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

**DATE:** July 6, 2006

**TO:** Director, Division of the Commission Clerk & Administrative Services (Bayó)

**FROM:** Division of Economic Regulation (Colson, Gardner, Lingo, Stallcup, Windham)  
Office of the General Counsel (Brown) *RC DS* *BW* *RET* *WJ*

**RE:** Docket No. 060220-EC – Petition for determination of need for Seminole Generating Station Unit 3 electrical power plant in Putnam County, by Seminole Electric Cooperative, Inc.

**AGENDA:** 07/18/06 – Regular Agenda – Post-Hearing Decision – Participation limited to Commissioners and Staff

**COMMISSIONERS ASSIGNED:** All Commissioners

**PREHEARING OFFICER:** Arriaga

**CRITICAL DATES:** July 24, 2006 – Commission decision required by Rule 25-22.080, F.A.C.

**SPECIAL INSTRUCTIONS:** None

**FILE NAME AND LOCATION:** S:\PSC\ECR\WP\060220.RCM.DOC

### Case Background

On March 10, 2006, Seminole Electric Cooperative, Inc. (Seminole) filed a petition for a determination of need for a proposed electrical power plant in Putnam County pursuant to Section 403.519, Florida Statutes, and Rule 25-22.080, Florida Administrative Code. Seminole proposes to build a 750 megawatt (MW) supercritical pulverized coal electrical power plant at its Seminole Generating Station (SGS) in Putnam County. The unit will be designed to burn 100% bituminous coal as well as a blend of bituminous coal and petroleum coke (petcoke) with a blend ratio of up to approximately 70% coal and 30% petcoke. SGS Unit 3 is scheduled for commercial operation in May 2012. The Commission issued a Notice of Commencement of

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Proceedings to the appropriate agencies, local governments, and interested persons on March 16, 2006. The Commission's Notice of Hearing and Prehearing, issued March 29, 2006, indicated that the Commission would only consider matters relative to the need determination. Other siting matters including environmental concerns would be addressed in the siting proceeding before the Division of Administrative Hearings. The Commission's jurisdiction and the substantive considerations of this case are governed by Section 403.519, Florida Statutes, which contains the following five areas the Commission must review when determining the need for an electrical power plant:

- (1) the need for electric system reliability and integrity;
- (2) the need for adequate electricity at reasonable cost;
- (3) whether the proposed plant is the most cost-effective alternative available;
- (4) conservation measures taken by or reasonably available to the applicant which might mitigate the need for the proposed power plant; and
- (5) other matters within the Commission's jurisdiction which it deems relevant.

At the Prehearing Conference held on May 30, 2006, six substantive issues were identified for resolution in this proceeding. All of these issues were identified and stipulated in the prehearing order. On June 5, 2006, the Sierra Club, Inc. petitioned to intervene in this proceeding. At the June 7, 2006, hearing, the Presiding Officer denied intervention, but granted the opportunity for public testimony on the issues. At the hearing, nine individuals provided public testimony in the proceeding. While several witnesses addressed environmental concerns that are beyond the scope of this need determination, several witnesses did address demand-side management, energy conservation and renewable energy. Those matters are arguably within the scope of this need determination and are addressed in the staff analysis below. Seminole filed a post-hearing brief on June 15, 2006.

The Commission has jurisdiction of this matter pursuant to Section 403.519, Florida Statutes. Rule 25-22.080, Florida Administrative Code, requires that the Commission make a decision regarding the petition by July 24, 2006.

### Discussion of Issues

**Issue 1:** Is there a need for the proposed Seminole Generating Station Unit 3, taking into account the need for electric system reliability and integrity, as this criterion is used in Section 403.519, Florida Statutes?

**Recommendation:** Yes. Seminole has projected its future needs based upon serving seven of the ten member distribution cooperatives (members) that have signed contract extensions. Based on reasonable projected load growth and the expiration of existing power purchase contracts, Seminole has identified a need for additional capacity of approximately 1200 MW by 2012, of which at least 750 MW needs to be base load capacity. (Colson, Stallcup)

**Staff Analysis:** Seminole's need assessment process demonstrated that, in order to meet Seminole's established reliability criteria, over 1200 MW of additional capacity will be needed in 2012. This capacity need results from the scheduled expiration of purchased power contracts (546 MW Oleander Power Project, L.P., 360 MW Calpine Construction Finance Company, L.P., and 55 MW Lee County, Florida), planned annual adjustments in Seminole's Partial Requirements contract with Progress Energy Florida (PEF), plus expected load growth (TR 113).

Seminole uses econometric and end-use modeling techniques to forecast the number of customers, energy, and monthly peak demands for each of its members. The individual member model results are aggregated to derive the Seminole forecast. Seminole made the decision to seek approval to build SGS Unit 3 after screening various other supply-side and demand-side alternatives as part of its resource planning process and then through a Request for Firm Base Load Capacity (RFP) (TR 85).

#### • LOAD FORECAST

The load forecast supporting the petition was sponsored by Seminole's witness William Lawton. Mr. Lawton offered direct testimony and exhibits summarizing the forecasts, economics, and end-use modeling techniques used to create the projected system peaks. According to Mr. Lawton, Seminole member cooperative's highest peak demand on record occurred in the winter of 2006 at 4113 MW. Since 2000, residential consumer growth has been 3.4 percent annually. Seminole's average annual compound growth rate (AAGR) for energy over the past five years was 5.2 percent (TR 84). Seminole forecasts a residential consumer growth rate of 2.8 percent over the next 10 years and reaching 1,087,362 consumers in 2015. Seminole's summer peak demand is forecast to increase at an AAGR of 3.9 percent over the next ten years. Seminole's AAGR for energy and winter peak demand is forecast to increase at 4.1 percent over the next ten years (TR 89).

#### • RESERVE MARGIN

According to Seminole's Witness Lane Mahaffey, Seminole has two principal reliability criteria: (1) a 15% reserve margin and (2) a 1% Equivalent Unserved Energy (EUE) limitation (TR 112). Based on Seminole's load forecast, Seminole's total resource need in 2012 is

expected to be 1261 MW (TR 92, Composite Exhibit No. 28). Absent the addition of SGS Unit 3 (750 MW of base load capacity), Seminole will fail to meet its 15% reserve margin criterion in the year 2012. Without the addition of SGS Unit 3, Seminole's Members and their consumers will be faced with an unacceptably high risk of service interruptions (TR 27). Seminole's capacity need results from the scheduled expiration of purchased power contracts, planned annual adjustments in Seminole's Progress Energy Florida partial requirements contract, and expected load growth (TR 113).

## **CONCLUSION**

Seminole's load forecast appears to be reasonable. Seminole's average annual compound growth rate (AAGR) for energy over the past five years was 5.2 percent (TR 84). Seminole's energy sales are forecast to increase at an AAGR of 4.1 percent over the next ten years. Seminole's summer peak demand is forecast to increase at an AAGR of 3.9 percent over the next ten years. Seminole's energy and winter peak is forecast to increase at an AAGR of 4.1 percent, reaching approximately 21,000 GWH and 5500 MW in 2012 (TR 89 Composite Exhibit No. 28). Therefore, staff recommends that SGS Unit 3 will be needed by May 2012 to maintain Seminole's electric system reliability and integrity.

**Issue 2:** Is there a need for the proposed Seminole Generating Station Unit 3, taking into account the need for adequate electricity at a reasonable cost, as this criterion is used in Section 403.519, Florida Statutes?

**Recommendation:** Yes. Seminole's analyses show that at least 750 MW of Seminole's capacity need in 2012 should be base load type capacity for reasons of economics. With current projections, SGS Unit 3 is expected to provide adequate electricity at a reasonable cost. If SGS Unit 3 is not constructed, Seminole's members and their consumers will face significantly higher costs and greater price uncertainty. (Colson)

**Staff Analysis:** As discussed in issue 1, Seminole's capacity need results from the scheduled expiration of purchased power contracts, planned annual adjustments in Seminoles' Progress Energy Florida partial requirements contract, and expected load growth (TR 113). Seminole first decided that it would solicit bids for the purchase of needed capacity in the 2012 time frame. As part of the evaluation process, Seminole hired Burns & McDonnell to assist them in selecting the appropriate technology and provide a detailed, screening level evaluation of the cost of building and operating the preferred alternative. This request initially led to the August 2004 Feasibility Study. This study contains the results of the economic analyses of three alternative self-build projects: A new Brownfield 600 MW subcritical solid fuel generating unit; a new Brownfield 600 MW supercritical solid fuel generating unit; and a new Greenfield 500 MW gas fired combined cycle unit. Other generating technologies were assessed, but were not considered for new generation at this time due to insufficient operational experience and information on cost and reliability of technology. The study found that the 20 year levelized bus bar cost for the three viable alternatives showed that the supercritical unit was the lowest at \$52.77/MWh; subcritical unit at \$52.97/MWh; and combined cycle unit at \$75.48/MWh (TR 57-58).

Seminole's interest in increasing the output of SGS Unit 3 from 600 MW to 750 MW led to the February 2005 Feasibility Study. This study, which is an update of Seminole's August 2004 Feasibility Study, concluded that both the supercritical and subcritical solid fuel generating units were feasible and would be substantially more economically sized at 750 MW than at 600 MW (the 20 year levelized bus bar cost declined to \$48.85/MWh for the supercritical coal unit, and to \$49.15/MWh for the subcritical coal unit). Both remained far less expensive than a conventional gas fired combined cycle unit (TR 59-60). Therefore, Seminole decided that 750 MW of base load capacity should be added in the 2012 time frame (TR 38). The estimated capital cost for the 750 MW supercritical SGS Unit 3 project is approximately \$1.4 billion in 2012 dollars (TR 48). SGS Unit 3 will be located at Seminole's Generating Station (SGS) on a 1922 acre site in northeast Putnam County, approximately five miles from the City of Palatka (TR 40).

SGS Unit 3 will be a pulverized coal, balanced draft unit employing supercritical steam pressure and temperature with a mechanical draft cooling tower for condenser cooling water. The primary advantages of supercritical steam cycles over subcritical steam cycles are improved plant efficiency due to elevated operating pressure and temperature, lower emissions and lower fuel consumption (TR 43). SGS Unit 3 will also employ state-of-the-art emission control equipment to further reduce emissions. The list of emission control equipment is provided in the direct testimony of Mr. Opalinski (TR 44). Mr. Opalinski stated that as a result of the emission-

reduction measures that are planned for SGS Units 1 and 2 independent of Unit 3's construction, the combined NO<sub>x</sub>, SO<sub>2</sub> and mercury emissions from all three units will be less than the current emission from Units 1 and 2 (TR 44-45).

Seminole believes and staff agrees that by building SGS Unit 3 at SGS instead of contracting with one of the bidders, Seminole will be able to use existing site facilities to the maximum extent possible. Seminole will avoid not only the cost of developing a new site, but also the cost of numerous facilities already at SGS that will be co-used by SGS Unit 3 (TR 40). Seminole will be able to take advantage of existing coal delivery, unloading and storage; potable water supply; cooling and service water supply; cooling discharge; limestone handling; transmission facilities; and plant egress/ingress (TR 41-42).

Public Witness, Mr. Hendrickson, raised an issue of whether Seminole had appropriately considered emission allowances in its economic analysis of alternatives. As stated above, Seminole will employ pollution control measures in the design and operation of SGS Unit 3. According to staff's first set of Interrogatories No. 32 (Composite Exhibit No. 2), Seminole stated that no projections of potential future emission allowance cost for SO<sub>2</sub> and NO<sub>x</sub> were considered in the primary economic analyses performed by Seminole. Seminole stated that prior to making the decision to add SGS Unit 3, Seminole decided to meet SO<sub>2</sub> and NO<sub>x</sub> standards by installing the emission control equipment rather than purchasing emission allowances. This approach afforded Seminole more operational and cost stability, given the potential price volatility of emission allowances (TR 44).

According to Seminole's witness Lane Mahaffey, Seminole's bus bar cost comparison revealed a significant economic advantage of coal-based alternatives over gas-based alternatives, and further, that self-build alternatives for coal and gas were significantly favorable relative to the purchased alternatives resulting from the RFP process (TR 120, Composite Exhibit No 34). According to Mr. Mahaffey, Seminole hired a consulting firm (R. W. Beck) to develop the analytical tools that Seminole used to perform a detailed risk analysis of power supply alternatives, and to assist with the risk analysis of coal versus gas scenarios. The approach used in the risk analysis included preparing market data inputs, such as: gas and coal prices; environmental cost inputs (R.W. Beck assumed a CO<sub>2</sub> emission allowance cost of \$5/ton in 2005 dollars plus inflation (Composite Exhibit No. 2, Staff's Interrogatory No. 32)); inputs on future generation cost by type of plant (including capital cost, operating cost, etc.); and load forecasting inputs. The results of the risk assessment yielded a projected savings of \$476 million (2005 dollars) for a coal strategy versus an all-gas strategy. The risk assessment concluded that there was an 80 percent probability that the coal strategy would yield lower cost over the study period than an all-gas strategy (TR 122-123).

## CONCLUSION

Staff believes that Seminole has chosen a proven technology, and has experience with the construction and operation of a pulverized coal unit. (TR 50). The estimated costs appear to be reasonable. Therefore, staff recommends that SGS Unit 3 will contribute to the provision of adequate electricity at a reasonable cost.

**Issue 3:** Is the proposed Seminole Generating Station Unit 3 the most cost-effective alternative available, as this criterion is used in Section 403.519?

**Recommendation:** Yes. SGS Unit 3 is the most cost-effective alternative available to Seminole, its members and their consumers to meet their base load capacity needs in 2012. Seminole's comprehensive evaluation of alternatives shows that SGS Unit 3 is more cost-effective than market-based and self-build alternatives, saving almost \$500 million relative to an all gas alternative. (Colson, Lester, Windham)

**Staff Analysis:** While not required pursuant to Commission Rules, Seminole conducted an open and fair capacity solicitation in an effort to secure the most cost-effective option for its members. On April 19, 2004, Seminole issued an all-source Request for Proposal for Firm Base Load Capacity (RFP). Seminole's April 2004 RFP was open to all parties, including, but not limited to: independent power producers (IPPs), investor owned utilities (IOUs), exempt wholesale generators, power marketers, qualifying facilities (QFs), and renewable energy providers, etc. (TR 100). Seminole's RFP goal was to allow potential bidders as much flexibility as possible to develop proposals to meet Seminole's need of 600 MW of additional base load capacity beginning in the 2009 – 2012 time frame. Seminole received a total of fourteen different proposals from five bidders (TR 102). Economic screening of the purchased power proposal was accomplished by comparing bus bar costs. All proposals, including the three self-build alternatives, were evaluated at 70%, 80% and 90% capacity factors, representing the base load operation range. The analysis included all fixed and variable costs, including fuel expense. The bid-to-bid comparisons (and associated ranking) were done on a levelized \$/MWh basis, calculated over a twenty-year period, on a nominal and present worth basis (TR 119). The bus bar cost comparison revealed a significant economic advantage of coal-based alternatives over gas-based alternatives, and further, that self-build alternatives for both coal and gas were significantly favorable to purchased alternatives resulting from the RFP process (TR 120, Composite Exhibit No. 34).

As stated in Issue 2, Seminole hired R. W. Beck to assist with a risk assessment and economic evaluation of alternatives. The risk assessment compared the economic risk of a coal-based scenario and an alternative all-gas scenario utilizing gas combined cycle technology. The present worth revenue requirements analysis, which served as the underlying base case for the risk assessment, yielded a projected savings of \$476 million (2005 dollars) for the studied coal strategy versus an all-gas strategy (TR 123). Seminole used the forecasted implicit price deflator published by Economy.com in May 2005 as the general inflation rate. This rate was applied to operation and maintenance costs in evaluating the power supply options. The inflation rate forecast trended down from 2.6% in 2006 to 1.7% in 2030 (EXH 3, Appendix G, pp. 1-2; EXH 2, p. 21). Seminole used 6.0% as the discount rate, which is based on projections of long-term debt financing provided by the Rural Utilities Service. This rate is used to determine present worth revenue requirements of the power supply options (EXH 3, Appendix G, pp. 1-2; EXH 2, p. 22). Staff notes that the inflation rate and the discount rate are based on reasonable sources and are applied to all power supply options (EXH 3, Need Study, p. 58). Therefore, staff believes the financial and economic assumptions are reasonable.

Also as noted in Issue 2, the approach used in the risk analysis included preparing market data inputs, such as: gas and coal prices; environmental cost inputs; inputs on future generation cost by type of plant (including capital cost, operating cost, etc.); and load forecasting inputs. The environmental cost inputs included a CO2 emission allowance cost of \$5/ton in 2005 dollars plus inflation (Composite Exhibit No. 2, Interrogatory No. 32).

Fuel price projections for the comparison between the proposed supercritical coal plant and a combined cycle gas plant were provided by Global Insight, Inc. and were supported by Seminole fuel witness, Jack Reid (EXH 25, WJR-5, pages 1-56). The projections resulted in a large savings for the proposed coal option over the combined cycle gas option. Emission allowance costs for sulfur and nitrogen oxides were not taken into consideration in the cost comparisons (Company response to Staff Interrogatory 31, Staff's First Set of Interrogatories, page 35, EXH 2). However, Seminole responded that future sulfur and nitrogen oxide emissions of the coal plant would be reduced by emission controls (Company response to Staff's First Set of Interrogatories, #32, EXH 2, page 37).

There were several public witnesses who testified that Seminole should consider using renewable energy resources in lieu of constructing SGS Unit 3 (TR 135, TR 145, TR195). Mr. Lloyd, Mr. Brinkman and Mr. Lupiani stated that Seminole should consider solar, biomass and wind as renewable resources. Mr. Brinkman stated that in a recently announced Progress Energy Florida purchase of 135 MW of capacity from a biomass plant, there will to be a 15,000-acre plantation that will supply the fuel. After being questioned by Commission Deason concerning the size of the facility that will supply the fuel, Mr. Brinkman agreed that if a 750 MW biomass facility was to fill the capacity need of Seminole in 2012, it would require between an 80 to 90,000-acre site (TR 145-146). Commissioner Arriaga pointed out that "if we took all the biomass produced in the state, we would not be able to meet the requirements that Seminole has in front of the Commission today" (TR 144). According to the direct testimony of Seminole's witness Timothy Woodbury, Seminole has contracts to purchase capacity from three renewable resource facilities. These purchases currently total approximately 54 MW (TR 22). As stated above, On April 19, 2004, Seminole issued an all-source Request for Firm Base Load Capacity (RFP). Seminole's April 2004 RFP was open to all parties, including, but not limited to: independent power producers (IPPs), investor owned utilities (IOUs), exempt wholesale generators, power marketers, qualifying facilities (QFs), and renewable energy providers, etc. There were no biomass, no wind resources and no solar providers that bid into Seminole's RFP (TR 100 Composite Exhibit No. 34).

## CONCLUSION

Staff believes that the evidence shows that there are not sufficient, low cost renewable resources available to meet Seminole's need. Staff also believes that Seminole's analyses show that at least 750 MW of Seminole's capacity need in 2012 should be base load type capacity for reasons of economics. With current projections, SGS Unit 3 is expected to provide adequate electricity at a reasonable cost. If SGS Unit 3 is not constructed, Seminole's members and their consumers will face significantly higher costs and greater price uncertainty.



**Issue 4:** Are there any conservation measures taken by or reasonably available to Seminole Electric Cooperative, Inc. which might mitigate the need for the proposed power plant?

**Recommendation:** No. Seminole's members currently have 237 MW of DSM in the form of load control Switches, voltage control, and distributed generation. Even after consideration of such conservation and DSM efforts, Seminole has a capacity need of over 750 MW in 2012. No additional DSM and conservation measures have been identified that would cost-effectively mitigate the need for SGS Unit 3. (Colson)

**Staff Analysis:** Seminole does not offer conservation or DSM programs directly to retail customers, and Seminole and its members do not have Commission-approved goals and plans pursuant to Florida Energy Efficiency and Conservation Act (FEECA), Section 366.80-85, Florida Statute. Seminole's members do offer conservation and DSM programs to their consumers, and the effects of those programs are captured in the load forecast (TR 92). Seminole's members currently have 237 MW of DSM in the form of load control Switches, voltage control, and distributed generation (TR 91, Composite Exhibit No. 3, - Appendix L). Even after consideration of such conservation and DSM efforts, Seminole has a capacity need of over 750 MW in 2012. No additional DSM and conservation measures have been identified that would cost-effectively mitigate the need for SGS Unit 3 (TR 92).

There were several public witnesses who advocated that Seminole could provide additional DSM to offset the need for additional power in 2012 (TR 183-184, TR 192-193). Seminole's witness William Lawton, stated that each member Cooperative is responsible for providing cost effective DSM to its consumers (TR 90 Composite Exhibit No. 3, Appendix L). According to Seminole's witness Timothy Woodbury, Seminole provides price signals to its members that are properly designed to provide incentives to lower on-peak demand. This allows Seminole's members to offer their end use customers a variety of conservation and DSM measures. Mr. Woodbury stated that Seminole's need for additional capacity captures the impact of conservation and DSM implemented by Seminole's Members by reflecting the impact of such measures in the load forecast. The need for SGS Unit 3 by Seminole and its Members by 2012 cannot be avoided by DSM (TR 29).

## CONCLUSION

Therefore, staff recommends that there are no additional cost-effective conservation measures available that might mitigate Seminole's need for SGS Unit 3.

**Issue 5:** Based on the resolution of the foregoing issues, should the Commission grant Seminole Electric Cooperative, Inc.'s petition to determine the need for the proposed Seminole Generating Station Unit 3?

**Recommendation:** Yes. Seminole has satisfied each of the statutory criteria for a determination of need, and Seminole, its Members and their consumers would suffer significant adverse consequences if such a determination were not granted. Seminole should continue to monitor the cost-effectiveness of SGS Unit 3 prior to committing substantial capital dollars. (Colson, Stallcup, Lester, Windham)

**Staff Analysis:** Former Commissioner Leon Jacobs presented public testimony on behalf of the Sierra Club, asking the Commission to consider the risks associated with solid fuel generation (TR 199 -215). During cross examination, former Commissioner Jacobs indicated that much of what he had discussed about the risks associated with solid fuel generation had been addressed by Seminole in its filings (TR 216-218). He acknowledged that Seminole would need additional capacity in the near future, but urged the Commission to consider the risks he identified over the long term.

Staff agrees with Seminole that much of Mr. Jacobs' testimony shows that an affirmative determination of need should be granted (see Seminole's brief, pgs 19-20). Seminole's need for additional capacity in the near future is significant. Therefore, staff recommends that Seminole's petition for determination of need for SGS Unit 3 meets the statutory requirements of Section 403.519, Florida Statutes, as discussed in prior issues and summarized here:

- SGS Unit 3 will help ensure that Seminole meets its 15% reserve margin criterion in the year 2012 and maintain Seminole's electric system reliability and integrity.
- Seminole's evaluation of alternative supply options, DSM options, and its RFP analysis shows SGS Unit 3 to be the most cost-effective option in the short-term and over the long-term.
- There are no conservation measures taken by or reasonably available to Seminole which might mitigate the need for the proposed power plant.

## CONCLUSION

Based on the discussion above, which summarizes other issues within this recommendation, staff believes Seminole's petition satisfies the statutory criteria. Therefore, staff recommends that Seminole's petition for determination of need for SGS Unit 3 be granted. The order Memorializing the Commission's vote on this recommendation will constitute the commission's report to the Department of Environmental Protection and the Siting Board under Section 403.507, Florida Statutes.

Docket No. 060220-EC

Date: July 6, 2006

**Issue 6:** Should this docket be closed?

**Recommendation:** Yes. When the Commission has issued its final order in the case and the time for reconsideration has passed, this docket should be closed. (Brown)

**Staff Analysis:** Upon expiration of the appeal period, if no party has timely appealed the order, this docket should be closed.