

PMTurkeyCOLPEm Resource

From: Orthen, Richard [Richard.Orthen@fpl.com]
Sent: Thursday, March 28, 2013 10:56 AM
To: Nguyen, John-Chau
Cc: Maher, William; Franzone, Steve; Hamrick, Steven; Ruiz, Marister
Subject: Turkey Point Units 3 & 4 EPU Final Environmental Assessment
Attachments: ML12074A251.pdf

John,

The NRC's March 27, 2012 FEA and FONSI for the Turkey Point Units 3 & 4 EPU license amendment is attached [ML12074A251].

Rick

Richard F. Orthen
Principal Licensing Engineer
New Nuclear Projects NNP/JBB3314
Florida Power & Light Company
700 Universe Boulevard
Juno Beach, FL 33408-0420
richard.orthen@nexteraenergy.com
o(561) 691-7512

Hearing Identifier: TurkeyPoint_COL_Public
Email Number: 785

Mail Envelope Properties (AC64FC620563494A9FBAD712DBEE5670094C73)

Subject: Turkey Point Units 3 & 4 EPU Final Environmental Assessment
Sent Date: 3/28/2013 10:55:37 AM
Received Date: 3/28/2013 10:57:51 AM
From: Orthen, Richard

Created By: Richard.Orthen@fpl.com

Recipients:

"Maher, William" <William.Maher@fpl.com>
Tracking Status: None
"Franzone, Steve" <Steve.Franzone@fpl.com>
Tracking Status: None
"Hamrick, Steven" <Steven.Hamrick@fpl.com>
Tracking Status: None
"Ruiz, Marister" <Marister.Ruiz@nexteraenergy.com>
Tracking Status: None
"Nguyen, John-Chau" <John-Chau.Nguyen@nrc.gov>
Tracking Status: None

Post Office: GOXSA1707.fplu.fpl.com

Files	Size	Date & Time
MESSAGE	393	3/28/2013 10:57:51 AM
ML12074A251.pdf	212046	

Options

Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

NUCLEAR REGULATORY COMMISSION

[Docket Nos. 50-250 and 50-251; NRC-2011-0259]

License Amendment

To Increase the Maximum Reactor Power Level, Florida Power & Light Company

Turkey Point, Units 3 and 4

AGENCY: Nuclear Regulatory Commission.

ACTION: Final environmental assessment and finding of no significant impact.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC or the Commission) is considering issuing an amendment for Renewed Facility Operating License Nos. DPR-31 and DPR-41, issued to Florida Power & Light Company (FPL or the licensee) for operation of the Turkey Point (PTN), Units 3 and 4, to increase the maximum power level from 2300 megawatts thermal (MWt) to 2644 MWt for each unit. The proposed power increase is approximately 15-percent over the current licensed thermal power, including a 13-percent power uprate and a 1.7-percent measurement uncertainty recapture, and approximately a 20-percent increase from the original licensed power level of 2200 MWt. The NRC did not identify any significant environmental impacts associated with the proposed action based on its evaluation of the information provided in the licensee's application and other available information, and has prepared this final Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for the proposed action.

ADDRESSES: Please refer to Docket ID **NRC-2011-0259** when contacting the NRC about the availability of information regarding this document. You may access information related to this document, which the NRC possesses and is publicly-available, using the following methods:

- **Federal Rulemaking Web site:** Go to <http://www.regulations.gov> and search for Docket ID **NRC-2011-0259**. Address questions about NRC dockets to Carol Gallagher; telephone: 301-492-3668; e-mail: Carol.Gallagher@nrc.gov.

- **NRC's Agencywide Documents Access and Management System (ADAMS):**
You may access publicly-available documents online in the NRC Library at <http://www.nrc.gov/reading-rm/adams.html>. To begin the search, select "[ADAMS Public Documents](#)" and then select "[Begin Web-based ADAMS Search](#)." For problems with ADAMS, please contact the NRC's Public Document Room (PDR) reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to pdr.resource@nrc.gov. The ADAMS accession number for each document referenced in this notice (if that document is available in ADAMS) is provided the first time that a document is referenced.

- **NRC's PDR:** You may examine and purchase copies of public documents at the NRC's PDR, Room O1-F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

FOR FURTHER INFORMATION CONTACT: Jason Paige, Project Manager, Plant Licensing Branch 2-2, Division of Operating Reactor Licensing, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; telephone: 301-415-5888; e-mail: Jason.Paige@nrc.gov.

SUPPLEMENTARY INFORMATION:

I. Introduction

The U.S. Nuclear Regulatory Commission (NRC) is considering issuance of an amendment for Renewed Facility Operating License Nos. DPR-31 and DPR-41, issued to FPL for operation of the PTN, Units 3 and 4, for a license amendment to increase the maximum power level from 2300 MWt to 2644 MWt for each unit. In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 51.21, the NRC has prepared this final EA and FONSI for the proposed action. The proposed power increase is approximately 15-percent over the current licensed thermal power, including a 13-percent power uprate and a 1.7-percent measurement uncertainty recapture, and approximately a 20-percent increase from the original licensed power level of 2200 MWt. The NRC did not identify any significant environmental impacts associated with the proposed action based on its evaluation of the information provided in the licensee's application and other available information. For further details with respect to the proposed action, see the licensee's application dated October 21, 2010, as supplemented by letters dated December 14, 2010 (ADAMS Accession No. ML103560167), and April 22, 2011 (ADAMS Accession No. ML11115A114).

The NRC published a notice in the *Federal Register* requesting public review and comment on a draft EA and FONSI for the proposed action on November 17, 2011 (76 FR 71379), and established December 19, 2011, as the deadline for submitting public comments. By letters dated December 9, 2011 (ADAMS Accession No. ML11347A194), and December 12, 2011 (ADAMS Accession No. ML12027A023), comments were received from FPL and Mr. Steve Torcise, Jr., of the Atlantic Civil, Inc., respectively. The FPL comments provided new estimates on the number of additional workers needed to support the outage work implementing

the proposed Extended Power Uprate (EPU) and revised the projected outage times necessary to implement the EPU. The FPL comments have been incorporated into this final EA with no change to the FONSI conclusion. The Atlantic Civil, Inc. comments have been incorporated into this final EA with no change to the FONSI conclusion and are summarized in the “**Summary of Comments**” (ADAMS Accession No. ML12075A035). Also, by letter dated January 12, 2012 (ADAMS Accession Number ML12019A348), the Southeast Regional Office of the U.S. Department of the Interior’s National Park Service provided comments on the draft EA and draft FONSI. Since these comments were received after the comment period deadline of December 19, 2011, the NRC will address these comments using separate correspondence.

II. Environmental Assessment

Plant Site and Environs:

The PTN site is located on 11,000 acres (ac) (4,450 hectares (ha)) in Florida’s South Miami-Dade County approximately 25 miles (mi) (40 kilometers [km]) south of Miami, Florida. The nearest city limits are Florida City approximately 8 miles (13 km) to the west, Homestead at approximately 4.5 miles (7 km) to the northwest and Key Largo at approximately 10 miles (16 km) south of the PTN site. The PTN site is bordered to the east by Biscayne National Park (BNP), to the north by the BNP and Homestead Bayfront Park, and on the west and south by FPL’s 13,000 ac (5,260 ha) Everglades Mitigation Bank. The PTN site consists of five electric generating units. Units 3 and 4 at the PTN site are nuclear reactors; Units 1, 2, and 5 are fossil-fueled units and are not covered by the proposed licensing action. Each nuclear reactor is a Westinghouse pressurized light-water reactor with three steam generators producing steam that turns turbines to generate electricity. The site features a 5,900 ac (2,390 ha) system of closed, recirculating cooling canals that are used to cool the heated water discharged by Units 1

through 4. Unit 5 has mechanical draft cooling towers for the steam generation cycle using water from the Upper Floridan Aquifer (UFA) as makeup and routing cooling tower blowdown to the cooling canal system. The five units and supporting equipment (excluding the cooling canal system) occupy approximately 130 ac (53 ha).

In June 2009, FPL submitted an application for a combined construction permit and operating license (COL) for two Westinghouse Advanced Passive 1000 (AP1000) pressurized-water reactors (PWRs) designated as PTN, Units 6 and 7.

Background Information on the Proposed Action:

By application dated October 21, 2010, the licensee requested an amendment to its license for an EPU for PTN Units 3 and 4 to increase the licensed thermal power level from 2300 MWt to 2644 MWt for each unit. This represents an increase of approximately 15-percent above the current licensed thermal power, including a 13-percent power uprate and a 1.7-percent measurement uncertainty recapture. This change requires NRC approval prior to the licensee implementing the EPU. The proposed action is considered an EPU by the NRC because it exceeds the typical 7-percent power increase that can be accommodated with only minor plant changes. An EPU typically involves extensive modifications to the nuclear steam supply system contained within the plant buildings.

The licensee plans to make extensive physical modifications to the plant's secondary side (i.e., non-nuclear) steam supply system to implement the proposed EPU. These modifications would occur during separate refueling outages for each unit. The EPU-related work for Unit 3 is scheduled for the spring 2012 outage and Unit 4 during the fall 2012 outage. The EPU, if approved by the NRC, would be implemented following each unit's refueling outage in 2012.

Approximately 800 people are employed at PTN Units 3 and 4 on a full-time basis with increases of approximately 600 – 900 during refueling outages. The licensee estimates that it will need approximately 2500 workers for implementation of the EPU resulting in a potential maximum outage/EPU workforce of approximately 3400 during each of the EPU outages.

As part of the overall process to obtain approval for the EPU, in September 2007, FPL submitted a Petition to Determine Need for Expansion of Electrical Power Plants to the Florida Public Service Commission (FPSC). The petition contained FPL's analysis for meeting the need for electric system reliability, integrity, and providing adequate electricity at a reasonable cost; how the proposed EPU is the most cost-effective alternative available; and why there are no renewable energy sources and technologies or conservation measures reasonably available to FPL that would avoid or mitigate the need for the proposed EPU. On January 7, 2008, the FPSC issued a Final Order Granting Petition for Determination of Need approving the proposed expansion of PTN Units 3 and 4 based on compliance with conditions required by the state.

The Need for the Proposed Action:

As stated in the FPL's application, the proposed action is to provide an additional supply of electric generation in the State of Florida without the need to site and construct new facilities. The proposed EPU will increase the electrical output for each unit by about 104 megawatts electric (MWe), from about 700 MWe to about 804 MWe.

Environmental Impacts of the Proposed Action:

As part of the original licensing process for PTN Units 3 and 4, the NRC published a Final Environmental Statement (FES) in July 1972. The FES contains an evaluation of the potential environmental impacts associated with the operation of PTN Units 3 and 4 over their

licensed lifetimes. In 2002, the NRC evaluated the environmental impacts of renewing the operating license of PTN Units 3 and 4 for an additional 20 years beyond its current operating license. The NRC concluded that the overall environmental impacts of license renewal were small. This evaluation is presented in NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plant, Supplement 5, Regarding Turkey Point, Units 3 and 4" (EIS Supplement No. 5 (SEIS-5)) issued in January 2002 (ADAMS Accession Nos. ML020280119, ML020280202, and ML020280226). Additionally, in October 2008, the State of Florida Department of Environmental Protection (FDEP) completed a thorough and comprehensive review under the Florida Electrical Power Plant Siting Act and issued a site certification to FPL approving the proposed EPU for PTN Units 3 and 4. In June 2009, FPL submitted an application for a COL for two AP1000 PWRs designated as PTN, Units 6 and 7. The COL application included an Environmental Report (ER) with FPL's analysis of the reasonably foreseeable impacts to the environment from the construction and operation of the two new units along with an environmental description of the existing PTN site. The NRC staff used information from the licensee's license amendment request for the EPU, the FESs, SEIS-5 to NUREG-1437, documents related to the FDEP site certification process, and information provided in the Turkey Point COL Environmental Report to perform its EA for the proposed EPU for PTN Units 3 and 4.

In order to implement the EPU, significant modifications will be required to the steam and power conversion equipment located within the buildings of PTN Units 3 and 4. Two changes outside of the reactor buildings including a change to the electric switchyard to accommodate new electrical equipment and construction of a temporary warehouse for EPU-related equipment would occur in developed portions of the power plant site. Modifications to the secondary side (i.e., non-nuclear) of each unit include the following: replacing the high-

pressure turbine, modifying condensate pump operations, installing fast acting backup automatic feedwater isolation valves, replacing two feedwater heaters, providing supplemental cooling for selected plant systems, implementing electrical upgrades, system modifications to accommodate greater steam and condensate flow rates, and changing system setpoints and associated software.

The sections below describe the potential nonradiological and radiological impacts to the environment that could result from the proposed EPU.

Nonradiological Impacts

Land Use and Aesthetic Impacts:

Potential land use and aesthetic impacts from the proposed EPU include impacts from plant modifications at the PTN site. While some plant components would be modified, most plant changes related to the proposed EPU would occur within existing structures, buildings, and fenced equipment yards housing major components within the developed part of the site. As previously discussed, EPU-related modifications at the PTN plant site would occur within the developed portions of the power plant site.

Existing parking lots, road access, equipment lay-down areas, offices, workshops, warehouses, and restrooms would be used during plant modifications. Therefore, land use conditions would not change at the PTN site. Also, there would be no land use changes along transmission line corridors and no new transmission lines would be required. The PTN Units 3 and 4 electric switchyard would be expanded to accommodate new equipment, which will be expanded on previously disturbed or already developed portions of the PTN site.

Since land use conditions would not change at the PTN site, and because any land disturbance would occur within previously disturbed areas, there would be little or no impact to

aesthetic resources in the vicinity of PTN Units 3 and 4. Therefore, there would be no significant impact from EPU-related plant modifications on land use and aesthetic resources in the vicinity of the PTN site.

Air Quality Impacts:

Major air pollution emission sources at the PTN site are regulated by the FDEP's Division of Air Resource Management under the Prevention of Significant Deterioration program. Nonradioactive emission sources at PTN Units 3 and 4 consist of four 2.5 MWe emergency generators, five smaller emergency generators, and various general purpose generators regulated under a Florida Title V Air Operating Permit. There will be no changes to the emissions from these sources as a result of the EPU.

Some minor and short duration air quality impacts would occur during implementation of the EPU at the PTN site. The main source of air emissions would come from the vehicles driven by outage workers needed to implement the EPU. However, air emissions from the EPU workforce, truck deliveries, and construction/modification activities would not be significantly greater than previous refueling outages at the PTN site.

Upon completion of the proposed EPU, nonradioactive air pollutant emissions would not increase. Therefore, there would be no significant impact on air quality in the region during and following implementation of the proposed EPU.

Water Use Impacts

Surface Water:

The PTN Units 3 and 4 are located in the low-lying areas of coastal Miami-Dade County on the western shore of Biscayne Bay. There are no significant freshwater surface bodies

outside of the PTN site (i.e., lakes, major rivers, or dams), but there is a network of canals, such as the Everglades National Park-South Dade Conveyance System, in addition to local drainage canals that either control drainage from southeast Florida to Biscayne Bay or provide freshwater to the Everglades National Park. The most significant surface water body on the PTN site is the closed-cycle cooling canal system (CCS), permitted by the State of Florida as an industrial wastewater facility, used for the cooling of heated water discharged from the main condensers and auxiliary systems of PTN Units 1 through 4.

The CCS covers approximately 5,900 ac (2,390 ha) of the PTN site with a large system of north-south aligned 168 miles of interconnected earthen canals to dissipate heat through surface evaporation. The canals are a closed recirculating loop that serves as the ultimate heat sink for PTN Units 3 and 4. The CCS is operated under an industrial wastewater facility “No Discharge” National Pollutant Discharge Elimination System (NPDES) permit from the FDEP (NPDES permit number FL0001562) for water discharges to an onsite closed-loop recirculation cooling canal system. The seasonal temperature of the canal water ranges from approximately 85 °F to 105 °F (29 °C to 40 °C) for heated water entering the CCS with cooled water returning to the power plants at approximately 70 °F to 90 °F (21 °C to 32 °C). Additionally, the CCS water is hyper-saline (twice the salinity of Biscayne Bay) with seasonal variations ranging from approximately 40 to 60 parts per thousand (ppt).

The CCS does not discharge directly to fresh or marine surface waters. Makeup water to replace water lost due to evaporation comes from used plant process water that has been treated, incident rainfall, storm water runoff, and from infiltration and exchange of saline water with local groundwater and Biscayne Bay. Because the PTN canals are unlined, there is an exchange of water between the PTN canal system and local groundwater and Biscayne Bay. An interceptor ditch is located along the west side of the CCS. During the dry season, when the

natural groundwater gradient is from Biscayne Bay and Card Sound toward the Everglades, water is pumped from the interceptor ditch to the CCS to create an artificial groundwater gradient from the Everglades into the ditch. This process is used to minimize the flow of hyper-saline water from the CCS toward the Everglades. Maintenance of the CCS includes mechanical removal of submerged, rooted marine plants on an approximate 3-year cycle and removal of terrestrial woody vegetation from the canal berms on a 10-year cycle.

Each nuclear unit discharges approximately 5.35 billion British Thermal Units (BTU) per hour of waste heat to the CCS. Under the proposed EPU, the quantity of waste heat discharged by each nuclear unit to the CCS would increase to approximately 6.10 billion BTU per hour. This results in a net total increase of 1.5 billion BTU in waste heat discharged by both nuclear units. The licensee calculated that the maximum change in water temperature due to the proposed EPU would be approximately 2.0 °F to 2.5 °F (1.1 °C to 1.4 °C) for a total maximum water temperature up to 108.6 °F (42.6 °C) for water entering the CCS and a 0.9 °F (0.5 °C) increase with a total maximum water temperature up to 92.8 °F (33.8 °C) for the water returning to the power plants. The licensee calculated that the higher water temperature will increase water losses from the CCS due to evaporation resulting in a slight increase in salinity of approximately 2 to 3 ppt.

In accordance with the FDEP site certification process for the proposed EPU, FPL must meet state imposed requirements contained in the Conditions of Certification (CoC). The CoC was developed based on interactions by FPL with the FDEP and other stakeholders, including opportunities for public comment, during the FDEP site certification process. The inclusion of stakeholders' recommendations into the CoC formed the basis for FDEP recommending approval of the site certification application for the proposed EPU. The CoC requires FPL to have a program to monitor and assess the potential direct and indirect impacts to ground and

surface water from the proposed EPU. The monitoring includes measuring water temperature and salinity in the CCS and monitoring the American crocodile populations at the PTN site. The monitoring plan expands FPL's monitoring of the CCS's ground and surface water to include the land and water bodies surrounding the PTN site such as Biscayne Bay.

The implementation of the CoC monitoring plan is an ongoing program coordinated by FDEP. The results of the monitoring will be publicly available via a South Florida Water Management District (SFWMD) website. If the proposed EPU is approved by the NRC, the CoC monitoring plan would continue to assess the environmental impacts. The CoC allows FDEP to impose additional measures if the monitoring data is insufficient to adequately evaluate environmental changes, or if the data indicates a significant degradation to aquatic resources by exceeding State or County water quality standards, or the monitoring plan is inconsistent with the goals and objectives of the Comprehensive Everglades Restoration Plan Biscayne Bay Coastal Wetlands Project. Additional measures could include enhanced monitoring, modeling, or mitigation. Abatement actions provided in the CoC include: mitigation measures to comply with State and local water quality standards, which may include methods to reduce and mitigate salinity levels in groundwater; operational changes to the PTN cooling canal system to reduce environmental impacts; and other measures required by FDEP in consultation with SFWMD and Miami-Dade County to reduce the environmental impacts to acceptable levels.

The field data on surface water monitoring currently available are being reviewed by FPL, FDEP, SFWMD, and stakeholders for the development of a water budget model. The data and other documentation show that there is indirect surface water communication between the CCS and Biscayne Bay. Approving the proposed EPU license amendment is not expected to cause significant impacts greater than current operations because the monitoring plan will provide data for FPL and state agencies to assess the effectiveness of current environmental

controls and additional limits and controls could be imposed if the impacts are larger than expected. Therefore, there would be no significant impact to surface water resources following implementation of the proposed EPU.

Groundwater:

Southeastern Miami/Dade County is underlain by two aquifer systems; the unconfined Biscayne Aquifer and the Floridan Aquifer System (FAS). The Biscayne Aquifer has been declared a sole-source aquifer by the U.S. Environmental Protection Agency (EPA). The Biscayne Aquifer underlying the PTN site, however, contains saline to saltwater in this area and is not usable as a potable water supply. The FAS underlies approximately 100,000 square miles (258,000 km²) in southern Alabama, southeastern Georgia, southern South Carolina, and all of Florida. The FAS is a multiple-use aquifer system in that where it contains freshwater, it is the principal source of water supply. Where the aquifer contains saltwater, such as along the southeastern coast of Florida, treated sewage and industrial wastes are injected into it.

Recharge of groundwater at the PTN site varies seasonally between surface recharge during the rainy season and saline recharge from the ocean during the dry season. As a result, there is a large seasonal variation in the salinity of the groundwater near the surface at the PTN site. However, below about 40 ft (12 meters (m)) into the Biscayne aquifer, relatively high salinity (greater than 28 ppt) exists year round. Florida classifies the groundwater in this area as G-III based on its salinity. This classification is used to identify groundwater that has no reasonable potential as a future source of drinking water due to high total dissolved solids.

The current and proposed operations at the PTN site do not require the withdrawal of groundwater. The potable water and general service water supply at the PTN site are provided by Miami-Dade County public water supply. This potable water comes from the Biscayne

Aquifer, which occurs at or close to the ground surface and extends to a depth of about 70 ft (21 m) below the surface. The PTN Units 3 and 4 use approximately 690 gallons per minute (2612 liters per minute (L/min)) of potable water. The licensee is not requesting an increase in water supply under the proposed EPU. Therefore, no significant impacts to offsite users of the Miami-Dade public water supply are expected.

As discussed in the surface water impacts section, the FPL's implementation of the CoC monitoring plan is ongoing and consists of an integrated system of surface, groundwater, vadose zone, and ecologic sampling. Fourteen groundwater monitoring well clusters at selected sites have been constructed in accordance with the monitoring plan and an associated quality assurance plan. The field data collected prior to implementation of the proposed EPU will be used to characterize existing environmental conditions from current PTN operations. The CoC allows the FDEP to require additional measures if the pre- and post-EPU monitoring data are insufficient to evaluate changes as a result of the EPU. If the data indicate an adverse impact, additional measures, including enhanced monitoring, modeling or mitigation, would likely be required to evaluate or to abate such impacts.

Abatement actions provided in the CoC include: (1) mitigation measures to offset such impacts of the proposed EPU necessary to comply with State and local water quality standards; (2) operational changes in the cooling canal system to reduce impacts; and (3) other measures to abate impacts specified a revised CoC approved by the FDEP after consultation with SFWMD and Miami-Dade County.

Approving the proposed EPU license amendment is not expected to cause significant impacts greater than current operations because the monitoring plan will provide data for FPL and state agencies to assess the effectiveness of current environmental controls and additional limits and controls could be imposed if the impacts are larger than expected. Therefore, there

would be no significant impact to the groundwater following implementation of the proposed EPU.

Aquatic Resources Impacts:

The discharges of chemicals and heated wastewater from PTN Units 3 and 4 have the potential to impact aquatic biota from the proposed EPU. Biscayne Bay and Card Sound are shallow, subtropical marine waters located between the mainland and a grouping of barrier islands that form the northernmost Florida Keys. These waters contain a variety of marine life, including seagrass, sponges, mollusks, crustaceans, fish, sea turtles, and marine mammals. The portion of Biscayne Bay adjacent to Turkey Point is part of Biscayne National Park, which includes the mainland shore, the bay, the keys, and offshore coral reefs. The Intracoastal Waterway traverses Biscayne Bay and Card Sound, and a barge passage runs from the Intracoastal Waterway to the fossil-fueled facility at the PTN site. Biscayne Bay and Card Sound would be unaffected by the proposed EPU because FPL does not withdraw or discharge to any natural water body.

Turkey Point's cooling system receives heated water discharged from the two reactors as well as from the two fossil fueled electric generating stations. The cooling system spans about 5,900 ac (2,400 ha) spread out over a 5 mi by 2 mi (8 km by 3.2 km) area of the site. The heated water is discharged into a series of 32 feeder channels that dissipate the heat. The feeder channels merge into a single collector canal that returns the cooled water to the plants through a main return canal and six return channels.

Under EPU conditions, the cooling canal system would increase in both temperature and salinity. The licensee predicts that discharged water would increase a maximum of an additional 2.5 °F (1.4 °C), which would increase the change in temperature as water passes

through the condensers from 16.8 °F to 18.8 °F (9.3 to 10.4 °C). Because condenser cooling water discharges at the northeastern corner of the cooling canal system flows west, and then south, the system exhibits a north-south temperature gradient. Therefore, while the northeast portion of the system may increase by 2.0 °F to 2.5 °F (1.1 °C to 1.4 °C) under EPU conditions, the temperature increase attributable to the EPU would decrease as water moves south through the system. The increased discharge temperatures will cause additional evaporative losses to the cooling canal system. The Florida Department of Environmental Protection predicted that an additional 2 to 3 million gallons per day (7,600 to 11,000 cubic meters per day) will be lost to evaporation under EPU conditions. The increased evaporation would, in turn, increase the cooling canal's salinity of 40 to 60 ppt by 2 to 3 ppt. Due to the north-south temperature gradient, evaporative losses would be greater in the northern portion of the canal system, and thus, salinity will also demonstrate a north-south gradient.

The cooling canal system supports a variety of aquatic species typical of shallow, subtropical, hyper-saline environments, including phytoplankton, zooplankton, marine algae, rooted plants, crabs, and estuarine fish. The most abundant fish in the cooling canal system is killifish (Family Cyprinodontidae). The aquatic species found within the cooling canal system are subtropical or tropical and readily adapt to hyper saline environments. The aquatic populations within the cooling canal system do not contribute any commercial or recreational value because the cooling canal system is owner-controlled and closed to the public.

Because aquatic organisms in the cooling canal system are unable to travel to or from Biscayne Bay, Card Sound, or any other natural water body, changes to the conditions within the cooling canal system would not affect any aquatic species' populations in the natural aquatic habitats. Therefore, the staff concludes that there would be no significant impacts to aquatic resources as a result of the proposed EPU.

Terrestrial Resources Impacts:

The PTN site is situated on low, swampy land that was previously mangrove-covered tidal flats. Mangrove swamps extend inland approximately 3 to 4 mi (5 to 6.5 km), and undeveloped portions of the site remain under 1 to 3 inches (2 to 8 centimeters) of water, even during low tide. Of the 24,000-ac (9,700-ha) site, approximately 11,000-ac is developed for PTN Units 3 and 4, the cooling canal system, and three FPL-owned fossil fuel units.

The impacts that could potentially affect terrestrial resources include loss of habitat, construction and refurbishment-related noise and lighting and sediment transport or erosion. Because all activities associated with the EPU would occur on the developed portion of the site, the proposed EPU would not directly affect any natural terrestrial habitats and would not result in loss of habitat. Noise and lighting would not impact terrestrial species beyond what would be experienced during normal operations because refurbishment and construction activities would take place during outage periods, which are already periods of heightened activity. Sediment transport and erosion is not a concern because activity would only take place on previously developed land and best management practices would ensure that no loose sediment is transported to wetland areas, tidal flats, or waterways. The staff concludes that the proposed EPU would have no significant effect on terrestrial resources.

Threatened and Endangered Species Impacts:

Under Section 7 of the Endangered Species Act of 1973, as amended (ESA), Federal agencies, in consultation with the U.S. Fish and Wildlife Service (FWS) or the National Marine Fisheries Service (as appropriate), must ensure that actions the agency authorizes, funds, or

carries out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat.

In order to fulfill its duties under section 7 of the ESA, the NRC prepared and submitted a biological assessment to the FWS on September 9, 2011, in order to determine the potential effects of the proposed EPU on Federally listed species. The following Table identifies the species that the NRC considered in its biological assessment.

Table of Federally Listed Species Occurring in Miami-Dade County

Scientific Name	Common Name	ESA Status^(a)
Aquatic Invertebrates		
<i>Acropora cervicornis</i>	staghorn coral	PT
<i>Acropora palmate</i>	elkhorn coral	PT
Birds		
<i>Ammodramus maritimus mirabilis</i>	Cape Sable seaside sparrow	E
<i>Charadrius melodus</i>	piping plover	T
<i>Dendroica kirtlandii</i>	Kirtland's warbler ^(b)	E
<i>Mycteria americana</i>	wood stork	E
<i>Polyborus plancus audubonii</i>	Audubon's crested caracara ^(b)	T
<i>Rostrhamus sociabilis plumbeus</i>	Everglade snail kite	E
<i>Vermivora bachmanii</i>	Bachman's warbler ^(b)	E
Fish		
<i>Pristis pectinata</i>	smalltooth sawfish	E
Flowering Plants		
<i>Amorpha crenulata</i>	crenulate lead-plant	E
<i>Chamaesyce deltoidea</i> ssp. <i>Deltoidea</i>	deltoid spurge	E
<i>Chamaesyce garberi</i>	Garber's spurge	T
<i>Cucurbita okeechobeensis</i> ssp. <i>Okeechobeensis</i>	okeechobee gourd ^(b)	E
<i>Galactia smallii</i>	Small's milkpea	E
<i>Halophia johnsonii</i>	Johnson's sea grass	T
<i>Jacquemontia reclinata</i>	beach jacquemontia	E
<i>Polygala smallii</i>	tiny polygala	E

Insects		
<i>Heraclides aristodemus ponceanus</i>	schaus swallowtail butterfly	E
Mammals		
<i>Puma concolor</i>	mountain lion ^(b)	T/SA
<i>Felis concolor coryi</i>	Florida panther	E
<i>Trichechus manatus</i>	West Indian manatee	E
Reptiles		
<i>Alligator mississippiensis</i>	American alligator	T/SA
<i>Caretta caretta</i>	loggerhead sea turtle	T
<i>Chelonia mydas</i>	green sea turtle	E
<i>Crocodylus acutus</i>	American crocodile	T
<i>Dermochelys coriacea</i>	leatherback sea turtle	E
<i>Drymarchon corais couperi</i>	eastern indigo snake	T
<i>Eretmochelys imbricata</i>	hawksbill sea turtle	E
<i>Lepidochelys kempii</i>	Kemp's ridley sea turtle ^(c)	E
Snails		
<i>Orthalicus reses</i>	Stock Island tree snail ^(b)	T
^(a) E = endangered; PT = proposed threaten; T = threatened; T/SA = threatened due to similarity of appearance ^(b) Species not previously considered in 2001 biological assessment for Turkey Point. ^(c) The Kemp's ridley is not listed by the FWS as occurring in Miami-Dade County. However, the species occurs in the neighboring Monroe County and FPL has reported the species' occurrence in Biscayne Bay and Card Sound.		
Source: U.S. Fish and Wildlife Service		

In the biological assessment, the NRC concluded that the proposed EPU may adversely affect the American crocodile (*Crocodylus acutus*). The NRC concluded that the proposed EPU would not adversely affect the remaining 30 species listed in the Table above. The NRC also concluded that the proposed EPU may adversely modify the cooling canal system, which is designated as a critical habitat for the American crocodile.

The FWS responded to NRC's biological assessment on October 25, 2011. In their letter, the FWS concluded that the proposed EPU may affect, but is not likely to adversely

affect, the American crocodile. The FWS also noted that the proposed EPU is unlikely to result in modification to designated American crocodile critical habitat. This letter fulfilled the NRC's requirements under Section 7 of the ESA.

Based on the FWS's conclusions, the NRC concludes that the proposed EPU would not significantly impact threatened or endangered species.

Historic and Archaeological Resources Impacts:

As reported in the SEIS-5, the NRC reviewed historic and archaeological site files at the Florida Department of State, Division of Historical Resources; the National Park Service Southeast Archaeological Center; and at Biscayne National Park; and confirmed that no historic or archaeological and historic architectural sites have been recorded on the PTN site. As previously discussed, EPU-related plant modifications would take place within existing buildings and facilities at PTN, except for the expansion of the switchyard on previously disturbed land. Since ground disturbance or construction-related activities would not occur outside of previously disturbed areas, there would be no significant impact from the proposed EPU on historic and archaeological resources in the vicinity of PTN Units 3 and 4 and the switchyard.

Socioeconomic Impacts:

Potential socioeconomic impacts from the proposed EPU include increased demand for short-term housing, public services, and increased traffic in the region due to the temporary increase in the number of workers at the PTN site required to implement the EPU. The proposed EPU could also increase tax payments due to increased power generation.

Approximately 800 people are employed at PTN Units 3 and 4 on a full-time basis with increases of approximately 600 – 900 during periodic refueling outages. These workers reside

primarily in Miami-Dade County, Florida. The licensee estimates that it will need approximately 2500 workers for implementation of the EPU resulting in a potential maximum outage/EPU workforce of approximately 3400 during each of the EPU outages. The licensee estimates that the outages to implement the EPU will last approximately 160 days for Unit 3 and 130 days for Unit 4. As previously discussed, EPU-related modifications would take place during the spring and fall 2012 refueling outages for Units 3 and 4, respectively. Once EPU-related plant modifications have been completed, the size of the refueling outage workforce would return to normal levels, with no significant increases expected during future refueling outages. The size of the regular plant workforce is not expected to be affected by the proposed EPU.

Most of the EPU-related plant modification workers would be expected to relocate temporarily to Miami-Dade County, resulting in short-term increases in the local population along with increased demands for public services and housing. Because plant modification work would be short-term and up to half a year, most workers would stay in available rental homes, apartments, mobile homes, and camper-trailers. According to the 2010 census housing data, there were approximately 122,000 vacant housing units in Miami-Dade County available to meet the demand for rental housing. Additionally, there are over 200,000 available public lodging accommodations in Miami-Dade County. Therefore, a temporary increase in plant employment for this duration would have little or no noticeable effect on the availability of housing and public services in the region.

The principal road access to the PTN site is via East Palm Drive (SW 344 Street). East Palm Drive is a two-lane road for approximately half of its length from the PTN plant to Florida City, where it intersects with U.S. Highway 1 approximately 14 km (9 miles) from the PTN site. Increased traffic volumes during normal refueling outages typically have not degraded the level of service capacity on local roads. The FPL evaluation asserts that the projected traffic will

remain well within the Miami-Dade County peak hour capacity. Therefore, the roadways used by plant workers and the public are expected to operate at an acceptable level of service as designated by Miami-Dade County. However, the additional number of workers and truck material and equipment deliveries needed to support EPU-related plant modifications could cause short-term level of service impacts on access roads in the immediate vicinity of PTN. During periods of high traffic volume (i.e., morning and afternoon shift changes), work schedules could be staggered and employees and/or local police officials could be used to direct traffic entering and leaving the PTN site to minimize level of service impacts on SW 334th Street (East Palm Drive).

Tangible personal property (principally business equipment) and real property (namely land and permanent buildings) are subject to property tax in Florida as administered by the local government. For 2007, FPL paid approximately \$6.9 million to Miami-Dade County and the Miami-Dade school district in real property taxes for PTN Units 3 and 4. Future property tax payments could take into account the increased value of PTN Units 3 and 4 as a result of the EPU and increased power generation.

Due to the short duration of EPU-related plant modification activities, there would be little or no noticeable effect on tax revenues generated by temporary workers residing in Miami-Dade County. Therefore, there would be no significant adverse socioeconomic impacts from EPU-related plant modifications and operations under EPU conditions in the vicinity of the PTN site.

Environmental Justice Impacts:

The environmental justice impact analysis evaluates the potential for disproportionately high and adverse human health and environmental effects on minority and low-income populations that could result from activities associated with the proposed EPU at the PTN site.

Such effects may include human health, biological, cultural, economic, or social impacts.

Minority and low-income populations are subsets of the general public residing in the vicinity of the PTN site, and all are exposed to the same health and environmental effects generated from activities at PTN Units 3 and 4.

The NRC considered the demographic composition of the area within a 50-mi (80-km) radius of the PTN site to determine the location of minority and low-income populations and whether they may be affected by the proposed action.

Minority populations in the vicinity of the PTN site, according to the U.S. Census Bureau data for 2000, comprise approximately 70 percent of the population (approximately 2,170,000 individuals) residing within a 50-mile (80-kilometer) radius of the PTN site. The largest minority group was Hispanic or Latino (approximately 1,465,000 persons or 47 percent), followed by Black or African Americans (approximately 670,000 persons or about 22 percent).

According to the U.S. Census Bureau, about 83 percent of the Miami-Dade County population identified themselves as minorities, with persons of Hispanic or Latino origin comprising the largest minority group (63 percent). According to 2009 American Community Survey census data 1-year estimate, as a percent of total population, the minority population of Miami-Dade County increased approximately one percent, with persons of Hispanic or Latino origin comprising the largest minority group (82 percent) in 2009.

According to 2000 census data, low-income populations comprised approximately 98,000 families and 488,000 individuals (approximately 13 and 16 percent, respectively) residing within a 50-mi (80-km) radius of the PTN site.

The 2009 Federal poverty threshold was \$22,490 for a family of four with one related child under 18 years. According to census data in the 2009 American Community Survey 1-Year Estimate, the median household income for Florida was \$53,500, with 11 percent of

families and 15 percent of individuals determined to be living below the Federal poverty threshold. Miami-Dade County had a lower median household income average (\$42,000) than the State of Florida and also had higher percentages of county families (14 percent) and individuals (18 percent), respectively, living below the poverty level.

Environmental Justice Impact Analysis:

Potential impacts to minority and low-income populations would mostly consist of environmental and socioeconomic effects (e.g., noise, dust, traffic, employment, and housing impacts). Radiation doses from plant operations after the EPU are expected to continue to remain below regulatory limits.

Noise and dust impacts would be short-term and limited to onsite activities. Minority and low-income populations residing along site access and the primary commuter roads through Florida City, Florida (e.g., U.S. Highway 1 and East Palm Drive) could experience increased commuter vehicle traffic during shift changes. Increased demand for rental housing during EPU-related plant modifications could disproportionately affect low-income populations. However, due to the short duration of the EPU-related work and the availability of rental housing, impacts to minority and low-income populations would be short-term and limited. According to 2010 census information, there were approximately 122,000 vacant housing units in Miami-Dade County and approximately 20,000 vacant housing units in Monroe County.

Based on this information and the analysis of human health and environmental impacts presented in this environmental assessment, the proposed EPU would not have disproportionately high and adverse human health and environmental effects on minority and low-income populations residing in the vicinity of the PTN site.

Nonradiological Cumulative Impacts

The NRC considered potential cumulative impacts on the environment resulting from the incremental impact of the proposed EPU when added to other past, present, and reasonably foreseeable future actions. For the purposes of this analysis, past actions are related to the construction and licensing of PTN Units 3 and 4, present actions are related to current operations, and future actions are those that are reasonably foreseeable through the end of station operations including operations under the EPU.

The application to build two new nuclear units at the PTN site is considered a reasonably foreseeable future action that is considered in this review. A COL application was submitted by FPL to the NRC in June 2009, for the construction and operation of two Westinghouse AP1000 units at the PTN site along with the construction of transmission corridors. It is expected, however, that the proposed EPU, if approved, would be completed prior to the construction of the new units. Thus, the cumulative impacts briefly discussed in this section consider PTN Units 3 and 4 operations (under the EPU) combined with the environmental impacts from the proposed construction and operation of PTN Units 6 and 7.

It is important to note that submitting the COL application does not commit FPL to build two new nuclear units, and does not constitute approval of the proposal by the NRC. The COL application will be evaluated on its merits and after considering and evaluating the environmental and safety implications of the proposal, the NRC will decide whether to approve or deny the licenses. Environmental impacts of constructing and operating PTN Units 6 and 7 will depend on their actual design characteristics, construction practices, and power plant operations. These impacts will be assessed by the NRC in a separate National Environmental Policy Act (NEPA) document. The cumulative impacts presented in this EA may differ from those impacts assessed for the COL.

For some resource areas (e.g., air quality, water, aquatic, terrestrial resources, and threatened and endangered species), the contributory effect of ongoing actions within a region are regulated and monitored through a permitting process (e.g., NPDES and 401/404 permits under the Clean Water Act) under State or Federal authority. In these cases, impacts are managed as long as these actions are in compliance with their respective permits and conditions of certification.

Units 6 and 7 of the PTN site would be constructed on undeveloped land immediately south of PTN Units 3 and 4. The EPU modifications to PTN Units 3 and 4 are expected to be completed before the proposed PTN Units 6 and 7 are constructed.

Units 6 and 7 of the PTN site would have a closed-cycle cooling system utilizing cooling towers with makeup water from Biscayne Bay and treated wastewater from Miami-Dade County. Waste water discharges are expected to be disposed of by deep well injection. Impacts to water resources for PTN Units 3 and 4 and PTN Units 6 and 7 would occur separately, and any potential cumulative impacts would not be significantly greater than current operations.

Units 6 and 7 of the PTN site transmission lines, and related infrastructure improvements would be constructed and operated according to Federal and State regulations, permit conditions, existing procedures, and established best management practices. Nevertheless, wildlife may be destroyed or displaced during land clearing for PTN Units 6 and 7. Less mobile animals, such as reptiles, amphibians, and small mammals, would incur greater mortality than more mobile animals, such as birds. Although undisturbed habitat would be available for displaced animals during construction, increased competition for available habitat may result in local population stresses. As construction activities end, habitats could be restored either naturally or through mitigation activities.

Terrestrial species and habitat could be affected by PTN Units 6 and 7 cooling system operations. As described in the Environmental Report for the new units, the primary source of makeup water would be treated waste water from the Miami-Dade Water and Sewer Department. If not enough reclaimed water is available to meet the needs of PTN Units 6 and 7, then seawater would be withdrawn from under Biscayne Bay via radial collector wells. Because of this situation, the operation of mechanical draft cooling towers can result in salt deposition (i.e., salt drift); a greater risk of avian collision mortality; and noise.

Land needed for the proposed PTN Units 6 and 7 has been surveyed for historical and archaeological sites. The survey identified no new or previously recorded historic or archaeological resources within or adjacent to the proposed site.

Socioeconomic impacts from the construction and operation of PTN Units 6 and 7 would occur several years after the EPU. The large construction and operation workforces combined with ongoing operation of PTN Units 3 and 4 under the EPU would have a noticeable effect on socioeconomic conditions in local communities from the increased demand for temporary and permanent housing, public services (e.g., public schools), and increased traffic.

Nonradiological Impacts Summary:

As discussed above, the proposed EPU would not result in any significant nonradiological impacts. Table 1 summarizes the nonradiological environmental impacts of the proposed EPU at PTN Units 3 and 4.

Table 1: Summary of Nonradiological Environmental Impacts

Land Use	The proposed EPU is not expected to cause a significant impact on land use conditions and aesthetic resources in the vicinity of the PTN.
Air Quality	The proposed EPU is not expected to cause a significant impact to air quality.
Water Use	The proposed EPU is not expected to cause impacts significantly greater than current operations. No significant impact on groundwater or surface water resources.
Aquatic Resources	The proposed EPU is not expected to cause impacts significantly greater than current operations. No significant impact to aquatic resources due to chemical or thermal discharges.
Terrestrial Resources	The proposed EPU is not expected to cause impacts significantly greater than current operations. No significant impact to terrestrial resources.
Threatened and Endangered Species	The proposed EPU would not cause impacts significantly greater than current operations. No significant impact to federally-listed species.
Historic and Archaeological Resources	No significant impact to historic and archaeological resources on site or in the vicinity of the PTN.
Socioeconomics	No significant socioeconomic impacts from EPU-related temporary increase in workforce.
Environmental Justice	No disproportionately high and adverse human health and environmental effects on minority and low-income populations in the vicinity of the PTN site.
Cumulative Impacts	<p>The proposed EPU would not cause impacts significantly greater than current operations. To address potential cumulative impacts for water and ecological resources, a monitoring plan for the PTN site has been implemented. The State of Florida has authority to impose limits on nonradiological discharges to abate any significant hydrology and ecology impacts.</p> <p>The NRC staff has not identified any significant cumulative impacts associated with construction and operation of Units 6 and 7; however, the NRC will prepare a separate Environmental Impact Statement documenting the potential impacts associated with the construction and operation of Units 6 and 7.</p>

Radiological Impacts

Radioactive Gaseous and Liquid Effluents and Solid Waste

The PTN uses waste treatment systems to collect, process, recycle, and dispose of gaseous, liquid, and solid wastes that contain radioactive material in a safe and controlled manner within NRC and EPA radiation safety standards. The licensee's evaluation of plant operation at the proposed EPU conditions shows that no physical changes would be needed to the radioactive gaseous, liquid, or solid waste systems.

Radioactive Gaseous Effluents

The gaseous waste management systems include the radioactive gaseous system, which manages radioactive gases generated during the nuclear fission process. Radioactive gaseous wastes are principally activation gases and fission product radioactive noble gases resulting from process operations, including continuous degasification of systems, gases collected during system venting, gases used for tank cover gas, and gases generated in the radiochemistry laboratory. The licensee's evaluation determined that implementation of the proposed EPU would not significantly increase the inventory of carrier gases normally processed in the gaseous waste management system, since plant system functions are not changing and the volume inputs remain the same. The analysis also showed that the proposed EPU would result in an increase in the equilibrium radioactivity in the reactor coolant, which in turn increases the radioactivity in the waste disposal systems and radioactive gases released from the plant. The bounding increases in effluent releases estimated by the licensee from the proposed EPU are 17.1 percent for noble gases, 17.6 percent for gaseous radionuclides with short half-lives, and 15.3 percent for tritium while a higher secondary side moisture carryover could result in a bounding increase of 25.3 percent in iodine releases.

The licensee's evaluation concluded that the proposed EPU would not change the radioactive gaseous waste system's design function and reliability to safely control and process the waste. The projected gaseous release following EPU would remain bounded by the values given in the FES for PTN Units 3 and 4. The existing equipment and plant procedures that control radioactive releases to the environment will continue to be used to maintain radioactive gaseous releases within the dose limits of 10 CFR 20.1302 and the as low as is reasonably achievable (ALARA) dose objectives in Appendix I to 10 CFR Part 50.

Radioactive Liquid Effluents

The liquid waste management system collects, processes, and prepares radioactive liquid waste for disposal. Radioactive liquid wastes include liquids from various equipment drains, floor drains, the chemical and volume control system, steam generator blowdown, chemistry laboratory drains, laundry drains, decontamination area drains and liquids used to transfer solid radioactive waste. The licensee's evaluation shows that the proposed EPU implementation would not significantly increase the inventory of liquid normally processed by the liquid waste management system. This is because the system functions are not changing and the volume inputs remain the same. The proposed EPU would result in a 15.3-percent increase in the equilibrium radioactivity in the reactor coolant which in turn would impact the concentrations of radioactive nuclides in the waste disposal systems.

Since the composition of the radioactive material in the waste and the volume of radioactive material processed through the system are not expected to significantly change, the current design and operation of the radioactive liquid waste system will accommodate the effects of the proposed EPU. The projected liquid effluent release following EPU would remain bounded by the values given in the FES for PTN Units 3 and 4. The existing equipment and

plant procedures that control radioactive releases to the environment will continue to be used to maintain radioactive liquid releases within the dose limits of 10 CFR 20.1302 and ALARA dose standards in Appendix I to 10 CFR Part 50.

Radioactive Solid Wastes

Radioactive solid wastes include solids recovered from the reactor coolant systems, solids that come into contact with the radioactive liquids or gases, and solids used in the reactor coolant system operation. The licensee evaluated the potential effects of the proposed EPU on the solid waste management system. The largest volume of radioactive solid waste is low-level radioactive waste (LLRW), which includes sludge, oily waste, bead resin, spent filters, and dry active waste that result from routine plant operation, refueling outages, and routine maintenance. Dry active waste includes paper, plastic, wood, rubber, glass, floor sweepings, cloth, metal, and other types of waste generated during routine maintenance and outages.

The licensee manages LLRW contractually and continues to ship Class A, B, and C LLRW offsite for processing and disposal. EnergySolutions, Inc. (with a Class A disposal facility located in Clive, Utah) is currently under contract with FPL for the processing and disposal of Class A LLRW. Studsvik, Inc., is under contract with FPL for processing, storage, and disposal of Class B and C LLRW.

As stated by the licensee, the proposed EPU would not have a significant effect on the generation of radioactive solid waste volume from the primary reactor coolant and secondary side systems since the systems functions are not changing and the volume inputs remain consistent with historical generation rates. The waste can be handled by the solid waste management system without modification. The equipment is designed and operated to process the waste into a form that minimizes potential harm to the workers and the environment. Waste

processing areas are monitored for radiation and there are safety features to ensure worker doses are maintained within regulatory limits. The proposed EPU would not generate a new type of waste or create a new waste stream. Therefore, the impact from the proposed EPU on the management of radioactive solid waste would not be significant.

Occupational Radiation Dose at EPU Conditions

The licensee stated that the in-plant radiation sources are expected to increase approximately linearly with the proposed increase in core power level. To protect the workers, the licensee's radiation protection program monitors radiation levels throughout the plant to establish appropriate work controls, training, temporary shielding, and protective equipment requirements so that worker doses will remain within the dose limits of 10 CFR Part 20 and ALARA.

In addition to the work controls implemented by the radiation protection program, permanent and temporary shielding is used throughout PTN Units 3 and 4 to protect plant personnel against radiation from the reactor and auxiliary systems containing radioactive material. The licensee determined that the current shielding design is adequate to offset the increased radiation levels that are expected to occur from the proposed EPU since:

- conservative analytical techniques were used to establish the shielding requirements,
- conservatism in the original design basis reactor coolant source terms used to establish the radiation zones, and
- Plant Technical Specification 3.4.8, which limits the reactor coolant concentrations to levels significantly below the original design basis source terms.

Based on the above, the staff concludes that the proposed EPU is not expected to significantly affect radiation levels within the plants and, therefore, there would not be a significant radiological impact to the workers.

Offsite Doses at EPU Conditions

The primary sources of offsite dose to members of the public from PTN Units 3 and 4 are radioactive gaseous and liquid effluents. The contribution of radiation shine from plant buildings and stored radioactive solid waste was evaluated by the licensee and found to be negligible. As previously discussed, operation at the proposed EPU conditions will not change the radioactive waste management systems' abilities to perform their intended functions. Also, there would be no change to the radiation monitoring system and procedures used to control the release of radioactive effluents in accordance with NRC radiation protection standards in 10 CFR Part 20 and Appendix I to 10 CFR Part 50.

Based on the above, the offsite radiation dose to members of the public would continue to be within NRC and EPA regulatory limits and, therefore, would not be significant.

Spent Nuclear Fuel

Spent fuel from PTN Units 3 and 4 is stored in the plant's spent fuel pool and in dry casks in the Independent Spent Fuel Storage Installation. The PTN Units 3 and 4 are licensed to use uranium-dioxide fuel that has a maximum enrichment of 4.5 percent by weight uranium-235. Approval of the proposed EPU would increase the maximum fuel enrichment to 5 percent by weight uranium-235. The average fuel assembly discharge burnup for the proposed EPU is expected to be approximately 52,000 megawatt days per metric ton uranium (MWd/MTU) with no fuel pins exceeding the maximum fuel rod burnup limit of 62,000 MWd/MTU. The licensee's

fuel reload design goals will maintain the fuel cycles within the limits bounded by the impacts analyzed in 10 CFR Part 51, Table S-3 - Table of Uranium Fuel Cycle Environmental Data, and Table S-4 - Environmental Impact of Transportation of Fuel and Waste to and from One Light-Water-Cooled Nuclear Power Reactor, as supplemented by NUREG-1437, Volume 1, Addendum 1, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Main Report, Section 6.3 – Transportation Table 9.1, Summary of findings on NEPA issues for license renewal of nuclear power plants." Therefore, there would be no significant impacts resulting from spent nuclear fuel.

Postulated Design-Basis Accident Doses:

Postulated design-basis accidents are evaluated by both the licensee and the NRC to ensure that PTN Units 3 and 4 can withstand normal and abnormal transients and a broad spectrum of postulated accidents without undue hazard to the health and safety of the public.

On June 25, 2009, the licensee submitted license amendment request (LAR) number 196 (LAR 196), Alternative Source Term to the NRC, to update its design-basis accident analysis. In LAR 196, the licensee requested NRC approval to use a set of revised radiological consequence analyses using the guidance in NRC's Regulatory Guide 1.183, *Alternative Radiological Source Terms (AST) for Evaluating Design Basis Accidents at Nuclear Power Reactors*. On June 25, 2010, the licensee submitted a supplement to LAR 196 to revise the radiological dose consequence analyses. The analyses for LAR 196 are applicable for the power level in the proposed EPU. The NRC evaluated the proposed changes in LAR 196 separately from the EPU.

In LAR 196, the licensee reviewed the various design-basis accident (DBA) analyses performed in support of the proposed EPU for their potential radiological consequences and

concluded that the analyses adequately account for the effects of the proposed EPU. The licensee states that the results of the revised AST analysis were found to be acceptable with respect to the radiological consequences of postulated DBAs, since the calculated doses meet the exposure guideline values specified in 10 CFR 50.67 and General Design Criteria 19 in Appendix A of 10 CFR Part 50.

The results of the NRC's evaluation and conclusion approving the proposed changes submitted in LAR 196 are documented in a Safety Evaluation related to Amendment Nos. 244 and 240 for PTN Units 3 and 4, respectively (ADAMS Accession No. ML110800666)

Radiological Cumulative Impacts

The radiological dose limits for protection of the public and workers have been developed by the NRC and EPA to address the cumulative impact of acute and long-term exposure to radiation and radioactive material. These dose limits are specified in 10 CFR Part 20 and 40 CFR Part 190.

The cumulative radiation dose to the public and workers are required to be within the regulations cited above. The public dose limit of 25 millirem (0.25 millisieverts) in 40 CFR Part 190 applies to all reactors that may be on a site and also includes any other nearby nuclear power reactor facilities. There is no other nuclear power reactor or uranium fuel cycle facility located near PTN Units 3 and 4. The NRC staff reviewed several years of radiation dose data contained in the licensee's annual radioactive effluent release reports for PTN Units 3 and 4. The data demonstrate that the dose to members of the public from radioactive effluents is within the limits of 10 CFR Part 20 and 40 CFR Part 190. To evaluate the projected dose at EPU conditions for PTN Units 3 and 4, the NRC staff increased the actual dose data contained in the reports by 15 percent. The projected doses at EPU conditions remained within regulatory limits.

Therefore, the NRC staff concludes that there would not be a significant cumulative radiological impact to members of the public from increased radioactive effluents from PTN Units 3 and 4 at the proposed EPU operation.

A COL application was submitted in June 2009 to the NRC to construct and operate two new AP1000 reactor plants on the PTN site designated as Units 6 and 7. The FPL radiological assessment of the radiation doses to members of the public from the proposed two new reactors concluded that the doses would be within regulatory limits. The staff expects continued compliance with regulatory dose limits during PTN Units 3 and 4 operations at the proposed EPU power level. Therefore, the staff concludes that the cumulative radiological impacts to members of the public from increased radioactive effluents from the combined operations of PTN Units 3 and 4 at EPU conditions and the proposed two new reactors would not be significant.

As previously discussed, the licensee has a radiation protection program that maintains worker doses within the dose limits in 10 CFR Part 20 during all phases of PTN Units 3 and 4 operations. The NRC staff expects continued compliance with NRC's occupational dose limits during operation at the proposed EPU power level. Therefore, the staff concludes that operation of PTN Units 3 and 4 at the proposed EPU levels would not result in a significant impact to the worker's cumulative radiological dose.

Radiological Impacts Summary:

As discussed above, the proposed EPU would not result in any significant radiological impacts. Table 2 summarizes the radiological environmental impacts of the proposed EPU at PTN Units 3 and 4.

Table 2: Summary of Radiological Environmental Impacts

Radioactive Gaseous Effluents	Amount of additional radioactive gaseous effluents generated would be handled by the existing system.
Radioactive Liquid Effluents	Amount of additional radioactive liquid effluents generated would be handled by the existing system.
Occupational Radiation Doses	Occupational doses would continue to be maintained within NRC limits.
Offsite Radiation Doses	Radiation doses to members of the public would remain below NRC and EPA radiation protection standards.
Radioactive Solid Waste	Amount of additional radioactive solid waste generated would be handled by the existing system.
Spent Nuclear Fuel	The spent fuel characteristics will remain within the bounding criteria used in the impact analysis in 10 CFR Part 51, Table S-3 and Table S-4.
Postulated Design-Basis Accident Doses	Calculated doses for postulated design-basis accidents would remain within NRC limits.
Cumulative Radiological	Radiation doses to the public and plant workers would remain below NRC and EPA radiation protection standards.

Alternatives to the Proposed Action:

As an alternative to the proposed action, the NRC staff considered denial of the proposed EPU (i.e., the “no-action” alternative). Denial of the application would result in no change in the current environmental impacts. However, if the EPU were not approved for PTN Units 3 and 4, other agencies and electric power organizations may be required to pursue other means, such as fossil fuel or alternative fuel power generation, to provide electric generation capacity to offset future demand. Construction and operation of such a fossil-fueled or alternative-fueled plant could result in impacts in air quality, land use, and waste management greater than those identified for the proposed EPU for PTN Units 3 and 4. Furthermore, the

proposed EPU does not involve environmental impacts that are significantly different from those originally identified in the PTN Unit 3 or Unit 4 FES, and NUREG-1437, SEIS-5.

Alternative Use of Resources:

The action does not involve the use of any different resources than those previously considered in the PTN Unit 3 or Unit 4 FES.

Agencies and Persons Consulted:

In accordance with its stated policy, the NRC staff consulted with the FDEP, SFWMD, Miami-Dade County, BNP, and FWCC regarding the environmental impact of the proposed action and specifically regarding the monitoring and mitigation plan that formed the basis of the Florida agencies recommending approval to the FDEP for the proposed EPU subject to the CoC during the State of Florida site certification process.

III. Finding of No Significant Impact

On the basis of the details provided in the EA, the NRC concludes that granting the proposed EPU license amendment is not expected to cause impacts significantly greater than current operations. Therefore, the proposed action of implementing the EPU for PTN Units 3 and 4 will not have a significant effect on the quality of the human environment because no

significant permanent changes are involved and the temporary impacts are within previously disturbed areas at the site and the capacity of the plant systems. Accordingly, the NRC has determined it is not necessary to prepare an environmental impact statement for the proposed action.

Dated at Rockville, Maryland, this 27th day of March 2012.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Jason C. Paige, Project Manager
Plant Licensing Branch 2-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation