Florida Public Service Commission

2007 Ten-Year Site Plan Workshop

FRCC Presentation

Sarah Rogers
President and CEO

August 15, 2007
Florida Reliability Coordinating Council

The purpose of the Florida Reliability Coordinating Council is to ensure and enhance the reliability and adequacy of the bulk electricity supply in Florida, now and into the future.
2007

FRCC Load & Resource Plan
Comparison of 2006 vs. 2007
FRCC Firm Peak Demand Forecast
(Summer)
Comparison of 2006 vs. 2007
FRCC Firm Peak Demand Forecast
(Winter)
Load & Resource Plan
FRCC Planned Reserve Margin

Year

Reserve Margin (%)


Summer
Winter

7
FRCC Reliability Assessment

Reserve Margin Review

- Ensure that the Regional Planning Reserve Margin meets the 15% FRCC Standard
- Planned Reserve Margin Exceeds 20% for all peak periods for next 10 years, except 19% for 2008
FRCC Reliability Assessment

Conclusion

- The results of the resource adequacy review indicate that the FRCC Region is reliable for the next ten years from a planning perspective.
- Evaluate impact of planned coal plants being changed to natural gas or other technologies.
Load & Resource Plan

Fuel Mix

Net Energy for Load (GWH)

2007

- Coal: 24%
- Gas: 37%
- Nuclear: 13%
- Renewables: 1%
- Other: 13%

2007 GWH: 239,446

2016

- Coal: 29%
- Gas: 44%
- Nuclear: 13%
- Renewables: 1%
- Other: 8%

2016 GWH: 308,343
Load & Resource Plan

Fuel Mix

Summer Demand (MW)

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<tr>
<th>Fuel Type</th>
<th>2007 MW*</th>
<th>2016 MW*</th>
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<tr>
<td>Nuclear</td>
<td>3,903</td>
<td>5,208</td>
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<tr>
<td>Coal</td>
<td>9,368</td>
<td>14,030</td>
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<tr>
<td>Gas</td>
<td>26,190</td>
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<td>Other</td>
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<td>1,064</td>
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<td>Hydro</td>
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* Does not include imports into FRCC
% Fueled by Natural Gas

Actuals by Year

Net Energy for Load (% GWH)
% Fueled by Natural Gas

![Graph showing percentage of net energy for load (% GWh) from 2007 to 2016, with projections for future years. The graph indicates a trend of increasing percentage of natural gas usage, with specific notes on coal replacement and site plan changes.]
Renewable Resources

2007 Total Capacity
1,441 MW
Renewables Forecast

Existing Renewable Capacity  1,441 MW

Planned  (2008 – 2016)

- Biomass  125 MW
- Hydro  0 MW
- Landfill Gas  13 MW
- Municipal Solid Waste  0 MW
- Heat Recovery  0 MW
- Wood Products  88 MW
## Coal Forecast

### Existing Coal-Fired Capacity

- **9,368 MW**

### Planned

<table>
<thead>
<tr>
<th>Plant Name</th>
<th>Owner(s)</th>
<th>Type</th>
<th>MW</th>
<th>Year</th>
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<td>FPL</td>
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<td>980</td>
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<td>340</td>
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Nuclear Forecast

Existing Nuclear Capacity

- Crystal River 3: 838 MW
- St. Lucie 1 & 2: 1,679 MW
- Turkey Point 3 & 4: 1,386 MW

Total: 3,903 MW

Planned

- Crystal River 3 (upgrade): 40 MW (2009)
- Crystal River 3 (upgrade): 140 MW (2011)
- Progress Energy: 1,125 MW (2016)
20% Renewables NEL by 2016

2016 NEL 308,343 GWH
20% 61,669 GWH

If renewable energy is achieved totally from large Municipal Solid Waste processing plants (100 MW at 80% capacity factor), then about 85 new MSW plants would be needed by 2016.

If renewable energy is achieved totally from windmill generator (2 MW at 15% capacity factor), then over 23,000 new windmill plants would be needed by 2016.
FRCC NATURAL GAS DELIVERABILITY / ELECTRIC GENERATION INTERDEPENDENCY STUDY
Florida Gas Transmission Network
AND
Gulfstream Natural Gas System
AND
Areas Where Power Plants are Concentrated
## Pipeline Capacity into FRCC

- **FGT**: 2.22 BCF / Day
- **GS**: 1.25 BCF / Day
- **Cypress**: 0.06 BCF / Day

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Total</td>
<td>3.54 BCF / Day</td>
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</table>

- Fully subscribed with firm gas transmission
High Level Assessment (Base Case Data Collection)

- 39,600 MW of generation can burn gas
- 28,800 MW of dual fuel capable generation
- 11,700 MW of generation with dual direct pipeline access
- 7,600 MW of generation has no alternate fuel capability or alternate pipeline access

Point of Reference: If all 39,600 MW of generation ran at full unit output for 24 hours, the maximum natural gas consumption would be 8.5 BCF / Day.
Natural Gas Pipeline Adequacy

- Developed a gas flow model to simulate transient gas flow conditions

- Simulation provides a detailed assessment of gas pipeline contingencies that may adversely affect electric system reliability
Deliverability Analysis –
Studies to Date

I. Maximum natural gas transportation capacity to West Central Florida generation

II. Impact to transportation capacity to West Central Florida for complete outage of pumping station

III. Catastrophic failure of pipeline serving West Central Florida generation

IV. Impact to transportation capacity to FRCC for complete outage of pumping station into Florida
Analysis I: Maximum Natural Gas Transportation Capacity to West Central Florida Generation

- Available capacity
  - 1.66 BCF / Day

- Firm contractual rights for generation
  - 1.44 BCF / Day

- Natural gas generation
  - 14,800 MW

- Generation with alternate fuel capability
  - 10,833 MW

- Generation minimum natural gas consumption
  - 0.58 BCF / Day *
    - 4,000 MW

- Natural gas generation affected: 0 MW

* Assuming full utilization of alternate fuel capabilities
Analysis II: Impact to Transportation Capacity to West Central Florida Generation for Complete Outage of Pumping Station

- Post-outage capacity
  - 1.45 BCF / Day
  - New equilibrium point

- 775 MW of gas-fired generation affected out of 7,634 MW running in base model (10%)
Analysis III: Catastrophic Failure of Pipeline Serving West Central Florida Generation

- Impacts to generation
  Depending on time of day, impacts may be immediate or may be delayed up to 3 hours
- Approximately 2,900 MW of gas-fired generation affected out of 7,634 MW running in base model (38%)
Analysis IV: Impact to Transportation Capacity for FRCC for Complete Outage of Pumping Station into Florida

- Impacts to generation
  Depending on time of day, impacts may be immediate or may be delayed up to 3 hours

- Approximately 900 MW of gas-fired generation affected out of 36,900 MW (~ 2%).
Redundancies Available to Mitigate Fuel Outage Risks

- Dual Fuel Capabilities
  - 39,600 MW of generation can be fueled with gas
  - 28,800 MW with dual fuel (fuel oil & gas) capability

- Dual Pipeline Interconnects
  - 11,700 MW of generation have dual pipeline connections

- Supply Alternatives
  - Natural gas storage capacity
  - Supply diversity increasing with Cypress and southeast supply header

- LNG Projects
Next Steps

- The current plans are to re-assemble the FRCC Gas Study Group in September 2007

- Review Summary Reference Document
  - Results of analysis
  - Increase the understanding of current pipeline operations and Reliability implications within FRCC
  - Refine current modeling parameters
  - Document a FRCC Study & Assessment methodology

- Determine amount of gas storage that has been contracted by member utilities

- Analyze impact of gas storage plans
FRCC Regional Transmission Planning Process
FRCC Planning Committee

- Promotes the reliability of the bulk electric system in the FRCC region
- Assesses and encourages generation and transmission adequacy
- Provides a vehicle for ensuring that transmission planning within the FRCC will provide for the development of a robust transmission network within the FRCC Region
FRCC Transmission Planning

- In July 2005, FRCC Board of Directors approved Transmission Planning Process
  - Started with transmission owners’ plans and sought comments from stakeholders
  - Transmission Working Group (TWG) and FRCC staff reviews to ensure reliable, robust transmission system
  - Members include FERC jurisdictional and non-jurisdictional entities

- Provides 10 year site plans and transmission reports to FPSC
FRCC Transmission Planning

- Revised to support objectives of FERC Order 890
- Revisions approved by FRCC Planning Committee on May 2, 2007
- Approved by Board of Directors in July, 2007
FRCC Regional Transmission Planning Process

- FRCC databank compiled
- Step 1 – Transmission Owners submit plans to FRCC and plans are posted for comments
- Step 2 – Feedback from customers and other stakeholders
- Step 3 – Review and assess plans to ensure that composite plans meet customers’ needs, ensures reliability and conducts sensitivity studies
FRCC Regional Transmission Planning Process

- Step 4 – Issues preliminary regional plan
- Step 5 – Approves regional plan
- Step 6 – Dispute resolution for unresolved issues
FRCC Regional Transmission Planning Process

Key aspects of FRCC Planning

- Provides coordination between all participants
- Provides openness and transparency
- FRCC coordinates the information exchange
- Comparability is ensured throughout process
FRCC Regional Transmission Planning Process

Key aspects of FRCC Planning (continued)

- Dispute Resolution included
- Regional participation ensured
  - Coordinated participation for entire region
  - Inter-regional studies with SERC
  - Participation with Eastern Interconnection Reliability Assessment Group (ERAG)

- Economic Planning Studies
- Cost Allocation – agreement on high level principles and methodology
FRCC Regional Transmission Planning Process

- Meets all objectives outlined in FERC Order 890 for regional planning activities
- Consistent with all nine principles
- Supported by all transmission owners, customers and other stakeholders
- Supported by FPSC
FRCC TRANSMISSION STUDIES

- 10 Year Transmission Reliability Study
- Summer & Winter Seasonal Assessments
- Inter-regional Transmission Study
10 YEAR TRANSMISSION STUDY

RELIABILITY STANDARDS TEST

- Single Component Outages: No loss of electrical demand
- Multiple component outages: Controlled loss of electrical demand
- Extreme component outages: No wide area cascading loss of electrical demand
- 2007 – 2016 Transmission plans satisfy these tests
INTER-REGIONAL TRANSMISSION STUDY

PURPOSE: Determine the amount of reliable Import and Export capability of the FRCC-Southern transmission interface
INTER-REGIONAL TRANSMISSION STUDY RESULTS

Summer 2007

- Import to FRCC: 3,600 MW
- Export from FRCC: 1,500 MW

Winter 2007/08

- Import to FRCC: 3,700 MW
- Export from FRCC: 2,000 MW
# Florida Central Coordinated Re-Study Projects

## Original FCCS Projects Included in Re-Study Base Case

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>New / Rebuild</th>
<th>Needed In-Service</th>
<th>Planned In-Service</th>
<th>Ownership</th>
<th>Status</th>
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<td>Jun, 2009</td>
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| Total miles Rebuild   | 76.2                |
| Total miles New       | 154.7               |

## Florida Central Coordinated Re-Study Projects

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<tr>
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FRCC Cost Sharing Task Force Update

Greg Ramon
Tampa Electric Company
Chairman
Background

- FRCC Transmission Planning Process Formation After GridFlorida

- 2006 Ten-Year Site Plan Discussions Related to Cost Allocation Methodology

- FERC Order 890 Requirements
Conceptual Framework

- Addresses third party impacts
  - Simple 3rd party impact definition
    » Transmission expansion required on one system due to additions (e.g., generation) on another transmission system
  - A transmission owner is responsible for upgrading its respective transmission system to meet NERC and FRCC Reliability Standards, identified under the FRCC Regional Transmission Planning Process
  - The cost sharing/allocation methodology will address 3rd party impact circumstances
Third Party Impact Example

- Alpha Plans Plant at B
- Line A-City overloads
- Line A-City will be rebuilt
- Situation
  - Alpha has request
  - Bravo has overload & remedy
    » Third Party Impact
- Cost Sharing applies!
Conceptual Framework

- Development of threshold criteria to determine whether request by an “Affected Transmission Owner” is qualified for cost sharing
- Work will continue to develop additional detail and clarification
  - Who pays & how much?
    » Generation
    » Load
  - Complicated issues
Time Line

- Aug 17 – FRCC Board of Directors Review
- Sept 14 – Required posting of the “strawman” framework by the transmission providers to meet FERC Order 890
- Oct & Nov – FERC Regional Technical Conferences to review planning processes
- Sept thru Nov
  - Development of additional detail & clarification
  - FRCC Board Approval
  - Regulatory Review & Approval Process
- Dec 7 – FERC Compliance Filing by Transmission Providers