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

March 10, 2017

Mr. Dennis Madison
Southern Nuclear Operating Co., Inc.
Joseph M. Farley Nuclear Plant
7388 North State Highway 95
Columbia, AL 36319

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT – NUCLEAR REGULATORY COMMISSION POST-APPROVAL SITE INSPECTION FOR LICENSE RENEWAL, INSPECTION REPORT 05000348/2017008 AND 05000364/2017008

Dear Mr. Madison:

On January 26, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed a Post-Approval Site Inspection for License Renewal at your Joseph M. Farley Nuclear Plant, Units 1 and 2 in accordance with NRC Inspection Procedure 71003. The enclosed report documents the inspection results, which were discussed on January 26, 2017, with Mr. Scott Briggs, Plant Manager, and other members of the Farley management staff.

Based on the inspection sample selected for review, the NRC inspectors did not identify any finding or violation of more than minor significance. The inspectors identified a number of observations associated with the implementation of certain aging management activities. The inspectors determined that the overall implementation of aging management programs and time-limited aging analyses was consistent with the license renewal commitments, the Updated Final Safety Analysis supplement for license renewal, and the conditions in the renewed operating license. The inspectors also determined that structures, systems, and components within the scope of 10 CFR 54.37(b) were adequately identified and evaluated. The inspectors determined that commitment changes not affecting the Updated Final Safety Analysis were evaluated in accordance with the applicable requirements.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at http://www.nrc.gov/reading-rm/adams.html and at the NRC Public Document Room in accordance with 10 CFR 2.390, “Public Inspections, Exemptions, Requests for Withholding.”

Sincerely,

/RA/

Shakur A. Walker, Chief
Engineering Branch 3
Division of Reactor Safety

Docket Nos.: 50-348, 50-364
License Nos.: NPF-2, NPF-8

Enclosures:
Inspection Report 05000348/2017008
and 05000364/2017008
w/Attachment: Supplemental Information

cc: Distribution via Listserv

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT – NUCLEAR REGULATORY COMMISSION POST-APPROVAL SITE INSPECTION FOR LICENSE RENEWAL, INSPECTION REPORT 05000348/2017008 AND 05000364/2017008 March 10, 2017

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.:	50-348, 50-364
License Nos.:	NPF-2, NPF-8
Report Nos.:	0500348/2017008 and 0500364/2017008
Licensee:	Southern Nuclear Operating Company, Inc.
Facility:	Joseph M. Farley Nuclear Plant, Units 1 and 2
Location:	Columbia, AL
Dates:	January 9 – January 26, 2017
Inspectors:	R. Williams Jr., Senior Reactor Inspector, Team Lead R. Carrion, Senior Reactor Inspector A. Butcavage, Reactor Inspector B. Collins, Reactor Inspector P. Cooper, Reactor Inspector
Approved by:	Shakur A. Walker, Chief Engineering Branch 3 Division of Reactor Safety

Enclosure

SUMMARY

IR 0500348/2017008 and 0500364/2017008; 01/09/2017 – 01/26/2017; Joseph M. Farley Nuclear Plant, Units 1, and 2; Post Approval Site Inspection for License Renewal.

The report covers a team inspection conducted by five regional inspectors in accordance with NRC Manual Chapter 2515 and NRC Inspection Procedure 71003. There were no findings or violations of more than minor significance identified. The team identified a number of observations associated with the implementation of certain aging management activities.

On the basis of the sample selected for review, the team 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 Joseph M. Farley Nuclear Plant, Units 1 and 2. Based on the review of program documents and activities completed at the time of this inspection, the team determined that the licensee had established the majority of 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 the two units. For the established aging management programs and time-limited aging analyses, the team determined that the licensee completed all planned aging management activities due prior to entering the period of extended operation of Units 1 and 2, with some exceptions. While most commitment items remained open in the corrective action program the inspectors determined that essentially all the required aging management activities such as inspections, procedure revisions, and evaluations were performed as described in the commitments.

The team determined that the licensee took appropriate actions to assure that newly identified structures, systems, and components within the scope of 10 CFR 54.37(b) were identified and evaluated for management of aging affects. The team did not identify significant inconsistencies between the aging management program descriptions in the Updated Final Safety Analysis Report supplement for license renewal, as revised, and the aging management activities being implemented. The team also determined that commitment changes not affecting the Updated Final Safety Analysis were evaluated in accordance with the applicable requirements.

The NRC's program for overseeing the safe operations of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

REPORT DETAILS

4. OTHER ACTIVITIES

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

.1 License Conditions and Commitments for License Renewal, Implementation of Aging Management Programs and Time-Limited Aging Analyses

a. Inspection Scope

The team reviewed a sample of regulatory commitments, aging management programs (AMPs), and time-limited aging analyses (TLAAs) associated with the renewed operating license for Joseph M. Farley Nuclear Plant (FNP), Units 1 and 2 issued in May 2005. This inspection took place prior to the period of extended operation (PEO) for Units 1 and 2, which will begin on June 25, 2017 and March 31, 2021, respectively. The inspectors reviewed license renewal program documents, conducted interviews with licensee staff and performed system walkdowns. These activities were performed to verify that the licensee completed the necessary actions to comply with the conditions listed in the renewed facility operating license.

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 license renewal application (LRA), the NRC safety evaluation report (SER), and the Updated Final Safety Analysis Report (UFSAR) supplement. The licensee was tracking the completion of regulatory commitments for license renewal through their corrective action program, via individual entries for each commitment.

The AMPs, TLAAs, and commitment items selected for the inspection sample are summarized below based on their description in Appendix A of the NRC SER issued in March 2005 (ADAMS Accession Numbers ML050630571) and the UFSAR supplement for license renewal, as revised. For each inspection sample listed, the team reviewed the licensing basis, program basis documents, administrative procedures and implementing procedures to verify that the program was developed as described in the license renewal application and the NRC SER. The team also interviewed the program owners and reviewed the results of previous program walkdowns and inspections to verify that program procedures accomplished the actions as described in the commitment and that each commitment had been implemented prior to its due date. The specific inspection activities conducted for each commitment, AMP, and TLAA are also described below. Specific documents reviewed for each commitment, AMP, and TLAA are listed in this report's attachment.

Flow Accelerated Corrosion AMP and Commitment 01

The UFSAR description of this AMP stated that the Flow Accelerated Corrosion (FAC) Program was developed to include the following elements: analysis to determine susceptible locations, baseline inspections of wall thickness, follow-up inspections, and predictive modeling techniques. This program was also identified as being consistent with the guidance contained in Section XI.M17 of NUREG-1801, "Generic Aging Lessons Learned," Rev. 0. Additionally, Commitment 01 specified that prior to entering

the PEO, the FAC AMP would be enhanced by adding the auxiliary feedwater pump turbine exhaust piping to the scope of the program. The team also verified that that the program effectively implemented the guidelines of NSAC-202L-R2, "Recommendations for an Effective Flow-Accelerated Corrosion Program," as referenced in NUREG-1801.

The licensee considered the status for the administrative action items associated with the implementation of this AMP and commitment as completed for Unit 1. For Unit 2, some administrative action items had yet to begin their implementation. The team verified that the outstanding actions were being tracked by the licensee's corrective action program and scheduled for completion prior to the PEO for Unit 2.

Fuel Oil Chemistry Control AMP and Commitment 02

The UFSAR description of this AMP stated that the Fuel Oil Chemistry Control Program was an existing program governed by the technical specifications (emergency diesel generators fuel oil systems) and the approved Fire Protection Program (diesel-driven fire pumps fuel systems). The program included activities to mitigate loss of material from diesel fuel oil storage and transfer components that could result from intrusion of water or other contaminants. The program scope included the internal surfaces of the emergency diesel generator fuel oil storage tanks, the emergency diesel generator fuel oil day tanks, and the associated transfer piping and components. It also included the internal surfaces of the fire pump diesel fuel oil storage tanks and the associated piping and components. With a few exceptions, this AMP was identified as being consistent with the guidance contained in Section XI.M30 of NUREG-1801. Additionally, Commitment 02 specified that prior to entering the PEO, an evaluation of the Fuel Oil Chemistry Control Program scope and the need to improve procedural guidance for maintaining and monitoring the diesel driven operation fire pump fuel oil system would be performed and any necessary changes would be implemented.

The licensee considered the status for the administrative action items associated with the implementation of this AMP and commitment as completed for Units 1 and 2.

Structural Monitoring AMP and Commitment 03

The UFSAR description of this AMP stated that the Structural Monitoring Program (SMP) monitored the condition of structures and structural components within the scope of the Maintenance Rule (10 CFR 50.65), providing reasonable assurance that there was no loss of structure or structural component intended function during the PEO. This AMP was identified as being consistent with the guidance contained in Sections XI.S5 and XI.S6 of NUREG-1801. Additionally, Commitment 03 specified that prior to entering the PEO, the SMP would be enhanced to include portions of structures and components which were in-scope for license renewal but were not currently being monitored. These additional structures and components included:

- submerged portions of the service water intake structure,
- in-scope support features for anticipated transients without SCRAM, station blackout, and fire protection safe shutdown equipment in the turbine building,
- structural portions of the oil static pump house, and
- in-scope components in the low-level radwaste building and solidification/dewatering building.

Additionally, an enhancement would be made to the SMP to clarify that hangers and supports would be inspected in seismic Category I buildings. The team conducted a walkdown of in-scope structures to confirm the implementation of the program as described in the commitment.

The licensee considered the status for the administrative action items associated with the implementation of this AMP and commitment as completed for Units 1 and 2. The team identified one observation associated with the implementation of this program, which is discussed in further detail in section 4OA5.1.b.(1) of this report.

Service Water AMP and Commitment 04

The UFSAR description of this AMP stated that the Service Water Program would use mitigation, as well as performance and condition monitoring techniques to manage fouling and loss of material in the service water system and components it served. This AMP was identified as being consistent with the guidance contained in Section XI.M20 of NUREG-1801. Additionally, Commitment 04 specified that prior to entering the PEO, the scope of the Service Water Program would be expanded to include inspection of piping from the main service water header to the air compressor credited for Appendix R safe shutdown and inspection of the service water pump columns.

The licensee considered the status for the administrative action items associated with the implementation of this AMP and commitment as completed for Units 1 and 2. The team identified one observation associated with the implementation of this program, which is discussed in further detail in section 4OA5.1.b.(2) of this report.

Fire Protection AMP and Commitment 05

The UFSAR description of this AMP stated that the Fire Protection Program was an existing program which conducted inspections, performance testing, and monitoring for water- and gas-based fire protection systems, fire dampers, fire doors, fire penetration seals, cable wrap, and fire pump diesels (including the external surfaces of exposed fuel oil piping). This AMP was identified as being consistent with the guidance contained in Sections XI.M26 and XI.M27 of NUREG-1801. Commitment 05 stated that the FNP Fire Protection Program would be enhanced prior to entering the PEO (except for sprinkler head testing which would be implemented prior to 50 years of fire protection system service) as follows:

- The fire protection sprinkler system piping would be subjected to wall thickness evaluations prior to the PEO and at specific intervals thereafter. The plant-specific inspection interval would be established from the initial inspection results and revised as appropriate for subsequent inspection results.
- A sample of sprinkler heads would be inspected by using the guidance of National Fire Protection Association (NFPA) 25 (2002), Section 5.3.1.1.1, at or before 50 years of service and every 10 years thereafter.
- Diesel-driven fire pump surveillance procedures would be upgraded to provide more detailed instructions related to inspection of the fuel oil supply piping.
- The current practice of replacing CO_2 hoses at 5-7 year intervals would be formalized in fire protection procedures.

At the time of this inspection, the status of some administrative action items associated with the implementation of this AMP and commitment for Unit 1 were still in progress and were scheduled to be completed prior to the PEO for Unit 1. For Unit 2, some

administrative action items had yet to begin their implementation. The team verified that the outstanding actions were being tracked by the licensee's corrective action program and scheduled for completion prior to the PEO for Unit 2.

Reactor Vessel Internals AMP and Commitment 06

The UFSAR description of this AMP stated that the Reactor Vessel Internals (RVI) Program provided an integrated inspection program that addressed the reactor internals. The AMP was governed by administrative controls and procedures to supplement the inspection requirements of American Society of Mechanical Engineers (ASME) Section XI, IWB Category B-N-3 to ensure that aging effects did not result in a loss of intended function of internal components during the PEO. This AMP managed the effects of crack initiation and growth due to irradiation-assisted stress corrosion cracking; loss of fracture toughness due to irradiation embrittlement, thermal embrittlement, or void swelling; or changes in material properties (dimension) due to void swelling. Additionally, Commitment 06 stated that FNP would continue to participate in industry initiatives intended to clarify the nature and extent of aging mechanisms potentially affecting the FNP reactor internals. FNP would also incorporate the results of these initiatives into the RVI AMP. At least 22 months prior to entering the PEOs for each FNP units, the licensee was required to submit an inspection program for the RVI Program for NRC review and approval. The team reviewed recent licensee submittals to verify that appropriate due dates had been met. The team also conducted interviews with program owners to obtain reasonable assurance that FNP would continue its industry participation throughout the PEO.

The licensee considered the status for the administrative action items associated with the implementation of this AMP and commitment as completed for Units 1 and 2. At the time of this inspection, the RVI Program submittal was still under NRC review. The team identified one observation associated with the implementation of this program, which is discussed in further detail in section 4OA5.1.b.(3) of this report.

Flux Detector Thimble Inspection AMP and Commitments 07 and 19

The UFSAR description of this AMP stated that the Flux Detector Thimble Inspection Program would be used to identify loss of material due to fretting/wear in the detector thimble tubes during the PEO. Commitment 07 stated that the Flux Detector Thimble Inspection Program would be implemented prior to entering the PEO and would formalize examinations already being performed. The program would use eddy current testing or other suitable examination methods to identify applicable degradation mechanisms in the detector thimbles. The program would also include flux detector thimbles from both units. Additionally, Commitment 19 stated that FNP would submit to the NRC the following information on the Unit 1 flux thimble tubes:

- the worst case cumulative wear from the U1R20 flux thimble tube eddy current inspection,
- the uncertainty applied to the actual measured wear data,
- the thimble tube wall thickness,
- the schedule for the next Unit 1 flux thimble tube inspection (inspection interval),
- the projected wear value for the worst-case wear location at the end of the next inspection interval, and
- a discussion of the technical basis for establishing the Unit 1 inspection interval that would be implemented after performing the U1R20 flux thimble tube eddy current inspection of the new tube materials.

The program would also base future examination frequencies on wear predications evaluated using the guidance in proprietary document WCAP-12866. The team verified that program procedures included a program of scheduled inspections based on previous examination tube wear results and vendor-recommended inspection frequencies as described in the commitments. The team also verified that the required documentation listed in Commitment 19 had been submitted by FNP.

The licensee considered the status for the administrative action items associated with the implementation of this AMP and commitment as completed for Units 1 and 2.

External Surfaces Monitoring AMP and Commitment 08

The UFSAR description of this AMP stated that the External Surfaces Monitoring Program would be a new plant-specific condition monitoring program that would be implemented prior to entering the PEO. It would include periodic visual inspections of external surfaces of carbon steel, low alloy steel, and other susceptible materials in components requiring aging management for license renewal. This AMP would also be responsible for susceptible materials or components which were not within the scope of the Structural Monitoring AMP. Additionally, Commitment 08 specified that the External Surfaces Monitoring AMP would manage accessible and insulated external surfaces susceptible to loss of material (including carbon steel and low alloy steels in inside and outside environments, and galvanized steel, cast iron, copper alloys, and aluminum in an outside environment). This AMP would also would manage loss of material, cracking, and change in material properties in elastomers within the scope of the program. The inspectors performed walkdowns of portions of the service water intake structure, the 1A diesel generator, the nitrogen storage room, fire protection tanks number 1 and number 2, and diesel-driven fire pump storage tank numbers 1 and 2 to verify the results of the baseline inspections conducted by the licensee upon establishing the External Surfaces Monitoring Program.

At the time of this inspection, the licensee considered the status for the administrative action items associated with the implementation of this AMP and commitment as completed for Unit 1. However, the baseline inspections for Unit 2 were scheduled for completion during the next Unit 2 refueling outage (October/November 2017). The team verified that the outstanding actions were being tracked by the licensee's corrective action program and scheduled for completion prior to the PEO for Unit 2.

Buried Piping and Tank Inspection AMP and Commitment 09

The UFSAR description of this AMP stated that the Buried Piping and Tank Inspection Program would be used to manage loss of material from the external surfaces of in-scope pressure-retaining buried carbon steel piping and tanks, as well as buried stainless steel and copper alloy piping components. Buried piping and tanks within the scope of the program would be inspected when they were excavated for maintenance or when those components were exposed for any reason. With a few exceptions, this AMP was identified as being consistent with the guidance contained in Section XI.M34 of NUREG-1801. Additionally, Commitment 09 specified that this AMP would be implemented prior to entering the PEO and that FNP would perform an inspection of buried piping and tanks within ten years after entering the PEO, unless an opportunistic inspection had occurred within this ten-year period. Before the tenth year, FNP would also perform an engineering evaluation to determine if sufficient inspections had been

conducted to draw a conclusion regarding the ability of the underground coatings to protect the underground piping and tanks from degradation. If not, the licensee would conduct a focused inspection to allow that conclusion to be reached.

The licensee considered the status for the administrative action items associated with the implementation of this AMP and commitment as completed for Units 1 and 2.

One-Time Inspection AMP and Commitment 10

The UFSAR description of this AMP stated that the One-Time Inspection (OTI) Program would include measures to verify the effectiveness of various other AMPs and confirm the absence of aging effects requiring management. With a few exceptions, this AMP was identified as being consistent with the guidance contained in Sections XI.M32 and XI.M33 of NUREG-1801. Additionally, Commitment 10 specified that the OTI Program would be implemented prior to entering the PEO. Insofar as practical with respect to scheduled outages, the inspections would be performed within a window of five years immediately preceding the PEO. Specific commitments in the OTI sample population included the following:

- inspection of the pressurizer cast austenitic stainless-steel spray heads and associated coupling/lock bar,
- examination of reactor coolant system small bore (<4-inch NPS) ASME Class 1 piping components,
- inspection of a reactor coolant pump thermal barrier component cooling water nozzle,
- inspection of cast iron, bronze, brass, and other alloy components in any system requiring aging management that were exposed to environments that may lead to selective leaching,
- inspection of a bounding chemical and volume control system letdown orifice or charging/safety injection pump miniflow orifice (based on pressure drop),
- inspection of a sample portion of the external surface of the service water piping in the diesel generator building which was obscured by guard piping
- inspection of the turbine drive auxiliary feed pump lube oil coolers (fouling of the tubes in a lube oil environment), and
- inspection of the Unit 1 condensate storage tank bottom (thickness measurement).

Furthermore, the OTI Program would select and inspect representative locations from the general LRA systems based on the applicable material, environment, and aging effect combinations (as specified in the LRA and docketed correspondence) to confirm that an aging effect does not require management and to verify aging management program effectiveness. Additionally, alloy steel steam and fluid traps in a steam and treated water environment would be included in the scope of the OTI Program.

At the time of this inspection, the licensee considered the status for the administrative action items associated with the implementation of this AMP and commitment as completed for Unit 1. The team verified that the outstanding actions for Unit 2 were being tracked by the licensee's corrective action program and scheduled for completion prior to the PEO for Unit 2. The team identified one observation associated with the implementation of this program, which is discussed in further detail in section 4OA5.1.b.(4) of this report.

Nickel Alloy Management AMP and Commitment 11

The UFSAR description of this AMP stated that Nickel Alloy Management Program was implemented to address the potential for primary water stress corrosion cracking (PWSCC) in nickel alloy components exposed to the reactor coolant environment. The scope of the program included nickel-based alloy reactor coolant pressure boundary components with known or potential susceptibility to PWSCC, but excluded steam generator tubes and reactor internals, which were addressed by the Steam Generator Program and RVI Program, respectively. Additionally, Commitment 11 stated that FNP would continue to participate in industry initiatives (such as the Westinghouse Owners Group and EPRI Materials Reliability Program), and that susceptibility rankings would be consistent with the latest version of the EPRI Materials Reliability Program safety assessment regarding Alloy 82/182 piping butt welds. The licensee was also required to submit an inspection plan for the program at least 24 months prior to entering the PEO for each unit.

The licensee considered the status for the administrative action items associated with the implementation of this AMP and commitment as completed for Unit 1. For Unit 2, some administrative action items had yet to begin their implementation. The team verified that the outstanding actions were being tracked by the licensee's corrective action program and scheduled for completion prior to the PEO for Unit 2.

Non-EQ Cables AMP and Commitment 12

The UFSAR description of this AMP stated that the Non-Environmentally Qualified (EQ) Cables Program would be used to maintain the function of electrical cables and connections which were not subject to the environmental qualification requirements of 10 CFR 50.49, but were exposed to adverse localized environments caused by heat, radiation, or moisture. Additionally, Commitment 12 specified that prior to entering the PEO, FNP would implement the new Non-EQ Cables and Connections Program which would consist of two parts. The first part would address non-EQ electrical cable connections used in circuits with sensitive, high voltage, low-level signals, such as radiation monitoring and nuclear instrumentation. An AMP designed specifically for these types of cables would be implemented as an alternate to the program described in NUREG-1801, Section XI.E2. Additionally, all in-scope instrument circuit cables with sensitive, high voltage, low-level signals which were installed in adverse localized environments would be tested. The second part would address non-EQ electrical cables and connections exposed to adverse localized environments caused by heat, radiation, or moisture and inaccessible medium voltage cables that were simultaneously exposed to significant moisture and voltage. This part would be implemented consistent with NUREG-1801, Sections XI.E1 and XI.E3.

The licensee considered the status for the administrative action items associated with the implementation of this AMP and commitment as completed for Units 1 and 2. The team identified one observation associated with the implementation of this program, which is discussed in further detail in section 4OA5.1.b.(4) of this report.

Fatigue Monitoring AMP and Commitments 13 and 16

The UFSAR description of this AMP stated that the Fatigue Monitoring program would be used to monitor plant transients that were significant contributors to the fatigue cumulative usage factor. This AMP would also provide a general methodology intended to prevent exceeding the fatigue usage design limit during the PEO. FNP maintained the option to, in lieu of monitoring the number of certain transients, perform more

detailed local monitoring of plant transients to compute the actual fatigue usage of each transient, at a bounding location. Additionally, Commitment 13 stated when fully implemented, this AMP would include cycle counting of plant transients that were significant contributors to the fatigue cumulative usage factor, thermal stratification monitoring of susceptible locations, and stress-based fatigue monitoring of the surge line and lower region of the pressurizer. Other specific components included the pressurizer subcomponents, the reactor pressure vessel shell and head, reactor pressure vessel inlet and outlet nozzles, reactor coolant piping, charging nozzles, safety injection nozzles and the other Class 1 piping one-inch in diameter or larger. Commitment 16 specified that prior to entering the PEO, the licensee would collect data for certain transients which were not counted prior to installation of fatigue monitoring software, and would use this data to develop a best-estimate historical count and an expected 60-year count.

The licensee considered the status for the administrative action items associated with the implementation of this AMP and commitment as completed for Units 1 and 2. The team identified one observation associated with the implementation of this program, which is discussed in further detail in section 4OA5.3.b.(1) of this report.

Commitment 14

Commitment 14 stated that the application of the appropriate environmental factors to the calculations for the charging nozzles, alternate charging nozzles, and residual heat removal (RHR) 6-inch RHR/SI nozzles to the reactor coolant system cold leg resulted in environmentally-assisted fatigue adjusted values greater than 1.0. For these locations, FNP would take corrective action prior entering to the PEO. These corrective actions would include a more refined analysis, repair, replacement, and/or an inspection program approved by the NRC. The team verified that the refined analysis approach used for fatigue evaluation of the RHR, safety injection and charging line connections to the reactor coolant loop included the application of appropriate environmental fatigue factors. Additionally, the team verified that projected fatigue values for the end of the PEO were less than the maximum allowed values documented in the analysis.

The licensee considered the status for the administrative action items associated with the implementation of this AMP and commitment as completed for Units 1 and 2.

TLAA for Residual Heat Removal Relief Valve Capacity Verification Calculations and Commitment 15

The UFSAR description of this TLAA stated that FNP would take credit for the relief capacity of the RHR relief valves in the cold overpressure mitigation analysis for FNP. FNP performed a calculation that verified relief valve capacity given the safe operating pressure/temperature (P-T) limit curves. The calculation adjusted the P-T limit curves to account for the flow-induced pressure drop from the beltline of the reactor vessel to the RHR relief valves. Additionally, Commitment 15 stated that FNP would update the RHR relief valve flow capacity analysis. This analysis utilized P-T curves as an input. The analysis would be updated to include the calculated 54 effective full power years P-T Limit Curves prior to the PEO.

The team verified that the licensee generated the P-T limit curves for the PEO for Units 1 and 2, and incorporated the calculations into the technical specifications after the approval of the license amendment. As a result, the team determined that the licensee had met the requirements of 10 CFR 54.21(c)(1)(ii).

The licensee considered the status for the administrative action items associated with the implementation of this TLAA and commitment as completed for Units 1 and 2.

Commitment 17
Commitment 17 stated that FNP would use the NUREG-1437 Supplemental Environmental Impact Statement along with the original Farley Environmental Impact Statement as the basis for any environmental reviews performed during the renewal term. The team reviewed recently performed environmental reviews and program documents to give reasonable assurance that compliance with this commitment would be maintained during the PEO.

The licensee considered the status for the administrative action items associated with the implementation of this commitment as completed for Units 1 and 2.

Reactor Vessel Surveillance Program AMP and Commitment 18
The UFSAR description of this AMP stated that the Reactor Vessel Surveillance Program would be used to evaluate neutron embrittlement through surveillance capsule testing and evaluation, fluence calculations and benchmarking, and monitoring of effective full power years. For fluence calculations, FNP used NRC Regulatory Guide 1.190, "Calculational and Dosimetry Methods for Determining Pressure Vessel Neutron Fluence," which provided for a "best estimate" fluence calculation. Additionally, Commitment 18 stated that for each unit, FNP would install alternative dosimetry to monitor neutron fluence on the reactor vessel after removal of the last surveillance capsule in that unit. After all surveillance capsules had been removed, the exposure conditions of the reactor vessel would be monitored to ensure consistency with those used to project the effects of embrittlement to the end of the license period. The program would also include provisions that if reactor vessel exposure conditions were altered such that analysis assumptions could be invalidated, appropriate actions would be performed (e.g., re-evaluation, re-instituting an active surveillance program, notifying the NRC, etc.) to assure the adequacy of the projection to the end of the license period.

The licensee considered the status for the administrative action items associated with the implementation of this AMP and commitment as completed for Units 1 and 2.

Periodic Surveillance and Preventive Maintenance Activities AMP and Commitment 20
The UFSAR description of this AMP stated that the Periodic Surveillance and Preventive Maintenance Activities Program consisted of plant-specific periodic inspections and tests that were relied upon for license renewal to manage the aging effects applicable to the components included in the program that were not managed by other aging management programs. The periodic surveillance and preventive maintenance activities were implemented through repetitive tasks and surveillances. Additionally, Commitment 20 stated that prior to entering the PEO, the following activities were to be implemented under this AMP: boric acid tank diaphragm inspections, reactor makeup water storage tank diaphragm inspections, and condensate storage tank diaphragm inspections.

The licensee considered the status for the administrative action items associated with the implementation of this AMP and commitment as completed for Units 1 and 2.

TLAA for Reactor Vessel Neutron Embrittlement Analyses
The UFSAR description of the TLAA for Reactor Vessel Neutron Embrittlement Analyses specified that the FNP reactor vessels were subject to neutron irradiation from their

cores which results in embrittlement of the vessel materials. Additionally, the following types of analyses would be performed to address the irradiation effects: upper-shelf energy, pressurized thermal shock, pressure-temperature limits, adjusted reference temperature, and neutron fluence. The UFSAR Supplement contained different subsections for each of these analyses, and a broad description for each was contained therein. Each analysis concluded that the effect of neutron embrittlement was adequately accounted for throughout the PEO.

The licensee considered the status for the administrative action items associated with the implementation of this TLAA as completed for Units 1 and 2.

TLAA for Metal Fatigue Analysis

The UFSAR description of the TLAA for Metal Fatigue Analyses was broken down into three subsections – ASME Section III/Class 1, ASME Class III/Non-Class 1, and Reactor Coolant Pump Flywheel – and each of these sections discussed the methodology used for each analysis. In general, each analysis was based on reviewing the transient cycle assumptions used for the initial license period and reassessing them for the PEO to ensure that components would not exceed design limits or would be monitored appropriately to prevent it. In combination with the continued actions described in the Fatigue Monitoring AMP (UFSAR Section 18.3.2), the analyses concluded that fatigue would be adequately managed throughout the PEO.

The licensee considered the status for the administrative action items associated with the implementation of this TLAA as completed for Units 1 and 2.

TLAA for Containment Tendon Pre-Stress Analysis

The UFSAR description of this TLAA stated that to meet the requirements on 10 CFR 50.55a(b)(2), the licensee used an analysis to predict the amount of residual pre-stress in the containment tendons for Units 1 and 2. The licensee performed a new analysis to estimate the amount of residual pre-stress on the tendons after 60 years of operation, as required by with 10CFR54.21(c)(1)(ii). The new analysis included the latest actual measurements of containment tendon pre-stress taken since the plant began commercial operation, obtained from anchor pull testing performed in accordance with the IWL Inservice Inspection Program. The analysis indicated that acceptable containment tendon pre-stress would continue to exist throughout the PEO. The next containment tendon inspections were scheduled to be performed in March 2017. Once these inspections have been completed and the inspection report and data is provided, the containment tendon pre-stress calculation and analysis will be updated.

The licensee considered the status for the administrative action items associated with the implementation of this TLAA as completed for Units 1 and 2.

TLAA for Environmental Qualification Calculations

The UFSAR description of this TLAA stated that the FNP EQ Program was intended to continue to implement the requirements of 10 CFR 50.49 during the PEO. The TLAA of EQ electrical components included all long-lived, passive, and active electrical and instrumentation and controls components that were important to safety and located in a harsh environment. The EQ equipment was comprised of safety-related Q-list equipment and non-safety related equipment, the failure of which could prevent satisfactory accomplishment of any safety-related function; and the necessary post-accident monitoring equipment. The team reviewed a random sample of plant

modifications that impacted EQ components and operating experience evaluations and verified that any issues discovered were dispositioned in accordance with program requirements.

The licensee considered the status for the administrative action items associated with the implementation of this TLAA as completed for Units 1 and 2.

TLAA for Leak-Before-Break Analysis

The UFSAR description of this TLAA stated that FNP identified that Leak-Before-Break (LBB) analyses for the primary coolant loop (RCL) and the pressurizer surge line had been previously performed. LBB analyses evaluated postulated flaw growth in the piping for the RCL and the pressurizer surge line. In support of license renewal activities, FNP updated the previously performed LBB analysis on the RCL to account for the PEO in accordance with 10 CFR 54.21(c)(1)(ii). Additionally, FNP reviewed the existing LBB analysis of the pressurizer surge line and determined that it was bounding throughout the PEO. The team reviewed the program documentation and confirmed that the LBB evaluations for the RCL and the pressurizer surge line for FNP Units 1 and 2 had been updated for 60 years of operation.

The licensee considered the status for the administrative action items associated with the implementation of this TLAA as completed for Units 1 and 2.

b. Findings and Observations

No findings were identified.

On the basis of the sample selected for review, the team 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 FNP Units 1 and 2. The inspectors noted that due to the approximately four-year span between the start of the PEO dates for Units 1 and 2, several programs for Unit 2 had either yet to be developed or to be fully implemented at the time of this inspection; however, these programs and their implementation dates were being actively tracked in the licensee's corrective action program. Based on the review of program documents and activities completed at the time of this inspection, the team determined that the licensee had established the required AMPs and TLAAs to manage the aging effects of in-scope structures, systems, and components through the period of extended operation of the two units.

The team noted that the status of most of the selected sample in the corrective action program was shown as CT-IMP. This status meant that while all the planned actions to meet the commitments were complete, ongoing maintenance actions were being tracked for completion during the PEO. Additionally, while several programs contained outstanding implementation items (e.g., inspections due to be performed during upcoming refueling outages or implementation dates for Unit 2 specific items that were scheduled closer to the Unit 2 PEO), the team verified that those items were properly scheduled to be implemented either prior to the licensee entering the PEO for the respective Unit or prior to specific implementation dates for those items, as applicable. The team determined through interviews and documentation review that most of required aging management activities, such as inspections, procedure revisions, and

evaluations, were performed as described in the commitments and the pending actions consisted of the administrative closure of action items.

(1) Observation – Structural Monitoring AMP

The FNP SMP was credited for aging management of in-scope structures and support components. Specifically, the SMP credited the inspection of pull boxes associated with non-EQ medium voltage cables. The pull boxes associated with non-EQ cables at FNP used rectangular reinforced concrete boxes with steel or aluminum covers for safety-related boxes and aluminum covers for non-safety related boxes.

Licensee program document NMP-ES-021, "Structural Monitoring Program for the Maintenance Rule," Ver. 9, established the required qualifications of personnel, inspection acceptance criteria, and inspection frequency for in-scope components. Because pull boxes were inaccessible for inspection during normal operations, the licensee included the inspection of the structural portion of pull boxes in procedure NMP-ES-051-004, "Pull Box Inspection Procedure," Ver. 5. The inspectors identified that elements of the structural inspection per NMP-ES-021, such as the minimum qualifications and acceptance criteria, had not been incorporated into procedure NMP-ES-051-004. The licensee entered this issue into their corrective action program as CR10322705.

(2) Observation – Service Water AMP

The FNP Service Water Program implemented the recommendations of NRC Generic Letter 89-13. Program documents indicated that the program activities included mitigation, as well as performance and condition monitoring activities that manage fouling and loss of material in the service water system and associated components. Furthermore, Table 3.3.2-5 of the license renewal application defined the aging effects requiring management of in-scope heat exchangers as loss of material and fouling.

The service water program used activities such as flow testing, biocide treatment, and cleaning as mitigation techniques for the heat exchanger tubes. Performance testing and volumetric examinations such as eddy current and ultrasonic examination (UT) were used to identify fouling or loss of material. The team identified instances where performance testing and/or volumetric testing was not being performed on a periodic basis. Thus, it was unclear how the licensee was managing fouling and loss of material in all heat exchangers within the scope of license renewal. The licensee entered this issue into their corrective action program as CR10322150.

(3) Observation – Reactor Vessel Internals AMP

As described, commitment SNC28381, the RVI program, was based on requirements of industry guidance provided in Materials Reliability Program (MRP)-227-A. Section 4.3.2.4 of WCAP 18011-NP, which developed and documented the aging management program for reactor internals, provides an applicability statement of the assumptions contained in the MRP-227-A that are required to be met for MRP-227-A results to be applicable for each unit. One such assumption concerned fuel assembly loading patterns that are assumed in the MPR-227-A document. The team identified that while the licensee could offer procedures that required general review requirements for core reloads, no direct tie to the MRP-227-A assumption on low

leakage core pattern requirements could be identified. The licensee entered this issue into their corrective action program as TE-977777.

(4) Observation – One-Time Inspection and Non-EQ Cables AMPs
Commitment 10 stated that the OTI Program would be implemented prior to the PEO. Specifically, a sample population would consist of an examination of reactor coolant small bore (<4 inch NPS) ASME Class 1 piping components, consistent with Section XI.M32 of NUREG-1801, to address NRC concerns regarding cracking due to PWSCC or thermal cycling. NUREG-1801, Section XI.M32 specified that the non-destructive examination technique employed must permit inspection of the inside surfaces of the piping, that all indications or relevant conditions were evaluated, and that follow-up of any unacceptable inspection findings included expansion of the sample size and locations.

Initially, the licensee developed a strategy to limit examinations to butt welded locations since butt weld locations may have a greater susceptibility to PWSCC (based on industry operating history) and since UT is more appropriate at butt welded locations. Upon review, the team determined that UT examinations were also being performed on socket welds. The UT exams on the socket welds; however, were not performed using a qualified technique to confirm the presence of cracking due to stress corrosion cracking or thermal cycling. The licensee was committed to being consistent with NUREG-1801, Rev. 0. The current revision of NUREG-1801, Rev. 2, incorporated new guidance on performing inspections on socket welds with a qualified volumetric technique or by destructive examinations. The licensee entered this issue into their corrective action program as CR10322691.

.2 Newly Identified Structures, Systems, and Components

a. Inspection Scope

The inspectors discussed the evaluation of newly identified structures, systems, or components (SSCs) with the licensee's staff to verify compliance with the provisions of 10 CFR 54.37(b). The team reviewed licensee evaluations performed for newly identified structures within the scope of license renewal to verify that the aging management review was performed in accordance with 10 CFR 54.37. The team also reviewed a list of plant modifications performed from the time the LRA 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. Additionally, the team reviewed a sample of licensee procedures to verify that adequate guidance was provided to ensure that SSCs within the scope of 10 CFR 54.37(b) were identified, evaluated, and reported.

b. Findings and Observations

No findings were identified.

Based on the sample selected for review, the team 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 licensee self-assessments, the team determined that newly identified structures had been identified that would have been subject to aging management during the preparation of the original LRA and

subsequent revisions. These structures were the plant service water seismic restraints. The team determined that the licensee performed an aging management review of these structures consistent with the requirements in 10 CFR 54 and included them within the scope of existing AMPs. The licensee also planned to update the UFSAR to include these newly identified SSCs. The team did not identify any other 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.

.3 Description of Aging Management Programs in the UFSAR Supplement

a. Inspection Scope

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

- The team reviewed the UFSAR supplement submitted with the LRA, as revised, to identify the program attributes and future inspection activities that were originally relied upon for the approval of the renewed operating license.

- The team reviewed the revision of the UFSAR submitted to the NRC pursuant to the requirements in 10 CFR 50.71(e)(4) following the issuance of the renewed operating license to verify that the UFSAR supplement for license renewal was included with the UFSAR as required by the condition of the renewed operating license.

- The team reviewed the latest revision of the UFSAR supplement for license renewal (Revision 31) to verify that the program attributes and inspection activities were consistent with the AMPs as originally approved by the NRC and subsequent revisions performed under the provisions of 10 CFR 50.59. The team also verified that any changes caused by the inclusion of newly identified SSCs were included in the UFSAR supplement.

b. Findings and Observations

Except for the observation detailed below, the team determined that the UFSAR supplement, as revised, was incorporated or scheduled to be incorporated into the UFSAR. Additionally, the team determined that the UFSAR supplement descriptions matched the AMPs and TLAAs being implemented. The team also determined that changes, caused by the inclusion of newly identified SSCs, were scheduled to be included in the next revision of the UFSAR under 10 CFR 50.71(e).

(1) Observation – Fatigue Monitoring

Section 18.3.2 of the UFSAR stated, in part, that “If plant cycles exceed a design assumption, SNC will take corrective action which may include a more refined analysis or replacement or an inspection program approved by the NRC.” This program was also stated as being consistent with NUREG-1801 Rev. 0. Item 7, Corrective Actions in Section X.M1 of NUREG-1801 Rev. 0 stated that, “The program provides for corrective

actions to prevent the usage factor from exceeding the design code limit during the period of extended operation." This requirement emphasized preventive action rather than reactive action, specifically to avoid exceeding a design code limit. The verbiage in the UFSAR Supplement was determined to potentially allow for misinterpretation of that aspect. The licensee entered this issue into their corrective action program as CR10322181.

.4 Changes to License Renewal Commitments and the UFSAR Supplement for License Renewal

a. Inspection Scope

As part of the review of license renewal commitments, AMPs, and TLAAs 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 the commitments, including their elimination. The team 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 team also reviewed the licensee's procedures for commitment revision to obtain reasonable assurance that future changes to regulatory 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

The renewed operating license for FNP, Condition C.5, stated in part that the revised UFSAR supplement submitted with the LRA shall be included in the next scheduled update to the UFSAR required by 10 CFR 50.71(e)(4) following the issuance of the renewed operating license. Until that update is complete, the license condition allowed the licensee to make changes to the programs and activities described in the supplement without prior Commission approval, if Farley evaluated such changes pursuant to the criteria set forth in 10 CFR 50.59 and otherwise complied with the requirements in that section. The team noted that the licensee made changes to the UFSAR supplement in accordance with the approved commitment change process.

4OA6 Management Meetings

Exit Meeting Summary

On January 26, 2017, the team presented the inspection results to Mr. Scott Briggs, Plant Manager, and other members of the licensee staff. The licensee acknowledged the issues presented. The team 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

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

B. Arnes	License Renewal Team
C. Blackburn	License Renewal Program Owner
C. Bock	License Renewal Engineer
J. Collier	Regulatory Affairs Engineer
D. Enfinger	Chemistry Manager
K. King	Boric Acid Corrosion Control Engineer
J. Lattner	Fleet Principal Fire Protection Engineer
W. Malone	Buried Piping Program Engineer
D. Meendering	License Renewal Staff
K. Moore	License Renewal Program Manager
A. Perkins	Fleet Buried Piping and Tanks Program Owner
D. So	License Renewal Staff
S. Walden	Lead Civil Engineer
T. Wells	Reactor Internals Program Owner
C. Westberry	License Renewal Staff
K. Wilson	Fire Protection System Engineer
L. Worthy	Chemistry Supervisor

LIST OF DOCUMENTS REVIEWED

Calculations

Calculation – 40-Year Effective Pre-stress, dated, 1-16-73
Calculation – Initial Pre-stress, dated 4/18/73
Calculation 001.01, Pre-stress Losses, Revision 1
Calculation 003.05, Pre-stress Calculations (Initial and 40 Years), Revision 1
Calculation 003.10, Pressurization Effect on Tendons, dated 2/28/73
Calculation 003.11, Pre-stressing Correspondence, Revision 1
Calculation SC-99-0174-001, Projection of 60-Year Tendon Lift-Off Forces, Revision 2
FP-FNP-319, Structural Integrity Associates Calculation, Farley SI Fatigue-Pro 4.0 Baseline Analysis Startup through 12/31/14, Rev. 0, 10/12/16

Condition Reports Reviewed

CR00891373, 120 dpm Valve Leak in CTMT, 11/8/14
CR10013050, NSR31 Pull Box Found with Water Intake inside SNC581694, 1/15/15
CR10042404, Submerged cables in pool boxes, 3/18/15
CR10084919, Non-Safety Related Pull Boxes with submerged cables, 6/17/15
CR10201000, Refueling and Reactor Makeup Water Pipe Trench, 3/26/16
CR10202031, Pull Box 1WN1M28 with Submerged cables, 3/25/16
CR10223167, Unit-2, Removal and Replacement of Ex-Vessel Neutron Dosimeters during 2R24, 6/7/2016
CR10260383, EQ Components Nearing the End of Their 40 Year Qualified Life, 8/12/16
CR10280773, Unit 1 MSVR walkdown, 10/1/16
CR10291924, Review of Past Structural Monitoring Walk Down Results, 10/28/16

Condition Reports Generated

CR10316586, Ensure a license renewal transition plan is communicated
CR10317318, Update PMs N1C56007 and N2C56007
CR10317422, Revise procedure NMP-ES-063-003
CR10317770, Revise NF-CAP-200
CR10317858, Typo in AMP Book: NSAC-212L vice -202L
CR10317903, NMP-ES-011-001 Revisions for License Renewal
CR10317910, FSAR 18.2.9 Change Request for FAC Program
CR10318009, General license renewal inspector comments
CR10319728, Add step 4.1.4.b
CR10319857, Revise FNP-0-M-114.0
CR10319899, Revise NMP-ES-052-F01
CR10320764, Revise NMP-EN-501-002 and NMP-EN-501-F01
CR10321430, Evaluate acceptability of creating procedure description form
CR10321566, Revise NMP-ES-063 for Clarity (Responsibilities)
CR10322069, Revise FNP-0-M-82
CR10322113, Revise FNP-1/2-STP-165.0
CR10322150, Service water system engineer to establish a process to track and trend loss of material and fouling in SW HXs
CR10322181, Revision to FSAR Chapter 18 (License Renewal) Needed
CR10322511, Revise NMP-ES-038-GL01
CR10322559, Add section to NMP-ES-064
CR10322622, FAC Procedure License Renewal Vulnerability
CR10322690, Create a PM that requires the aging management coordinator to review each refueling outage scope for opportunistic inspections
CR10322691, Add specific criteria to CST bladder inspections
CR10322705, Revise PMs for inspection medium voltage pull boxes
CR10322916, License renewal
TE972307, Revise FSAR 18.2.19 for Accuracy
TE977299, Evaluate NMP-ES-029-GL for Scheduling Vulnerabilities
TE977777, Procedure Revision Request

Drawings

D-172110, Outdoor Ducts and Grounding Plan Cooling Tower Plan, Ver. 13
D-173008, Conduit Plan Low Voltage Switchyard, Ver. 14
D-173008, Conduit Plan Low Voltage Switchyard, Ver. 5
D-175010, P&ID – Containment Cooling & Purge Systems, Ver. 26
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D-518324, Chemical & Volume Control System, Ver. 2
U-165970D, Residual Heat Removal System, Ver. 3

Other Documents

1B11I (IVVI), FNP-Unit-1, Component Surveillance Schedule, Ver. 7
ALA-14-104, Transmittal of Farley 2R23 Flux Thimble eddy Current Examination Field Service Report, 12/9/14
ALA-15-55, Transmittal of Farley 1R26 Flux Thimble eddy Current Examination Field Service Report, 6/18/15
AMP-EQ, Environmental Qualification Program Basis Document, Ver. 1.0
AMP-EQ, Environmental Qualification Program, Operating Experience Review, Ver. 1.0
AMP-FAC, Flow Accelerated Corrosion Program, Ver. 1.0
AMP-FDTI, Flux Detector Thimble Inspection Program, Operating Experience Review, Ver. 1.0

AMP-FDTI, Flux Detector Thimble Inspection Program, Ver. 1.0
AMP-FOCC, Fuel Oil Chemistry Control Program, Ver.1.0
AMP-FOCHM, Fuel Oil Chemistry Control Program, Ver.1.0
AMP-NAMP – Nickel Alloy Management Program, Ver. 1.0
AMP-PSPMS, Periodic Surveillance and Preventative, Ver. 1.0
AMP-RVI, Reactor Vessel Internals Program Operating Experience Review, Ver. 1.0
AMP-RVS, Reactor Vessel Surveillance Program, Ver. 1.0
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DCP1053027801, Ex-Vessel Neutron Dosimetry System, Unit-1, Ver. 2.0
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EPRI-MRP, Integration Committee Meeting, Presenters List, November 16-17, 2016
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FNP-1-STP-116.2, Examination of Ex-Vessel Neutron Dosimetry, Ver. 8.0
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FNP-IVIintro.doc, Plant Farley Reactor Pressure Vessel Internals Examination Plan Description, Ver. 6.0
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LDCR 15-026, FSAR License Renewal Chapter 18.2 Update to Vessel Internals and Nickel Alloy Programs, 1/12/16
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Licensing Document Change Request (LDCR), 2006036FS, Unit-1, Ex-Vessel Neutron Dosimetry System LDCR, Ver. 1.0
LTR-RIAM-16-58, Farley Units 1 and 2 MRP-227-A Baffle-Former Bolt Inspection Timing Justification, 9/2/16
LTR-SEE-IV-10-139, Farley Unit 1 (ALA) Flux Thimble Eddy Current Evaluation for 1R23, November 3, 2010
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NMP-ES-018, SNC Inservice Inspection Engineering Program, Ver. 10.1
NMP-ES-029, PWR Primary System Integrity Program, Ver. 9.1
NMP-ES-029-GL01, Alloy 600 Program Management, Ver. 8.1
NMP-ES-029-GL02, PWR Internals Program Strategic Plan, Ver. 3.0
NMP-ES-038-GL01, General Engineering Procedure, Ver. 9.1
NMP-ES-063-GL02, Farley License Renewal Program Manual, Ver. 1.2
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NUREG/CR-5704 ANL- 98/31, Effects of LWR Coolant Environments on Fatigue Design Curves of Austenitic Stainless Steels, April 1999
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U-418647B, Bottom Mounted Instrumentation, Thimble Guide Tube Routing to Reactor Vessel, Rev. A1
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U-418649B, Bottom Mounted Instrumentation Fabrication Details, Rev. A4
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FNP-0-CCP-1112.0, Diesel Fuel Oil Storage Tank Sampling, Ver. 52
FNP-0-CCP-202.0, Water Chemistry Specifications, Ver. 145.0, Tables 47 and 63
FNP-0-CCP-332, Chemical Addition to the Diesel Fuel Oil Storage Tanks, Ver. 12.0
FNP-0-ETP-1007.0, Service Water Inspection and Cleanup, Ver. 13
FNP-0-ETP-4505.0, One-Time Inspection Program Examination, Ver. 2.1
FNP-0-ETP-4505.1, One-Time Inspection of Gray Cast Iron and Brass Components for Selective Leaching, Ver. 2.1
FNP-0-ETP-4505.2, One-Time Inspection of Jacketed Service Water System Piping External Surfaces, Ver. 1.1
FNP-0-ETP-4505.3, One-Time Inspection of the Turbine Driven Aux Feed Pump Turbine Lubricating Oil Cooler, Ver. 1.1
FNP-0-FSP-19, Low Pressure CO2 – Annual, Ver.11.0
FNP-0-FSP-201.1, No. 1 Diesel Driven Fire Pump Functionality Test, Ver. 19.0
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FNP-0-FSP-53.0, Fire Distribution System Flow Test, Ver. 7.0
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FNP-0-FSP-62.0, Analysis of A Fire Diesel Fuel Oil Storage Tank Contents, Ver. 8
FNP-0-FSP-62.1, Fire Diesel Fuel Oil Bottom Sample Quality Appearance Test, Ver. 4
FNP-0-GMP-141.0, Diesel Generator Fuel oil Storage Tank Cleaning, Ver. 3
FNP-0-M-113.0, One-Time Inspection Program, Ver. 3.0
FNP-0-M-114.0, External Surfaces Monitoring Program, Ver. 3.1
FNP-0-M-32.0, Master List of Fire Surveillance, Ver. 31.0
FNP-0-M-32.0, Master List of Fire Surveillance, Ver. 32.0
FNP-0-M-82, Service Water Plan, Ver. 14
FNP-0-MP-1.2, Removal and Installation of Ex-Vessel Neutron Dosimetry, Ver. 3.0
FNP-0-MP-1.2, Removal and Installation of Ex-Vessel Neutron Dosimetry, Ver. 3.1
FNP-0-MP-93.1, Replacement and Inspection of Boric Acid Tank Diaphragms, Ver. 5.0
FNP-0-SOP-0.4, Fire Protection Operability and LCO Requirements, Ver. 100.0
FNP-0-SOP-61.0, Fire Protection Pump House Yard Main, Ver. 49.1
FNP-0-STP-423.0, Analysis of an Emergency Diesel Generator Diesel Fuel Oil Storage Tank Contents, Ver. 35.0
FNP-0-STP-423.1, Analysis of New Diesel Generator Diesel Fuel Storage Tanker Contents, Ver. 7.1
FNP-0-STP-423.2, Additional Analysis of New Diesel Generator Diesel Fuel Storage Tanker Contents, Ver. 6.1
FNP-0-SYP-22.0, Farley Nuclear Plant Systems Performance Procedure, Flux detector Thimble Inspection Program
FNP-1-ETP-4503.0, One-Time Ultrasonic Examination of the Unit 1 CST Bottom, Ver. 1.0
FNP-1-FSP-422.1, Sprinkler Head Testing, Ver. 1.0

FNP-1-FSP-423.1, Sprinkler System Piping Nondestructive Examination for Wall Thinning and Flow Blockage, Ver. 1.0
FNP-1-FSP-63.04, Visual Inspection of Penetration Fire Barriers (Cable Chases), Ver. 7.0
FNP-1-FSP-63.06, Visual Inspection of Penetration Fire Barriers (Auxiliary Building - Computer Rm., Communications Rm. HSP Rm., Battery Rm. 1B), Ver. 10.0
FNP-1-FSP-63.5, Visual Inspection of Penetration Fire Barriers (Auxiliary Building: Computer Room, HSP Room, CCW Room, MCC 1E Room), Ver. 6.0
FNP-1-FSP-65.2, Fire Doors Functional Inspection Auxiliary Building-Diesel Building-Service Water Building, Ver. 12.0
FNP-1-FSP-65.2A, Fire Doors Functional Inspection Auxiliary Building-Diesel Building-Service Water Building Train "A", Ver. 3.0
FNP-1-FSP-65.2B, Fire Doors Functional Inspection Auxiliary Building-Diesel Building-Service Water Building Train "B", Ver. 3.0
FNP-1-MP-42.0, Maintenance of Byron Jackson Service Water Pumps, Ver. 18
FNP-1-STP-116.1, Examination of Ex-Vessel Neutron Dosimetry, Ver. 8.0
FNP-2-FSP-422.1, Sprinkler Head Testing, Ver. 1.0
FNP-2-FSP-423.1, Sprinkler System Piping Nondestructive Examination for Wall Thinning and Flow Blockage, Ver. 1.0
FNP-IMP-AMP-21, Non-EQ Cable Program License Renewal Implementation Package, 5/31/05 Inspection Program, Ver. 1.0
NMP-CH-401, Diesel Fuel Oil Program, Ver. 4.0
NMP-CH-401-001, Bio-Diesel Content Using the Nicolet iS10 Spectrometer, Ver. 1.2
NMP-CH-401-002, API and Specific Gravity Determination, Ver. 1.0
NMP-CH-401-003, Clear and Bright Determination, Ver. 1.0
NMP-CH-401-004, Flash Point Determination, Ver. 2.0
NMP-CH-401-005, Kinematic Viscosity Determination, Ver. 1.0
NMP-CH-401-006, Water and Sediment Determination, Ver. 1.0
NMP-CH-401-007, Particulate Contamination Determination, Ver. 1.2
NMP-CH-401-F01, Diesel Fuel Oil Chain of Custody, Ver. 1.2
NMP-CH-401-F02, New EDG Diesel Fuel Oil Results Worksheet, Ver. 1.2
NMP-EN-501-002, Procedure for Performing Non-Radiological Environmental Impact Evaluations, Ver. 3.0
NMP-ES-006, Preventative Maintenance Implementation and Continuing Equipment Reliability Improvement, Ver. 9.1
NMP-ES-012, Heat Exchanger Program, Ver. 1.0
NMP-ES-016, Environmental Qualification Program, Ver. 9.0
NMP-ES-016-001, Environmental Qualification Program Notebooks, Ver. 5.0
NMP-ES-016-GL01, Environmental Qualification Implementation, Ver. 3.0
NMP-ES-018, SNC Inservice Inspection Engineering Program, Ver. 10.1
NMP-ES-018, SNC Inservice Inspection Engineering Program, Ver. 10
NMP-ES-021, Structural Monitoring Program for the Maintenance Rule, Ver. 9
NMP-ES-024-510, Ultrasonic Flow-Accelerated Corrosion Examination Procedure, Ver. 8.0
NMP-ES-029, PWR Primary System Integrity Program, Section 4.3, Ver. 9.1
NMP-ES-029-GL02, PWR Reactor Internals Program Strategic Plan, Ver. 3.0
NMP-ES-030, Reactor Coolant System Materials Management Program Supplemental Governance, Section 4.4, Ver. 5.0
NMP-ES-035, Fire Protection Program, Ver. 5.1
NMP-ES-035-001, Fire Protection Program Implementation, Ver. 13.0
NMP-ES-036, Underground Pipe and Tanks Monitoring Program, Ver. 13.0
NMP-ES-036-001, Underground Pipe and Tanks Monitoring Program Implementation, Ver. 10.0
NMP-ES-038-GL01, General Engineering Procedure Section D.4.7, Ver. 9.1

NMP-ES-051, Cable Monitoring Program, Ver. 9
NMP-ES-051-002, Tan Delta Testing, Ver. 9
NMP-ES-051-003, Adverse Localized Equipment Environment Walkdown, Ver. 2.4
NMP-ES-051-004, Pull Box Inspection Procedure, Ver. 5
NMP-ES-051-GL01, Cable Monitoring Program Scope, Ver. 5
NMP-ES-063, License Renewal Program, Ver. 3.0
NMP-ES-063-001, License Renewal Program Implementation, Ver. 2.0
NMP-ES-063-003, 10 CFR 54.37(b) Review Instructions, Ver. 3.0
NMP-ES-063-004, 10 CFR 54.37(b) Scoping Determination Instructions, Ver. 2.0
NMP-ES-064-001, Thermal Fatigue Monitoring Instruction, Ver. 2.1
NMP-ES-064-002, Thermal Stratification Management Instruction, Ver. 1.1
NMP-ES-069, Fleet Service Water Program, Ver. 3.1
NMP-ES-069-001, Fleet Service Water Program Instructions, Ver. 3.2
NMP-GM-019, Commitments Management, Ver. 4.0
NMP-GM-019-001, Commitment Tracking System Record Initiation and Revision Form Instructions, Ver. 2.1
NMP-MA-011-006, Procedure for Coating Condition Assessments, Ver. 7.0
NMP-MA-046, Excavation, Trenching and Shoring, Ver. 3.0

Work Orders – Completed
16-MT-018, 2B Emergency Diesel Generator Intercooler Tubesheet Analysis, 4/18/16
SNC312324, Internal Inspection of the Unit 1 RWST
SNC324757, Perform Direct Exams on the SW Piping
SNC353745, Inservice Inspection, 5/10/13
SNC389246, Inservice Inspection Class 3 Sys, 9/29/13
SNC415334, 1-2A DG Storage Tank – 10-Year
SNC422911, 2B DG Storage Tank – 10-Year
SNC428161, Unit-2, Perform In-core Thimble Eddy Current Testing, 5/6/2019
SNC429962, Work Orders are needed for UTs on the buried S29 Oil Static Lines (230 kV) and support
SNC434507, Perform Examination of Aux Steam Generator Fuel Oil Supply Tank
SNC436134, Perform a visual inspection of the CST bladder
SNC442503, Low-Pressure CO2 Hose – Replace and Lube Hose Reel
SNC442504, Low-Pressure CO2 Hose – Replace and Lube Hose Reel
SNC442709, Low-Pressure CO2 Hose Replacement and Lube Hose Reel
SNC442710, Low-Pressure CO2 Hose – Replace and Lube Hose Reel
SNC442731, Low-Pressure CO2 Hose – Replace and Lube Hose Reel
SNC442732, Low-Pressure CO2 Hose – Replace
SNC442976, Low-Pressure CO2 Hose Replacement and Lube Hose Reel
SNC442977, Low-Pressure CO2 Hose Reel - Replace
SNC442979, Low-Pressure CO2 Hose - Replace and Lube Hose Reel
SNC442993, Low-Pressure CO2 Hose - Replace and Lube Hose Reel
SNC443152, Low-Pressure CO2 Hose - Replace and Lube Hose Reel
SNC443153, Low-Pressure CO2 Hose - Replace
SNC443155, Low-Pressure CO2 Hose - Replace and Lube Hose Reel
SNC443193, LP CO2 Hose - Replace and Lube Hose Reel
SNC443299, Low-Pressure CO2 Hose - Replace and Lube Hose Reel
SNC457404, Inspect RWST per 0-EPT-4504
SNC460074, VT-1 Exam of CTMT Sump to RHR Pump Valve, 10-21-13
SNC460074, VT-1 Exam of Encapsulation Vessel Q1E13V003A, 10/21/13
SNC471712, Perform UT on SW Piping

SNC471713, Perform UT on SW Piping
SNC471714, Perform UT on SW Piping
SNC471715, Perform UT on SW Piping
SNC471717, Perform UT on B Train SW Piping
SNC492170, 1C DG Storage Tank – 10-Year
SNC496203, Low-Pressure CO2 Hose Replacement and Lube Hose Reel
SNC505034, 1B DG Storage Tank – 10-Year
SNC510638, 2C DG Storage Tank – 10-Year
SNC519747, Inspect SW Standpipe Surge Tank per 0-ETP-4504
SNC529362, Perform Examination of the Fire Training Facility Oil Storage Tanks
SNC529618, Perform Inspection of the RMWST diaphragm
SNC538522, U1 RMWST diaphragm – inspect
SNC550486, Letdown Flow Orifice (45gpm), 11/2/14
SNC562668, Inspect 1A boric acid tank diaphragm
SNC583196, Unit-1, Perform In-core Thimble Eddy Current Testing, 4/10/15
SNC583633, Inspect weld on 1RC-024A, 4/9/15
SNC583635, 1B RCP Thermal Barrier Hx Inlet and Outlet, 4/21/15
SNC583636, UT of CVCS Letdown Orifice B, 4/4/15
SNC583637, Inspect Weld on 1RC-024B, 4/9/15
SNC587904, Steam Turbine for TDAFW Pump, 12/4/14
SNC587905, Steam Turbine for TDAFW Pump, 12/4/14
SNC618994, Underground FPS Leak Downstream of N1Y43V271B
SNC622280, Diesel Emerg. PWR Generator, 11/16/15
SNC631557, One Time Inspection of U1 RHR Hx Tubesheet, 10/12/16
SNC631569, Perform One-Time Inspection of U1 RCDT Hx Shell with UT, 4/6/2015
SNC631578, OTI of U1 CCW Hx Tubesheet and Tubes, 8/16/16
SNC634859, Perform UT of HCD-94 2” socket weld piping, 12/21/15
SNC638321, Perform UT of CNMT ISOL Pipe Penetrations, 12/14/16
SNC638615, Perform One-Time inspection of weld ALA2-4201-5-RB5, 4/29/15
SNC639932, RWST Unit 1 Tank, 4/4/15
SNC644021, EV-1 Pressurizer, 3/10/2015
SNC65966, Perform visual inspection of the CST bladder
SNC666718, Structural Integrity Inspection of the Service Water Area, 11/1/16
SNC673910, D/G 1B Intercooler Water Heat Exchanger Thermostatic Bypass, 1/25/16
SNC678520, A-TRN SW Strainer, 9/4/14
SNC706739, FNP-0-FSP-201.1, No. 1 Diesel Driven Fire Pump Operability Test
SNC709204, FNP-0-FSP-201.2, No. 2 Diesel Driven Fire Pump OP
SNC714681, CVCS Letdown Orifice A, 10/12/16
SNC719295, LR Sprinkler Inspection PMs for FSP-423.1
SNC719308, Perform: License Renewal for 1D98 (Diesel Bldg. Train B Cable Tunnel)
SNC73091, Inspect the boric acid tank diaphragm every 36 M
SNC73093, 2B BAT inspect diaphragm
SNC73232, Unit-2, Perform Eddy Current Testing of In-core Thimbles, 11/8/14
SNC750001, 2B DG Fuel Storage Tank License Renewal Inspection
SNC791937, LRI of SW piping to 1C Air Compressor, 9/15/16
SNC794999, One Time Inspection U1 RHR Hx Shell, 10/12/16
SNC799315, Unit 1 Condensate Storage Tank, 10/9/16
SNC838125, Unit-1, Perform In-core Thimble Eddy Current Testing, 11/9/2019
SNC95083, Assess Structural Integrity and Condition of Fire Protection Tank #2