores			476		730		416
Normalized Scores			65.2%		100%		57%

Basis of Evaluation Finding and Input to Risk Mitigation Strategies
Redacted

Note that RFP question **F1**, "*Price basis for offering of new plant design*", and RFP question **F15**, "*Additional costs of initial nuclear fuel core, if included*", are not listed in the above table. Instead these questions provide direct input to the following analysis section entitled "Summary of Busbar Cost Analysis".

Decision Analysis: *Summary of Busbar Cost Analysis*

To compare the economics of the three competing designs in a consistent manner, the financial comparison was based on a calculation of the busbar costs for each vendor. The busbar costs represent the level, per MWhr total cost of generation for each of the vendors. The analysis was performed over a 40 year time horizon. The key inputs and assumptions used in the analysis are listed in a table following the summary charts. These comparisons were not site specific and are intended to present a comparison of the relative costs, on a $/MWhr basis, of each of the three technologies. This analysis includes the estimated costs of impacts to the system in terms of installed reserve requirements, spinning reserve requirements and transmission upgrades to support import capacity requirements. These estimates were made based on the size of each unit and the characteristics of the PEC and PEF systems.

The following Charts show the expected range of $/MWhr busbar costs for a single unit for each of the vendors. For the Westinghouse plant design, an additional scenario is included to show the estimated expected total busbar costs for two units at a single site. This scenario assumes that the second unit would be placed in service three years after the first and reflects the economies of scale for a second unit as presented in the Westinghouse bid.

Charts 1 and 3 are based on the plant capital costs as bid by the vendor and do not include any value for the Energy Policy Act of 2005 (EPACT) production tax credits. Chart 1 is based on PEC system impacts and Chart 3 is based on PEF.

Charts 2 and 4 include additional sensitivity on the plant Capex for the GE and AREVA units (increasing the top end of the range to reflect more potential uncertainty with their capital costs than Westinghouse) and also include a probability weighted value of the EPACT production tax credits to each vendor. The probabilities estimated for the tax credits are based on the vendors design certification status which impact the time to COL approval and therefore commercial in service date. The probabilities assigned are as follows: Redacted These probabilities are calculated under a potential application approach where only the first 6000 MWs on the grid receive the production tax credit. Redacted Chart 2 is based on PEC system impacts and Chart 4 is based on PEF.

Levelized Busbar Scoring

RFP Evaluation Criteria		Alternative Compliance					
		W		GE		Areva	
Levelized Busbar Cost	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score
Levelized busbar cost as calculated with RFP response information provided by the vendors	10	60%	6	100%	10	40%	4
Relative confidence of the calculated busbar cost data based on the actual design completion status or construction experience for the specific reactor technology	5	100%	5	40%	4	60%	6
Total Weighted Scores			11		14		10
Total Normalized Scores			78.6%		100%		71.4%

Chart 1 – *PEC System Impacts and Plant CapEx Based on Actual bids*

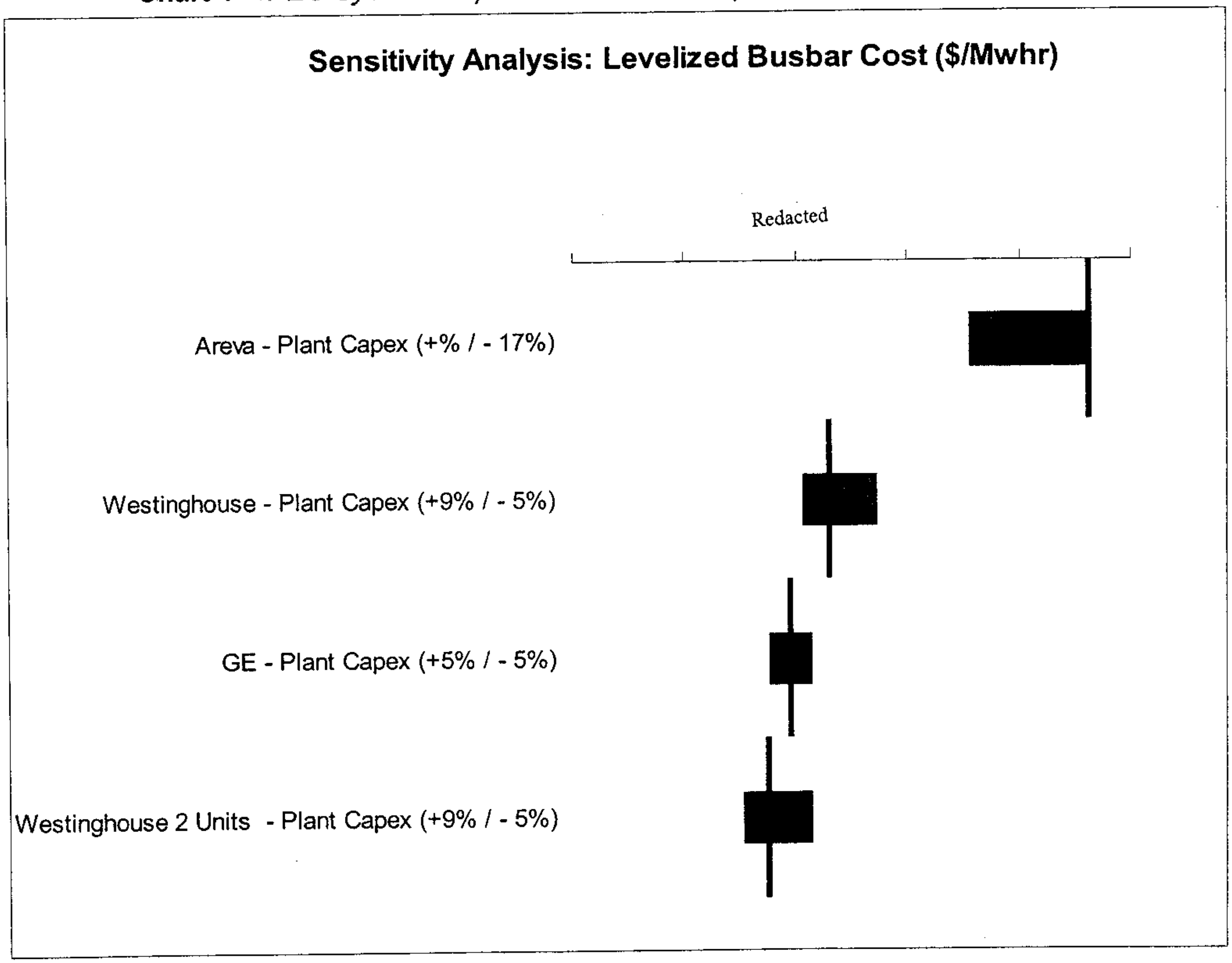


Chart 2 – *PEC System Impacts, High End of Plant CapEx Range Adjusted, and Probability Weighted Production Tax Credits*

Probability of Realizing Tax Credits: Redacted

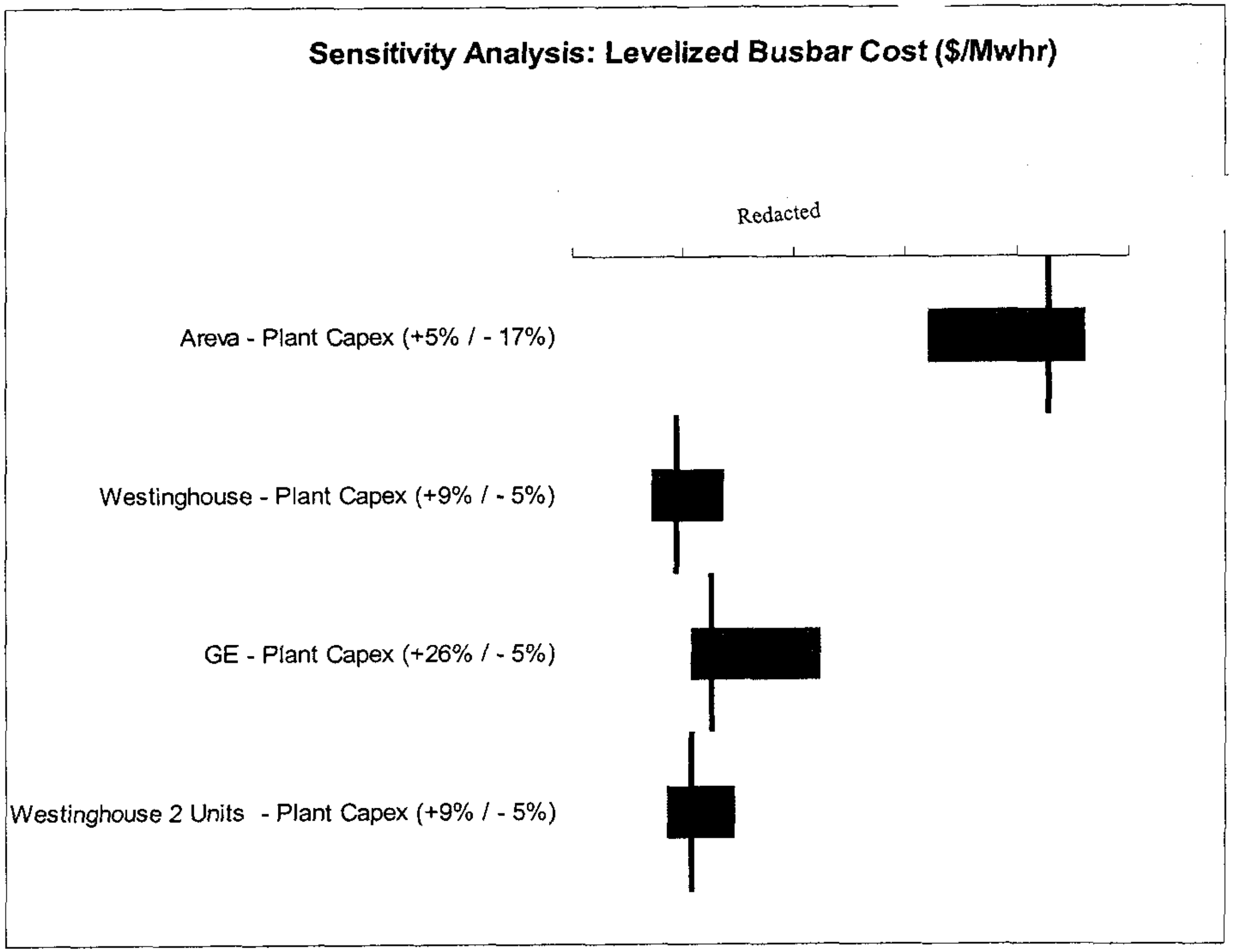


Chart 3 – *PEF System Impacts and Plant CapEx Based on Actual Bids*

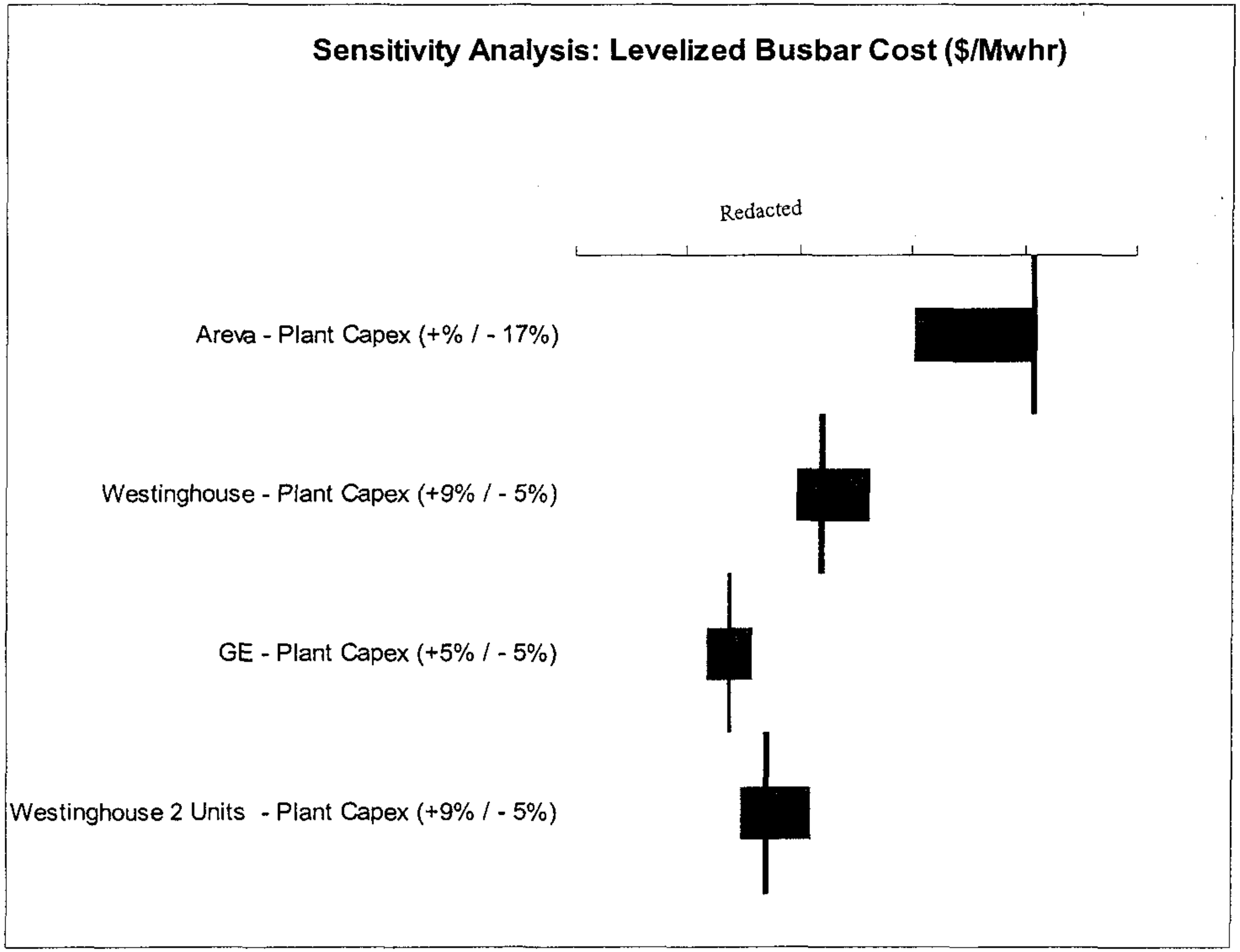


Chart 4 - *PEF System Impacts, High End of Plant CapEx Range Adjusted, and Probability Weighted Production Tax Credits*

Probability of Realizing Tax Credits: Redacted

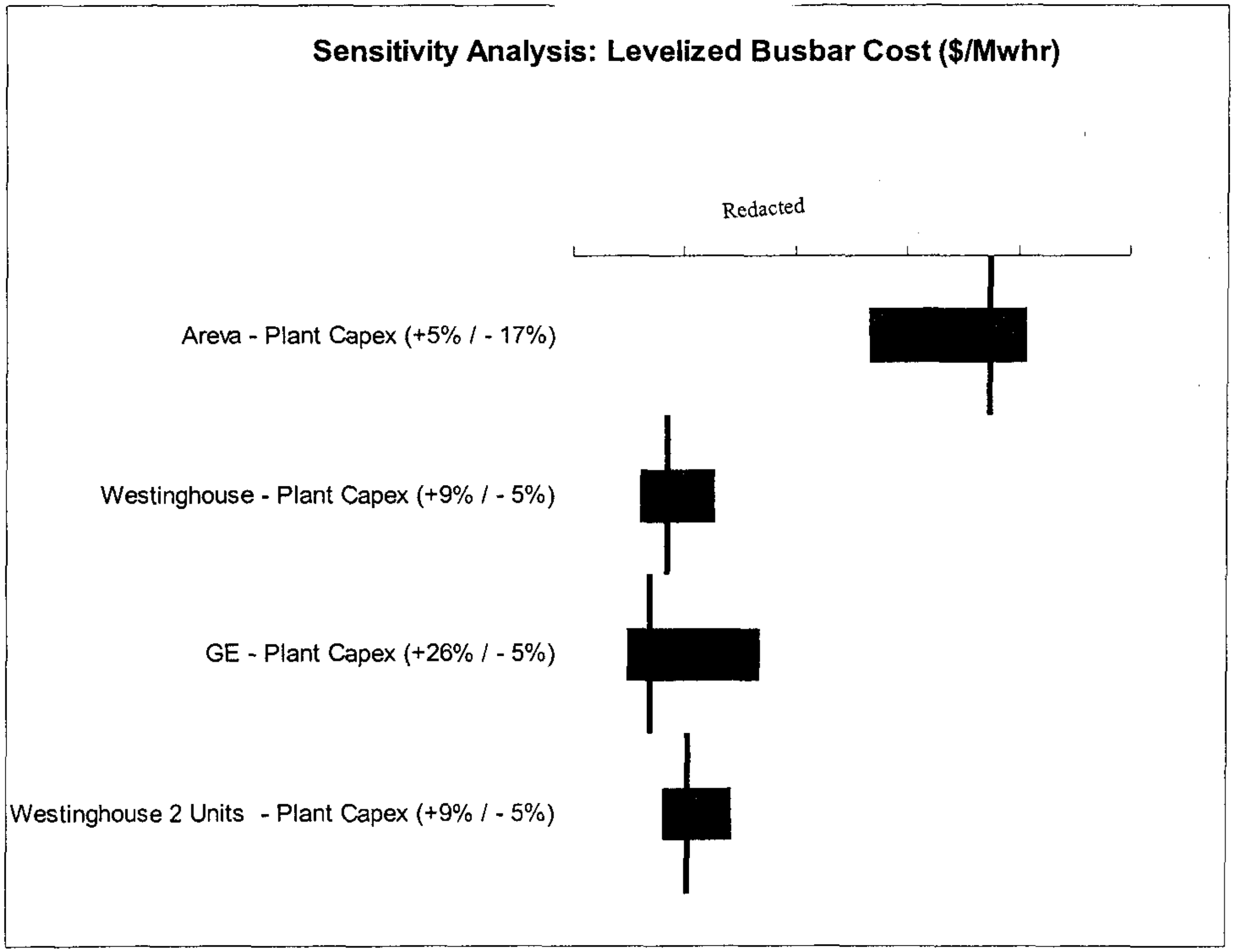


Table of Key Inputs and Assumptions

Capital Expenditures and Profile	Westinghouse			GE			AREVA			Westinghouse #2		
	Expected	Low Value	High Value	Expected	Low Value	High Value	Expected	Low Value	High Value	Expected	Low Value	High Value
COL Prep and Submittal												
Overnight Cost ($K)												
Average Escalation Factor [%]												
Plant CapEX												
Overnight Cost ($ per kW - Gross)												
kW - Gross												
Addders ($K)												
Overnight Cost ($K)												
Average Escalation Factor [%]												
Builders Risk Insurance												
Overnight Cost ($K)												
Average Escalation Factor [%]												
Site Prep Cost												
Overnight Cost ($K)												
Percentage of Vendor CapEx [%]												
Average Escalation Factor [%]												
Transmission Cost - with PEC estimates for import capacity												
Overnight Cost ($K)												
Average Escalation Factor [%]												
Transmission Cost - with PEF estimates												
Additional Capex - Installed Reserves - PEC Case shown												
Overnight Cost ($K)												
Average Escalation Factor [%]												
Additional Capex - Installed Reserves - PEF												
Startup Cost (% of Full year O&M Cost)												
Year 2014												
Year 2015												

Redacted

[redacted]

Redacted

Redacted

Table of Key Inputs and Assumptions (continued)

Capital Spending Curves		
Westinghouse	Total	[redacted]
COL Prep and Submittal	100.0%	
Plant CapEX	100.0%	
Owner's Cost	100.0%	
Site Prep Cost	100.0%	
Transmission Cost	100.0%	
Installed Reserves/ Spinning reserves	100.0%	
GE	Total	
COL Prep and Submittal	100.0%	
Plant CapEX	100.0%	
Owner's Cost	100.0%	
Site Prep Cost	100.0%	
Transmission Cost	100.0%	
Installed Reserves	100.0%	
AREVA	Total	
COL Prep and Submittal	100.0%	
Plant CapEX	100.0%	
Owner's Cost	100.0%	
Site Prep Cost	100.0%	
Transmission Cost	100.0%	
Installed Reserves	100.0%	
Westinghouse #2	Total	
COL Prep and Submittal	100.0%	
Plant CapEX	100.0%	
Owner's Cost	100.0%	
Site Prep Cost	100.0%	
Transmission Cost	100.0%	
Installed Reserves	100.0%	

Redacted

Production Data	Westinghouse			GE			AREVA			Westinghouse #2		
	Expected	Low Value	High Value	Expected	Low Value	High Value	Expected	Low Value	High Value	Expected	Low Value	High Value
Nominal Production Rate [MWhre-Net]												
Nominal Capacity Factor 1.000												

Redacted

Plant Yr	1	2	3	4	5
Startup Profile - Westinghouse					
Startup Profile - GE					
Startup Profile - AREVA					
Startup Profile - Westinghouse #2					

Redacted

Table of Key Inputs and Assumptions (continued)

Non Fuel O&M and Ongoing Capex		Westinghouse	GE	AREVA	Westinghouse #2
Total Non-Fuel O&M, includes A&G		[redacted]			
Nominal O&M [$K]	1.000				
Average Escalation Factor [%]					
Refueling Outage O&M					
Nominal Spending Level [$K]	1.000				
Average Escalation Factor [%]					
Property and Other Taxes					
Gen Related Property Tax Rate [NC%]					
Non-Gen Property Tax Rate [NC %]					
State Sales Tax Rate [NC%]					
Insurance and Misc. Operating Costs					
Nominal Annual Cost [$K]					
Average Escalation Factor [%]					
Nominal Ongoing Capital Costs [$K]	1.000				
Average Escalation Factor [%]					
Spinning Reserves Cost - PEC impacts shown					
[redacted]					
Fuel Costs					
Front End					
Reload Fuel Cost					
Average Fuel Cost Mills/Kwhre	1.000				
Reload Inflation Index					
Back End					
Nominal Charge [Mil/KWhr]					
D&D Fund					
Investment Rate [%]					
Target D&D Fund Future Value [2005	1.000				
Average Escalation Factor for D&D Cost [%]					

Redacted

Description of Key Inputs and Assumptions

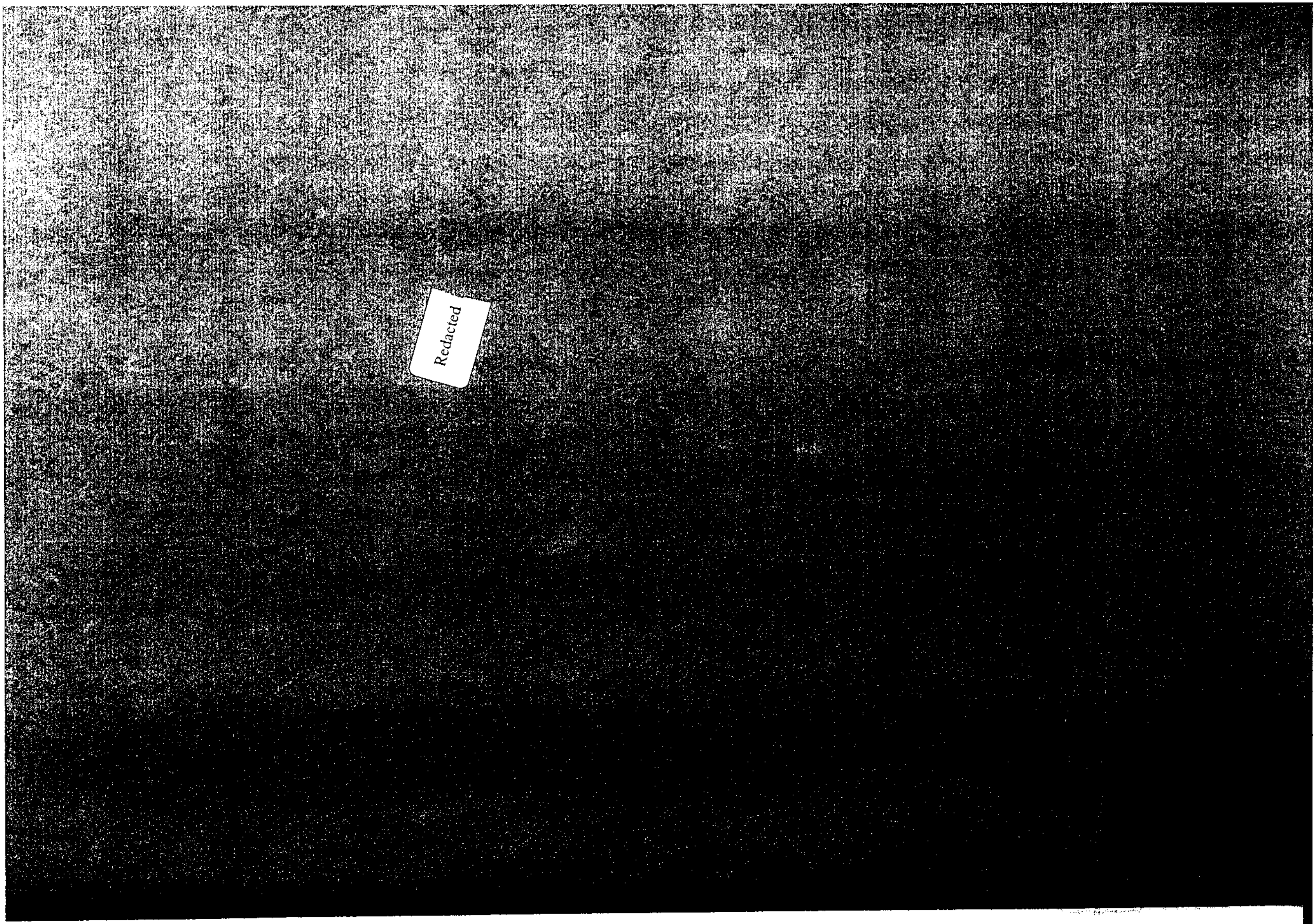
1) Cost of Capital, Tax Rates and Other Key Assumptions - WACC of 8.2% was used. Marginal Tax Rate of 38.58% was used. These are consistent with PEF standard assumptions; using the PEC assumptions of 8.4% and 40.27% would not have a material change on the relative results. The analysis horizon of 40 years corresponds with the initial license period for these plants.
2) Production tax credits – 1.8 cents per Kwhr not to exceed $125 million per year for the first 8 years of the plant life. The probability weighted value was calculated as the probability times 1.8 cents per kwhr and the probability times $125 million.
3) Plant Capex as provided by vendors in response to RFP. In addition to these values, an additional sensitivity was performed by increasing the high end of the GE range by Redacted and increasing the high end of the Areva range by Redacted
4) Site preparation costs were assumed to be 8% of plant capital costs.
5) Builders risk insurance during construction was estimated at Redacted per year for the Westinghouse plant and Redacted per year for the GE and Areva plants. This estimate was provided by Gary Little based on input from our insurance underwriters.
6) Transmission costs were included based on the study for the Harris plant. Although this analysis is not intended to be site specific, a generic estimate of transmission costs was seen to be critical to this analysis due to the fact that the larger units (GE and Areva) would almost certainly require additional capital in the form of transmission upgrades than the smaller Westinghouse unit regardless of the site chosen. Depending on the site, this variation could be very large. Additional costs associated with increasing transmission import capacity were also included in the analysis based on input from System Planning. Unique costs for the additional import capacity were developed for each jurisdiction (PEC and PEF).
7) Estimated annual costs to provide spinning reserves costs were included based on input from System Planning. Unique costs were developed for each jurisdiction (PEC and PEF).
8) Costs for additional installed reserves were included based on estimates from System Planning. Unique costs were developed for each jurisdiction (PEC and PEF).
9) The spending curves for the COL preparation and submittal, the owners cost, the site preparation costs and the transmission costs are high level internal estimates and are the same for all vendors. The spending curve for the plant capital is directly from the vendor responses to the RFP.
10) O&M estimates are based on the vendor responses to the RFP.
11) Annual property taxes are based standard assumptions for an average cost rate per dollar of plant net book value.
12) Annual insurance costs were provided by Gary Little based on input from our insurance underwriters.
13) Fuel costs are based on the vendor responses to the RFP and are the same for all vendors. Macroeconomic factors impacting nuclear fuel prices would be expected to have a similar impact on all vendors, in terms of cost per MWhr.
14) Decommissioning costs were estimated based on the actual current estimates of decommissioning costs for our existing fleet, adjusted for the specifics of each of the three new units.

Attachment IV – DC and COL Logic Timelines

The following graphics illustrate the vendor's proposed timelines (as presented in their RFP and follow-up presentations) with comparison to the published NRC schedule expectations per SECY-05-0139, "Semi-annual Update of the Status of New Reactors Licensing Activities and Future Planning for New Reactors", dated August 4, 2005.

[redacted]

Redacted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NEXT 2 PAGES

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Attachment V - Summary Comparison Table

Design and/or Attribute	Westinghouse AP-1000	GE ESBWR	Areva EPR
Vendor	Westinghouse BNFL	GE Nuclear Energy	Framatome ANP
Major Partner (A/E and Construction)	[redacted]	[redacted]	[redacted]
Reactor Thermal Power (MWth)	[redacted]	[redacted]	[redacted]
Electrical Output Net (MWe)	[redacted]	[redacted]	[redacted]
Net Efficiency (%)	[redacted]	[redacted]	[redacted]
Service Life (years)	[redacted]	[redacted]	[redacted]
Plant Design Type	[redacted]	[redacted]	[redacted]
Energy Policy Act of 2005 (EPACT) Eligible?	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
ECCS Approach	[redacted]	[redacted]	[redacted]
# of Safety-Related Emergency Diesel Generators	[redacted]	[redacted]	[redacted]
# of Safety-Related Pumps	[redacted]	[redacted]	[redacted]
Safety Building Volume (m^3/MWe)	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
# of Coolant Loops	[redacted]	[redacted]	[redacted]
Operating Pressure (psia)	[redacted]	[redacted]	[redacted]
Coolant Inlet Temp (F)	[redacted]	[redacted]	[redacted]
Coolant Flow Rate	[redacted]	[redacted]	[redacted]

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Design and/or Attribute	Westinghouse AP-1000	GE ESBWR	Areva EPR
Unique NSSS Features	[redacted]	[redacted]	[redacted]
Core Active Height (ft)	[redacted]	[redacted]	[redacted]
Number of Control Rods	[redacted]	[redacted]	[redacted]
Number of Fuel Assemblies	[redacted]	[redacted]	[redacted]
Type of Fuel Assembly	[redacted]	[redacted]	[redacted]
Avg Discharge Burn-up(MWd)/ metric ton	[redacted]	[redacted]	[redacted]
Avg Linear power Rate (kW/ft)	[redacted]	[redacted]	[redacted]
Fuel Cycle (months)	[redacted]	[redacted]	[redacted]
# of Steam Generators (SG)	[redacted]	[redacted]	[redacted]
SG tube material	[redacted]	[redacted]	[redacted]
Turbine/Generator Manufacturer	[redacted]	[redacted]	[redacted]
Saturation Pressure (psia)	[redacted]	[redacted]	[redacted]
# and Rating of Feed Pumps	[redacted]	[redacted]	[redacted]
Main Steam Flow (Mlbm/hr)	[redacted]	[redacted]	[redacted]
# of Feedwater Heaters	[redacted]	[redacted]	[redacted]
# of Natural Draft Cooling Towers	[redacted]	[redacted]	[redacted]
Make-up water requirements (million gallons/day)	[redacted]	[redacted]	[redacted]
Design Certification Status	[redacted]	[redacted]	[redacted]
# of Open DCD COL Action Items	[redacted]	[redacted]	[redacted]

Redacted

Design and/or Attribute	Westinghouse [redacted]	GE [redacted]	Areva [redacted]
Design % Complete - NSSS	[redacted]		
Design % Complete - BOP			
BOP A/E Design Partner			
Control Room Digital Platform			
Security Features		Redacted	
Construction Approach (turn-key, etc.)			
Modularization Usage			
Construction Schedule (1st concrete to fuel load)			
Similar Recent Construction			

NEXT 26 PAGES

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Attachment X – Environmental & Resource Planning Update

The following slides were taken from a November 29th, 2005 presentation by System Resource Planning to the Nuclear Baseload Steering Committee, and are provided herin for reference and discussion use.

Environmental & Resource Planning Update 2005

Nuclear Steering Committee

November 29, 2005

Progress Energy

PEC Forecast of Demand and Supply

[redacted]

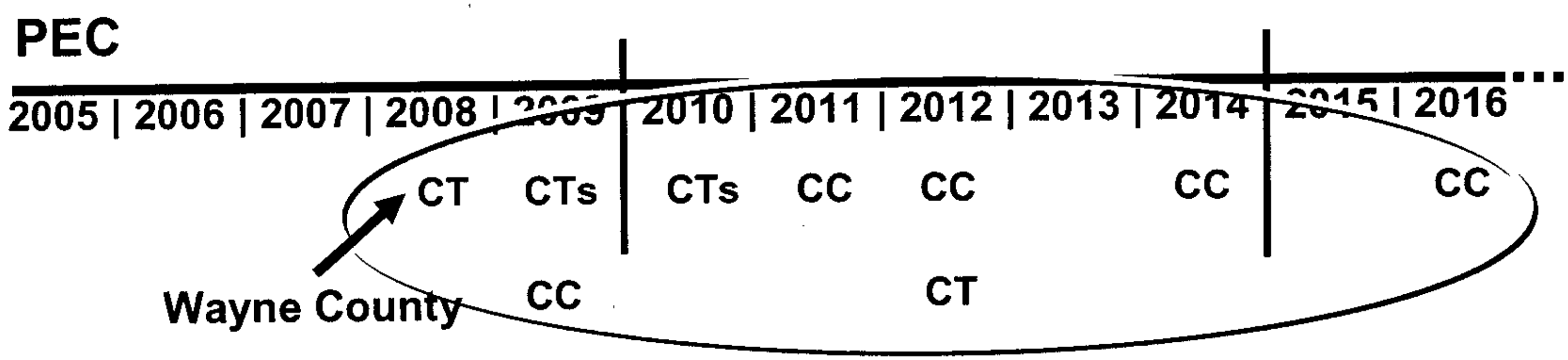
Redacted

PEF Forecast of Demand and Supply

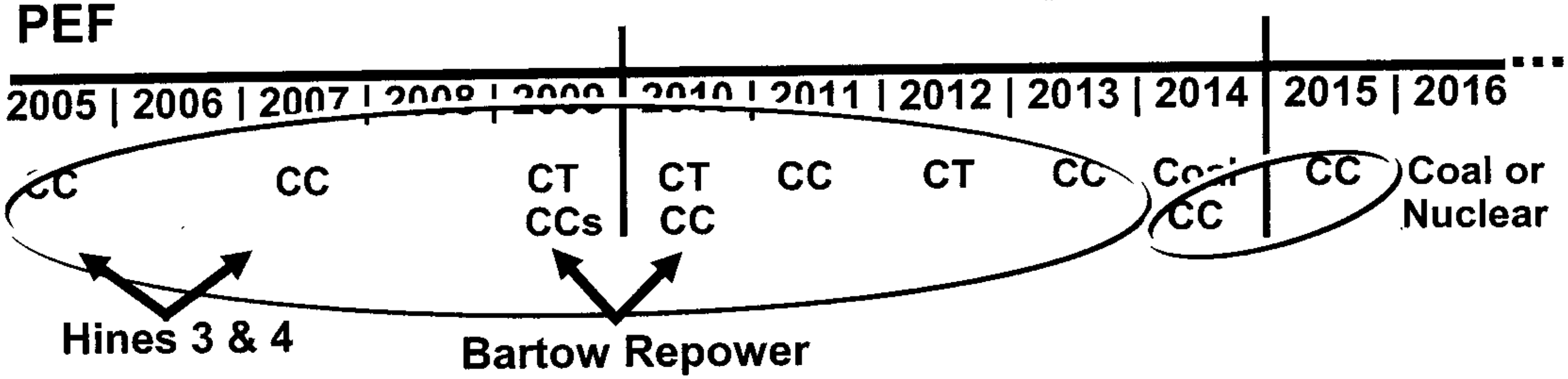
[redacted]

Redacted

Timeline – New Generation Model



Total Gas additions: 3,000+ megawatts



Total Gas additions: 3,200+ megawatts

Progress Energy

3

Generation & Operations Strategy
Resource Planning

In the long term, the nuclear option becomes available, in addition to coal.

	Combined Cycle[1]	Pulverized Coal[1]	IGCC[2]	Nuclear[6]
Rating, MW[3]	521	500	497	1100
Overnight Cost, $/kW[4]	Redacted			
Heat Rate, Btu/kWh	6,831	9,100	8,822	10,760
Fixed O&M, $/kW-yr[4]	Redacted			
Variable O&M, $/MWh[4]	Redacted			
Construction Time, years	3[5]	5[5]	3[5]	11

Notes:
1 – Based on Burns & McDonnell estimates
2 – Based on Conoco/Phillips estimates
3 – Average of winter and summer ratings
4 – All costs are 2005$
5 – Does not include siting and licensing time
6 – Based on latest internal estimates
7 - Based on Burns & McDonnell Coal estimate.

Progress Energy

Generation & Operations Strategy
Resource Planning - PEC

[redacted]

Redacted

Generation & Operations Strategy
Resource Planning - PEF

[redacted]

Redacted

[redacted]

Generation & Operations Strategy
Resource Planning - PEF

[redacted]

Redacted

Environmental & Resource Planning Update 2005

Post SMC Planning Strategy

Progress Energy

Strategy – Post SMC

[redacted]

Redacted

Timeline – New Generation Model

X = Purchase

PEC

2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 ...

CT X X X X COAL X X NUCLEAR

X X

Wayne County

PEF

2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 ...

CC CC X X X X COAL Coal X Nuclear

Hines 3 & 4

CCs CC

Bartow Repower

Progress Energy

11

Resource Plan Update – PEC Baseload Construction

[redacted]

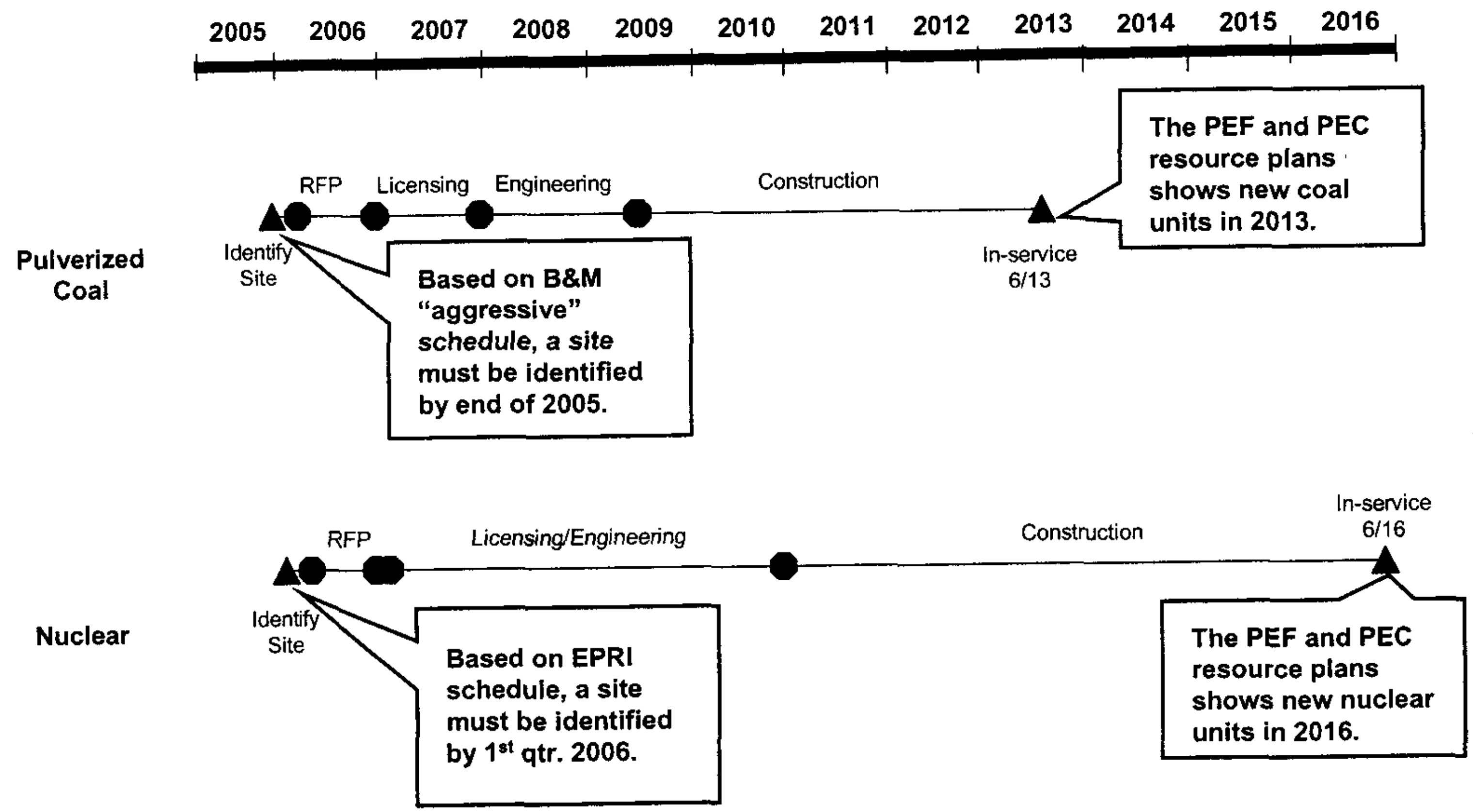
Redacted

Resource Plan Update – PEF
Baseload Construction

[redacted]

Redacted

Generation & Operations Strategy Implementation Schedules – Base Load



Under current Florida rules, RFPs will be required for coal and nuclear units.

Progress Energy

14

Generation & Operations Strategy

Operating Requirements Associated with Large Generating Units

Larger units contribute less to system reliability than smaller units

a 1600 MW nuclear unit may increase installed reserve requirements 1-2% versus an 1100 MW unit

Larger units require additional operating reserves

Operating reserves are based on loss of largest unit

additional spinning reserve requirements will increase fuel costs PEC estimated increase from 363 MW to 646 MW plus 200 MW fast start

Operating flexibility must be built into the large unit or dump power will increase significantly.

Transmission reserve requirements are proportional to unit size

Inrush flows and replacement energy must be accounted for

Import capability may need to be increased into PEC and peninsular Florida for a 1600 MW unit.

Progress Energy

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