



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION II  
245 PEACHTREE CENTER AVENUE N.E., SUITE 1200  
ATLANTA, GEORGIA 30303

July 12, 2012

Mr. Mano Nazar  
Executive Vice President  
and Chief Nuclear Officer  
Florida Power and Light Company  
P.O. Box 14000  
Juno Beach, FL 33408-0420

**SUBJECT: TURKEY POINT NUCLEAR PLANT – NRC POST-APPROVAL SITE  
INSPECTION FOR LICENSE RENEWAL, INSPECTION REPORT  
05000250/2012008 AND 05000251/2012008**

Dear Mr. Nazar:

On June 8, 2012, the U.S. Nuclear Regulatory Commission (NRC) completed a Post-Approval Site Inspection for License Renewal at your Turkey Point Nuclear Plant Units 3 and 4 in accordance with NRC Inspection Procedure 71003. The enclosed report documents the inspection results, which were discussed on June 8, 2012, with Mr. Juan Pallin, Maintenance Director, and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, and interviewed plant personnel.

Based on the inspection sample selected for review, no findings were identified. The inspectors determined that the overall implementation of Aging Management Program (AMP) activities was consistent with the license renewal commitments and the conditions in the renewed operating license. The inspectors also determined that changes to license renewal commitments were performed in accordance with applicable regulatory requirements. With the exception of one example discussed in the enclosed inspection report, the team determined that the Updated Final Safety Analysis Report (UFSAR) supplement for license renewal was adequately updated to reflect the completion of required activities and programmatic changes, including the incorporation of "newly identified" structures, systems, and components in accordance with 10 CFR 54.37(b).

The enclosed inspection report contains eight observations: seven observations associated with the implementation of various AMPs and one observation associated with the description of an AMP in the UFSAR. These observations were entered into the Corrective Action Program for resolution. Two of the observations remained open at the end of this inspection and are subject to further NRC inspection during future license renewal inspections, in order to provide reasonable assurance that your license renewal commitments are met. Additionally, some of the observations consisted of issues of concern that, if found during the period of extended operation, would have been considered for screening and evaluation of performance deficiencies in accordance with the NRC Reactor Oversight Process.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," 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 Publicly 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/*

Steven J. Vias, Chief  
Engineering Branch 3  
Division of Reactor Safety

Docket No. 50-250, 50-251  
License No. DPR-31, DRP-41

Enclosure: Inspection Report 05000250/2012008 and 05000251/2012008  
w/Attachment: Supplemental Information

cc w/encl: (See Page 3)

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," 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 Publicly Available Records System (PARS) component of NRC's Agency-wide 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/*

Steven J. Vias, Chief  
 Engineering Branch 3  
 Division of Reactor Safety

Docket No. 50-250, 50-251  
 License No. DPR-31, DRP-41

Enclosure: Inspection Report 05000250/2012008 and 05000251/2012008  
 w/Attachment: Supplemental Information

cc w/encl: (See Page 3)

PUBLICLY AVAILABLE       NON-PUBLICLY AVAILABLE       SENSITIVE       NON-SENSITIVE  
 ADAMS:  Yes      ACCESSION NUMBER: \_\_\_\_\_       SUNSI REVIEW COMPLETE       FORM 665 ATTACHED

OFFICE	RII:DRS	RIII:DRS	RII:DCI	RII:DRS	RII:DRS	RII:DRS	RII:DRS
SIGNATURE	RA	RA	RA	RA	RA	RA	RA
NAME	JRIVERA	SSHEDDON	CJULIAN	CFLETCHER	RWILLIAMS	ASENGUPTA	SVIAS
DATE	7/ 10 /2012	7/ 11 /2012	7/11 /2012	7/ 11 /2012	7/ 10 /2012	7/11 /2012	7/12/2012
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
OFFICE	RII:DRP						
SIGNATURE	RA						
NAME	DRICH						
DATE	7/ 12 /2012						
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

cc w/encl:  
Alison Brown  
Nuclear Licensing  
Florida Power & Light Company  
Electronic Mail Distribution

Larry Nicholson  
Director  
Licensing  
Florida Power & Light Company  
Electronic Mail Distribution

Michael Kiley  
Site Vice President  
Turkey Point Nuclear Plant  
Florida Power and Light Company  
Electronic Mail Distribution

Niel Batista  
Emergency Management Coordinator  
Department of Emergency Management  
and Homeland Security  
Electronic Mail Distribution

Paul Freeman  
Vice President  
Organizational Effectiveness  
Florida Power & Light Company  
Electronic Mail Distribution

Peter Wells  
Vice President  
Outage Support CFAM  
Florida Power & Light Company  
Electronic Mail Distribution

Robert J. Tomonto  
Licensing Manager  
Turkey Point Nuclear Plant  
Florida Power & Light Company  
Electronic Mail Distribution

Eric McCartney  
Plant General Manager  
Turkey Point Nuclear Plant  
Florida Power and Light Company  
Electronic Mail Distribution

Mitch S. Ross  
Vice President and General Counsel  
Nuclear  
Florida Power & Light Company  
Electronic Mail Distribution

Cynthia Becker  
(Acting) Chief  
Florida Bureau of Radiation Control  
Department of Health  
Electronic Mail Distribution

Senior Resident Inspector  
Turkey Point Nuclear Generating Station  
U.S. Nuclear Regulatory Commission  
9762 SW 344th St.  
Florida City, FL 33035

Attorney General  
Department of Legal Affairs  
The Capitol PL-01  
Tallahassee, FL 32399-1050

County Manager of Miami-Dade County  
111 NW 1st Street, 29th Floor  
Miami, FL 33128

George Gretsas  
City Manager  
City of Homestead  
Electronic Mail Distribution

Letter to Mano Nazar from Steven J. Vias dated July 12, 2012.

SUBJECT: TURKEY POINT NUCLEAR PLANT – NRC POST-APPROVAL SITE  
INSPECTION FOR LICENSE RENEWAL, INSPECTION REPORT  
05000250/2012008 AND 05000251/2012008

Distribution w/encl:

RIDSNRRDIRS

PUBLIC

RidsNrrPMTurkeyPoint Resource

**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket No: 50-250, 50-251

License No: DPR-31, DRP-41

Report No: 05000250/2012008, 05000251/2012008

Licensee: Florida Power & Light Company (FPL)

Facility: Turkey Point Nuclear Plant, Units 3 and 4

Location: 9760 S. W. 344th Street  
Homestead, FL 33035

Dates: May 21, 2012 – June 8, 2012

Inspectors: Joel Rivera-Ortiz, Senior Reactor Inspector (Lead)  
Caudle Julian, Senior Project Manager  
Cecil Fletcher, Senior Reactor Inspector  
Stuart Sheldon, Senior Reactor Inspector (NRC Region III)  
Abhijit Sengupta, Reactor Inspector  
Robert Williams, Reactor Inspector

Approved by: Steven J. Vias, Chief  
Engineering Branch 3  
Division of Reactor Safety

Enclosure

## SUMMARY OF FINDINGS

Inspection Report 05000250,-251/2012008; 05/21/2012 – 06/08/2012; Turkey Point Nuclear Plant, Units 3 and 4; Post Approval Site Inspection for License Renewal.

The report covers a team inspection conducted by six regional inspectors in accordance with NRC Manual Chapter 2515 and NRC Inspection Procedure 71003.

Based on the sample selected for review, the inspectors determined that the licensee had completed, or was on track to complete, the necessary tasks to meet the license renewal commitments, license conditions, and regulatory requirements associated with the issuance of the renewed operating license at Turkey Point Nuclear Plant Units 3 and 4. With the exception of the Reactor Vessel Internals Inspection Program, the inspectors determined that the licensee had established the required Aging Management Programs (AMPs) for in-scope structures, systems, and components in order to maintain their identified function(s) through the period of extended operation (PEO) of Units 3 and 4. The inspectors determined that the licensee completed the planned inspection activities required for Unit 3 prior to the PEO of this Unit. Some commitments and AMPs had pending actions for Unit 4, for which task items existed in the Corrective Action Program (CAP) or work control process to track their completion prior to the PEO of this Unit in April 2013.

The inspectors also determined that changes to license renewal commitments were performed in accordance with applicable regulatory requirements. With the exception of one example, that is discussed in section 4OA5.4.b(1) of this inspection report, the team determined that the Updated Final Safety Analysis Report (UFSAR) supplement for license renewal was adequately updated to reflect the completion of required activities and programmatic changes, including the incorporation of “newly identified” structures, systems, and components in accordance with 10 CFR 54.37(b).

The inspectors identified seven observations associated with the implementation of various AMPs and one observation associated with the description of an AMP in the UFSAR. These observations were entered into the CAP for resolution and six of them were corrected prior to the end of this inspection. The two observations that remained open are subject to further NRC inspection during future license renewal inspections to provide reasonable assurance that the license renewal commitments are met. Additionally, some of the observations consisted of issues of concern that, if found during the period of extended operation, would have been considered for screening and evaluation of performance deficiencies in accordance with the NRC Reactor Oversight Process.

The NRC’s program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, “Reactor Oversight Process,” Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealed Findings

None

B. Licensee-Identified Violations

None

Enclosure

## REPORT DETAILS

### 4. OTHER ACTIVITIES

#### 4OA5 Other Activities: Post-Approval Site Inspection for License Renewal (Phase 2)

##### .1 Implementation of License Conditions, License Renewal Commitments, and Aging Management Programs

###### a. Inspection Scope

The inspectors reviewed a sample of Aging Management Programs and Time-Limited Aging Analyses (TLAAs) associated with the renewed operating license for Turkey Point Nuclear Plant Units 3 and 4 issued on June 6, 2002. This inspection took place prior to the period of extended operation of Units 3 and 4, which begins on July 19, 2012 and April 10, 2013, respectively. The inspectors reviewed license renewal documents including administrative procedures, implementing procedures, work orders, inspection reports, engineering evaluations, condition reports, and conducted interviews with licensee staff. The objective of this inspection was 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 NRC Memorandum dated March 6, 2007 (hereinafter referred as "NRC Memorandum" which is available in ADAMS via Accession Number ML070640041), and (c) meet the future inspection activities described in the UFSAR supplement for license renewal submitted pursuant to 10 CFR 54.21(d). The license renewal application ([LRA](#)) for Turkey Point Nuclear Plant and the corresponding NRC Safety Evaluation Report ([SER](#)) documented in NUREG-1759, including [Supplement 1](#) are available on [www.nrc.gov](http://www.nrc.gov).

For those license renewal action items that were not completed at the time of this inspection, the team verified that there was reasonable assurance that such action items were on track for completion prior to the PEO or in accordance with an established implementation schedule consistent with the licensing basis documents. The tracking of pending administrative actions to meet the licensee renewal commitments was implemented through the licensee's Corrective Action Program via Action Request (AR) item AR 1626907. License renewal commitments and AMPs with pending actions that are subject to additional inspection by the NRC are presented as observations in section 4OA5.1.b of this report.

The commitment items and AMPs/TLAAs selected for the inspection sample are summarized below based on their description in the revised UFSAR supplement submitted with the LRA (FPL Letter L-2001-236, ADAMS ML013470150). The specific inspection activities conducted for each AMP are also described below. Specific documents reviewed are listed in the report attachment.

Auxiliary Feedwater Pump Oil Coolers Inspection (UFSAR Section 16.1.1 and Commitment No. 1 in NRC Memorandum): This commitment specified that prior to the end of the initial operating license term, a one-time visual inspection would be performed on one of the cast iron bonnets of the auxiliary feedwater pump lube oil coolers to assess the extent of loss of material due to corrosion. Turkey Point Units 3 and 4 share three steam driven auxiliary feedwater pumps: "A," "B," and "C" pumps. The aging mechanisms of concern are graphitic corrosion (i.e., selective leaching) and other types



of corrosion on cast iron parts of the auxiliary feedwater pumps lube oil coolers and turbine governor controller oil coolers, which are wetted internally by auxiliary feedwater. The results of this one-time inspection would be evaluated to determine the need for additional inspections or programmatic corrective actions.

The inspectors reviewed Program Basis Document PTN-ENG-LRAM-00-0060 and the latest program description in the UFSAR, which both presented the results of the one-time inspections, to verify that the inspections were performed as described in the license renewal application and the corresponding NRC Safety Evaluation Report. The inspectors also discussed the methods and results of these inspections, including any resulting programmatic actions, with the system engineer for the auxiliary feedwater system.

The inspectors reviewed the results of an inspection of the governor oil cooler for the "A" auxiliary feedwater pump turbine that was performed in March 2011. The oil cooler end caps were found in good condition with no evidence of corrosion. Both end caps were analyzed using an optical emission spectrometer. The results indicated that the end caps were not made of cast iron. The zinc content was found to be well below 15% by weight, therefore the licensee concluded that the end caps were not susceptible to selective leaching (dezincification) and no further inspection of the governor oil cooler end caps was necessary for the other auxiliary feedwater pumps.

The inspectors also reviewed the results of an inspection of the oil cooler for the "C" auxiliary feedwater pump turbine performed in February 2012, which included an inspection of the oil cooler end bells for selective leaching. The inspection identified significant loss of metal mostly in the divider plates. After sand blasting of the corroded surfaces, the licensee identified black surface color and porous surface texture, indicating that graphitic corrosion had occurred. The entire "C" auxiliary feedwater pump turbine lube oil cooler was replaced in February 2012.

The "B" auxiliary feedwater pump turbine lube oil cooler was scheduled to be replaced during the Unit 3R26 refueling outage (spring 2012) through Work Order 40147180. The "A" auxiliary feedwater pump turbine lube oil cooler was replaced in March 1999 as a precautionary measure, and it had been in service for 13 years as compared to the 39 years of service provided by the "C" auxiliary feedwater pump lube oil cooler without failure. The inspectors reviewed an evaluation documented in AR 1735146 to confirm that the "A" auxiliary feedwater lube oil cooler was acceptable for use during the period of extended operation and no further inspection or replacement was required.

The status of administrative action items associated with the implementation of this commitment was considered "complete" for Units 3 and 4 in the licensee's CAP.

Auxiliary Feedwater Steam Piping Inspection Program (UFSAR Section 16.1.2 and Commitment No. 2 in NRC Memorandum): This commitment specified that prior to the end of the initial operating license term, a program to inspect sections of the auxiliary feedwater steam piping would be implemented. The UFSAR supplement for license renewal stated that this inspection program manages the aging effects of loss of material due to general and pitting corrosion on the internal and external surfaces of carbon steel in the auxiliary feedwater steam supply lines. Periodic volumetric examinations of representative auxiliary feedwater steam supply components would be performed to ensure that minimum required wall thickness is maintained. Examinations would be

performed on piping/fittings and other components using volumetric techniques, such as ultrasonic or digital radiography. Program Basis Document PTN-ENG-LRAM-00-0053, identified procedure 0-ADM-534, "Auxiliary Feedwater Steam Piping Inspection Program", as providing the specific requirements to monitor and assess loss of material on interior and external surfaces of carbon steel in the auxiliary feedwater steam supply lines.

The inspectors reviewed the licensing basis, program basis documents, implementing procedures, applicable condition reports, and work orders; and interviewed the responsible plant personnel regarding these documents. The inspectors verified that the program had been implemented as described in the license renewal application and approved in the NRC Safety Evaluation Report.

The status of administrative action items associated with the implementation of this commitment was considered "complete" for Units 3 and 4 in the licensee's CAP.

Emergency Containment Coolers Inspection (UFSAR Section 16.1.3 and Commitment No. 3 in NRC Memorandum): This commitment specified that prior to the end of the initial operating license term for Units 3 and 4, a one-time volumetric examination of a sample of emergency containment cooler (ECC) tubes would be performed to determine the extent of loss of material due to erosion in the tubes. The UFSAR section of this program stated that the results of this inspection would be evaluated to determine the need for additional inspections and programmatic corrective actions.

The inspectors reviewed the licensing basis, program basis documents, administrative and implementing procedures to verify that the inspections were completed as described in the license renewal application and the corresponding NRC Safety Evaluation Report. The inspectors also interviewed licensee personnel to discuss the implementation of the inspections and associated corrective actions in order to verify consistency with the licensing basis.

The inspectors reviewed the results of a volumetric examination for a sample of tubes in 4B ECC (Unit 4). The licensee evaluated the existing and nominal wall thickness of the tubes for the 4B ECC and concluded that all the tubes for the six ECCs (three in each Unit) would remain above the required minimum wall thickness through the end of the period of extended operation. The licensee planned to perform another volumetric exam of the 4B ECC tubes during a future outage, in order to confirm the previously calculated erosion rate. However, the licensee had concluded that this planned examination was not required under the scope of license renewal in order to meet this commitment. Additionally, the licensee obtained wall thickness data from a previous volumetric examination on the 3B ECC (from unrelated exams) which provided additional assurance that the wall thickness measurements taken on the 4B ECC were representative of all six ECCs.

The status of administrative action items associated with the implementation of this commitment was considered "complete" for Units 3 and 4 in the licensee's CAP. The inspectors identified one observation associated with the implementation of this program, which is discussed in further details in section 4OA5.1.b(1) of this report.

Field Erected Tanks Internal Inspection (UFSAR Section 16.1.4 and Commitment No. 4 in NRC Memorandum): This commitment specified that a one-time visual inspection would be performed to determine the extent of corrosion on the internal surfaces of the field erected tanks for both units, including the condensate storage tanks, the common demineralized water storage tank, and the refueling water storage tanks. The results of these inspections would be evaluated to determine the need for additional inspections and programmatic corrective actions. These inspections would be implemented prior to the end of the initial operating license terms for Units 3 and 4.

The NRC conducted an inspection of the implementation of this commitment in March 2, 2012 as documented in NRC Inspection Report 05000250/2012007 for Unit 3. At that time four of the field erected tanks had been inspected and the Unit 3 condensate storage tank remained to be inspected. The inspectors reviewed Program Basis Document PTN-ENG-LRAM-00-0064, which contained the results of the tank inspections performed. The inspectors also reviewed SPEC-C-047, "Field Erected Tanks Internal Inspection," which contained the tank inspection guidance for this program.

The inspectors noted that all five tanks have been inspected using the specification SPEC-C-047. Three of the tanks were found to have intact coatings with no bare metal visible. The internal coating of the Unit 3 refueling water storage tank was found to be degraded and was repaired in March 2012 under Work Order 40098121. Unit 4 refueling water storage tank was found to have failed coatings in small scattered areas and the exposed tank steel was evaluated as having minor pitting within the acceptance criteria in the specification. Spot coating repairs in the Unit 4 refueling water storage tank were completed in May 2011 under Work Order 39022012 and future inspections were scheduled to be performed on a 10 year frequency and were included as part of the station preventive maintenance program.

The status of administrative action items associated with the implementation of this commitment was considered "complete" for Units 3 and 4 in the licensee's CAP.

Galvanic Corrosion Susceptibility Inspection Program (UFSAR Section 16.1.5 and Commitment No. 5 in NRC Memorandum): This commitment specified that prior to the end of the initial operating license terms for Units 3 and 4, a Galvanic Corrosion Susceptibility Inspection Program would be implemented to manage the aging effects of the loss of material due to galvanic corrosion on the internal surfaces of susceptible piping and components. The UFSAR supplement for license renewal stated that this program involves one-time inspections on the internal surfaces of selected piping and components with the greatest susceptibility to galvanic corrosion. The UFSAR also stated that loss of material is expected mainly in carbon steel components directly coupled to stainless steel components in raw water systems. Specification SPEC-M-078, "Galvanic Corrosion Susceptibility Inspection Program," was used to select a representative sample of components in Units 3 and 4 for a baseline examination in selected systems to determine if the corrosion mechanism was active and the need for follow-up examinations. From the nine inspection locations selected by SPEC-M-078, the licensee determined that none of the locations required additional inspection.

The inspectors reviewed the licensing basis, program basis documents, administrative and implementing procedures to verify that the program was developed as described in the license renewal application and the corresponding NRC Safety Evaluation Report.

The inspectors interviewed licensee personnel to discuss the selection process for the inspection points within the scope of the program and verify consistency with the licensing basis. The inspectors also reviewed a sample of visual inspections for locations susceptible to galvanic corrosion to verify that the examination and evaluation of results were performed in accordance with the implementing procedures.

The status of administrative action items associated with the implementation of this commitment was considered "complete" for Unit 3 in the licensee's CAP; and open action items existed in the licensee's action tracking system to perform additional inspections in Unit 4 prior to the period of extended operation of this Unit.

Reactor Vessel Internals Inspection Program (UFSAR Section 16.1.6 and Commitment No. 6 in NRC Memorandum): This commitment specified that prior to the period of extended operation, the licensee would implement a program for managing aging effects of the reactor vessel internals consisting of visual and ultrasonic examinations. The licensee also committed to submit a report to the NRC, summarizing the understanding of aging effects applicable to the reactor vessel internals. The report would be submitted prior to the period of extended operation of Unit 3 and would include an inspection plan, including the methods for detection and sizing of cracks and acceptance criteria.

On May 11, 2011, the licensee submitted letter L-2011-176 to the NRC, informing their intent to adopt and implement the guidance in Materials Reliability Program (MRP) Document MRP-227, "Electric Power Research Institute Reactor Vessel Internals Program," for Units 3 and 4. The MRP-227 guidance was a proposed industry approach to manage aging of the reactor vessel internal materials and it had been submitted to the NRC for review and approval through the Nuclear Energy Institute in January 2009. The licensee's letter of intent to adopt MRP-227 represented a change to the approach described in the original commitment to manage aging of the reactor vessel internals.

At the time the licensee submitted the letter of intent, the NRC was still reviewing the MRP-227 guidance. On June 22, 2011, the NRC issued Revision 0 of the Safety Evaluation Report for MRP-227, endorsing the guidance as long as eight plant specific actions and seven topical report condition items were implemented. On July 21, 2011, the NRC issued Regulatory Issue Summary 2011-07, "License Renewal Submittal Information for Pressurized Water Reactor Internals Aging Management," to inform the industry about the availability of MRP-227 as an acceptable approach for aging management of reactor vessel internals for license renewal. On December 16, 2011, the NRC issued Revision 1 of the Safety Evaluation Report to incorporate technical changes required to ensure the final approved version of MRP-227 (i.e. MRP-227-A) included all NRC required changes.

On December, 22, 2011, the licensee submitted a letter to the NRC formally revising the original license renewal commitment to implement a program in accordance with the recently approved MRP-227-A. However, the licensee requested additional time for the implementation of the plant specific MRP-227-A program as approved by the NRC. The licensee requested to extend the due date for the submittal of the Unit 3 inspection plan until December 31, 2012, and Unit 4 inspection plan prior to the period of extended operation of this Unit (April 10, 2013). The licensee also informed the NRC of their plans to revise the original license renewal commitment under the controls of 10 CFR 50.59.

The inspectors reviewed the licensing basis and available program documents to verify that this program was implemented in accordance with the revised commitment as described in the letter submitted to the NRC in December 2011. The inspectors also interviewed plant and corporate personnel to assess the implementation of the Reactor Vessel Internals Inspection Program. The inspectors identified an observation associated with the completion status of this program which is discussed in further details in section 4OA5.1.b(2) of this inspection report.

Small Bore Class 1 Piping Inspection (UFSAR Section 16.1.7 and Commitment No. 7 in NRC Memorandum): This commitment specified that prior to the end of the initial operating license term, a volumetric inspection of a sample of small bore Class 1 piping and nozzles would be performed to determine if cracking is an aging effect requiring management during the period of extended operation. This one-time inspection would address Class 1 piping less than four inches in diameter.

In letter L-2011-265 to the NRC dated August 16, 2011, the licensee revised this commitment to state "A volumetric inspection of a sample of small bore Class 1 piping and nozzles will be performed to determine if cracking is an aging effect requiring management during the period of extended operation. If an acceptable volumetric technique is not available to perform a volumetric inspection for socket welds, a destructive examination may be performed. For each socket weld that is destructively examined credit may be taken as being equivalent to volumetrically examining two socket welds. This one-time inspection will address Class 1 piping less than 4 inches nominal pipe size (less than NPS 4) and greater than or equal to NPS 1." This commitment change was consistent with Revision 2 of NUREG-1801, "Generic Aging Lessons Learned Report," program XI.M35.

The UFSAR supplement for license renewal stated that based on the results of these inspections, the need for additional inspections or programmatic corrective actions would be established. The UFSAR also stated that a report describing the details of the inspection plan would be submitted to the NRC prior to the implementation of this inspection. Program Basis Document PTN-ENG-LRAM-00-0039 identified evaluation PTN-ENG-SENS-11-062, "Turkey Point, Units 3 and 4 ASME Code Class 1 Small-Bore Piping One Time Inspection Plan", as providing the specific requirements for the inspections.

The inspectors reviewed the licensing basis, program basis documents, implementing procedures, applicable condition reports, and work orders; and interviewed the responsible plant personnel regarding these documents to verify that the program had been implemented as described in the license renewal application and approved in the NRC Safety Evaluation Report.

The status of administrative action items associated with the implementation of this commitment was considered "complete" for Unit 3 in the licensee's CAP; and open action items existed in the licensee's action tracking system to perform the one-time inspections in Unit 4 prior to the period of extended operation of this Unit. The inspectors identified an observation associated with the implementation of this program in section 4OA5.1.b(3) of this report.

Containment Cable Inspection Program (UFSAR Section 16.1.8): The UFSAR supplement for license renewal specified that the Containment Cable Inspection Program manages potential aging of non-environmentally qualified cable, connections, and penetrations through the implementation of periodic visual inspections of in-scope cables located in the containment structures that may be installed in adverse localized environments. The UFSAR also specified that the inspections would be implemented prior to the period of extended operation for Units 3 and 4. The latest revision of the UFSAR also included accessible low-voltage-environmentally-qualified cable from instrumentation and control applications as part of the scope of this program.

Program Basis Document PTN-ENG-LRAM-01-0044 documented the activities credited for the containment cable inspection program. Procedure SPEC-E-020, "Containment Cable Inspection Program," provided instructions for inspection and assessment of in-scope cables, connections, and electrical penetrations that are subject to adverse localized environments caused by heat or radiation in containment.

The inspectors reviewed the licensing basis, program basis documents, implementing procedures, applicable condition reports, and work orders; and interviewed the responsible plant personnel regarding these documents. The inspectors verified that the licensee developed procedures and conducted inspections as described in the Program Basis Document and the UFSAR. The inspectors also verified that the inspections were appropriately scheduled and tracked to meet the required inspection period.

The status of administrative action items associated with the implementation of this commitment was considered "complete" for Units 3 and 4 in the licensee's CAP.

ASME Section XI, Subsections IWB, IWC, and IWD Inservice Inspection Program (UFSAR Section 16.2.1.1): The UFSAR supplement for license renewal specified that the existing American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME BPVC), Section XI Inservice Inspection Program, Subsections IWB, IWC, and IWD would identify and correct degradation in Class 1, 2, and 3 components and piping. The program would manage the aging effects of loss of material, cracking, and loss of mechanical closure integrity. The program would provide for inspection and examination of accessible components, including welds, pump casings, valve bodies, steam generator tubing, and pressure-retaining bolting. This program would be enhanced to require visual VT-1 examinations of the core support lugs during the period of extended operation.

The inspectors reviewed the licensing basis, program basis documents, implementing procedures, examination records, and related corrective actions; and interviewed the responsible plant personnel regarding these documents to verify that the program was implemented as described in the license renewal application and NRC Safety Evaluation Report.

The status of administrative action items associated with the implementation of this commitment was considered "complete" for Units 3 and 4 in the licensee's CAP.

Boraflex Surveillance Program (UFSAR Section 16.2.2 and Commitment No. 8 in NRC Memorandum): This commitment specified that the Boraflex Surveillance Program would manage the aging effect of change in material properties, resulting in Boron depletion of the Boraflex neutron poison material in the spent fuel storage racks. The

program would be enhanced to provide for density testing (or other approved testing methods if available) of the encapsulated Boraflex material in the spent fuel storage racks prior to the end of the initial operating license terms for Units 3 and 4.

The inspectors reviewed document PTN-ENG-LRAM-00-0040, "Boraflex Surveillance Program-License Renewal Program Basis Document," which contained the results of the Boraflex density testing performed. The inspectors noted that the licensee performed Boraflex density testing in November 2000 on Unit 3 spent fuel racks as documented in condition report (CR) 2001-0234. Testing was again performed in 2004 as documented in CR 2004-3226. The third and final test on Unit 3 was performed in March 2007 and documented in CR 2007-40769. Density testing was also performed on Unit 4 spent fuel racks in May 2010 and the results were transmitted to the NRC on letter L-2010-173 dated August 5, 2010.

In January 2006, FPL submitted a Boraflex Remedy license amendment request to remove reliance on Boraflex as a neutron absorber material and take credit for Metamic inserts and other administrative controls to maintain subcriticality in the spent fuel racks. The license amendment was approved by the NRC and issued in July 2007. Plant modification PC/M 07-010 was completed and provided for the physical insertion of neutron absorbing material Metamic into the Units 3 and 4 spent fuel storage racks. In August of 2010 the Boraflex was no longer credited as a neutron absorber for the spent fuel racks and Metamic inserts were now credited as neutron absorbers for the spent fuel racks.

The change in neutron absorbing material constituted a change to the original license renewal commitment, which was addressed through the license amendment process. The inspectors noted that the licensee developed a surveillance program for monitoring the physical properties of Metamic and it was included as an AMP in the UFSAR supplement for license renewal. The periodic testing for aging management of the Metamic inserts was described in plant procedure 0-OSP-034.3, "METAMIC Insert Surveillance."

The status of administrative action items associated with the implementation of this commitment was considered "complete" for Units 3 and 4 in the licensee's CAP.

Boric Acid Wastage Surveillance Program (UFSAR Section 16.2.3 and Commitment No. 9 in NRC Memorandum): This commitment specified that prior to the end of the initial operating license term, the scope of the Boric Acid Wastage Surveillance Program would be enhanced to include systems and components outside containment. The specific systems referred to in the NRC Safety Evaluation Report were the spent fuel pool cooling system and the waste disposal system.

The UFSAR supplement for license renewal stated that the Boric Acid Wastage Surveillance Program manages the aging effects of loss of material and mechanical closure integrity due to aggressive chemical attack resulting from borated water leaks. The UFSAR also stated that the program addresses the reactor coolant system and structures and components containing, or exposed to, borated water. The program would utilize systematic inspections, leakage evaluations, and corrective actions to ensure that boric acid corrosion does not lead to degradation of pressure boundary or structural integrity of components, supports, or structures, including electrical equipment in proximity to borated water systems. Program Basis Document PTN-ENG-LRAM-00-

0028 identified various procedures including 0-ADM-537, "Boric Acid Corrosion Control Program," as providing the specific program requirements to identify and manage boric acid leakage on plant components.

The inspectors reviewed the licensing basis, program basis documents, implementing procedures, applicable condition reports, and work orders; and interviewed the responsible plant personnel regarding these documents. The inspectors verified that the spent fuel pool cooling system and the waste disposal system were included in 0-OSP-207.2, "Visual Inspection of Systems Outside Containment." The inspectors also verified that this surveillance was appropriately scheduled and tracked to meet the inspection period described in the application.

The status of administrative action items associated with the implementation of this commitment was considered "complete" for Units 3 and 4 in the licensee's CAP.

Containment Spray System Piping Inspection Program (UFSAR Section 16.2.5): The UFSAR supplement for license renewal specified that the Containment Spray System Piping Inspection Program would manage the aging effect of loss of material due to general, crevice, and pitting corrosion on the internal surfaces of carbon steel piping and fittings, and valves wetted by boric acid in the containment spray system spray headers. Periodic ultrasonic examinations of selected locations would be used to determine wall thickness and would be evaluated to ensure that minimum thickness requirements are maintained. Program Basis Document PTN-ENG-LRAM-00-0029 documented the requirements of the containment spray system piping inspection program. The program included inspections using standard non-destructive examination procedures.

The inspectors reviewed the licensing basis, program basis documents, implementing procedures, applicable condition reports, and work orders; and interviewed the responsible plant personnel regarding these documents. The inspectors verified that the licensee was periodically inspecting the containment spray piping by examining the most susceptible locations, in order to identify and manage degradation in the system.

The status of administrative action items associated with the implementation of this commitment was considered "complete" for Units 3 and 4 in the licensee's CAP.

Fatigue Monitoring Program (UFSAR Section 16.2.7): The UFSAR described the Fatigue Monitoring Program as an existing program designed to track cyclic and transient occurrences to ensure that reactor coolant system pressure boundary components remained within ASME BPVC, Section III fatigue limits. The specific fatigue analyses validated by this AMP included the reactor vessels, reactor vessel internals, pressurizers, steam generators, reactor coolant pumps, and the pressurizer surge lines. The program was considered a confirmatory program in that it compared the tracked cyclic and transient occurrences to the existing design frequency limits.

Several TLAAs, including the ASME Section III Class 1 Components and Environmentally Assisted Fatigue (EAF), referenced the Fatigue Monitoring Program as a confirmatory program to ensure that design fatigue limits are not exceeded during the period of extended operation. Fatigue cumulative usage factors (CUFs) for the critical locations in the Turkey Point Units 3 and 4 Nuclear Steam Supply System components were determined using design cycles that were specified in the plant design process. In performing the TLAAs, the licensee demonstrated that the analyzed reactor coolant



system components would remain below a fatigue CUF of 1.0 during the extended period of operation.

The inspectors reviewed the licensing basis, program basis documents, implementing procedures, applicable condition reports and interviewed the responsible plant personnel regarding these documents. The inspectors verified that the current scope of structures, systems, and components was consistent with those listed in the license renewal application.

In accordance with the licensee's response to a request for additional information (RAI) submitted by the NRC during the review of the application (Letter L-2001-75 to the NRC, dated April 19, 2001), the inspectors verified that for the pressurizer spray nozzles, the reactor pressure vessel shells at the core support pads, and the reactor vessel outlet nozzles, the acceptance criteria for the plant loading and unloading cycles was based on projected cycles, not design cycles. The inspectors also verified that the program contained administrative controls to notify plant management and initiate an engineering evaluation when plant cycles come to within 80% of projected cycles.

Additionally, the inspectors reviewed program documents and completed work orders to verify that three open items associated with the TLAA for environmentally assisted fatigue were completed at the time of the inspection. This included (1) performing inspections on all pressurizer surge line welds on both units and using the results as input to an inspection program that was submitted to the NRC prior to the licensee entering the PEO; (2) performing a more refined evaluation for the reactor pressure vessel outlet nozzles and the reactor pressure vessel shell at the core support pads to show acceptable CUFs for 60 years; and (3) performing a more refined evaluation using a detailed finite element model for the pressurizer spray nozzle to show acceptable CUFs for 60 years.

The status of administrative action items associated with the implementation of this commitment was considered "complete" for Units 3 and 4 in the licensee's CAP. The inspectors identified two observations associated with the implementation of this program, which are discussed in further details in sections 4OA5.1.b(4) and 4OA5.1.b(5) of this report.

Fire Protection Program (UFSAR Section 16.2.8 and Commitment No. 10 in NRC Memorandum): This commitment specified that the scope of the Fire Protection Program would be enhanced to include inspection of additional components prior to the end of the initial operating license period. Additionally, in response to NRC RAI 3.9.8-3, the licensee committed to perform testing of wet pipe sprinkler heads following the guidance of the National Fire Protection Association (NFPA) Code (NFPA-25), commencing in the year 2022. Section 2-3 of the referenced NFPA-25 Code stated, in part, that sprinklers that have been in service for 50 years shall be replaced or representative samples from one or more areas shall be submitted for field service testing.

The licensee determined that the commitment to enhance the scope of Fire Protection Program to include inspection of additional components was met by revising procedure 0-PMM-016.1, "Diesel Fire Pump Engine 18 Month Maintenance Inspection," to add the inspection of the rubber expansion joints on the suction and discharge of the diesel fire pump engine piping for evidence of cracking or drying. As discussed in the NRC Safety

Evaluation Report, all other components having aging effects requiring management under the existing Fire Protection Program were included in the scope of the program. With regard the testing of wet pipe sprinkler heads per NFPA-25, the licensee opted to not perform the test and replace the sprinkler heads in Units 3 and 4 as allowed by the NFPA Code.

The inspectors reviewed the licensing basis, program basis documents, implementing procedures and relevant condition reports to verify that the program was implemented as stated in the license renewal application and the NRC Safety Evaluation Report. The inspectors verified that these requirements were adequately translated into the UFSAR. The inspectors verified that program documents were administratively updated to reflect their applicability to the license renewal program, interviewed the responsible plant personnel regarding this program and verified that the required procedural updates listed in the commitment were implemented.

The status of administrative action items associated with the implementation of this commitment was considered "complete" for Units 3 and 4 in the licensee's CAP.

Flow Accelerated Corrosion Program (UFSAR Section 16.2.9 and Commitment No. 11 in NRC Memorandum): This commitment specified that prior to the period of extended operation for Units 3 and 4, the existing Flow Accelerated Corrosion Program would be enhanced to address internal and external loss of material of steam trap lines due to flow accelerated corrosion and general corrosion, respectively. The UFSAR description of this AMP stated that the program manages the aging effect of loss of material due to flow accelerated corrosion in high energy carbon steel piping associated with the main steam and turbine generators, and feedwater and blowdown systems.

The inspectors reviewed the licensing basis, program basis documents, administrative and implementing procedures, license renewal drawings, and self-assessments to verify that the program was developed as described in the license renewal application and the corresponding NRC Safety Evaluation Report. The inspectors interviewed licensee personnel to discuss the selection process of steam trap lines within the scope of the program and verify consistency with the licensing basis. The inspectors also reviewed a sample of non-destructive examinations of steam trap lines in Unit 3 to verify that the examination and evaluation of results were performed in accordance with the implementing procedures.

The status of administrative action items associated with the implementation of this commitment was considered "complete" for Units 3 and 4 in the licensee's CAP. The inspectors identified two observations associated with the implementation of this program, which are discussed in further details in sections 4OA5.1.b(6) and 4OA5.1.b(7) of this report.

Intake Cooling Water System Inspection Program (UFSAR Section 16.2.10 and Commitment No. 12 in NRC Memorandum): This commitment specified that the Intake Cooling Water System Inspection Program would be enhanced to improve documentation of scope and frequency of the intake cooling water piping crawl-through inspections and component cooling water heat exchanger tube integrity inspections prior to the end of the initial operating license terms for Turkey Point Units 3 and 4. The program would manage the aging effects of loss of material due to various corrosion mechanisms and biological fouling of intake cooling water system components. The

program would include inspections, performance testing, evaluations, and corrective actions that are performed as the result of licensee commitments to NRC Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment."

The inspectors reviewed Program Basis Document PTN-ENG-LRAM-00-0031, which described the enhancements taken to meet the license renewal commitment. The inspectors also reviewed the Intake Cooling Water Inspection Program implementing documents which included revised enhanced plant procedures, various engineering specifications, preventive maintenance tasks, and model work orders to verify that the program was implemented as described in the license renewal application and NRC Safety Evaluation Report.

The inspectors reviewed procedure 0-PMM-019.7, "Intake Cooling Water Basket Strainer Cleaning and Inspection," which had been revised to include inspection of the basket strainers for enhanced inspection and acceptance criteria for corrosion. The existing intake cooling water piping inspection guidelines (STD-ESI-92-002) were replaced by new specification SPEC-M-086, "Intake Cooling Water System Piping." The specification included: inspection criteria, repair methods, a basis for determining and documenting inspection frequency and scope, a method to document the inspection results and repairs; and provided for sketches to document inspection results. In addition, it referenced PTN-ENG-LRAM-00-0031 as a commitment document.

The inspectors also reviewed new engineering specification SPEC-M-081, "Component Cooling Water Heat Exchangers Tube Integrity Inspection," which had been developed for performance of the component cooling water heat exchanger tube integrity inspection. It included a basis for determining and documenting inspection frequency and scope, a method to document the inspection results and repairs, and defined the applicability of existing safety evaluations. In addition, it referenced PTN-ENG-LRAM-00-0031 as a commitment document.

The status of administrative action items associated with the implementation of this commitment was considered "complete" for Units 3 and 4 in the licensee's CAP.

Periodic Surveillance and Preventive Maintenance Program (UFSAR Section 16.2.11 and Commitment No. 13 in NRC Memorandum): This commitment specified that prior to the end of the initial operating license term, specific enhancements to the scope and documentation of some inspections performed under the Periodic Surveillance and Preventive Maintenance Program would be implemented. A specific list of these enhancements was included in licensee letter L-2001-65 to the NRC, dated April 19, 2001, in response to RAI 3.9.11-3.

The UFSAR supplement for license renewal stated that the Periodic Surveillance and Preventive Maintenance Program manages the aging effects of loss of material, cracking, fouling buildup, loss of seal, and embrittlement for systems, structures, and components. The scope of the program would provide for visual inspection and examination of selected surfaces of specific components and structural components. The program would also include leak inspection of limited portions of the chemical and volume control systems. Additionally, the program would provide for replacement/refurbishment of selected components on a specified frequency, as appropriate. Program Basis Document PTN-ENG-LRAM-00-0043 identified applicable

procedures, providing the specific inspection requirements to identify and manage aging of plant components that require periodic inspection.

The inspectors reviewed the licensing basis, program basis documents, implementing procedures, applicable condition reports, and work orders; and interviewed the responsible plant personnel regarding these documents. The inspectors verified that the appropriate procedures had been enhanced as described in letter L-2001-65. The inspectors also verified that the inspections were appropriately scheduled and tracked to meet the required inspection period.

The status of administrative action items associated with the implementation of this commitment was considered "complete" for Units 3 and 4 in the licensee's CAP.

Reactor Vessel Integrity Program (UFSAR Section 16.2.13 and Commitment No. 14 in NRC Memorandum): This commitment specified that prior to the period of extended operation, program documentation would be enhanced to integrate all aspects of the Reactor Vessel Integrity Program. The UFSAR stated that this program manages reactor vessel irradiation embrittlement and encompasses four subprograms:

- *Reactor Vessel Surveillance Capsule Removal and Evaluation* – This subprogram was credited with managing the aging effect of reduction in fracture toughness on the reactor vessel materials (beltline forgings and circumferential welds) due to neutron irradiation embrittlement by performing Charpy V-notch and tensile test on the reactor vessel irradiated specimens. This was an integrated program between both units so that data from samples from either unit can be used for both units.
- *Fluence and Uncertainty Calculations* – This subprogram was credited with providing an accurate prediction of the Turkey Point Units 3 and 4 reactor vessels accumulated fast neutron fluence values at the reactor vessel beltline forgings and circumferential welds for use in the development of the pressure-temperature limit curves and pressurized thermal shock calculations.
- *Monitoring Effective Full Power Years (EFPYs)* – This subprogram was credited with monitoring and tabulating the accumulated operating time experienced by the reactor vessels to ensure that the pressure-temperature limits and end-of-life reference temperatures are not exceeded during the life of each unit. This program ensured that the power history was within  $\pm 0.3$  effective full power days of the plant computer generated value and determined the period of time for which the pressure-temperature limit curves were applicable.
- *Pressure-Temperature Limit Curves* – This subprogram was credited with providing pressure-temperature limit curves for the Turkey Point Units 3 and 4 reactor vessels to establish the reactor coolant system operating limits. These curves were included in their respective unit's Technical Specifications and are used to prevent or minimize the potential of damaging the reactor vessel materials.

The inspectors reviewed the licensing basis, program basis documents, implementing procedures, applicable condition reports and interviewed the responsible plant personnel regarding these documents. The inspectors verified that changes made to the capsule

removal schedule were in accordance with 10 CFR 50, Appendix H and that appropriate notifications were made to the NRC in a timely manner. The inspectors verified, through review of program documentation and calculations performed, that the four above mentioned subprograms encompassed all aspects of the Reactor Vessel Integrity Program, including appropriate inspection schedules and acceptance criteria.

The status of administrative action items associated with the implementation of this commitment was considered "complete" for Units 3 and 4 in the licensee's CAP.

Systems and Structures Monitoring Program (UFSAR Section 16.2.15 and Commitment No. 15 in NRC Memorandum): The UFSAR supplement for license renewal stated that the Systems and Structures Monitoring Program manages the aging effects of loss of material, cracking, fouling, loss of seal, and change in material properties. The program would provide for periodic visual inspection and examination for degradation of accessible surfaces of specific systems, structures, and components, and corrective actions as required based on these inspections. This program would be enhanced for license renewal by restructuring it to address inspection requirements to manage certain aging effects in accordance with 10 CFR 54, modifying the scope of specific inspections, and improving documentation requirements prior to the end of the initial operating license terms for Turkey Point Units 3 and 4.

The inspectors reviewed Program Basis Document PTN-ENG-LRAM-00-0042, which described the program and the enhancements performed. The inspectors also reviewed documents 0-ADM-561, "Structures Monitoring Program," and 0-ADM-564, "Systems/Programs Monitoring." These procedures were developed to implement the license renewal enhancements. The program provided guidance for periodic visual inspections and examination for degradation of accessible surfaces of specific systems, structures, and components, and corrective actions as required based on these inspections. Preventive maintenance actions were generated to schedule these inspection activities.

The inspectors reviewed a sample of documented results from system walk-downs performed by system engineers to verify that the program was implemented in accordance with the license renewal application and the NRC Safety Evaluation Report. The licensee completed the in-scope structural walk-downs prior to the period of extended operation for Unit 3.

The status of administrative action items associated with the implementation of this commitment was considered "complete" for Unit 3 in the licensee's CAP; and open action items existed in the licensee's action tracking system to perform the structural walk-downs in Unit 4 prior to the period of extended operation of this Unit.

Thimble Tube Inspection Program (UFSAR Section 16.2.16): The UFSAR supplement for license renewal stated that the Thimble Tube Inspection Program manages the aging effect of material loss due to fretting wear. This program would consist of an eddy current test inspection of thimble tube N-05 on Unit 3 prior to the end of the initial operating license term of this Unit.

Program Basis Document PTN-ENG-LRAM-00-0030 documented the requirements of the Thimble Tube Inspection Program. Inspections were performed using procedures 3-

GMI-059.4, “Flux Map Thimble Tube Eddy Current Test (ECT)” and procedures 4-GMI-059.4, “Flux Map Thimble Tube Eddy Current Test (ECT)”.

The inspectors reviewed the licensing basis, program basis documents, implementing procedures, applicable condition reports, and work orders; and interviewed the responsible plant personnel regarding these documents. The inspectors verified the licensee performed the eddy current inspection on thimble tube N-05. This inspection identified degradation as documented in CR 2004-11271. Since degradation was identified in thimble tube N-05 and other examined locations that could not be demonstrated to last throughout the period of extended operation, the thimble tube inspection program was converted into a periodic inspection program in order to properly manage aging. This program was controlled through procedure BMI-FTT-IP, “Bottom Mounted Instrumentation Flux Thimble Tubing Inspection Program.”

The status of administrative action items associated with the implementation of this commitment was considered “complete” for Units 3 and 4 in the licensee’s CAP. The inspectors identified an observation regarding the program description in the latest revision of the UFSAR, which is discussed in more details in section 4OA5.4.b(1) of this report.

UFSAR Section 16.3 – Time-Limited Aging Analysis Activities: The inspectors selected a sample of TLAAs to verify that any pending actions identified during the review of the license renewal application and due prior to the period of extended operation were completed as described in the license renewal application and the NRC Safety Evaluation Report. The TLAAs selected for review are listed below:

- UFSAR Section 16.3.1 – Reactor Vessel Irradiation Embrittlement
  - Pressurized Thermal Shock
  - Upper-Shelf Energy
  - Pressure-Temperature Limits
- UFSAR Section 16.3.2 – Metal Fatigue
  - ASME BPVC, Section III, Class 1 Components
  - Reactor Vessel Underclad Cracking
  - Reactor Coolant Pump Flywheel
  - ANSI B31.1 Piping
  - Environmentally Assisted Fatigue
- UFSAR Section 16.3.5 – Containment Liner Plate Fatigue
- UFSAR Section 16.3.6 – Bottom Mounted Instrumentation Thimble Tube Wear
- UFSAR Section 16.3.8 – Leak-Before-Break For Reactor Coolant System Piping

b. Findings and Observations

No findings were identified.

On the basis of the sample selected for review, the inspectors determined that the licensee had completed, or was on track to complete, the necessary tasks to meet the license renewal commitments, license conditions, and regulatory requirements associated with the issuance of the renewed operating license at Turkey Point Nuclear

Plant Units 3 and 4. Based on the review of program documents and activities completed at the time of this inspection, and with the exception of the Reactor Vessel Internals Inspection Program, the inspectors determined that the licensee had established the required programs to manage aging effects of in-scope structures, systems, and components in order to maintain their function(s) through the period of extended operation of Units 3 and 4. Based on the inspection sample, the inspectors determined that the licensee completed all the required inspection activities required for Unit 3 prior to the period of extended operation of this Unit. Some commitments and AMPs had pending actions remaining for Unit 4, for which task items existed in the Corrective Action Program or work control process to track their completion prior to the period of extended operation of this Unit in April 2013.

The inspectors identified seven observations associated with the implementation of certain Aging Management Programs. As discussed below, some of the observations, if identified in the PEO, would have been considered for screening and evaluation of performance deficiencies in accordance with NRC Inspection Manual Chapter 0612, "Power Reactor Inspection Reports." These seven observations were entered into the CAP for resolution. Observations (1), and (4) through (7) were corrected prior to the end of this inspection. Observations (2) and (3) remained open at the time of this inspection and are subject to follow-up during future license renewal inspections to provide reasonable assurance that the license renewal commitments are met and that the aging effects of in-scope structures, systems, and components would be managed during the period of extended operation.

- (1) Observation for Emergency Containment Coolers Inspection – In its response to RAI 3.8.3-3 and as discussed in section 3.8.3.2 of the NRC Safety Evaluation Report, the licensee stated that the minimum wall thickness to be used for the acceptance criteria of the ECC tubes would consist of the minimum wall thickness (as calculated using ASME BPVC, Section III, Class C) plus a margin based on actual erosion rate. The inspectors reviewed AR 1626907, Assignment 4.11, which provided an evaluation of the acceptability of the ECC tubes through the PEO, and noted that the licensee did not add the safety margin based on actual erosion rate as described in the response to RAI 3.8.3-3. The licensee had performed a volumetric examination of the 4B ECC, which provided actual data for the erosion rate of the tubes. The inspectors noted that the licensee applied the minimum wall thickness as calculated in ASME Section III, Class C (0.010-inch) in all the evaluations without adding the safety margin that was referenced in RAI 3.8.3-3.

In response to this observation, the licensee revised the calculation for the acceptance criteria, including the safety margin, and found it to be 0.017-inch. The revised acceptance criteria was below the lowest wall thickness reading of 0.39-inch taken for all the tubes during the volumetric exam of the 4B ECC and below the lowest predicted wall thickness measurement. Based on the erosion rate data available at the time of this inspection, the use of the incorrect acceptance criteria would not represent an operability concern during the period of extended operation. However, had the licensee implemented the original acceptance criteria (0.010") during the PEO, this issue would have been considered for screening and evaluation of performance deficiencies in accordance with NRC Inspection Manual Chapter 0612, "Power Reactor Inspection Reports." The licensee entered this observation into the CAP as AR 01770005 and the issue was corrected prior to the end of this inspection by revising the calculation performed under AR 1626907 to

determine and apply the appropriate acceptance criteria for minimum wall thickness, consistently with the license renewal commitment.

- (2) Reactor Vessel Internals Inspection Program – The inspectors identified that the licensee had not completely developed the Reactor Vessel Internals Inspection Program as described in the latest correspondence submitted to the NRC in December 2011, revising the original license renewal commitment to adopt the guidelines in MRP-227-A. The inspectors noted that the licensee was still working on several tasks associated with the plant specific actions necessary to meet the guidelines in MRP-227-A. Other key action items that still needed completion were to develop implementing procedures and submit specific inspection plans for Units 3 and Unit 4. While the licensee was on track to meet the commitment within the timeframe requested in the December 2011 letter (i.e. no later than December 31, 2012 for Unit 3 and prior to April 10, 2013 for Unit 4), the inspectors determined that the licensee did not have a final inspection program in place for both Units. Therefore, this commitment is subject to further NRC inspection during future license renewal inspections to verify that corrective actions have been taken to develop and implement the program in accordance with the revised license renewal commitment.
- (3) Observation for Small Bore Class 1 Piping And Nozzles Inspections – Program Basis Document PTN-ENG-LRAM-00-0039 stated that the inspection of in-scope small bore piping would be performed at a sufficient number of locations to ensure an adequate sample. This number, or sample size, would be based on susceptibility, accessibility, dose considerations, operating experience, and limiting locations of the total population of ASME Code Class 1 small-bore piping inspections. The Program Basis Document further stated that the inspection sample size would be at least 3%, 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. The inspectors noted that, inconsistently with the intent of the program, the licensee selected five socket welds within a single pipe segment approximately one foot long. The inspectors were concerned that the single location or similar weld types selected for destructive examination did not constitute a representative sample on which to base a determination that no aging effects were present in general. This issue, if identified during the PEO, would have been considered for screening and evaluation of performance deficiencies in accordance with NRC Inspection Manual Chapter 0612, “Power Reactor Inspection Reports.” The licensee entered this issue into the CAP as AR 01770267 for Unit 3 and AR 01629607-08-14 for the inspections yet to be completed for Unit 4. This issue is subject to further NRC inspection during future license renewal inspections to verify that corrective actions have been taken to select a representative sample of welds as described in the program documents.
- (4) Observation for Fatigue Monitoring Program – The inspectors identified that the implementing procedures for the Fatigue Monitoring Program did not contain guidance to initiate corrective actions when fatigue design limits were approached. Specifically, the license renewal application stated that administrative action was required should the actual fatigue cycle count reach 80% of any design cycle limit. Additionally, the UFSAR stated that, “Guidance is provided in the event that design cycle limits are approached.” The inspectors noted that, inconsistently with the



UFSAR, the only proceduralized instruction was to notify management when this 80% threshold was reached and no further guidance or required actions were listed. This issue, if identified during the PEO, would have been considered for screening and evaluation of performance deficiencies in accordance with NRC Inspection Manual Chapter 0612, "Power Reactor Inspection Reports." This observation was captured in the licensee's CAP as AR 01769755 and the issue was corrected before the end of this inspection by adding specific guidance on the implementing procedures to initiate an Action Request when this situation occurs to be evaluated by engineering.

- (5) Observation for Fatigue Monitoring Program – In response to an RAI submitted by the NRC during the review of the application (Letter L-2001-75 to the NRC, dated April 19, 2001), the licensee committed to take specific actions when 80% of the fatigue cycle limits for Unit loading or unloading at 5% power per minute was reached. Turkey Point Units 3 and 4 had unique fatigue cycle limits for both loading and unloading transients. In procedure 0-ADM-553, the 80% action level was based upon the higher number of cycles between the two units for loading and unloading (2720 for loading based on Unit 3 and 2190 for unloading based on Unit 4). These action levels were uniformly applied to both units; however, using these action levels would lead to action being taken at greater than 80% of the fatigue cycle limits for loading on Unit 4 and unloading on Unit 3. This issue, if identified during the PEO, would have been considered for screening and evaluation of performance deficiencies in accordance with NRC Inspection Manual Chapter 0612, "Power Reactor Inspection Reports." This observation was captured in the licensee's CAP as AR 01769755 and the issue was corrected before the end of this inspection by revising the implementing procedures to use the lower number of cycles between the two units for loading and unloading as the threshold for further action.
- (6) Observation for Flow Accelerated Corrosion Program – As described in section 16.2.9 of the UFSAR supplement for license renewal, this program was enhanced to manage loss of material on the internal and external surfaces of steam trap lines. The inspectors identified that examination reports for digital radiographic exams did not always specify if loss of material was on the external or internal surface of the pipe. The inspectors were concerned about the lack of detail in the characterization of examination results, which could impact the adequacy of evaluations performed to accept material conditions for continuous operation since the aging mechanisms of concern and their erosion/corrosion rates are generally different for the internal and external surfaces. The licensee captured this observation in the CAP as AR 1770566 and the issue was corrected prior to the end of this inspection by revising the digital radiographic exam report template to require a description of whether the corrosion was found on the external or internal surfaces.
- (7) Observation for Flow Accelerated Corrosion Program – The inspectors noted that Program Basis Document PTN-ENG-LRAM-00-0033 and procedure ENG-FAC 2.3-3 stated that the scope of the program was revised to include portions of the Auxiliary Steam System within the scope of license renewal in response to open items discussed in the NRC Safety Evaluation Report (Letter L-2001-236 to the NRC dated November 1, 2001). The inspectors identified that none of the program implementing procedures included a specific description of the piping sections added to the program, which did not provide reasonable assurance that the scope

of the program was adequately described in the implementing procedures. This issue, if identified during the PEO, would have been considered for screening and evaluation of performance deficiencies in accordance with NRC Inspection Manual Chapter 0612, "Power Reactor Inspection Reports." The licensee captured this observation in the CAP as AR 1770566 and the issue was corrected prior to the end of this inspection by revising the scope of the implementing procedures.

## .2 License Renewal Commitment Changes

### a. Inspection Scope

As part of the review of license renewal commitments, Aging Management Programs, and Time-Limited Aging Analyses described in section 4OA5.1.a of this report, the inspectors reviewed license renewal commitment change documents to verify the licensee followed the guidance in NEI 99-04, "Guidelines for Managing NRC Commitment Changes," for any change to (or elimination of) the commitments. The inspectors 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 inspectors 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.

### b. Findings and Observations

On the basis of the sample selected for review, the inspectors determined that the licensee followed the established plant procedures to modify license renewal commitments, which referenced the guidance in NEI 99-04. Commitment changes were implemented against the guidance in NEI 99-04 and formal notification was submitted to the NRC where applicable. For changes to AMP descriptions in the UFSAR supplement, the licensee implemented such changes under the controls of 10 CFR 50.59. Additionally, for changes affecting the plant Technical Specifications, the licensee used the license amendment process pursuant to 10 CFR 50.90.

## .3 Newly Identified Structures, Systems, and Components (SSCs)

### a. Inspection Scope

In accordance with 10 CFR 54.37(b), after the renewed license is issued, the FSAR update required by 10 CFR 50.71(e) must include any "newly identified" SSCs that would have been subject to an aging management review or evaluation of Time-Limited Aging Analyses in accordance with 10 CFR 54.21. The FSAR update must describe how the effects of aging will be managed such that the intended function(s) in 10 CFR 54.4(b) will be effectively maintained during the period of extended operation.

The inspectors discussed the identification of new SSCs under the purview of 10 CFR 54.37(b) with the licensee's staff. The inspectors also reviewed an evaluation performed by the licensee under AR 01626907-39, which assessed the applicability of "newly

identified” SSCs described in Regulatory Issue Summary 2007-16 and other SSCs identified by the licensee through self-assessments. The inspectors also reviewed an assessment of plant modifications performed from the time the license renewal application was submitted to the time the renewed operating license was issued to identify any potentially new SSCs that would have been subject to aging management review at the time the NRC was reviewing the LRA. Finally, the inspectors reviewed licensee procedure LI-AA-207-1001, which was developed to continuously ensure compliance with 54.37(b) during the period of extended operation.

b. Findings and Observations

No findings were identified.

On the basis of the sample selected for review, the inspectors determined that the licensee took appropriate actions to assure “newly identified” SSCs were identified and evaluated for management of aging affects. Based on the review of NRC Generic Communications and licensee self-assessments, the inspectors determined that no “newly identified” SSCs had been identified that would have been subject to aging management during the preparation of the original license renewal application and subsequent revisions. Additionally, the inspection team did not identify any new SSCs that were subject to the provisions of 10 CFR 54.37(b) during the independent review of commitments and Aging Management Programs described in section 4OA5.1.a of this report.

.4 Description of Aging Management Programs in the UFSAR Supplement

a. Inspection Scope

As part of the review of implementation activities for the selected AMPs described in section 4OA5.1.a of this report, the inspectors reviewed the corresponding UFSAR sections to verify that the program descriptions were consistent with the licensing basis. The inspectors reviewed three versions of the UFSAR supplement for license renewal as follows:

- The inspectors reviewed the last revision of the UFSAR supplement submitted with the license renewal application to identify the program attributes and future inspection activities that were originally relied upon for the approval of the renewed operating license. This revision of the UFSAR was submitted to the NRC in FPL Letter L-2001-236, dated November 1, 2001.
- The inspectors reviewed the last revision of the UFSAR submitted to the NRC pursuant to the requirements in 10 CFR 50.71(e)(4) to verify that the UFSAR supplement for license renewal was included with the updated FSAR as required by the renewed operating license. This revision of the UFSAR was submitted to the NRC in FPL Letter L-2011-499, dated November 16, 2011.
- The inspectors reviewed the latest revision of the UFSAR supplement for license renewal (aka “Living FSAR”) to verify that the program attributes and inspection activities were consistent with the Aging Management Programs as originally approved by the NRC and subsequent revisions performed under the provisions

of 10 CFR 50.59. The inspectors also verified that any changes caused by the inclusion of “newly identified” SSCs were included in the UFSAR supplement.

b. Findings and Observations

No findings were identified.

With the exception of one observation described below, the inspectors did not identify inconsistencies between the AMPs approved with the renewed operating license and the latest revision of the UFSAR supplement for license renewal. The latest revision of the UFSAR supplement was revised to reflect the completion of administrative and inspection activities that were performed to meet the conditions in the renewed operating license and the license renewal commitments. The UFSAR supplement was also revised to capture the results of inspection activities and resulting programmatic changes. Additionally, the latest revision of the UFSAR submitted to the NRC pursuant to 10 CFR 50.71(e)(4) contained the supplement for license renewal as required by the renewed operating license.

- (1) Observation for Thimble Tube Inspection Program – As described in section 4OA5.1.a of this report, the original commitment was to perform a one-time inspection of thimble tube N-05 in Unit 3. Since degradation was identified in thimble tube N-05 and other examined locations that could not be demonstrated to last throughout the period of extended operation, the Thimble Tube Inspection Program was converted into a periodic inspection program in order to properly manage aging. The inspectors identified that this change in the Aging Management Program scope had not been adequately captured in the UFSAR update. The UFSAR only described the completion of the inspection of thimble tube N-05 in Unit 3 and did not include the programmatic changes resulting from the initial inspections (i.e. changing from a one-time inspection program to a periodic inspection program). This issue, if identified during the PEO, would have been considered for screening and evaluation of performance deficiencies in accordance with NRC Inspection Manual Chapter 0612, “Power Reactor Inspection Reports.” The licensee entered this issue into the Corrective Action Program as AR 01773604 and the affected section of the UFSAR was revised prior to the end of this inspection.

.5 Operating Experience

a. Inspection Scope

The inspectors reviewed licensee actions to address recent industry operating experience and its applicability to the existing Aging Management Programs. The renewed operating license for Turkey Point was issued in 2002 and a significant amount of industry operating experience has been identified since then. The NRC has captured relevant operating experience items, in part, in license renewal guidance documents including NUREG 1801, “Generic Aging Lessons Learned (GALL) Report,” Revision 1 and Revision 2, and various Regulatory Information Summaries. The inspectors selected the following Aging Management Programs as described in Revision 2 of the GALL Report and reviewed licensee actions to address the available operating experience for each program.

- XI.M18 Bolting Integrity Program

- XI.M23 Inspection of Overhead Heavy Load and Light Handling Systems
- XI.M24 Compressed Air Monitoring Program
- XI.M30 Fuel Oil Chemistry Program
- XI.M32 One-Time Inspections Program
- XI.M33 Selective Leaching Program
- XI.E5 Fuse Holders Program

The inspectors also reviewed licensee procedures to assess how operating experience directly associated with the management of aging effects would be continuously considered for the existing Aging Management Programs during the period of extended operation.

b. Findings and Observations

The inspectors determined that operating experience was being reviewed for applicability to the existing Aging Management Programs. For example, the licensee did not make any commitments in the original license renewal application to follow the recommendations described in the GALL Report because the application for Turkey Point was submitted prior to the first publication of the GALL Report in July 2001. However, the licensee performed a self-assessment to identify gaps between the existing Aging Management Programs and the recommendations included in Revision 2 of the GALL Report. At the time of this inspection, the licensee had not generated any specific action items in the CAP to address the gaps identified in the self-assessment. However, the inspectors noted that some Aging Management Programs were revised to adopt the recommendations in the GALL Report or reconcile the gaps with similar programmatic attributes in the existing AMPs.

The inspectors also identified that an action item was generated to revise the Operating Experience Program procedures to provide specific guidance on operating experience sources directly related to license renewal such as future revisions of the GALL Report, Interim Staff Guidance, and Generic Communications.

4OA6 Management Meetings

Exit Meeting Summary

On June 8, 2012, the inspectors presented the inspection results to Mr. Juan Pallin, Maintenance Director, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary. Proprietary material received during the inspection was returned to the licensee.

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee

J. Garcia, Engineering Director  
J. Pallin, Maintenance Director  
K. Mohindroo, License Renewal Manager  
R. Tomonto, Licensing Manager  
S. Mihalakea, Licensing Engineering  
R. Earl, License Renewal Team (Lead Contractor)  
D. Patel, License Renewal Team (Contractor)  
G. Warriner, License Renewal Team (Contractor)  
T. Satyan, License Renewal Team (Contractor)

### **LIST OF REPORT ITEMS**

#### Opened

None

#### Closed

None

#### Discussed

None

## LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety, but rather, that selected sections of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance or endorsement of the document or any part of it.

### Procedures

0-ADM-068.1, On-Line Work Prioritization Process, Rev. 8  
 0-ADM-523, ASME Section XI Pressure Tests for Quality Group A, B, C System Components, Rev. 0A  
 0-ADM-527, Reactor Material Surveillance Program, Rev. 3/18/10  
 0-ADM-530, Flow Accelerated Corrosion Inspection Implementation Program, Rev. 7/7/11  
 0-ADM-534, Auxiliary Feedwater Steam Piping Inspection Program, Rev. 0  
 0-ADM-537, Boric Acid Corrosion Control Program, Rev. 6  
 0-ADM-553, Maintaining Records for Design Cycles, Rev. 1A  
 0-ADM-557, Duties and Responsibilities of Reactor Engineers, Rev. 2  
 0-ADM-561, Structures Monitoring Program, Rev. 1A  
 0-ADM-563, Reactor Vessel Internals Aging Management Program, Rev. 0  
 0-ADM-564, Systems/Programs Monitoring, Rev. 0  
 0-ADM-717, Heavy Load Handling, Rev. 8  
 0-GMM-038.01, Fuel Transfer Tube Blind Flange Removal and Installation, Rev. 2A  
 0-GMP-102.2, Equipment Lubrication Guide, Rev. 3/23/10  
 0-GMP-102.23, Torque Methods and Guidelines, Rev. 0  
 0-OSP-034.3, METAMIC Insert Surveillance, Rev. 1  
 0-OSP-041.26, Containment Visual Leak Inspection, Rev. 5  
 0-OSP-207.2, Visual Inspection of Systems Outside Containment, Rev. 3  
 0-PME-025.02, Computer Room and Cable Spreading Room HVAC Maintenance, Rev. 0A  
 0-PME-111.1, HVAC Maintenance, Rev. 0A  
 0-PMM-013.6, Instrument Air Drain Trap Overhaul, Rev. 3  
 0-PMM-019.02, Intake Cooling Water Pump Removal and Installation, Rev. 1  
 0-PMM-019.7, Intake Cooling Water Basket Strainer Cleaning, Rev. 2B  
 0-PMM-019.8, Intake Cooling Water Pump Discharge Check Valve Removal and Installation, Rev. 1  
 0-PMM-047.12, Charging Pump Fluid Cylinder Side Overhaul, Rev. 1B  
 0-PMM-061.1, Auxiliary Building Floor, Radwaste Building Floor and Containment Building Roof Drains Inspection and Cleaning, Rev. 0A  
 0-SMM-102.1, Flood Protection Stoplog and Penetration Seal Inspection, Rev. 2  
 0-SMM-102.2, Roof Systems and Turbine Building Crane Rail Inspections, Rev. 0A  
 3-GMI-059.4, Flux Map Thimble Tube Eddy Current Test (ECT), Rev. 0A  
 3-GMM-041.01, Pressurizer Manway Removal and Installation, Rev. 0  
 3-OSP-045.2, ASME Section XI Quality Group B and Group C Bolted Connection Examination, Rev. 0  
 3-OSP-055.1, Emergency Containment Cooler Operability Test, Rev. 5A  
 3-PMM-022.05, Diesel Oil Day And Skid Tank Inspection And Cleaning, Rev. 1  
 3-PMM-022.4, Diesel Oil Storage Tank Cleaning, Rev. 1A  
 4-GMI-059.4, Flux Map Thimble Tube Eddy Current Test (ECT), Rev. 0A  
 4-OSP-056.2, Emergency Containment Filter System Performance Test, Rev. 0B  
 4-PMM-022.3, Emergency Diesel Generator 24 Month Preventive Maintenance, Rev. 4A  
 AD-AA-100-1004, Preparation, Revision, Review/Approval of Procedures, Rev. 8

BAW-1543, Master Integrated Reactor Vessel Surveillance Program, Rev. 4  
 BMI-FTT-IP, Bottom Mounted Instrumentation Flux Thimble Tubing Inspection Program, Rev. 5  
 ENG-FAC 2.3-2, Performing Flow-Accelerated Corrosion Analysis, Rev. 10  
 ENG-FAC 2.3-3, Selection of Locations for Examinations, Rev. 11  
 ENG-FAC 2.3-3, Selection of Locations for Examinations, Rev. 12  
 ENG-FAC 2.3-8, Application of Computed Radiography in the Long-Term FAC Monitoring Program, Rev. 5  
 ENG-IS 10.1, Computed Radiography Examination Data Processing, Rev. 3  
 ENG-QI 5.8, Reactor Vessel Integrity Program, Rev. 1  
 LDI-01, NRC Commitment Change Process, Rev. 4  
 LI-AA-107, Renewed License Program, Rev. 0  
 LI-AA-207, Renewed License Process, Rev. 3  
 LI-AA-207-1001, 10 CFR 54.37(b) Review Process, Rev. 0  
 NDE 5.18, NDE Manual Examination Procedure, Component, Support and Inspection, Ultrasonic Thickness Measurement, Rev. 8  
 NDE 6.3, Radiographic Examination General Requirements, Rev. 1  
 NDE 6.3-1, Radiographic Examination AWS D1.1, Rev. 1  
 PI-AA-102, Operating Experience Program, Rev. 3  
 PI-AA-204, Condition Identification and Screening Process, Rev. 17  
 RM-AA-100, Records Management Program, Rev. 5  
 SMM-101.1, Instrument Air Periodic Testing, Rev. 10/14/07  
 SPEC-C-047, Field Erected Tanks Internal Inspection, Rev. 1  
 SPEC-E-020, Containment Cable Inspection Program, Rev. 2  
 SPEC-M-078, Galvanic Corrosion Susceptibility Inspection Program TP Units 3 and 4, Rev. 2  
 SPEC-M-081 CCW Heat Exchangers Tube Integrity Inspection, Rev. 0, 6/2/02  
 SPEC-M-086 Intake Cooling Water System Piping, Rev. 1, 5/20/12  
 SWD-M-057-01, 36 Month Inspection on Normal Containment Coolers, Rev. 1

#### Program Basis Documents

PTN-EMG-LRAM-00-0044, ASME Section XI, Subsections IWB, IWC and IWD Inservice Inspection Program – License Renewal Program Basis Document, Rev. 3  
 PTN-ENG-LRAM- 01-0044, Containment Cable Inspection Program License Renewal Basis Document, Rev. 3  
 PTN-ENG-LRAM-00-0028, Boric Acid Wastage Surveillance Program License Renewal Basis Document, Rev. 4  
 PTN-ENG-LRAM-00-0029, Containment Spray System Piping Inspection Program License Renewal Basis Document, Rev. 4  
 PTN-ENG-LRAM-00-0030, Thimble Tube Inspection Program-License Renewal Basis Document , Rev. 3  
 PTN-ENG-LRAM-00-0031, Intake Cooling Water System Inspection Program –License Renewal Basis Document, Rev. 5  
 PTN-ENG-LRAM-00-0033, Flow Accelerated Corrosion Program – License Renewal Basis Document, Rev. 3  
 PTN-ENG-LRAM-00-0037, Reactor Vessel Integrity Program – License Renewal Basis Document, Rev. 4  
 PTN-ENG-LRAM-00-0039, Small Bore Class 1 Piping Inspection License Renewal Basis Document, Rev. 3  
 PTN-ENG-LRAM-00-0040, Boraflex Surveillance Program-License Renewal Program Basis Document, Rev. 2  
 PTN-ENG-LRAM-00-0041, Reactor Vessel Internals Inspection Program – License Renewal Basis Document, Rev. 3



PTN-ENG-LRAM-00-0042, Systems And Structures Monitoring Program-License Renewal Basis Document, Rev. 8  
 PTN-ENG-LRAM-00-0043, Periodic Surveillance And Preventive Maintenance Program License Renewal Basis Document, Rev. 6  
 PTN-ENG-LRAM-00-0051, Fatigue Monitoring Program – License Renewal Basis Document, Rev. 4  
 PTN-ENG-LRAM-00-0053, Auxiliary Feedwater Steam Piping Inspection Program License Renewal Basis Document, Rev. 3  
 PTN-ENG-LRAM-00-0054, Galvanic Corrosion Susceptibility Inspection Program License Renewal Basis Document, Rev. 3  
 PTN-ENG-LRAM-00-0055, Engineering Evaluation of Environmental Effects of Fatigue, Rev. 1  
 PTN-ENG-LRAM-00-0060, Auxiliary Feedwater Pump Oil Coolers Inspection License Renewal Basis Document, Rev. 2,  
 PTN-ENG-LRAM-00-0064, Field Erected Tanks Internal Inspection -License Renewal Basis Document, Rev. 4  
 PTN-ENG-LRAM-00-0065, ECC Inspection – License Renewal Basis Document, Rev. 1  
 PTN-ENG-LRAM-0038, EC 272407, Turkey Point Units 3, 4, and Common Fire Protection Program-License Renewal Basis Document, Rev. 5  
 PTN-ENG-LRAM-99-0033, License Renewal Aging Management Review for the Pressurizer, Rev. 3  
 PTN-ENG-LRAM-99-0034, License Renewal Aging Management Review For The Reactor Pressure Vessel, Rev. 5  
 PTN-ENG-LRAM-99-0054, License Renewal Aging Management Results Report - Class 1 Piping, Rev. 4

Corrective Action Documents (Action Requests/Condition Reports)

AR 00209387, Check Valve Failure Discovered During Radiographic Examination (Crystal River 3)  
 AR 00411435, Degradation Identified in Piping Attached to Steam Trap ST-3-8-PA  
 AR 004173121, Unit 3 Containment Cable Inspection Report, 10/20/10  
 AR 00444427, CR 2007-27211 – NRC RIS-07-16, Implementation of the Requirements of 10 CFR 54.37(b)  
 AR 00493720, AFW Drain Piping Pin Hole Leak  
 AR 00584728  
 AR 01617004  
 AR 01626907, Tracking of License Renewal Commitments for Turkey Point, 05/07/11  
 AR 01626907/05.06, Commitment Change Evaluation Form for Fire Protection Program  
 AR 01626907-04, Emergency Containment Cooler Tube Inspections, 02/08/2012  
 AR 01626907-07, Reactor Vessel Internals Inspections, 03/21/2012  
 AR 01626907-15, Reactor Vessel Integrity Program  
 AR 01626907-39, Turkey Point Nuclear Plant Unit 3 and 4 – 10 CFR 54.37(b) “Newly Identified SSC Report,” 5/10/12  
 AR 01626907-40, Perform GAP Analysis for GALL Rev. 2  
 AR 01636133  
 AR 01638881, Unit 4 Containment Spray Elbow at Minimum Wall  
 AR 01658636, License Renewal Basis Requirements for the ECC  
 AR 01691094  
 AR 01697800, AFW License Renewal Inspection Point ST-4-1415 Results  
 AR 01701233  
 AR 01709832, Through Wall Leak In Pipe 4-2922, 11/27/11  
 AR 01718835, AFW Steam Piping Inspection Results, 12/22/11

AR 01721220, PI-AA-102, Operating Experience Program, 01/01/12  
 AR 01735146  
 AR 01737140, Coordinated Reactor Vessel Surveillance Program – EPRI MRP-326  
 AR 01769755, Clarifications to Procedure 0-ADM-553  
 AR 01770005, ECC Tube Wall Thickness Acceptance Criteria  
 AR 01770267, Small Bore class 1 Piping Socket Weld Selection Criteria  
 AR 01770540, Inconsistent Definition of Accessible Between SPEC and EPRI, 5/25/12  
 AR 01770566, Clarify PTN License Renewal Commitment Related to FAC  
 AR 01771608, NRC Inspection-License Renewal-Fatigue Analysis Clarification  
 AR 01773226, Provide Evaluation of SI and CVCS Operating Parameters  
 AR 01773604, Update UFSAR for Thimble Tube Inspection Program, 6/6/12  
 AR 01773787, Correcting A Typo in LRAM-00-0037  
 CR 2000-1803, Containment Spray Piping Inspection Results, 10/6/00  
 CR 2001-0234  
 CR 2001-1759, FAC Examination Results for Steam Trap ST-3-13-P29  
 CR 2001-1844, FAC Examination Results for Steam Trap ST-3-10-P30, ST-3-10-P32, ST-3-10-P34, and ST-3-10-P36  
 CR 2003-0343, FAC Examination Results for Steam Trap ST-3-13-P29  
 CR 2003-0378, FAC Examination Results for Steam Trap ST-3-1 and ST-3-2  
 CR 2004-11271, PTN-3 Flux Map Thimble Tubing Examination Results, 10/17/04  
 CR 2004-3226  
 CR 2007-40769  
 CR 2009-566, License Renewal Focused Self-Assessment, June 22-30, 2009

#### Drawings

5613/4-M-3010/ 2, License Renewal Boundary Drawing for Main Steam System  
 5613/4-M-3014/ 3, License Renewal Boundary Drawing for Main Steam System  
 5613/4-M-3072/ 1, License Renewal Boundary Drawing for Main Steam System  
 5613/4-M-3084/ 1, License Renewal Boundary Drawing for Main Steam System  
 5613/4-M-3089/ 2, License Renewal Boundary Drawing for Main Steam System

#### Work Requests/Work Orders

WO 37019075  
 WO 39022011  
 WO 39022012  
 WO 39022126  
 WO 40005208  
 WO 40011000  
 WO 40074101  
 WO 40098121  
 WO 40147180  
 WO 40152465  
 WR 94026097

#### Other Documents

3-RCP-C, Visual Examination (VT-3) of Reactor Coolant Pump C Casing  
 3-RCP-C-A, Visual Examination (VT-1) of Reactor Coolant Pump Casing Weld  
 4-RCP-C, Visual Examination (VT-3) of Reactor Coolant Pump C Casing  
 4-RCP-C-A, Visual Examination (VT-1) of Reactor Coolant Pump C Casing  
 5.4-001, Weld Data Sheet, Pressurizer Relief Line, 10/7/10  
 5.4-006, Weld Data Sheet, CVCS to RC Loop C, 5/3/12

51-9133594-000, Turkey Point Units 3 & 4 EMA Reconciliation, Rev. 0  
 86-9111294-001, EMA Input to FPL License Amendment Request for EPU at Turkey Point 3 & 4, Rev. 1  
 Calculation 0900948.301, Environmental Fatigue Evaluation of Reactor Coolant System Components/Nozzles and Connected Systems, Rev. 1  
 Calculation 0900948.302, Environmentally-Assisted Fatigue Evaluation of the RPV Shell Using 60-Year Projected Cycles and Enveloping Cycles, Rev. 1  
 Calculation 1100768.303, Turkey Point Spray Nozzle ASME Code Fatigue Analysis, Rev. 0  
 Calculation 1100768.304, Turkey Point Spray Nozzle ASME Code Fatigue Analysis, Rev. 0  
 Calculation WCAP-10045, Turkey Point Unit 4 Fracture Evaluation for the Overpressure Events of November 1981 (Westinghouse)  
 Calculation#ANP-2312P, Low Upper-Shelf Toughness Fracture Mechanics Analysis of Reactor Vessels of Turkey Point Units 3 and 4 For Extended Life Through 48 Effective Full Power Years (Areva), Rev. 3  
 CN-PCAM-09-04, Turkey Point Units 3 and 4 Extended Power Uprate Reactor Vessel Integrity Evaluation, Rev. 4  
 CSI-FAC-PTN-3-19D, Flow Accelerated Corrosion Final Report for Turkey Point Unit 3, Fall 2001  
 CSI-FAC-PTN-3-21D, Flow Accelerated Corrosion Final Report for Turkey Point Unit 3, Fall 2004  
 CSI-FAC-PTN-3-22D, Flow Accelerated Corrosion Final Report for Turkey Point Unit 3, Spring 2006  
 CSI-FAC-PTN-3-25D, Flow Accelerated Corrosion Final Report for Turkey Point Unit 3, Fall 2010  
 ENG-CSI-FAC-100, Flow Accelerated Corrosion Monitoring Program, Rev. 16  
 ER-AA-105, Reactor Coolant System Materials Degradation Management Program (RCS MDMP), Rev. 1  
 FLO-36320, Failure Analysis of the Turkey Point AFW Turbine Governor Controller Oil Cooler, Ref PO 2288439, March 23, 2011  
 Flow Accelerated Corrosion Outage Inspection Plan for Turkey Point Unit 3, Fall 2010 Cycle 25  
 Flow Accelerated Corrosion Outage Inspection Plan for Turkey Point Unit 4, Spring 2011 Cycle 26  
 Focused Self Assessment Report FSA#1604417, License Renewal Post-Approval Inspection Readiness, October 10-14, 2011  
 FPL Letter L-2011-531, License Renewal (LR) Reactor Vessel Internals (RVI) Inspection Program Implementation Commitment Revision Notification  
 ISI-PTN-3/4, Fourth Interval Inservice Inspection Program Plan for Turkey Point Units 3 and 4, Rev. 3  
 ISI-PTN-3-2004 – Data Sheet 5.1-001, UT Results of transition cone of Cold Leg Weld for Steam Generator B, Unit 3  
 ISI-PTN-4-2011 – Data Sheet 5.1-003, UT Results of transition cone of Cold Leg Weld for Steam Generator B, Unit 4  
 L-2001-236, License Renewal Safety Evaluation Report Open Item and Confirmatory Item Responses and Revised License Renewal Application Appendix A, Nov 1, 2001  
 L-2001-499, Updated Final Safety Analysis Report – Unit 4 Cycle 25 Update, November 16, 2011  
 L-2001-65, Response to Request for Information,  
 L-2006-037, Reactor Vessel Surveillance Capsule Proposed Change in Withdrawal Schedule, 4/1/06  
 L-2010-113, License Amendment Request for Extended Power Uprate, 10/21/10

L-2011-265, One-Time Inspection of Class 1 Small Bore Piping Program Revised Commitment and Inspection Plan Submittal, August 16, 2011

L-2012-214, Letter to the US Nuclear Regulatory Commission Re: Submittal of Pressurizer Surge Line Welds Inspection Program, May 16, 2012

Letter to Mr. D. L. Howell, Safety Evaluation of BAW-1543, "Master Integrated Reactor Vessel Surveillance Program," Rev. 4, Supplement 3 (TAC No. MA5053), 10/26/99

Letter to Mr. J. A. Stall, Turkey Point Nuclear Plant, Unit Nos. 3 and 4 – Approval of Proposed Reactor Vessel Material Surveillance Capsule Withdrawal Schedule (TAC Nos. MD2927 and MD2928), 10/23/06

List of Major and Minor Plant Modifications Implemented at Turkey Point from September 1, 2000 until July 31, 2002.

Material Safety Data Sheet for N-5000 High Purity Anti-Seize, Item 51243/IDH No. 234280

Material Safety Data Sheet for Neverseez Lubricant Stock Code 0191696-3

Materials Reliability Program: Coordinated PWR Reactor Vessel Surveillance Program (CRVSP) Guidelines (MRP-326)

N-91-0508, Min Wall Conditions on Containment Spray Piping, 6/28/91

OE 29869- Check Valve Failure Discovered During Radiographic Examination (Crystal River 3)

OE 34331-Reactor Pressure Vessel Head Penetration Repair Execution Issues

P11-2409-00, Turkey Point Safety Injection Fitting Welds, 5/14/12

PMCR 01670365, AFW Steam Pipe Inspection Implementation, 7/19/11

PTN-09-024, Fire Protection Functional Area Audit, 12/30/09

PTN-ENG-3FJF-10-093, Turkey Point Unit 3 Cycle 25 Technical Specification Review, Rev. 0

PTN-ENG-4FJF-09-149, Turkey Point Unit 4 Cycle 25 Technical Specification Review, Rev. 0

PTN-ENG-LRTA-99-044, Engineering Evaluation for Time Limited Aging Analysis and TLAA Exemptions, Rev. 2

PTN-ENG-LRTA-99-044, Engineering Evaluation for Time Limited Aging Analyses and TLAA Exemptions, Rev. 2, 11/28/00

PTN-ENG-LRTA-99-044, Time Limited Aging Analysis and TLAA Exemptions, Rev. 2

PTN-ENG-SENS-11-062, Turkey Point, Units 3 and 4 ASME Code Class 1 Small-Bore Piping One Time Inspection Plan, Rev. 0

PTN-ENG-SESJ-99-0118, Reactor Vessel Data, Rev. 1

Quality Assurance Audit Report QAS-CSI-04-1, August 13, 2004

Quality Assurance Audit Report QAS-CSI-06-1, August 21, 2006

Report No. 1100756.401, Flaw Tolerance Evaluation of Turkey Point Surge Line Welds Using ASME Code Section XI, Appendix L, Rev. 1

Test 03-CCW-30203-L-01, System Leakage Test for CCW

Test 03-CCW-30203-L-02, System Leakage Test for CCW

Test 03-CSS-0814-L-01, System Leakage Test for CSS

Test 03-CVCS-4750-L-02, System Leakage Test for CVCS

Test 03-OSP-045.2, Visual Examination Report (VT-2) Unit 3 Class B and C, Outside Containment Bolted Joints

Test 03-RHR-5026-L-01, System Leakage Test for RHR

Test 04-AFW-7501-L-02, System Leakage Test for AFW

Test 04-CCW-30208-L-01, System Leakage Test for CCW

Test 04-CCW-30212-L-02, System Leakage Test for CCW

Test 04-CVCS-4747-L-01, System Leakage Test for CVCS

Test 04-CVCS-4747-L-02, System Leakage Test for CVCS

Test 04-CVCS-4747-L-02, System Leakage Test for CVCS

Ultrasonic Thickness Calibration Data Sheet #5.18-001, PTN-3, Emergency Containment Cooler B

Ultrasonic Thickness Calibration Data Sheet #5.18-003, PTN-4, Emergency Containment Cooler B

Unit 4 Containment Cable Inspection Report, 4/2/11

Updated Final Safety Analysis Report Supplement for License Renewal, Chapter 16, 05/23/2012

WCAP-15092, Turkey Point Units 3 and 4 WOG Reactor Vessel 60-Year Evaluation Minigroup Heatup and Cooldown Limit Curves for Normal Operation, Rev. 5

WCAP-17096-NP, Rev. 2, Dec 2009, Reactor Internals Acceptance Criteria Methodology and Data Requirements, December 2009

WCAP-17460-P, Rev. 0-A, Inspection Flaw Acceptance Criteria for Turkey Point Unit 3 Reactor Vessel Internals MRP-227 Primary and Expansion Components

WCAP-17470-P, Rev. 0-B, Component Inspection Details Supporting Aging Management of Reactor Internals at Turkey Point Unit 3

WCAP-17475-P, Rev. 0-B, Component Inspection Details Supporting Aging Management of Reactor Internals at Turkey Point Unit 4