**UNITED STATES**
**NUCLEAR REGULATORY COMMISSION**
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

April 12, 2017

Mr. Mano Nazar
President and Chief Nuclear Officer
Nuclear Division
Florida Power & Light Company
Mail Stop NT3/JW
15430 Endeavor Drive
Jupiter, FL 33478

SUBJECT: ST. LUCIE PLANT UNIT 2 – U.S. NUCLEAR REGULATORY COMMISSION POST-APPROVAL SITE INSPECTION FOR LICENSE RENEWAL, INSPECTION REPORT 05000389/2017008

Dear Mr. Nazar:

On March 3, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed a Post-Approval Site Inspection for License Renewal at your St. Lucie Plant, Unit 2, in accordance with NRC Inspection Procedure 71003. On March 3, 2017, the NRC inspector discussed the results of this inspection with Mr. Dan Deboer, Plant Saint Lucie Site Director, and other members of your staff. Inspector documented the results of this inspection in the enclosed inspection report (IR).

The NRC inspector did not identify any findings or violations of more than minor significance.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, “Public inspections, exemptions, requests for withholding” of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter, its Enclosure, and your response (if any), will be available electronically for public inspection in the NRC Public Document Room, or from the Publically Available Records System (PARS) component of NRC's Agencywide Documents Access

and Management System (ADAMS); accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

***/RA/***

Binoy B. Desai, Acting Chief
Engineering Branch 3
Division of Reactor Safety

Docket No. 50-389
License No. NPF-16

Enclosures:
NRC Post-Approval Site Inspection
For License Renewal, IR 05000389/2017008
w/Attachment: Supplementary Information

cc: Distribution via Listserv

SUBJECT: ST. LUCIE PLANT UNIT 2 – U.S. NUCLEAR REGULATORY COMMISSION POST-APPROVAL SITE INSPECTION FOR LICENSE RENEWAL, INSPECTION REPORT 05000389/2017008 – April 12, 2017

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ADAMS: ☒ Yes ACCESSION NUMBER: **ML17102B262** ☒ SUNSI REVIEW COMPLETE ☐ FORM 665 ATTACHED

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**U.S. NUCLEAR REGULATORY COMMISSION**
**REGION II**

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|---|---|
| Docket No: | 05000389 |
| License No: | NPF-16 |
| Report No: | 05000389/2017008 |
| Licensee: | Florida Power & Light Company |
| Facility: | St. Lucie Plant, Unit 2 |
| Location: | 6501 S. Ocean Drive<br>Jensen Beach, FL 34957 |
| Dates: | February 27 – March 3, 2017 |
| Inspector: | Robert Carrion, Senior Reactor Inspector |
| Approved by: | Binoy B. Desai, Acting Chief<br>Engineering Branch 3<br>Division of Reactor Safety |

Enclosure

## SUMMARY

Inspection Report (IR) 05000389/2017008; February 27 - March 3, 2017; St. Lucie Plant, Unit 2; Post-Approval Site Inspection for License Renewal, Phase 1

This report covers an inspection conducted by one regional inspector in accordance with NRC Inspection Manual Chapter 2515 and NRC Inspection Procedure 71003.

Based on the sample selected for review, the inspector determined that commitments, license conditions, and regulatory requirements associated with the renewed facility operating license were met. The inspector also determined that the licensee had administrative controls in place to ensure completion of pending actions scheduled both prior to and during the period of extended operation.

The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process."

No findings were identified.

## REPORT DETAILS

## 4. OTHER ACTIVITIES

4OA5 Other Activities

.1 Post-Approval Site Inspection for License Renewal – Inspection Procedure 71003 (Phase 1)

a. Inspection Scope

(1) Implementation of License Conditions and Commitments, including Aging Management Programs

The inspector reviewed a sample of license renewal activities scheduled for the Unit 2 spring 2017 refueling outage. The inspector selected this refueling outage because it would present the best opportunity to observe the implementation of Aging Management Programs (AMPs) associated with license renewal commitments specific to Unit 2. The inspection objective was to maximize observations of the actual implementation of license renewal activities before the beginning of the period of extended operation (PEO) (April 6, 2023), and to verify that the licensee completed the necessary actions to: (a) comply with the conditions stipulated in the renewed facility operating license; (b) meet the license renewal commitments described in NUREG-1779, Safety Evaluation Report (SER) Related to the License Renewal of St. Lucie Nuclear Plant, Units 1 and 2, dated September 2003 (ADAMS Accession Number ML032940205); and (c) meet the future inspection activities described in the Updated Final Safety Analysis Report (UFSAR) supplement submitted pursuant to 10 CFR 54.21(d). The license renewal application (LRA) for St. Lucie, Units 1 and 2, and the corresponding NRC SER, documented in NUREG-1779, is publicly available on ADAMS under Accession Numbers ML013400155 and ML032940205, respectively.

The inspector reviewed the licensing basis and program basis documents of these programs; and for select programs, implementing procedures, applicable condition reports, and work orders to verify that the selected AMPs were implemented as described in the LRA. In addition, the inspector conducted interviews with licensee staff, observed in-process outage activities, and performed visual inspection of structures, systems, and components (SSCs), including those not accessible during power operation. The commitment items and AMPs selected for the inspection sample are summarized below, based on their description in Appendix A of the LRA, and their respective UFSAR description. The specific additional inspection activities conducted for each AMP are also described below. Specific documents reviewed are listed in this report's Attachment.

Updated Final Safety Analysis Report, Section 18.1.1 – Galvanic Corrosion Susceptibility Inspection Program [NUREG-1779, Commitment No. 1]:

This commitment specified that prior to the end of the initial operating license terms for Units 1 and 2, selected one-time inspections on the surfaces of piping and components with the greatest susceptibility for galvanic corrosion, would be conducted to manage the aging effect of loss of material due to galvanic corrosion on the surfaces of susceptible piping and components. Baseline examinations (visual inspection or volumetric

examinations) in select systems were performed and evaluated to establish if this corrosion mechanism was active. Evaluation of the inspection results considered the minimum required wall thickness for the component, consistent with the applicable design codes. Based on the results of these inspections, the need for followup examinations or programmatic corrective actions were established.

The inspector verified that the licensee developed procedures and conducted inspections, as described in the Program Basis Document and the UFSAR. The inspector also verified that the inspections were appropriately scheduled and tracked. In addition, the inspector directly observed the visual examination inspection of the Instrument Air System, between flanges of stainless steel flex hose and carbon steel piping (compressor 2A discharge), to verify that inspection procedures were followed, and any adverse conditions found were entered in the licensee Corrective Action Program (CAP) and evaluated properly, in accordance with the license renewal commitment.

Updated Final Safety Analysis Report, Section 18.1.4 – Small Bore Class 1 Piping Inspection Program [NUREG-1779, Commitment Nos. 5 and 6]:

These commitments specified that prior to the end of the initial operating license terms for Units 1 and 2, selected one-time volumetric inspections and destructive examinations of a sample of small bore Class 1 piping, would be performed to determine if cracking is an aging effect requiring management during the PEO. This one-time inspection addressed Class 1 piping less than 4 inches in diameter. Based on the results of these inspections, the need for additional inspections or programmatic corrective actions were established.

The inspector verified that the licensee developed procedures and conducted inspections, as described in the Program Basis Document and the UFSAR. The inspector also verified that the inspections were appropriately scheduled and tracked. In addition, the inspector performed a review of the samples that the licensee selected, and a walkdown of the areas where the five socket weld samples were taken to verify that they were performed in accordance with the license renewal commitments. The inspector also observed the ultrasonic examination (UT) of a small bore piping line (I-3-SI-191) which is part of this program.

Updated Final Safety Analysis Report, Section 18.1.5 – Thermal Aging Embrittlement of Cast Austenitic Stainless Steel Program [NUREG-1779, Commitment No. 7]:

This commitment specified that continuing through the PEO, the licensee would perform a determination of the susceptibility of Class 1 Cast Austenitic Stainless Steel (CASS) piping components to thermal aging embrittlement and would provide for the subsequent aging management of those components that were identified as being potentially susceptible. Aging management, if required, would be accomplished through either enhanced volumetric examination or plant-specific or component-specific flaw tolerance evaluation.

The inspector verified that the licensee developed procedures and conducted inspections, as described in the Program Basis Document and the UFSAR. The inspector also verified that the inspections were appropriately scheduled and tracked. In addition, the inspector directly observed the phased array ultrasonic examination and

data acquisition of a CASS (steam generator 2B1 cold leg), and interviewed the qualified examiner/analyst who performed the analysis of the element to verify that it was done in accordance with the license renewal commitment. The examination results were evaluated and dispositioned in accordance with the acceptance criteria specified in licensee procedures.

Updated Final Safety Analysis Report, Section 18.2.13 – Systems and Structures Monitoring Program [NUREG-1779, Commitment No. 16]:

This commitment specified that continuing through the PEO, the Systems and Structures Monitoring Program managed the aging effects of loss of material, cracking, fouling (for mechanical components only), loss of seal, and change in material properties. The program provided for periodic visual inspection and examination for degradation of accessible surfaces of specific SSCs and corrective actions, as required, based upon these inspections. The program was enhanced to provide guidance for managing the aging effects of inaccessible concrete, inspection of insulated equipment and piping, and evaluating masonry wall degradation and uniform corrosion.

The inspector verified that the licensee developed procedures and conducted inspections, as described in the Program Basis Document and the UFSAR. The inspector also verified that the inspections were appropriately scheduled and tracked. In addition, the inspector performed direct observations of the following systems to verify that they were inspected in accordance with the license renewal commitments:

- A walkdown of accessible components of the Unit 2 Emergency Core Cooling System (ECCS) (specifically, the Safety Injection (High Pressure Safety Injection (HPSI) and Low Pressure Safety Injection (LPSI)) and Containment Spray systems) in the Reactor Auxiliary Building (RAB).
- A walkdown of accessible components of the Unit 2 Chemical and Volume Control System (CVCS) at Elevations 18’ and 23’ of the Reactor Containment Building (RCB).

(2) Review of Newly-Identified Structures, Systems, and Components

This inspection requirement will be completed during the Phase 2 implementation of IP 71003.

(3) Review of License Renewal Commitment Changes

As part of the review of license renewal commitments described in Section 4OA5.1.a(1) of this report, the inspector reviewed license renewal commitment change documents to verify the licensee followed the guidance in Nuclear Energy Institute (NEI) 99-04, “Guidelines for Managing NRC Commitment Changes,” for any change to the commitments, including their elimination. The inspector verified that the licensee properly evaluated, reported, and approved, where necessary, changes to license renewal commitments listed in the UFSAR in accordance with 10 CFR 50.59.

The inspector also reviewed the licensee’s procedures for commitment revision to obtain reasonable assurance that future changes to (or elimination of) license commitments would follow the guidance in NEI 99-04, and would properly evaluate, report, and

approve changes to license renewal commitments listed in the UFSAR, in accordance with 10 CFR 50.59.

During the course of the Unit 2 spring 2017 refueling outage, the licensee identified potential commitment changes to the Small Bore Class 1 Piping AMP; the details of which are documented as an observation in the Findings and Observations section below.

b. Findings and Observations

No findings were identified. Based on the review of licensee actions completed at the time of this inspection, and the timeliness of those actions, the inspector determined that the implementation of AMP activities reviewed during the Unit 2 spring 2017 refueling outage were consistent with license renewal commitments, license conditions, and applicable regulatory requirements. The inspector also determined that the licensee had administrative controls in place to ensure completion of pending actions scheduled both prior to and during the PEO.

The following observation for the Small Bore Class 1 Piping AMP was made:

- By letter dated September 3, 2014, (ADAMS accession number ML14261A107), the licensee submitted their Inspection Plan for Small Bore Class 1 Piping, in accordance with the commitments set forth in the SER. In this commitment letter, the licensee stated in Section 4, Description of Aging Effects, “The one-time inspection to detect cracking in socket welds will be either a volumetric or destructive examination. The inspection to detect cracking resulting from thermal and mechanical loading, vibration, or intergranular stress corrosion of full penetration welds will be a volumetric examination. Volumetric examination will be performed using demonstrated techniques from the ASME Code that are capable of detecting the aging effects in the examination volume of interest.” In addition, the licensee’s plan stated, “The inspection sample size will be at least 3 percent, up to a maximum of 10 welds, of each weld type, for each operating unit using a methodology to select the most susceptible and risk-significant welds, from the risk-informed approach as described above. For socket welds, destructive examination may be performed in lieu of volumetric examinations. Because more information can be obtained from a destructive examination than from nondestructive examination, credit will be taken for each weld destructively examined equivalent to having volumetrically examined two welds.”

  Accordingly, the licensee selected a total number of five destructive examinations on socket welds, and three volumetric examinations on full penetration welds, to represent their Small Bore Class 1 inspection program. During the spring 2017 refueling outage, the licensee was pursuing this strategy and was in the process of completing the work during this inspection.

4OA6 Management Meetings

.1 Exit Meeting Summary

On March 3, 2017, the inspector presented the inspection results to Mr. Dan DeBoer, Site Director, and other members of the licensee staff. The inspector confirmed that none of the potential report input discussed was considered proprietary.

ATTACHMENT: Supplementary Information

## SUPPLEMENTARY INFORMATION

## KEY POINTS OF CONTACT

Licensee Personnel:
P. Atkinson, License Renewal Implementation Project Manager
L. Berry, Principal Nuclear Engineer, Licensing
B. DiVentura, License Renewal Engineer
D. Patel, License Renewal Engineer

## LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

None

## LIST OF DOCUMENTS REVIEWED

Corrective Action Documents
Action Request 2107058

Drawings
2998-G-078, Sheet 109

Procedures
NDE Manual Examination Procedure, Component, Support & Inspection Ultrasonic Examination of Austenitic Piping Welds, Revision 21

Program Basis Documents
PSL-ENG-LRAM-00-095, Systems and Structures Monitoring Program License Renewal Basis Document
PSL-ENG-LRAM-00-110, Galvanic Corrosion Susceptibility Inspection Program License Renewal Basis Document
PSL-ENG-LRAM-00-117, Small Bore Class 1 Piping Inspection License Renewal Basis Document
PSL-ENG-LRAM-01-022, Thermal Aging Embrittlement of CASS Program License Renewal Basis Document

## LIST OF ACRONYMS

| | |
|---|---|
| AMPs | Aging Management Programs |
| CAP | Corrective Action Program |
| CASS | Cast Austenitic Stainless Steel |
| LRA | Licensee Renewal Application |
| NEI | Nuclear Energy Institute |
| PEO | Period of Extended Operation |
| SER | Safety Evaluation Report |
| SSCs | Systems, Structures, or Components |
| UFSAR | Updated Final Safety Analysis Report |