BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 070650 -EI
FLORIDA POWER & LIGHT COMPANY

IN RE: FLORIDA POWER & LIGHT COMPANY'S PETITION TO DETERMINE NEED FOR TURKEY POINT NUCLEAR UNITS 6 AND 7 ELECTRICAL POWER PLANT

DIRECT TESTIMONY & EXHIBIT OF:

HECTOR J. SANCHEZ

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

FLORIDA POWER & LIGHT COMPANY

DIRECT TESTIMONY OF HECTOR J. SANCHEZ

DOCKET NO. 07____-EI

OCTOBER 16, 2007

Q. Please state your name and business address.

A. My name is Hector J. Sanchez. My business address is Florida Power & Light Company, 4200 West Flagler Street, Miami, FL 33134.

Q. By whom are you employed and what is your position?

A. I am employed by Florida Power & Light Company (FPL) as the Director of Transmission Services and Planning.

Q. Please describe your duties and responsibilities in that position.

A. I am responsible for matters relating to the provision of transmission services on the FPL system and for planning the expansion of the FPL transmission system to meet the requirements of FPL's retail and wholesale customers, and its transmission service obligations.

Q. Please describe your educational background and professional experience.

A. In December 1985, I received a Bachelor of Science degree in Electrical Engineering from the University of Miami. In 1990, I completed the Southeastern Electric Exchange's Course in Modern Power Systems Analysis held at Auburn University. In 1991, I received a Master of Business

Administration degree from Florida International University. Additionally, I have completed various other power system courses offered by Power Technology Incorporated, courses offered internally at FPL, and business and management courses at Columbia University.

Since joining FPL in 1986, I have held positions of increasing responsibility. My first positions at FPL were as an Applications Engineer in the Power Systems Control group and as an Engineer in the Protection and Control department. In 1989, I joined the System Operations group in the area of operations planning where I was responsible for performing technical analyses associated with short-term planning and operation of the FPL system. In 1994, I became a Transmission Business Manager where I was responsible for issues associated with the provision of transmission service. Subsequent to that assignment, in March 2000, I held the position responsible for the planning of the bulk transmission system and interconnections. In January of 2006, I became responsible for the operation and dispatch of the FPL system on a real time basis. Lastly, in March of 2006 I assumed my current position as Director of Transmission Services and Planning.

Q. Are you sponsoring an exhibit in this case?

A. Yes. I am sponsoring Exhibit HJS-1, Summary of Required Facilities for Turkey Point Units 6 & 7 (Turkey Point 6 & 7), which is attached to my direct testimony.

Q. Are you sponsoring any sections in the Need Study document?

A. Yes. I am sponsoring the portions of Section V.A.4 addressing Transmission Facilities. In addition, I sponsor Appendix A of the Need Study.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to describe FPL's process for determining the transmission plan for the interconnection and integration of FPL's Turkey Point 6 & 7. The two nuclear units are expected to have in-service dates of 2018 and 2020, respectively, with each unit ranging in size from approximately 1,100 to 1,520 MW net output. I discuss the overall transmission evaluation process and the attendant results of preliminary studies performed by FPL to determine how to interconnect and integrate Turkey Point 6 & 7 into FPL's transmission system.

Q. Please summarize your testimony.

A. My testimony provides a description of the evaluation process used to develop the transmission-related requirements for the Turkey Point 6 & 7 generation expansion plan, considering factors associated with planning, construction, and operation of the electric system. The results of FPL's evaluation are that the transmission facilities and upgrades described in Exhibit HJS-1 present the necessary transmission interconnection and integration requirements for Turkey Point 6 & 7 within the range of generator sizes being contemplated. Based on FPL's preliminary assessment, the addition of Turkey Point 6 & 7 at approximately 1,200 MW gross output for each unit is not expected to adversely impact the transmission import capability into the state of Florida.

If the unit size increases, more detailed studies will be needed to determine the specific impacts and mitigation alternatives.

EVALUATION PROCESS FOR DETERMINING FPL'S TRANSMISSION SYSTEM REQUIREMENTS

Q. Please describe FPL's evaluation process for transmission interconnection and integration of new generation resources.

A. The process commences with an evaluation team, including engineers from transmission and substation planning, operations, engineering, project management, permitting, and siting who together use their combined knowledge and years of experience to perform the evaluation and develop a transmission interconnection and integration plan. The evaluation process considers many factors, as outlined below, in order to develop an effective transmission plan. In some instances, the determination of the transmission interconnection and integration plan is relatively straightforward; however, other times it requires an iterative assessment of various factors and a substantial amount of time to perform appropriate studies. The resultant plan must be in compliance with North American Electric Reliability Corporation (NERC) and Florida Reliability Coordinating Council (FRCC) Reliability Standards.

Generally, the first step in the process is to evaluate the proposed generating plant site location to determine its proximity to existing transmission facilities. To the extent there are existing transmission facilities nearby, those facilities are assessed to determine their capabilities for reliably interconnecting and integrating the proposed new generation into the transmission system as a firm FPL generation resource. Next, other factors such as those listed below are considered (as applicable):

- Amount of generation (MW) being added at the new generation site, and the dispatch profile of the new generation resource relative to FPL's other generation resources in serving FPL's load;
- Capabilities to upgrade existing facilities (e.g., can the conductor on an existing transmission line be upgraded on the existing structures or would the entire transmission line have to be rebuilt?);
- Capability of transmission lines needed, right-of-way requirements, existing right-of-way capabilities, siting of new right-of-way, permitting requirements, and expected time-frame to acquire right-of-way and necessary permits;
- Ability to transport power efficiently (e.g., would using higher voltages be more efficient by reducing the amounts of transmission losses incurred when moving large amounts of power over long distances?);
- Existing and new substation requirements, capabilities, and availability;
- Impact on existing facilities (e.g., does the proposed interconnection and integration plan result in an overload on an existing facility or does it

result in a material adverse impact somewhere else on the transmission system?);

- Constructability (e.g., can the necessary transmission facilities be constructed without having to take existing operating facilities out of service during periods that would result in an adverse reliability impact?);
- Overall compatibility with the system (e.g., do the new facilities require new material stocking requirements or the need for new tools to maintain?);
- Compliance with NERC and FRCC Reliability Standards;
- Operating considerations (e.g., what are the maintenance requirements of the proposed interconnection and integration facilities and how will they impact the on-going operation of the system?);
- The timing and amount of power needed for testing of equipment such as pumps and motors;
- Expected in-service testing and commercial operations dates for new generation (e.g., which transmission facilities necessary for interconnection and integration need to be in-service prior to the commercial operation in-service date for testing?);
- The need for procuring transmission service from a third party;
- Material adverse impact on third party transmission owner(s); and,
- Initial and recurring costs of facilities and operations.

The next step in the interconnection and integration evaluation process is to perform power flow studies for a proposed transmission interconnection and integration plan. These power flow studies are used to evaluate the performance of the system and to converge on specific new system facilities and upgrades that would be needed to interconnect and integrate the new generation into the transmission system.

When the evaluation team is satisfied that they have developed an effective transmission interconnection and integration plan that is in compliance with NERC and FRCC Reliability Standards for the new generation resources, the process is deemed complete. If this result is not achieved, the evaluation process proceeds iteratively, as needed, until this result is achieved.

I would also note that this evaluation process, including the power flow studies, is the same as that used in FPL's recent Need Determination proceedings.

Q. Please describe how FPL evaluated the transmission-related requirements associated with Turkey Point 6 & 7.

A. When evaluating a generation plan, FPL considers different categories of transmission requirements that arise from the proposed delivery of additional power over FPL's transmission system. These categories are:

1) Transmission interconnection;

2) Transmission integration; and

3) Third party transmission service (as applicable).

FPL's Transmission Services and Planning Department evaluated the three categories of transmission requirements for Turkey Point 6 & 7 under my direction.

Q. Please describe in more detail each of the three categories associated with the transmission requirements that you have identified.

A. The three categories can be summarized as follows:

1) Transmission interconnection requirements

Transmission interconnection requirements are generally the facilities necessary to connect the new generation to the system. These facilities typically include generator step-up transformers, connection facilities from the transformers to the switchyard, and certain substation equipment at the point of interconnection. Additionally, certain facilities may need to be replaced or upgraded as a result of the generator interconnection at locations beyond the point of interconnection, such as circuit breakers and overhead ground wires due to increased fault current from the generator. Finally, there is the potential that interconnecting a generator that is larger than the largest single generator in the region may require upgrades to the transmission system to accommodate the instantaneous loss of the larger generator. The instantaneous loss of any generator in Peninsular Florida results in a sudden in-rush of power into Florida from the eastern United States interconnection

reacting to make up for the deficiency in generation. The transmission system must be capable of sustaining the loss of the single largest generator without violating any NERC or FRCC Reliability Standards.

2) Transmission integration requirements

Transmission integration requirements include system upgrades of existing transmission facilities and new transmission facilities that the power flow studies have determined are necessary for the reliable operation and firm delivery of the new FPL generation resources to FPL's load.

As part of this assessment, any adverse impacts that result in NERC or FRCC Reliability Standard violations on third party transmission systems are identified. In such instances, FPL would confer with the parties to confirm that the violation is valid and, if so, determine if there is a mitigation measure already available, or jointly develop mitigation measures to address the violation.

3) Third party transmission service requirements (as applicable)

Third party transmission service requirements are considered when generation resources are connected to an external transmission provider's system(s). When a generation expansion plan, such as the plan that includes FPL's Turkey Point 6 & 7, does not contain generation connected to a third party transmission system, there is no need for transmission service for the delivery

of generation connected to a third party to the FPL system. As such, this category of transmission service requirements will not be discussed further in my testimony.

TRANSMISSION SYSTEM REQUIREMENTS FOR TURKEY POINT 6 & 7

Q. Please describe FPL's proposed Turkey Point 6 & 7 units for which transmission requirements are being evaluated.

A. As discussed in FPL witness Silva's testimony, Turkey Point 6 is proposed as an 1,100 to 1,520 MW net nuclear unit (1,200 to 1,650 MW gross electrical output) with a planned in-service date of 2018, and Turkey Point 7 is proposed as an 1,100 to 1,520 MW net nuclear unit (1,200 to 1,650 MW gross electrical output) with a planned in-service date of 2020.

TRANSMISSION INTERCONNECTION

Q. Please describe the transmission interconnection requirements for Turkey Point 6 & 7.

A. The required transmission interconnection facilities for Turkey Point 6 & 7 are summarized in Exhibit HJS-1, Summary of Required Facilities for Turkey Point 6 & 7. These facilities include:

- The connection of Turkey Point 6 & 7 Generator Step Up (GSU) transformers to a new 500 kV switchyard at the Turkey Point site, and attendant bus equipment; and,
- Circuit breaker and overhead ground wire upgrades that may be required.

Additionally, as discussed later in my testimony, there may be potential upgrades associated with increasing the size of the largest unit in the FRCC beyond approximately 1,200 MW gross output.

TRANSMISSION INTEGRATION

Q. Please describe the transmission integration evaluation for the new generation at Turkey Point 6 & 7.

A. The integration evaluation is comprised of power flow studies. The power flow studies are used to identify any upgrades to existing transmission facilities or new transmission facilities that may be needed to integrate Turkey Point 6 & 7 into the transmission system as firm FPL generation resources while meeting NERC and FRCC Reliability Standards. The methodology used to perform these power flow studies is the same as that used in connection with FPL's other recent need determination proceedings, and is consistent with the methods used to ensure compliance with the NERC and FRCC Reliability Standards. In addition, compliance with U.S. Nuclear Regulatory Commission (NRC) requirements must be ensured. I reviewed

and approved the results of the power flow studies and reviewed the need for new facilities and upgrades required to integrate Turkey Point 6 & 7 into the transmission system as firm FPL generation resources used to serve FPL's retail customers.

My review determined that to reliably integrate the new generation resources in compliance with NERC and FRCC Reliability Standards, and with NRC requirements, new system facilities and upgrades are required for Turkey Point 6 & 7 for either the 1,100 MW or 1,520 MW net units. Exhibit HJS-1 summarizes the new system facilities and facility upgrades required for the range of unit sizes being considered.

Q. Please describe the power flow studies performed.

A. First contingency alternating current (AC) power flow analyses were performed for Turkey Point 6 & 7 to assess the need for transmission system upgrades and new facilities. All analyses were performed using the latest available 2007 FRCC power flow databank cases, updated to reflect FPL's latest load and resource forecast. Since the FRCC only developed load flow cases through 2017, FPL's load in the 2017 case was scaled to the latest available load information through 2020.

Analyses were performed using power flow simulations to identify the facilities that may become overloaded because of the integration of the capacity provided by Turkey Point 6 & 7, as well as the upgrades and new

transmission facilities required to mitigate such overload(s). An AC solution technique was also used to assess the voltage performance of the system against NERC and FRCC Reliability Standards. In the analysis, Turkey Point 6 & 7 were subjected to a first contingency screening for loss of transmission elements or generators out of service, one at a time, in accordance with NERC and FRCC Reliability Standards. This resulted in approximately 3,600 power flow calculations being performed for each case assessed. All of the Peninsular Florida interconnected transmission system was analyzed to determine whether thermal or voltage reliability criteria violations for system elements at voltages of 69 kV and above occur as a result of the generation resource addition. NERC or FRCC Reliability Standard violations on any FPL or other Peninsular Florida system elements directly related to the generation resource addition could indicate the potential need for transmission reinforcements.

Q. What factors associated with Turkey Point 6 & 7 have a major impact on the results of the analysis?

A. The requirement to add major transmission facilities is the result of the need to deliver from 2,200 MW (from two 1,100 MW net units) to 3,040 MW (from two 1,520 MW net units) of new generation northward from the existing Turkey Point site in the southern most part of Miami-Dade County in order to serve FPL's load. This results in significant transmission facilities being required in the area from Turkey Point to central Miami-Dade County.

Q. Please provide a general description of the transmission upgrades and new transmission facilities required for Turkey Point 6 & 7.

A. Turkey Point 6 & 7 will be connected to a new switchyard at the site. The two units will be connected to the new switchyard at 500 kV. This new switchyard will be connected by two 500 kV transmission lines to the 500 kV section of the existing Levee substation in central Miami-Dade County, which is located approximately 42 miles north of the Turkey Point switchyard. A new 230 kV line, approximately 13 miles long, will also be required from the Levee substation to the Gratigny substation located north and east of the Levee substation in central Miami-Dade County. The new switchyard at Turkey Point will also have a 230 kV section. The new 500 and 230 kV sections will be connected via a 500/230 kV auto-transformer. The new 230 kV section will be connected to the Davis substation in southern Miami-Dade County utilizing an approximately 18 mile line which will be rerouted from the existing Turkey Point plant switchyard and rebuilt to larger capacity. Additionally, the 230 kV line rerouted from the existing Turkey Point plant switchyard will be replaced with a new 230 kV circuit from the switchyard to the Levee 230 kV substation. The aforementioned facilities are required for either the 1,100 MW net units or the 1,520 MW net units. Finally, depending upon the amount of generation output of Turkey Point 6 & 7, certain other 230 and 138 kV upgrades to existing facilities are required. A summary of the base and additional facilities is set forth below:

Base Facilities Required for Two 1,100 MW Net Units:

- The connection of Turkey Point 6 Generator Step Up (GSU) transformer to the new Turkey Point switchyard, and attendant bus equipment.
- The connection of Turkey Point # 7 GSU transformer to the new Turkey Point switchyard, and attendant bus equipment.
- The new Turkey Point 500/230 kV switchyard.
- The two 500 kV transmission lines from the new Turkey Point switchyard to Levee Substation.
- The 230 kV transmission line from the Levee Substation to the Gratigny Substation.
- Rebuild and rerouting of the existing Turkey Point-Davis #1 230 kV line to the new Turkey Point 230 kVswitchyard.
- Replace the line removed from the existing Turkey Point switchyard with a new line from the existing Turkey Point switchyard to Levee 230 kV line.
- Upgrade Killian-Turkey Point 230 kV line
- Upgrade Turkey Point-Galloway Tap 230 kV line
- Upgrade Davis-Montgomery 138 kV line
- Upgrade Dadeland Tap-Snapper Creek 138 kV line
- Two 5-Ohm Reactors installed on the 230 kV side of the autotransformers at Levee Substation

- Two 5-Ohm Reactors installed on the 230 kV side of the autotransformers at Andytown Substation
- Two 5-Ohm Reactors installed on the 230 kV buses at the existing Turkey Point 230 kV switchyard.

Additional Facilities Required for Two 1,520 MW Net Units:

- Upgrade Killian-Miller 230 kV line
- Upgrade Mitchell-Court 138 kV line
- Upgrade Kendall-Suniland 138 kV line
- Upgrade Marion-Village Green 138 kV line
- Upgrade Marion-Montgomery 138 kV line

These facilities for Turkey Point 6 & 7 are also summarized in Exhibit HJS-1.

Q. Are there other factors associated with Turkey Point 6 & 7 that have a potential to require additional transmission facilities or upgrades?

A. Yes. The size of the single largest generator in Peninsular Florida is a significant factor because the transmission system must be capable of sustaining the loss of that generator without violating any NERC or FRCC Reliability Standards. This requirement may have a direct impact on the import capability from the Southeast Electric Reliability Council (SERC).

Q. Will either Turkey Point 6 or 7 increase the size of the single largest unit in the FRCC when they enter service?

A. Yes. Prior to the addition of Turkey Point 6 or 7, Progress Energy Florida plans to uprate its Crystal River nuclear unit to 1,080 MW gross output, making it the largest sized unit expected to be in-service in the FRCC. Turkey Point 6 & 7 are each expected to be larger than 1,080 MW gross output under either unit size scenario.

Q. Because a unit size of greater than 1,080 MW gross output will be selected for Turkey Point 6 & 7, how will such a unit impact the FRCC's import capability from SERC?

A. The import capability into Peninsular Florida from SERC is in large part determined by the contingency of the instantaneous loss of the largest unit in the FRCC, and the attendant sudden in-rush of power from the eastern United States interconnection reacting to replace such lost power source until more generation is dispatched in the FRCC region (within thirty minutes). Currently, based upon preliminary assessments by FPL, the sudden outage of a unit size of approximately 1,200 MW gross output or less should not adversely impact the FRCC's import capability from SERC in this time frame. If the unit size increases, more detailed studies will be needed to determine the specific impacts and mitigation alternatives.

Q. What evaluation process and assessments must be performed to determine how the capability of the transmission system would be increased to accommodate a larger sized unit?

A. First, FPL would complete its preliminary assessments. Next FPL would request through the FRCC that an FRCC/SERC regional/inter-regional study be performed to review the preliminary assessment findings performed by FPL and to determine the requirements, if any, to the transmission systems within the FRCC and SERC to accommodate a larger sized unit. Such a study would be performed with members of the FRCC, SERC, and FPL. Initial communications with the FRCC are currently underway to prepare for the commencement of this study. It is expected that this study would take up to 24 months to complete. The 2018 and 2020 commercial operation dates for Turkey Point 6 & 7 should not be affected so long as the results indicate that any required transmission improvements within the FRCC and SERC regions to accommodate a larger sized unit will be effective and feasible within this time frame.

Subsequent to the completion of such a study, FPL would seek an affirmation by the FRCC that the interconnection and integration plan for Turkey Point 6 & 7 is adequate and results in no reliability issues. Additionally, FPL would seek a determination from the FRCC and SERC that the interconnection and integration plan for Turkey Point 6 & 7, as it relates to any impacts on the FRCC-SERC interface, is adequate and results in no reliability issues.

Q. Does this conclude your testimony?

A. Yes.

Summary of Required Facilities for Turkey Point 6 & 7

Base Facilities required for two 1,100 MW net units.

Transmission Facility Item #	Voltage (kV)	Description
TF-1	500	The connection of Turkey Point # 6 Generator Step Up (GSU) transformer to the new Turkey Point switchyard, and attendant bus equipment.
TF-2	500	The connection of Turkey Point # 7 Generator Step Up (GSU) transformer to the new Turkey Point switchyard, and attendant bus equipment.
TF-3	500	The new Turkey Point 500/230 kV switchyard.
TF-4	500	The two 500 kV transmission lines from the new Turkey Point switchyard to Levee Substation. (Approximately 42 miles each)
TF-5	230	The 230 kV transmission line from the Levee Substation to the Gratigny Substation. (Approximately 13 miles)
TF-6	230	Rebuild and rerouting of the existing Turkey Point-Davis #1 230 kV line to the new Turkey Point 230 kVswitchyard.
TF-7	230	Replace the line removed from the existing Turkey Point switchyard with a new line from the existing Turkey Point switchyard to Levee 230 kV. (Approximately 42 miles)
TF-8	230	Upgrade Killian-Turkey Point 230 kV line
TF-9	230	Upgrade Turkey Point-Galloway Tap 230 kV line
TF-10	138	Upgrade Davis-Montgomery 138 kV line
TF-11	138	Upgrade Dadeland Tap-Snapper Creek 138 kV line
TF-12	230	Two 5-Ohm Reactors installed on the 230 kV side of the autotransformers at Levee Substation (one per auto)
TF-13	230	Two 5-Ohm Reactors installed on the 230 kV side of the autotransformers at Andytown Substation (one per auto)
TF-14	230	Two 5-Ohm Reactors installed on the 230 kV buses at the existing Turkey Point 230 kV switchyard.

Additional Facilities required for two 1,520 MW net units.

TF-15	230	Upgrade Killian-Miller 230 kV line
TF-16	138	Upgrade Mitchell-Court 138 kV line
TF-17	138	Upgrade Kendall-Suniland 138 kV line
TF-18	138	Upgrade Marion-Village Green 138 kV line
TF-19	138	Upgrade Marion-Montgomery 138 kV line

Note: These facilities do not include other potential facilities that may be required to mitigate the effect of the largest unit in the FRCC being larger than 1,200 MW gross output.