



June 14, 2022

L-2022-087
10 CFR 54.17

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
11545 Rockville Pike
One White Flint North
Rockville, MD 20852-2746

St. Lucie Nuclear Plant Units 1 and 2
Dockets 50-335 and 50-389
Renewed Facility Operating Licenses DPR-67 and NPF-16

SUBSEQUENT LICENSE RENEWAL APPLICATION - ENVIRONMENTAL AUDIT REQUESTS FOR CLARIFICATION OF/ADDITIONAL INFORMATION (RCI/RAI) RESPONSE

References:

1. FPL Letter L-2021-192 dated October 12, 2021 – Subsequent License Renewal Application – Revision 1 (ADAMS Accession No. ML21285A107)
2. FPL Letter L-2022-043 dated April 7, 2022 – Subsequent License Renewal Application Revision 1 – Supplement 1 (ADAMS Accession No. ML22097A202)
3. FPL Letter L-2022-044 dated April 13, 2022 – Subsequent License Renewal Application Revision 1 – Supplement 2 (ADAMS Accession No. ML22103A014)
4. FPL Letter L-2022-071 dated May 19, 2022 – Subsequent License Renewal Application Revision 1 – Supplement 3 (ADAMS Accession No. ML22139A083)
5. NRC Email and Enclosure dated May 2, 2022, St. Lucie Plant Units 1 and 2 - Summary of the Environmental Remote Audit Related to the Review of the Subsequent License Renewal Application Enclosure RCIs and RAIs (ADAMS Accession Nos. ML2210A228, ML22101A232)

Florida Power & Light Company (FPL), owner and licensee for St. Lucie Nuclear Plant (PSL) Units 1 and 2, has submitted a revised and supplemented subsequent license renewal application (SLRA) for the Facility Operating Licenses for PSL Units 1 and 2 (References 1 - 4). Based on their environmental audit of the SLRA, the NRC issued its Set 1 RCIs and RAIs to FPL (Reference 5). The attachments to this letter provide the response to those information requests.

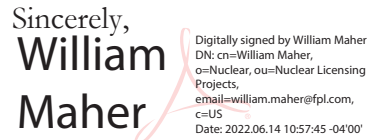
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Should you have any questions regarding this submittal, please contact me at (561) 304-6256 or William.Maher@fpl.com.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on the 14th day of June 2022.

Sincerely,
William
Maher

A digital signature in red ink is written over the name "William Maher". To the right of the signature, there is a block of small text providing digital certificate details.

Digitally signed by William Maher
DN: cn=William Maher,
o=Nuclear, ou=Nuclear Licensing
Projects,
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Date: 2022.06.14 10:57:45 -04'00'

William D. Maher
Licensing Director - Nuclear Licensing Projects
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Cc: Regional Administrator, USNRC, Region II
Senior Resident Inspector, USNRC, St. Lucie Plant
Chief, USNRC, Division of New and Renewed Licenses
Senior Project Manager, USNRC, Division of New and Renewed Licenses
Chief, Bureau of Radiation Control, Florida Department of Health

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END		

Attachment No. 1

Alternatives (ALT)

NRC RCI Number: ALT-2

Sections 7.2.2 and 7.2.3 of the environmental review (ER) cite the Florida Power & Light Company (FPL) Ten Year Power Plant Site Plan for 2020-2029 as the reference supporting FPL's determination as to whether certain energy technologies and approaches would be reasonable replacement power alternatives. In April 2021, FPL subsequently filed the 2021-2030 Ten Year Power Plant Site Plan with the Florida Public Service Commission. Based on the information discussed during the environmental audit breakout session pertaining to replacement power alternatives, please confirm that the underlying basis supporting FPL's selection of reasonable alternatives to St Lucie relicensing have not changed (i.e., the list of viable non-nuclear resource options for FPL's service territory still includes solar, battery storage, and gas-fueled generation).

PSL Response:

This information has been confirmed to be correct as stated.

References:

None

Associated Enclosures:

None

Attachment No. 2

Alternatives (ALT)

NRC RCI Number: ALT-3

Section 7.2.1 of the ER identifies energy alternatives that FPL considers reasonable, all of which would be located offsite of the St. Lucie plant. Based on the information discussed during the environmental audit breakout session pertaining to replacement power alternatives, please confirm that the constraining factor precluding the consideration of siting replacement power alternatives at the St. Lucie site is the lack of available suitable land (i.e., undeveloped land that is not classified as wetlands or considered ecologically sensitive).

PSL Response:

This information has been confirmed to be correct as stated.

References:

None

Associated Enclosures:

None

Attachment No. 3

Aquatic Resources (AQ)

NRC RCI Number: AQ-3

Please confirm the following: In accordance with a Florida Fish and Wildlife Conservation Commission Special Activity License, FPL captures, tags, and releases fish and other marine organisms from the intake canal. Biologists typically collect fish two to three times per month. Target species include elasmobranchs (i.e., sharks, rays, skates, and sawfish), goliath grouper (*Epinephelus itajara*), and recreationally important species, such as common snook (*Centropomus undecimalis*), snapper (family Lutjanidae), and grouper (subfamily Epinephelinae). Over the past 10 years, FPL has removed from the intake canal and released back to the ocean approximately 6,400 pounds of fish. FPL intends to continue this mitigation program during the proposed subsequent license renewal term.

PSL Response:

This information has been confirmed to be correct as stated.

References:

None

Associated Enclosures:

None

Attachment No. 4

Air Quality and Noise (AQN)

NRC RCI Number: AQN-2

Section 3.4 of the ER identifies that St. Lucie did not receive noise complaints during the 2015-2019 time period. During the environmental audit, Air Quality and Noise breakout session, and in response to information need AQN-2, FPL stated that there have been no noise complaints related to St. Lucie plant operations after that time period. Please confirm that FPL has not received noise complaints as a result of St. Lucie plant operations after the 2015-2019 time period.

PSL Response:

This information has been confirmed to be correct as stated.

References:

None

Associated Enclosures:

None

Attachment No. 5

Cumulative Impacts (CI)

NRC RCI Number: CI-1

Sections 3.1.4 and 4.12 of the ER discuss past, present, and reasonably foreseeable projects or actions that could potentially result in cumulative impacts during the proposed St. Lucie subsequent license renewal period, including several projects that were identified in the ER as conceptual or for which the need had yet to be determined. Based on the information discussed during the environmental audit breakout sessions pertaining to cumulative impacts and land use, please confirm:

- a) FPL has identified no additional past, present, or reasonably foreseeable projects or actions at St. Lucie since the ER was prepared.
- b) FPL plans to re-engineer existing onsite dredge spoils pits (located west of the intake canal) to increase their capacity to facilitate future dredge activities. The current plan is to initiate the bid process for this project in 2022, but no construction or completion dates have been established.
- c) The status of a potential project to increase St. Lucie's stormwater discharge capacity and revise its stormwater pollution prevention plan remains in a conceptual phase with no construction plans developed or completion date established.
- d) Because the possible need to expand the independent spent fuel storage installation (ISFSI) and the scope of any such expansion cannot be determined at this time, the possibility of such an expansion remains speculative and not reasonably foreseeable.

PSL Response:

This information has been confirmed to be correct as stated.

References:

None

Associated Enclosures:

None

Attachment No. 6

Cumulative Impacts (CI)

NRC RCI Number: CI-2

Section 3.1.4 of the ER discusses improvements to transmission lines at St. Lucie that were initiated by FPL in late 2016 but does not address when these improvements were completed. Based on the information discussed during the environmental audit breakout sessions pertaining to cumulative impacts and land use, please confirm that these improvements, (i.e., installation of a 13.65-mile underground transmission line known as the Port St. Lucie Transmission Line Reliability Project), were completed in 2017.

PSL Response:

This information has been confirmed to be correct as stated.

References:

None

Associated Enclosures:

None

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Attachment No. 7

General (GEN)

NRC RCI Number: GEN-1

Please confirm the updated information, including new expiration dates, for environmental permits that were provided as part of the environmental audit.

PSL Response:

This information has been confirmed to be correct as stated.

References:

None

Associated Enclosures:

None

Attachment No. 8

Human Health (HH)

NRC RCI Number: HH-1

As discussed during the audit breakout session, please confirm the in-scope transmission lines discussed in Section 3.10.2 of the ER are the same as those discussed in Section 2.2.5.1. Specifically, the elevated tower connections discussed in 3.10.2 are not considered to be in-scope.

PSL Response:

The elevated tower connections are in-scope based on the description in NUREG-1437, Rev. 1 Section 3.1.6.5 which states " Only those transmission lines that connect the power plant to the switchyard where electricity is fed into the regional distribution system (encompassing those lines that connect the nuclear plant to the first substation of the regional electric power grid) and power lines that feed the plant from the grid during outages are considered within the regulatory scope of license renewal environmental review and this GEIS.." As discussed during the audit IN HH-1, the in-scope transmission lines are part of what the current (2017) NESC defines as an electric supply station. As part of the electric supply station, they are subject to Part 1 of the current (2017) NESC rather than Part 2 where the 5-mA limit is established. Part 1 does not include a 5-mA short circuit limit for induced voltage on objects near the electric supply conductors.

References:

None

Associated Enclosures:

None

Attachment No. 9

Human Health (HH)

NRC RCI Number: HH-3

Please confirm that based on a search of available resources, such as the Florida Department of Health, Florida Department of Environmental Protection, and local news websites, there have been no changes that would increase the risk of waterborne diseases in the waters in the vicinity of the plant.

PSL Response:

This information has been confirmed to be correct as stated.

References:

None

Associated Enclosures:

None

Attachment No. 10

Human Health (HH)

NRC RCI Number: HH-6

The NRC staff struggled to navigate the associated websites regarding accessing references related to industrial wastewater. Please confirm the proper site navigation as discussed during the audit breakout session.

PSL Response:

As discussed under the audit Document Request No. HH-6, to access the documents via the internet, the URL is <<https://depdms.dep.state.fl.us/Oculus/servlet/search>>, and select Public Oculus Login. On the Search page, select the Catalog area, for these two documents it would be Wastewater and select under Profile, Permitting_Authorization. Type in the Facility-Site ID (the permit number), which is FL0002208.

References:

None

Associated Enclosures:

None

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Attachment No. 11

Land Use/Visual Resources (LU)

NRC RCI Number: LU-3

If an ISFSI expansion occurs during the subsequent license renewal period, please confirm there exists sufficient land on the St. Lucie site to accommodate the construction and operation of the ISFSI expansion.

PSL Response:

This information has been confirmed to be correct as stated.

References:

None

Associated Enclosures:

None

Attachment No. 12

Socioeconomics (SOC)

NRC RCI Number: SOC-1

During the St. Lucie environmental audit, socioeconomics breakout session, and in response to information need SOC-2, FPL provided annual 2020 and 2021 property tax payments for St. Lucie. Please confirm that 2020 and 2021 county property tax payments for St. Lucie were \$43,866,726.19 and \$42,525,898.26, respectively.

PSL Response:

This information has been confirmed to be correct as stated.

References:

None

Associated Enclosures:

None

Attachment No. 13

Special Status Species & Habitats (SSH)

NRC RCI Number: SSH-1

Please confirm the following: FPL maintains a company-wide Avian Protection Plan, which it developed in accordance with the Avian Power Line Interaction Committee and Fish and Wildlife Service's (FWS's) Avian Protection Plan Guidelines (APLIC and FWS 2005). The plan includes guidelines for working around federally listed bird and their nests and procedures workers should follow to ensure that listed birds are protected during site activities, such as vegetation maintenance, power restoration, and continued use of existing facilities. The plan provides flow charts to help workers determine whether FPL should coordinate with the FWS or obtain any Federal or State permits for a given activity. FPL has also established nest buffers within the Avian Protection Plan for working around migratory bird nests. Each buffer area follows species-specific guidance from the FWS, State resource agencies, and relevant scientific literature. The table below lists the nest buffers that apply to the federally listed birds that may occur in the St. Lucie action area.

Buffer Guidance for Working Around Nests of Federally Listed Birds

Species	Nest Buffer for Active Nest
Audubon's crested caracara	985 ft during nesting season (Nov-Apr) ⁽¹⁾
Florida scrub-jay	to be established following APC coordination with FWS biologist
wood stork	500–1500 ft ⁽²⁾
⁽¹⁾ Ogden 1990 ⁽²⁾ FWS 2004	

PSL Response:

This information has been confirmed to be correct as stated.

Note that Ogden 1990 is the reference for the wood stork and FWS 2004 is for the crested caracara. The references as noted in the above table have been switched.

References:

USFWS (U.S. Fish and Wildlife Service). 2004. Species Conservation Guidelines, South Florida. Audubon's Crested Caracara. Draft. April 20, 2004. 40 p. Retrieved from <<https://www.fws.gov/verobeach/BirdsPDFs/2004SpeciesConservationGuidelinesCaracaraALLINCLUSIVE.pdf?spcode=A003>> (accessed February 23, 2022).

Ogden J.C. 1990. Habitat Management Guidelines for the Wood Stork in the Southeast Region. Prepared for the U.S. Fish and Wildlife Service. 11 p. Available at

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<https://www.saj.usace.army.mil/Portals/44/docs/regulatory/sourcebook/endangered_species/wood_stork/habitatGuidelines.pdf> (accessed February 23, 2022).

APLIC and FWS (Avian Power Line Interaction Committee and U.S. Fish and Wildlife Service). 2005. 88 p. Retrieved from
<https://www.aplic.org/uploads/files/2634/APPguidelines_final-draft_April2005.pdf>
(accessed February 23, 2022).

Associated Enclosures:

None.

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FPL Response to NRC RCI No. SW-3
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Attachment No. 14

Surface Water (SW)

NRC RCI Number: SW-3

Please confirm that there have been no reportable violations of the Industrial Wastewater Facilities Permit (IWFP)/National Pollutant Discharge Elimination System (NPDES) permit requirements since the ER was submitted.

PSL Response:

This information has been confirmed to be correct as stated.

References:

None

Associated Enclosures:

None

Attachment No. 15

Waste Management (WM)

NRC RCI Number: WM-1

Please confirm that there have been no reportable unplanned releases of radioactive materials (unplanned/inadvertent radioactive liquid or gaseous releases) which would trigger a notification requirement since the ER was written.

PSL Response:

This information has been confirmed to be correct as stated.

References:

None

Associated Enclosures:

None

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FPL Response to NRC RCI No. WM-2
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Attachment No. 16

Waste Management (WM)

NRC RCI Number: WM-2

Please confirm that there have been no reportable inadvertent nonradioactive releases that would be classified as an incidental spill which would trigger a notification requirement since the ER was written.

PSL Response:

This information has been confirmed to be correct as stated.

References:

None

Associated Enclosures:

None

Attachment No. 17

Waste Management (WM)

NRC RCI Number: WM-3

St. Lucie is subject to the reporting provisions of 40 CFR Part 110 as it relates to the discharge of oil in such quantities as may be harmful pursuant to Section 311(b)(4) of the Federal Water Pollution Control Act. Any discharges of oil in such quantities that may be harmful to the public health or welfare or the environment must be reported to Environmental Protection Agency's National Response Center. In Section 9.5.3.7 of the ER, the applicant discusses reportable spills and states that for the for the 5-year period of 2016-2020, there were no reportable spills/no releases. Please confirm that there have been no discharges of oil in such quantities that would be reportable to the Environmental Protection Agency National Response Center.

PSL Response:

This information has been confirmed to be correct as stated.

References:

None

Associated Enclosures:

None

Attachment No. 18

Waste Management (WM)

NRC RCI Number: WM-4

St. Lucie is subject to the reporting provision under Florida Administrative Code 62-780 and under the site conditions of certification. This reporting provision requires that any spills of materials having potential to significantly pollute surface or groundwaters and which are not confined to a building or similar containment structure be reported to the Florida Department of Environmental Protection (FDEP), Office of Emergency Response, by telephone immediately after discovery of such spill, followed by a detailed written report. Section 9.5.3.8 of the ER states that between the 5-year period of 2016 to 2020, there has been one release at St. Lucie that triggered the notification requirement (on October 22, 2019). Please confirm that there have been no additional spills which would trigger the notification requirement since the ER was written.

PSL Response:

This information has been confirmed to be correct as stated.

References:

None

Associated Enclosures:

None

Attachment No. 19

Waste Management (WM)

NRC RCI Number: WM-6

Please confirm that the waste minimization measures applicable to solid waste and hazardous waste are listed in the plant's applicable waste management and recycling procedures. Confirm that the measures applicable to hazard waste include:

- Where possible, replace halogenated solvents used for cleaning with environmentally safe, non-halogenated cleaners.
- To minimize the volume of hazardous waste produced, segregate waste materials as much as possible to minimize the amount of non-hazardous waste that is mixed with hazardous waste
- Minimize the use of halogenated solvents in spray cans and use substitutes where possible.
- Keep the number of chemical materials with a short shelf-life to a minimum.
- Use all the products in cylinders.
- Obtain only the amount of materials needed for a job.
- In addition, please confirm that other sections of the applicable waste management and recycling procedures specifically address waste stream recycling.

PSL Response:

This information has been confirmed to be correct as stated, with the following clarifications:

- **Bullet Point #4** – PSL works with the supply chain to minimize the introduction of short shelf-life chemicals available for use by various departments throughout the facility. Although PSL procedures do not directly address this good practice, review of items on the approved chemical control list do occur to minimize short shelf-life chemicals/products, or in some cases suggest alternate products. For certain epoxies/resins or coatings, only the required amount of product is utilized to minimize excess waste.
- **Bullet Point #5** – PSL procedures necessitate leaving a little product in used cylinders to prevent atmospheric air and moisture from entering the cylinder and causing internal corrosion.

References:

None

Associated Enclosures:

None

Attachment No. 20

Waste Management (WM)

NRC RCI Number: WM-7a

Based on the staff's review of information in the ER for the radioactive solid waste program concerning how the plant plans to handle low-level radioactive waste (Class A, B, and C, mixed waste, and spent nuclear fuel) during the license renewal term (onsite storage, potential expansion of storage facilities, and disposal options), please confirm that there are no proposed changes or upgrades to the program being considered during the license renewal term.

PSL Response:

This information has been confirmed to be correct as stated.

References:

None

Associated Enclosures:

None

Attachment No. 21

Waste Management (WM)

NRC RCI Number: WM-7b

In terms of the ER for the Radiation Protection Program with emphasis on the as low as reasonably achievable (ALARA) program to control worker radiation exposure (annual dose goals and status), please confirm that there have been no proposed changes or upgrades to the program being considered during the license renewal term.

PSL Response:

This information has been confirmed to be correct as stated.

References:

None

Associated Enclosures:

None

Attachment No. 22

Alternatives (ALT)

NRC RAI Number: ALT-4

REQUIREMENT: 10 CFR 51.53(c)(2) requires that applicants discuss in the ER the environmental impacts of alternatives and any other matters described in 10 CFR 51.45; 10CFR 51.45 requires that the discussion of alternatives be sufficiently complete to aid the Commission in developing and exploring, pursuant to Section 102(2)(E) of NEPA, “appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources.”

ISSUE: Section 7.2.3.4 of the ER states that the solar alternative is comprised of approximately 95 solar photovoltaic facilities, each having an approximately 75 MW nameplate capacity and 56 MW battery storage. To support the audit, NextEra posted a description to the portal indicating how these numerical factors were calculated to support replacement of St. Lucie’s 1,968 MW net generation. The NRC staff requires the information that was posted to the portal and discussed during the breakout session to be docketed in order to verify and reference this replacement power approach.

REQUEST: Provide the information posted to the portal and discussed during the environmental audit discussion held on 3/1/2022 addressing the narrative response to Information Need ALT-4.

PSL Response:

As provided in response to audit Information Need ALT-4:

The projection of 95 solar facilities of 75 MW each, and 95 battery storage facilities of 56 MW each, was based on a projection of how many annual GWh of energy the 1,968 MW St. Lucie nuclear site generates on average. A summary of the calculation steps used to develop the values that appear in the ER is provided below (numbers are approximate):

- 1,968 MW x 90% (assumed average annual capacity factor of the two nuclear units) x 8,760 hours/year x 1 GWh/1,000 MWh = 15,516 GWh produced annually by St. Lucie nuclear.
 - Solar only operates during daylight hours, but the St. Lucie units operate around-the-clock. Therefore, it is necessary to figure out how many MW of solar are needed during daylight hours, plus how many MW of solar and batteries are needed to supply the necessary amount of GWh of energy during nighttime hours.
 - Assume 55% of FPL’s total energy consummation occurs during daylight hours and 45% during nighttime. Thus 15,516 GWh x 55% = 8,534 GWh of St. Lucie’s output is consumed during daylight hours, and 15,516 GWh x 45% = 6,982 GWh of St. Lucie’s output is consumed during nighttime hours.
- St. Lucie Nuclear Plant Units 1 and 2
- Assume the annual net capacity factor of solar is 25%. Thus 1 MW of solar produces 8,760 hours x 25% = 2,190 MWh per year.
 - The amount of solar needed to produce the same amount of energy that is consumed from St. Lucie during daylight hours is estimated as follows: (8,534 GWh x 1,000

$MWh/GWh) / (2,190 MWh/solar MW) = 3,897 MW$ of solar.

- And to produce enough energy from solar to match the St. Lucie output consumed during nighttime hours was estimated as follows: $(6,982 GWh \times 1,000 MWh/GWh) / (2,190 MWh/solar MW) = 3,188 MW$ of solar.

- So total solar MW needed was estimated to be: $3,897 MW + 3,188 MW = 7,085 MW$. Assuming 75 MW size solar facilities, this equates to: $7,085 / 75 = 94.5$ solar facilities.

- In regard to battery storage, assume the batteries are 4-hour duration; i.e., can provide energy the equivalent of 4 hours per night at full output. Also assume the batteries have a 90% round-trip efficiency; i.e., 90% of the energy stored during charging is available to be discharged.

- Then in order to supply the same amount of energy consumed at nighttime that is generated by St. Lucie leads to: $((6,982 GWh \times 1,000 MWh/GWh) / 90\%) / (365 \text{ nights} \times 4 \text{ hours/night}) = 5,314 MW$ of batteries. This roughly equates to 95 facilities of 56 MW each = 5,320 MW.

References:

None

Associated Enclosures:

None

Attachment No. 23

Historic and Cultural Resources (HCR)

NRC RAI Number: HCR-1

REQUIREMENT: 10 CFR 51.53(c)(2)(K) requires that all applicants identify any potentially historic or archaeological properties and assess whether any of these properties will be affected by future plant operations and any planned refurbishment activities in accordance with the National Historic Preservation Act (NHPA). Section 106 of the NHPA directs Federal Agencies to take into account the effects of their undertakings on historic properties. In accordance with 36 CFR 800.4(b), in consultation with the SHPO, the NRC shall take the steps necessary to identify historic properties within the area of potential effect.

ISSUE: Section 3.8.5 of the ER states that there have been four previous cultural resource investigations conducted within the St. Lucie property. Additionally, Section 3.8.5 of the ER states that a cultural resource survey was conducted in the vicinity of the St. Lucie property in 2007 (FMSF Survey 14038). Attachment D to the ER provides a copy of a letter from FPL to the Florida State Historic Preservation Officer (SHPO). The letter identifies that there have been 13 cultural resource surveys conducted within close proximity to the St. Lucie site, five of which were conducted within portions of the 1,132-acre property. Furthermore, the letter to the SHPO identifies that FMSF Survey 14038 is one of the five cultural resource surveys conducted within the 1,132-acre property. During the environmental audit, the NRC staff reviewed a total of six cultural resource surveys conducted within St. Lucie property that were provided by FPL on the electronic portal. The NRC staff noted that in addition to the six cultural resource surveys that were provided for review during the environmental audit, there are other cultural resource surveys that have been conducted within the St. Lucie site.

REQUEST:

- a) Clarify and identify the total number of cultural resource surveys conducted within the 1,132-acre site property.
- b) Identify and describe the site identified in the Archaeological and Historical Conservancy, Inc. 2008 cultural resource study. As part of the description, include: the type of site, eligibility for the National Register of Historic Places, site significance, and any recommendations related to the site resulting from the survey.

PSL Response:

- a) There are six cultural resources studies within the St. Lucie property listed in the Florida Master Site Files (FMSF):
 1. FMSF Survey 600
 2. FMSF Survey 4558
 3. FMSF Survey 17392

4. FMSF Survey 17449
5. FMSF Survey 20868
6. FMSF 22912

In addition to the six studies listed on the FMSF, a private archaeological survey was conducted on portions of the St. Lucie property by Archaeological and Historical Conservancy, Inc. (AHC) in 2008. The results of the private 2008 AHC survey have not been submitted for SHPO review due to the cancellation of the project.

b) The 2008 AHC survey resulted in the recording of one prehistoric site which was identified as 8SL3045.

Site 8SL03045 is listed in the private report as prehistoric midden of unknown size which likely to have been a habitation site. The site is characterized by a moderate to diffuse subsurface scatter of sand-tempered pottery sherds, in a matrix midden with faunal bone (small unidentified fish bone), and oyster shell. Cultural materials listed include six sand tempered pottery sherds. Two positive shovel tests at the site revealed archaeological material at depths ranging from 30-95cm below ground surface. Weathering and storm action are noted to have likely impacted the integrity of the site. An initial test unit placed at the site was inconclusive for determining the potential significance of the site, and the significance of the site is listed as unknown. AHC recommended additional testing of the site to determine the full extent of the site, and to evaluate the significance of the site.

References:

None

Associated Enclosures:

None

Attachment No. 24

Historic and Cultural Resources (HCR)

NRC RAI Number: HCR-3

REQUIREMENT: 10 CFR 51.53(c)(2)(K) requires that all applicants identify any potentially historic or archaeological properties and assess whether any of these properties will be affected by future plant operations and any planned refurbishment activities in accordance with the NHPA. Section 4.6 of NUREG 1555 S1 states, in part, if resources are located within the area of potential affect, the assessment to historic and cultural resource impacts associated with continued operations should consider procedures or integrated cultural resource managements plans implemented by the licensee to protect the historic and cultural resources identified.

ISSUE: Section 3.8.6 of the ER states that there is no cultural resource management plan nor unanticipated discoveries plan in place at St. Lucie. Section 3.8.6 of the ER further states that inadvertent discovery of human remains is handled via 872.05 Florida Statutes. The ER, however, does not describe how known onsite historic and cultural resources are protected or how inadvertent discoveries are handled in accordance with Florida Statutes.

REQUEST:

- a) Discuss how known onsite historic and cultural resources are protected.
- b) Describe administrative controls, procedures, or protocols in place to ensure that human remains are handled via 872.05 Florida Statutes in the event of inadvertent discovery related to land disturbing activities
- c) Describe how inadvertent cultural resource discoveries, in addition to human remains, would be treated during land-disturbing activities.
- d)) Describe how/if employees and staff involved in potential land-disturbing activities are trained to identify historic or cultural resources.

PSL Response:

- a) The locations of known onsite cultural resources are protected from public access by fences and natural water features.
- b) FPL has a professional archaeologist on staff in their Juno Beach, Florida Offices. This individual meets the Secretary of the Interior's standards for archaeology as well as being a Registered Professional Archaeologist (RPA). Any inadvertent discovery of human remains, funerary objects, or suspected human remains would be dealt with by this trained professional.
- c) FPL's Staff Archaeologist is on-call to respond to any inadvertent cultural discoveries. All ground-disturbing activities in the immediate vicinity of the discovery would stop. The discovery would be recorded, tested (if necessary), and evaluated. Coordination with the Florida Department of State, Division of

Historical Resources (SHPO) may be necessary to assist with the evaluation of the discovery's significance. FPL's policy is to avoid all unnecessary impacts to historic properties and sites of religious and cultural importance to Tribes.

- d) FPL's Staff Archaeologist provides training, as needed, to all FPL business units. This can include one-on-one training, on-site discussions, and virtual PowerPoint presentations. All FPL business units have the ability to directly contact FPL's Staff Archaeologist should cultural materials (artifacts) or paleontological specimens be discovered during ground-disturbing activities. FPL's Environmental Services Unit is engaged with all FPL projects involving ground-disturbing activities that require permitting. This Unit is also able to provide specific cultural resource identification training during their overall environmental compliance training.

References:

None

Associated Enclosures:

None

Attachment No. 25

Land Use/Visual Resources (LU)

NRC RAI Number: LU-4

REQUIREMENT: 10 CFR 51.53(c)(2) requires that an applicant's environmental report (ER) contain the applicant's plans to modify the facility, describe in detail the affected environment around the plant and describe modifications directly affecting the environment.

ISSUE: Section 3.1.4 in the ER describes a 2020 pilot project off the shoreline in the Atlantic Ocean performed in part to stop beach erosion. During the environmental audit, FPL responded to the NRC staff's information need LU-4 by describing shoreline loss between various dates and FPL's ongoing beach and dune restoration projects addressing these losses.

REQUEST: With the understanding that 2020 pilot project is still in progress and results are not yet final, how much beach erosion (in linear feet) would you estimate has occurred in the St. Lucie Atlantic Ocean waterfront area since the previous license renewal application?

PSL Response:

Between 1972 and 2009 the highest rate of shoreline change was an average of 3.17 ft/yr loss. Between June 2004 and November 2004, due to a series of storms and hurricanes, a large amount of beach erosion caused the shoreline to recede by an average of 59 feet in the project area. (FPL 2012).

References:

FPL (Florida Power and Light). 2012. St Lucie Nuclear Power Plant Discharge Canal Reef/Breakwater Project, Attachment J, Coastal Engineering Narrative. Retrieved from <https://prodenv.dep.state.fl.us/DepNexus/public/electronic-documents/BCS_0314668-001-JC/%7B%22catalogId%22:%2220%22,%22guid%22:%2220.21136.1%22%7D> (accessed February 14, 2022.)

Associated Enclosures:

None

Attachment No. 26

Human Health (HH)

NRC RAI Number: HH-5

REQUIREMENT: 10 CFR 51.53(c)(2) requires, in part, that applicants describe in detail in their environmental report the affected environment around the plant. Regulatory Guide 4.2, Supplement 1, Revision 1 states that, "The applicant should consult the State agency responsible for environmental health regarding the potential existence and concentration of... microorganisms in the receiving waters for plant cooling water discharge. The applicant should document the results of this consultation in the ER. The ER should include copies of correspondence with the responsible agency indicating concurrence with the applicant's risk assessment and proposed mitigation strategy, if one is required."

ISSUE: Appendix E of the ER includes a letter from FPL to the State regarding microbiological hazards, but no reply is included.

REQUEST:

- a) Please describe St. Lucie's consultation with the State related to microbiological hazards and the State's views of the environmental health risks to the public from thermal effluent from the site.
- b) Please submit with the response copies of the relevant correspondence between St. Lucie and the State.

PSL Response:

- a) FPL sent a letter to the Florida Department of Health (FDOH) in 2021 regarding microbiological hazards and this letter is enclosed in Appendix E of the ER. No response was received from the letter enclosed in Appendix E of the ER. A second letter to the FDOH was sent by FPL on May 9, 2022. A response from FDOH was received via email on May 18, 2022, indicating receipt of FPL's most recent letter and that the FDOH is in the process of gathering information to respond to FPL's May 9, 2022, letter. A response letter dated May 27, 2022, was received from FDOH, indicating no concerns with *Naegleria fowleri* or *Legionella* and that the recreators (such as swimmers) exposure to PSL's heated wastewater discharge is minimal or may not occur and potentially unlikely for the microorganisms of concern.
- b) FDOH's May 27, 2022, letter response which includes FPL's May 9, 2022, letter as an attachment is provided in Enclosure 1.

References:

None

Associated Enclosures:

Enclosure 1: Florida Department of Health May 27, 2022, response letter on public health risk

Mission:

To protect, promote & improve the health of all people in Florida through integrated state, county & community efforts.



Ron DeSantis
Governor

Joseph A. Ladapo, MD, PhD
State Surgeon General

Vision: To be the Healthiest State in the Nation

May 27, 2022

William D. Mahler
Licensing Director, Nuclear Licensing Project
Florida Power & Light Company
15430 Endeavor Drive
Jupiter, Florida 33478

Re: Florida Power & Light Company (FPL)—St. Lucie Nuclear Power Plant (PSL) Units 1 and 2
Subsequent License Renewal

Dear Mr. Mahler:

The Florida Department of Health (Department), Bureau of Environmental Health is committed to ensuring that people in Florida have the best information available to understand the environmental hazards and the potential health risks associated when exposed to such.

This letter is a response to your request from May 9, 2022, to the Department to assess the potential public health impact resulting from thermophilic organisms in connection to the FPL St. Lucie PSL Units 1 and 2 that have heated wastewater discharged to the Atlantic Ocean (Attachment 1).

Site Description

PSL Units 1 and 2 are located on Hutchinson Island in St. Lucie County, Florida (Figure 1). Facilities on the property and around the power block area include the containment building, which houses the nuclear steam supply system, the turbine generator building, the auxiliary building, the fuel-handling building and the FLEX equipment storage building. Features beyond the power block area include the intake canal, discharge canal, intake wells, evaporation and percolation ponds, switchyard, technical and administrative support facilities, firing range, meteorological tower, 230-kilovolt (kV) switchyard, Hutchinson Island substation and public education facilities.

Operations at the FPL St. Lucie PSL are licensed by the U.S. Nuclear Regulatory Commission (NRC). Currently, FPL St. Lucie PSL is applying for a renewal license that shall expire at midnight on March 1, 2036 (Unit 1), and April 6, 2043 (Unit 2). FPL has prepared an environmental report in conjunction with its application to the NRC for a subsequent renewal of its Unit 1 and 2.

In April 2021, the Department provided assistance in regard to public health questions that were posed as to whether there was a risk for exposure of *Naegleria fowleri* (*N. fowleri*) to recreators (e.g., swimmers, surfers, divers, boaters). *N. fowleri* typically occurs in warm freshwater bodies or untreated, contaminated waters. All nuclear power plants in Florida use seawater for the external (open) cooling loop. The Department concluded that if *N. fowleri* is washed out from the plant into the ocean, it most likely would not survive long in either, the saline wastewater discharged or the ocean water itself.

Florida Department of Health

Division of Disease Control & Health Protection • Bureau of Environmental Health
4052 Bald Cypress Way, Bin A-08 • Tallahassee, FL 32399
PHONE: 850/245-4250 • FAX: 850/487-0864

FloridaHealth.gov



Accredited Health Department
Public Health Accreditation Board

Further, the discharge occurred approximately 1,000 yards (approximately 0.5 miles) from the coast posing a minimal exposure risk to recreators such as swimmers.

Environmental Data and Risk Evaluation

For this assessment, the Department was requested to assess the impact to public health, mainly recreators, as a result of exposure to specific thermophilic organisms:

- *Naegleria fowleri* (*N. fowleri*)
- *Acanthamoeba*
- *Legionella* species (spp.)
- *Salmonella* spp.
- *Shigella* spp.
- *Pseudomonas aeruginosa* (*P. aeruginosa*)
- Thermophilic fungi

As no environmental data are available at the moment to evaluate a detection of and in what concentrations the organisms above occurred. The Department reviewed the Merlin database to evaluate if cases caused by organisms were reported in the zip code where the FPL PSL is located. The Department further evaluated if the cases were above average and therefore of immediate concern.

It is important to note that the Department requires *N. fowleri*, *Acanthamoeba* species, *Legionella* species, *Salmonella* spp. and *Shigella* spp. cases (cases) to be reported to the Department by practitioners and laboratories via Rule 64D-3, Florida Administrative Code. The Department collects this information which is stored in the Merlin database. *Pseudomonas aeruginosa* and thermophilic fungi on the other hand are not reportable diseases in Florida and are therefore not required to be reported to the Department.

Besides using available data on reportable diseases, the Department also looks at ways people could be exposed to environmental hazards such as these organisms. Concerns for human health occur if people can get exposed to these organisms (come in contact with). Exposures typically occur when a source of an environmental hazard has all of the following:

- an environmental medium to hold or transport it; like air, soil or water
- an exposure point where people contact it
- an exposure route through which it enters the body
- an exposed population who contacts it

Without human contact, environmental hazards such as these organisms cannot enter the body and cause harmful effects.

Conclusions and Recommendations

Following conclusions and recommendations are based on the data available to the Department at the time of the assessment and based on professional judgement.

Wastewater discharge occurs in the Atlantic Ocean, creating an exposure situation to recreators such as swimmers and surfers. However, potential adverse health effects for recreators would only occur if someone contacts with the organisms via ingestion (*Salmonella* spp., *Shigella* spp.), inhalation (*Legionella* spp.), entering the body through the nose (*N. fowleri*) or dermal (thermophilic fungi). According to the Appendix E—Applicant Environmental Report (2022)¹, public access to the discharge

¹ <https://www.nrc.gov/docs/ML2121/ML21215A319.pdf>

Mr. Mahler
Page Three
May 27, 2022

canals is posted as no trespassing/authorized personnel only as well as controlled by barriers. Furthermore, wastewater discharge is approximately 1,500 to 3,400 feet (approximately 0.3 to 0.6 miles) offshore. This does limit exposure options for the public.

Considering that *N. fowleri* is not found in saltwater and the discharge occurs 1,500 feet offshore and mixes with surrounding ocean water, the Department has no additional questions or concerns regarding this microorganism. In addition, *Legionella* spp. is mainly a concern when amplification occurs and individuals are exposed through inhalation or aspiration. *Legionella* spp. exposure and amplification are unlikely in this type of water body; therefore, the risk to recreators is considered minimal.

A review of the Merlin database for *Salmonella* spp. and *Shigella* spp. cases reported to the Department in the zip code 34957 since 2018–2021 showed no cases above average or immediate concern.

Due to the findings above, the Department assumes that exposure or contact for recreators (such as swimmers) to heated wastewater discharge is minimal or may not occur and potentially unlikely for the microorganisms of concern.

The Department recommends monitoring of the area impacted by the heated wastewater discharge to ensure compliance. Wastewater temperatures should stay within the licensing limitations of 115 degrees Fahrenheit (°F) or 30°F above ambient temperatures during normal operations and should not exceed the maximum temperatures of 117°F or 32°F above ambient temperatures during maintenance operations.

If you have any questions or comments concerning this letter, please contact the Bureau of Environmental Health at 877-798-2772 or at phtoxicology@flhealth.gov.

Sincerely,



Dr. rer. nat. Gladys Liehr, CPM, FCCM, PMP
Chief and Lead Toxicologist
Bureau of Environmental Health

 Signed in Delegation
for Clayton Weiss

Clayton R. Weiss, MPH
Chief
Bureau of Epidemiology

GAL/lm/ks
Enclosure

cc: Dr. Carina Blackmore, DVM, PhD, Dipl ACVPM, State Epidemiologist, Director, Division of Disease Control and Health Protection, Florida Department of Health
Michael Mitchell, Section Lead, Public Health Toxicology, Bureau of Environmental Health, Florida Department of Health
Laura Matthias, Reports and Analysis Unit Manager, Bureau of Epidemiology, Florida Department of Health
Kimberly Stockdale, Food and Waterborne Disease Program Coordinator, Bureau of Epidemiology, Florida Department of Health
Richard F. Orthen, Principal Licensing Engineer, Nuclear Licensing Projects, NextEra Energy, Inc., Florida Power & Light Company



Figure 1. Florida Power & Light Company (FPL)—St. Lucie Nuclear Power Plant (PSL). (Source: <https://www.nrc.gov/docs/ML2121/ML21215A319.pdf>) (Note: Red and Green Buffers do not show the area of potential wastewater discharge. Buffers are solely used to show distance from the shoreline. Wastewater discharge is approximately 1,500 to 3,400 feet (approximately 0.3 to 0.6 miles) offshore to the east.)



Attachment 1

May 9, 2022

Kenneth Scheppke, MD, FAEMS
Deputy Secretary for Health
Florida Health
4052 Bald Cypress Way
Tallahassee, FL 32399

RE: Florida Power & Light Company – St. Lucie Nuclear Power Plant (PSL) Units 1 and 2 Subsequent License Renewal

Dear Dr. Scheppke:

Florida Power & Light Company (FPL) is seeking a license renewal (see Table 1) from the U.S. Nuclear Regulatory Commission (NRC) for the St. Lucie Nuclear Power Plant Units 1 and 2 (PSL), which have a heated wastewater discharge to the Atlantic Ocean. As part of the license renewal process, the NRC may request a consultation with your agency.

Table 1. PSL Licensing Dates

PSL Unit	Current License Expiration Date	Extended License Expiration Date
Unit 1	March 1, 2036	March 1, 2056
Unit 2	April 6, 2043	April 6, 2063

The NRC requires a license renewal applicant to assess public health impacts resulting from thermophilic organisms. It is our intent by this letter to introduce you to the project, to make available any data you need to ensure an efficient and effective consultation process, and request input from the Florida Department of Health (FDOH) regarding:

- Any questions or additional information needs FDOH may have regarding our thermophilic organism impact assessment summarized below.
- Confirmation that continued operation of PSL will create no potential public health hazards from pathogenic microorganisms due to PSL discharge-related warming of the Atlantic Ocean.

Information concerning this request, specific microorganisms of concern identified by NRC, and PSL's thermal discharge are presented below. A figure depicting the station site and the vicinity within a 6-mile radius is attached.

As part of the renewal process, the NRC requires that the license renewal application include an environmental report (ER) that assesses the impacts from continued operation and any refurbishment undertaken to enable the continued operation of the units. One of the environmental impact topics is the potential public health hazard associated with thermophilic microorganisms. The presence and numbers of these organisms can be increased in the

receiving waterbody by the addition of heat from a nuclear power plant's cooling water discharge. FPL's ER concludes that PSL's heated wastewater discharge to the Atlantic Ocean would not enhance the growth of thermophilic microorganisms.

Microorganisms of Concern

- Free-living amoebae of the genera *Naegleria* (*N. fowleri*) and *Acanthamoeba*
- *Legionella* spp.
- Enteric pathogens *Salmonella* spp., *Shigella* spp., and *Pseudomonas aeruginosa*
- Thermophilic fungi

Information to Support Consultation on Thermophilic Microorganisms

Of greatest concern is the known human pathogen of genera *Naegleria*, *N. fowleri*. *Naegleria* spp. is ubiquitous in nature and thrives in freshwater bodies at temperatures ranging from 95-106°F or higher. *N. fowleri*, the organism that caused primary amebic meningoencephalitis, does not live in seawater.

Exposure to *Legionella* spp. from power plant operations is generally an occupational health concern rather than a public health concern. Occupational exposure is associated with tasks where a worker could dislodge biofilms, where *Legionella* are often concentrated, such as during the cleaning of condenser tubes and cooling towers. PSL does not have cooling towers and condenser tube cleaning is mechanized, minimizing occupational exposure.

Other human pathogens mentioned above have infection routes of contact with infected persons or contaminated water, food, soil, or other contaminated material. The exposure route of concern would be contact with contaminated water (i.e., containing a population of microorganisms sufficient for human infection). The pathogens can grow at a range of temperatures. There were no reported cases of infection from waterborne *Salmonella* spp. in the United States in 2019. There were no infection cases from waterborne pathogens in untreated recreational water in Florida in 2013-2014.

PSL's wastewater discharge permit issued by the Florida Department of Environmental Protection limits the waste heat that PSL can reject to the Atlantic Ocean and requires reporting of intake and discharge temperatures. The wastewater is discharged 1,500 feet offshore via two submerged pipes. The design of the discharge creates a high degree of mixing with the surrounding ocean water.

The nearest public beach areas to PSL are Walton Rocks Beach and Dog Park and Ocean Bay Riverside Park within and south of the PSL property, and Blind Creek Beachside and Blind Creek Riverside South north of the property. The discharge is located away from public access beaches and navigation buoys in the ocean flank the discharge area, restricting public access.

As stated earlier, this letter seeks your input on potential public health impacts associated with the microorganisms of concern as they relate to the proposed continued operation of PSL. Your response is kindly requested within 45 days of receiving this letter.

Should you or your staff have any questions or comments, please contact Richard Orthen at (561) 304-6283 / richard.orthen@fpl.com.

Sincerely,



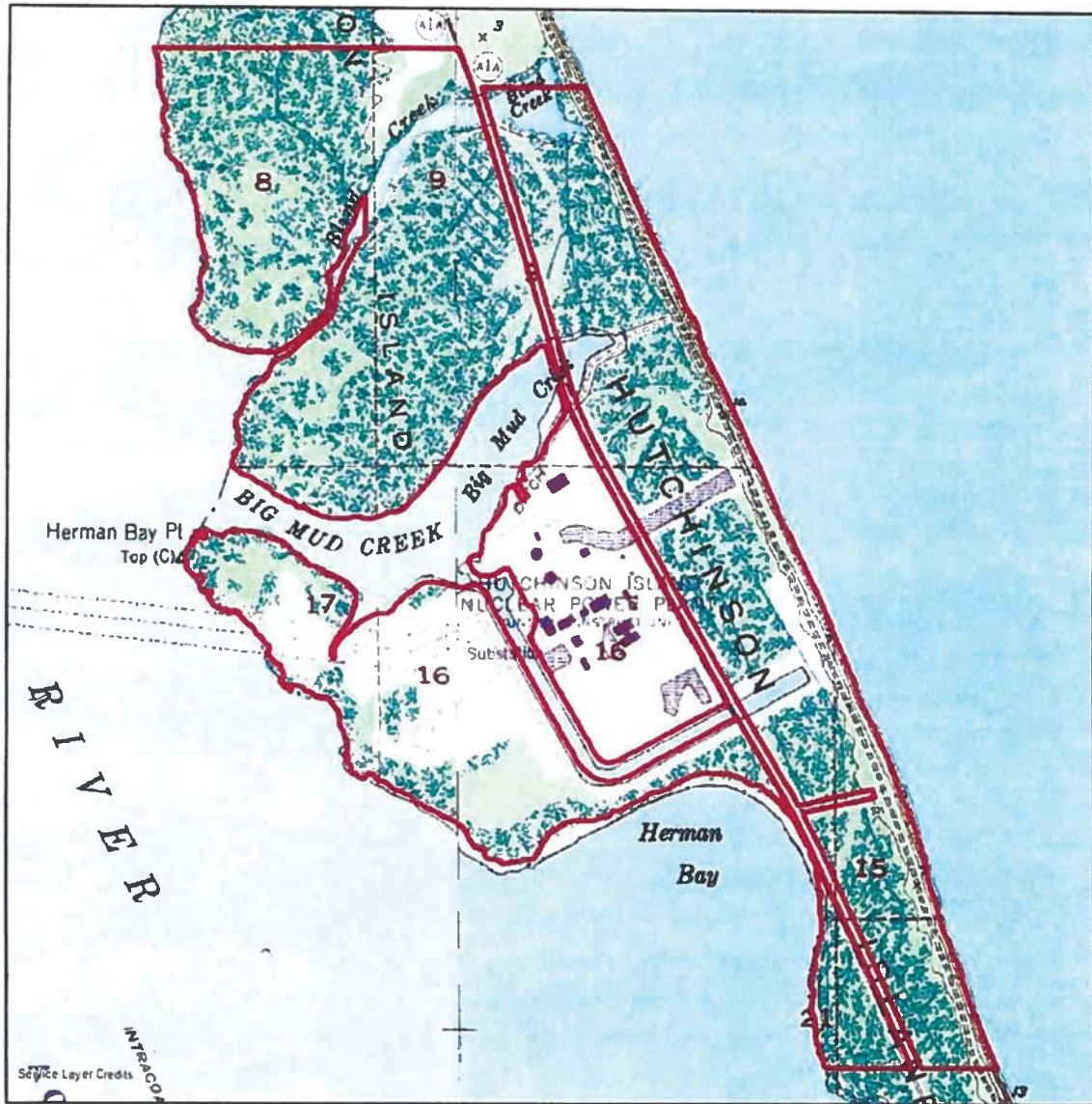
William D. Maher
Licensing Director - Nuclear Licensing Projects

Attachments:

Figure 1. PSL Site

Figure 2. PSL 6-mile Vicinity

Figure 1. PSL Site



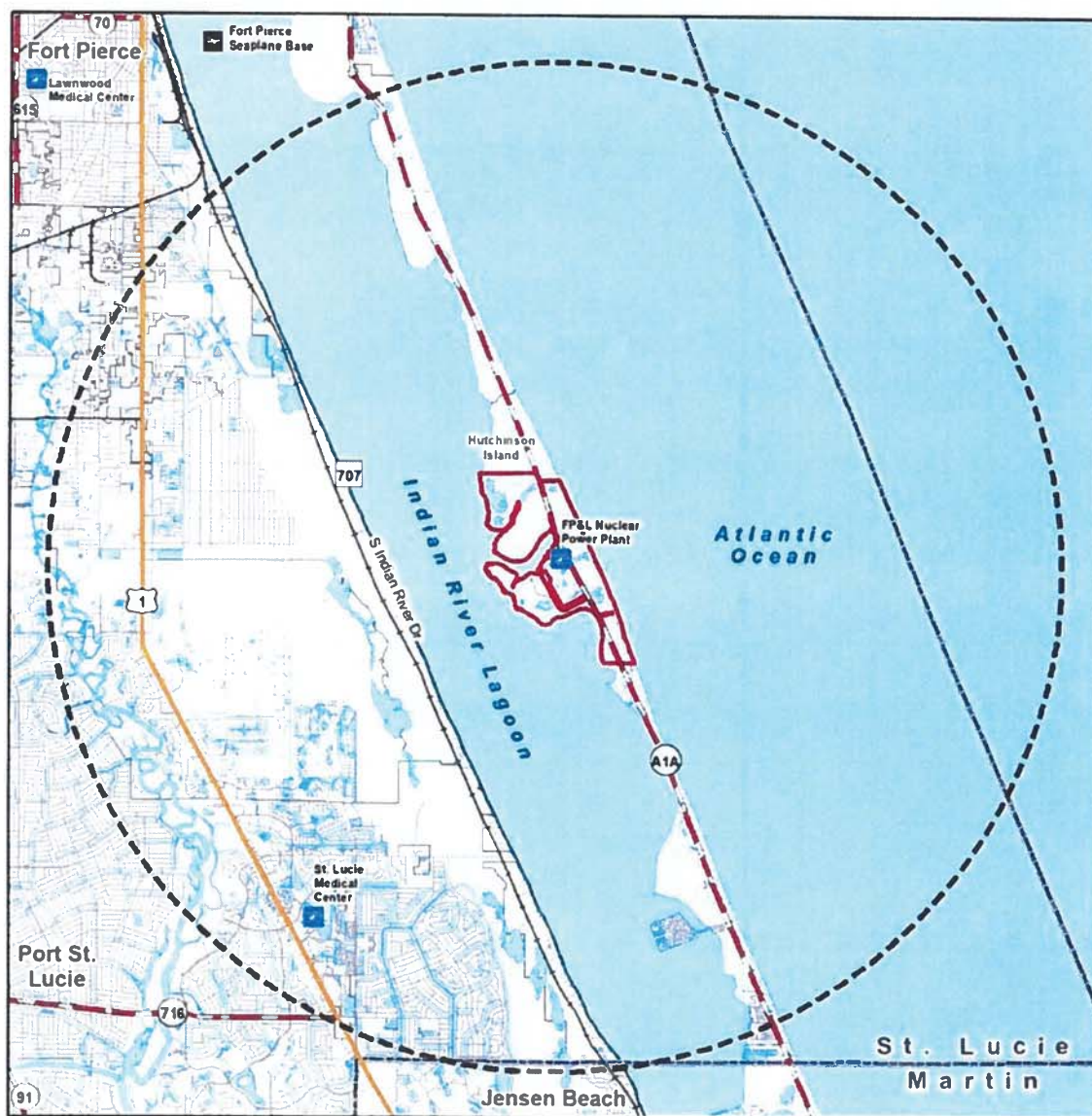
Legend

 PSL Site Boundary



0 0.25 0.5 Miles

Figure 2. PSL 6-Mile Vicinity



Legend

- | | | | |
|--|---------------|--|-------------------|
| | Heliport | | Railroad |
| | Seaplane Base | | Surface Water |
| | U.S. Route | | PSL Site Boundary |
| | State Road | | Place |
| | County Road | | 6-Mile Radius |
| | Local Road | | County |
-

Attachment No. 27

SAMA (SAMA)

NRC RAI Number: SAMA 1 / 2

REQUIREMENT: The NRC’s regulations in 10 CFR Part 51, which implement Section 102(2) of NEPA, require that all applicants for license renewal must submit an ER to the NRC, in which they identify any “new and significant information regarding the environmental impacts of license renewal of which the applicant is aware” (10 CFR 51.53(c)(3)(iv)). This includes new and significant information that could affect the environmental impacts related to postulated severe accidents or that could affect the results of a previous severe accident mitigation alternatives (SAMA) analysis.

Accordingly, in its subsequent license renewal application ER, FPL evaluates areas of new and significant information that could affect the environmental impact of postulated severe accidents during the subsequent license renewal period of extended operation and possible new and significant information as it relates to SAMAs.

ISSUE: The St. Lucie ER did not provide the specific values for internal and external event Core Damage Frequency (CDF) used to determine the potential environmental impacts related to postulated severe accidents or that could affect the results of a previous SAMA analysis.

REQUEST: Please provide plant-specific internal and external event CDF values, including a brief description, overview, and/or reference of the screening processes used to justify the conclusions in the St. Lucie ER. These numbers are necessary for NRC staff to make a comparison to the generic values or considerations in the 2013 Generic Environmental Impact Statement, as well as the values presented in the 2003 environmental impact statement for St. Lucie’s initial license renewal.

PSL Response:

The current plant CDF Values are as follows:

Hazard	PSL Unit 1 CDF (per year)	PSL Unit 2 CDF (per year)
Internal Events	1.8E-6	1.4E-6
Internal Flood	7.0E-7	6.2E-7
Internal Fire	4.6E-5	3.6E-5
Seismic	Screened [NRC 2016]	Screened [NRC 2016]
Other external events such as high wind events, external flooding, transportation, and nearby facility accidents	Screened [FPL 2017]	Screened [FPL 2017]

As for seismic risk, PSL did not perform a seismic margins assessment for the IPEEE because it is located in the area with the lowest seismic activities in the country. The documented external events screening approach indicates that for Seismic, the NRC approved an alternate method to Seismic Margins which is updated in response to the Fukushima Dai-ichi accident with the NRC Staff approval. [NRC 2016] Therefore, seismic risk has been judged to be insignificant compared to internal events risk. Therefore, no new information pertaining to seismic risk is considered significant.

Regarding Other External Events, the License Amendment Request to adopt 10 CFR 50.69 Attachments 4 and 5 provide a detailed screening process of all external events. [FPL 2017] All other external hazards including high winds, external flood, transportation and nearby facility accidents remain screened from applicability at PSL Units 1 and 2. Therefore, there is no new and significant information regarding other external hazards.

References:

FPL (Florida Power and Light). 2017. Letter "St. Lucie Units 1 and 2 - Application to Adopt 10 CFR 50.69, "Risk-Informed Categorization and Treatment of Structures, Systems, and Components for Nuclear Power Reactors," December 19, 2017. ADAMS Accession no. ML17353A929

NRC (Nuclear Regulatory Committee). 2016 NRC letter "St. Lucie Plant, Units 1 and 2 - Staff Assessment and Closure of Information Provided Pursuant to Title 10 of the Code of Federal Regulations Part 50, Section 50.54(f), Seismic Hazard Reevaluations for Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident (CAC Nos. MF3940 and MF3941)," January 7, 2016. ADAMS Accession no. ML15352A053.

Associated Enclosures:

None

Attachment No. 28

Socioeconomics (SOC)

NRC RAI Number: SOC-9

REQUIREMENT: 10 CFR 51.53(c)(2) requires, in part, that applicants describe in detail in their environmental report the affected environment around the plant. Section 4.4.1 of NUREG-1555, Supplement 1, Revision 1, "Standard Review Plans for Environmental Reviews for Nuclear Power Plants: Operating License Renewal," directs the staff to describe the socioeconomic characteristics of the counties within the region of influence, including tax payment information to local tax authorities (i.e., county, public school district) directly affected by plant operations.

ISSUE: During the environmental audit, socioeconomics breakout session, and in response to information need SOC-2, FPL identified that annual funding for emergency preparedness is provided to local jurisdictions on behalf of St. Lucie. Payments in addition to property taxes are not discussed in the ER.

REQUEST: Provide the annual funding amount for emergency preparedness FPL pays on behalf of St. Lucie and identify the local organizations, communities, or jurisdictions to which the funding is provided.

PSL Response:

FPL provides annual funding for emergency preparedness support on behalf of PSL and 2021 fees totaled \$1,638,306. Emergency planning funding is annually distributed to St. Lucie County, Martin County, Palm Beach County, Indian River County, Brevard County, Florida Department of Emergency Management, and the Florida Department of Health.

References:

None

Associated Enclosures:

None