



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION II

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ATLANTA, GEORGIA 30303-1257

October 27, 2017

Dennis R. Madison  
Vice President  
Southern Nuclear Operating Company, Inc.  
Joseph M. Farley Nuclear Plant  
7388 North State Highway 95  
Columbia, AL 36319

**SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT – NUCLEAR REGULATORY  
COMMISSION INTEGRATED INSPECTION REPORT 05000348/2017003 AND  
05000364/2017003**

Dear Mr. Madison:

On September 30, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Joseph M. Farley Nuclear Plant, Units 1 and 2. On October 18, 2017, NRC inspectors discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented a finding of very low safety significance (Green) in this report. This finding involved a violation of NRC requirements. In addition, the inspectors documented a licensee-identified violation which was determined to be of very low safety significance in this report. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violations or significance of these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement; and the NRC resident inspector at the Joseph M. Farley Nuclear Plant, Units 1 and 2.

If you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement; and the NRC resident inspector at the Joseph M. Farley Nuclear Plant, Units 1 and 2.

D. Madison

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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/*

Shane Sandal, Chief  
Reactor Projects Branch 6  
Division of Reactor Projects

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

Enclosure:  
IR 05000348/2017003, 05000364/2017003  
w/Attachment: Supplemental Information

cc Distribution via ListServ

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT – NUCLEAR REGULATORY  
 COMMISSION INTEGRATED INSPECTION REPORT 05000348/2017003 AND  
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**U.S. NUCLEAR REGULATORY COMMISSION  
REGION II**

Docket Nos.: 50-348, 50-364

License Nos.: NPF-2, NPF-8

Report No.: 05000348/2017003; and 05000364/2017003

Licensee: Southern Nuclear Operating Company, Inc.

Facility: Joseph M. Farley Nuclear Plant

Location: Columbia, Alabama

Dates: July 1, 2017 through September 30, 2017

Inspectors: P. Niebaum, Senior Resident Inspector  
K. Miller, Resident Inspector  
R. Kellner, Senior Health Physicist (2RS7, 4OA1)  
W. Pursley, Health Physicist (2RS8)  
A. Nielsen, Senior Health Physicist (2RS6)  
G. Ottenburg, Senior Reactor Inspector (4OA5)  
B. Collins, Reactor Inspector (1R07)

Approved by: Shane Sandal, Chief  
Reactor Projects Branch 6  
Division of Reactor Projects

Enclosure

## SUMMARY

IR 05000348/2017003; and 05000364/2017003, July 1, 2017 through September 30, 2017;  
Joseph M. Farley Nuclear Plant, Units 1 and 2, Follow up of Events

The report covered a three-month period of inspection by resident inspectors and regional inspectors. There is one NRC-identified violation documented in this report. The significance of inspection findings are indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP) dated April, 29, 2015. The cross-cutting aspects are determined using IMC 0310, "Aspects within the Cross-Cutting Areas" dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated November 1, 2016. The NRC's program for overseeing the safe operations of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6. Documents reviewed by the inspectors which are not identified in the Report Details are identified in the List of Documents Reviewed section of the Attachment.

### Cornerstone: Mitigating Systems

Green. The NRC identified a non-cited violation (NCV) of Technical Specification (TS) 5.4.1.a, "Procedures," for the licensee's failure to implement corrective maintenance work order instructions to identify and replace piping as necessary for a degraded threaded joint on the 2B emergency diesel generator (EDG) jacket water keep warm system piping. As a result, a leak occurred at this threaded pipe joint during surveillance testing which rendered the 2B EDG inoperable. The inspectors determined that the failure to follow work order instructions to replace degraded jacket water system piping during corrective maintenance on the 2B EDG on March 3, 2017, was a performance deficiency (PD).

The finding was more than minor because it was associated with the equipment reliability attribute of the mitigating systems cornerstone and adversely affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The significance of this finding was evaluated using IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012. Initial screening by the resident inspectors using the Sapphire Farley 1 & 2 SPAR Model resulted in a potentially greater-than-green significance. Therefore, a detailed risk analysis was performed by a regional senior reactor analyst (SRA). The NRC Farley SPAR model was used for internal events, seismic and tornado/high winds risk estimates and the licensee's Farley fire probabilistic risk assessment model was used for fire risk estimation. The major analysis assumptions included: a 51-day exposure period, EDG 2B operation at nominal failure to run probability until 8 hours when EDG assumed to fail due to the PD, PD treated as having common cause failure to run potential, no recovery of the 2B EDG was assumed, and no credit for FLEX equipment was assumed. The operation of the EDG for 8 hours prior to failure and remaining mitigating equipment limited the risk. The dominant sequence was a station blackout sequence consisting of a site-wide weather-related loss of offsite power, successful reactor shutdown, random failure to run of the 1/2A and 1C EDGs, failure of the 2B EDG due to the performance deficiency, failure to manually operate the turbine driven auxiliary feedwater pump long term, and failure to recover offsite power or an EDG leading to loss of core heat removal and core damage. The detailed risk evaluation (DRE) determined that the increase in core damage frequency due to the PD was  $<1.0 \text{ E-6}$  per year, a Green finding of very low safety significance. The finding had a cross-cutting aspect of Conservative Bias in the Human

Performance area, because the decision to leave the diesel in a degraded condition following maintenance on March 3, 2017 was neither conservative nor prudent when additional action could have been taken to adequately repair or evaluate the threaded pipe joint [H.14].

Violations of very low safety significance that were identified by the licensee have been reviewed by the NRC. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and corrective action tracking numbers are listed in Section 4OA7 of this report.

## REPORT DETAILS

### Summary of Plant Status

Unit 1: Unit 1 started the report period at approximately 100 percent rated thermal power (RTP). Unit 1 maintained approximately 100 percent RTP through the end of the report period.

Unit 2: Unit 2 started the report period at approximately 100 percent RTP. Unit 2 maintained approximately 100 percent RTP through the end of the report period.

#### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

##### 1R01 Adverse Weather Protection (71111.01)

###### a. Inspection Scope

Impending Adverse Weather Conditions: The inspectors reviewed the licensee's preparations to protect risk-significant systems from adverse weather conditions expected during the week of September 11, 2017. The inspectors evaluated the licensee's implementation of adverse weather preparation procedures and compensatory measures, including operator staffing, before the onset of the adverse weather conditions. The inspectors verified that operator actions specified in the licensee's adverse weather procedure maintain readiness of essential systems. The inspectors also verified that the licensee implemented periodic equipment walkdowns or other measures to ensure that the condition of plant equipment met operability requirements.

###### b. Findings

No findings were identified.

##### 1R04 Equipment Alignment (71111.04)

###### a. Inspection Scope

Partial Walkdown: The inspectors verified that critical portions of the following systems were correctly aligned by performing partial walkdowns. The inspectors determined the correct system lineup by reviewing plant procedures and drawings listed in the Attachment.

- Units 1 and 2, Shared ('A' Train) '1C' diesel generator (DG) following maintenance
- Unit 1, Residual Heat Removal (RHR), 'A' Train while the 'B' Pump was inoperable for testing and maintenance
- Unit 1, '1A' Motor Driven Auxiliary Feedwater (AFW) Pump while the turbine driven AFW pump was inoperable for maintenance

Complete Walkdown: The inspectors verified the alignment of the Unit 1 600 Volt A.C. Emergency Load Centers by reviewing plant procedures, drawings, the updated final safety analysis report, and other documents. The inspectors also reviewed records related to the system outstanding design issues, maintenance work requests, and deficiencies.

The inspectors reviewed corrective action documents, including condition reports and outstanding work orders, to verify the licensee was identifying and resolving equipment alignment discrepancies. The inspectors also reviewed periodic reports containing information on the status of risk-significant systems, including maintenance rule reports and system health reports.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05AQ)

a. Inspection Scope

Quarterly Inspection: The inspectors evaluated the adequacy of fire plans by comparing the fire plans to the defined hazards and defense-in-depth features specified in the fire protection program the following four fire areas.

- Unit 1, Room 254 – Unit 1 Hot Shutdown Room, Fire Area 1-012, Fire Zone 0254
- Unit 1, Room 334 – Electrical Penetration Room, Train B, Fire Area 1-034, Fire Zone 334
- Unit 1, Room 333 - Electrical Penetration Room, Train A, Fire Area 1-035, Fire Zone 335
- Unit 1, Room 347 – Electrical Penetration Room, Fire Area 1-035, Fire Zone 347

The inspectors assessed the following:

- control of transient combustibles and ignition sources
- fire detection systems
- water-based fire suppression systems
- gaseous fire suppression systems
- manual firefighting equipment and capability
- passive fire protection features
- compensatory measures and fire watches
- issues related to fire protection contained in the licensee's corrective action program
- material condition and operational status of fire protection equipment

b. Findings

No findings were identified.



1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

Internal Flooding: The inspectors reviewed related flood analysis documents and walked down the area(s) listed below containing risk-significant structures, systems, and components susceptible to flooding. The inspectors verified that plant design features and plant procedures for flood mitigation were consistent with design requirements and internal flooding analysis assumptions. The inspectors also assessed the condition of flood protection barriers and drain systems. In addition, the inspectors verified the licensee was identifying and properly addressing issues using the corrective action program.

- Unit 1, Auxiliary Building 100' elevation, Component Cooling Water (CCW) Heat Exchanger room

1R07 Heat Sink Performance (71111.07T)

Triennial Review

a. Inspection Scope

The inspectors conducted an onsite review of the implementation of the licensee's heat exchanger and heat sink performance program. The scope of this review included heat exchangers and heat sinks required to remove decay heat and provide cooling water for risk significant or safety-related equipment.

The inspectors reviewed the Unit 2 CCW heat exchangers, Unit 2 Motor-Driven Auxiliary Feedwater (MDAFW) pump room coolers and the Unit 1 RHR pump room coolers, which were directly cooled by the service water system. The inspectors reviewed operability determinations, completed surveillances, vendor manual information, associated calculations, performance test results, and inspection results. This information was used to determine if the condition and operation of the heat exchangers was consistent with design assumptions in heat transfer calculations and as described in the final safety analysis report.

For those heat exchangers directly cooled by the service water system, the inspectors additionally determined if testing, inspection, maintenance, and monitoring of biotic fouling and macrofouling programs were adequate to ensure proper heat transfer. The inspectors reviewed the methods and results of heat exchanger performance inspections and cleanings to determine if the as-found results were recorded, evaluated, and appropriately dispositioned so that the as-left condition was acceptable. The inspectors also evaluated the test results to determine if the frequency was sufficient enough to detect performance degradation.

The inspectors determined if performance of the ultimate heat sink (UHS), and its subcomponents such as piping, intake screens, pumps, valves, etc., was appropriately evaluated by tests or other equivalent methods, to ensure availability and accessibility to the onsite cooling water systems. Specifically, the inspectors:

- performed walkdowns and reviews of the UHS to determine if the licensee's inspection of the UHS was thorough and of sufficient depth to identify degradation of the shoreline protection or loss of structural integrity
- reviewed the licensee's operation of the service water system and UHS to determine if key design requirements were considered as inputs and maintained
- performed a system walkdown and reviewed documentation on the service water and closed cooling water systems to determine if the licensee's assessment on structural integrity was adequate
- performed a system walkdown of the service water intake structure to determine if the licensee's assessment on structural integrity and component functionality was adequate and that the licensee ensured proper functioning of traveling screens and strainers, and structural integrity of component mounts

The inspectors also reviewed condition reports related to heat exchanger and heat sink performance issues to determine if the licensee had an appropriate threshold for identifying issues and to evaluate the effectiveness of the corrective actions. The documents that were reviewed are included in the Attachment to this report. These inspection activities constituted four heat sink inspection samples as defined in IP 71111.07-05.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program and Licensed Operator Performance (71111.11)

a. Inspection Scope

Resident Inspector Quarterly Review of Licensed Operator Regualification:

The inspectors observed a simulator scenario conducted for training of an operating crew for requalification on September 12, 2017.

The inspectors assessed the following:

- licensed operator performance
- the ability of the licensee to administer the scenario and evaluate the operators
- the quality of the post-scenario critique
- simulator performance

Resident Inspector Quarterly Review of Licensed Operator Performance:

The inspectors observed licensed operator performance in the main control room during Unit 1 "A" train reactor trip breaker testing on August 23, 2017.

The inspectors assessed the following:

- use of plant procedures
- control board manipulations
- communications between crew members
- use and interpretation of instruments, indications, and alarms
- use of human error prevention techniques
- documentation of activities
- management and supervision

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors assessed the licensee's treatment of the three issues listed below to verify the licensee appropriately addressed equipment problems within the scope of the maintenance rule (10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants"). The inspectors reviewed procedures and records to evaluate the licensee's identification, assessment, and characterization of the problems as well as their corrective actions for returning the equipment to a satisfactory condition. The inspectors also interviewed system engineers and the maintenance rule coordinator to assess the accuracy of performance deficiencies and extent of condition.

- Unit 2, Instrument air system, '2B' service air compressor motor bearing failure
- Unit 2, '2B' charging pump breaker tripped on pump start
- Unit 1 and 2, Shared, '1-2A' DG jacket water keep warm piping leak

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

a. Inspection Scope

The inspectors reviewed the three maintenance activities listed below to verify that the licensee assessed and managed plant risk as required by 10 CFR 50.65(a)(4) and licensee procedures. The inspectors assessed the adequacy of the licensee's risk assessments and implementation of risk management actions.

The inspectors also verified that the licensee was identifying and resolving problems with assessing and managing maintenance-related risk using the corrective action program. Additionally, for maintenance resulting from unforeseen situations, the inspectors assessed the effectiveness of the licensee's planning and control of emergent work activities.

- Unit 2, August 8, 2017, '2B' CCW Heat Exchanger out of service (OOS)
- Unit 1, August 8, 2017, penetration room filtration (PRF) system boundary breach and '1B' RHR pump OOS
- Unit 2, September 19, 2019, '1-2A' diesel generator, '1C' CCW pump and 500kV Sinai Cemetery line OOS

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15)

a. Inspection Scope

Operability Determinations and Functionality Assessments Review:

The inspectors selected the five operability determinations or functionality evaluations listed below for review based on the risk-significance of the associated components and systems. The inspectors reviewed the technical adequacy of the determinations to ensure that technical specification operability was properly justified and the components or systems remained capable of performing their design functions. To verify whether components or systems were operable, the inspectors compared the operability and design criteria in the appropriate sections of the technical specification and updated final safety analysis report to the licensee's evaluations. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. Additionally, the inspectors reviewed a sample of corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with operability evaluations.

- Request for Engineering Review (RER) SNC881160, PRF Boundary Breach
- CR 10391185, Deficiencies identified on the 1C diesel generator (DG)
- CR 10392660, Air line for solenoid to Unit 2 FCV-489 is broken
- CR 10392886, #1 Service Water Battery missing one hold down fastener
- CR 10393270, Q1P17HV2229 – NORM/BLOCK switch found in SI BLOCK position

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors either observed post-maintenance testing or reviewed the test results for the four maintenance activities listed below to verify the work performed was completed correctly and the test activities were adequate to verify system operability and functional capability.

- FNP-1-STP-20.2, verification of PRF operability following restoration of PRF boundary breach
- SNC884089, Perform '1C' EDG cross-drive backlash gear measurements
- SNC788873, Preventive maintenance on the U1 reactor trip breaker "A"
- SNC80302, '2A' CCW heat exchanger relief valve test

The inspectors evaluated these activities for the following:

- Acceptance criteria were clear and demonstrated operational readiness.
- Effects of testing on the plant were adequately addressed.
- Test instrumentation was appropriate.
- Tests were performed in accordance with approved procedures.
- Equipment was returned to its operational status following testing.
- Test documentation was properly evaluated.

Additionally, the inspectors reviewed a sample of corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with post-maintenance testing.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed the four surveillance tests listed below. The surveillance test was either observed directly or test results were reviewed to verify testing activities and results provide objective evidence that the affected equipment remain capable of performing their intended safety functions and maintain their operational readiness consistent with the facility's current licensing basis. The inspectors evaluated the test activities to assess for:

- preconditioning of equipment,
- appropriate acceptance criteria,
- calibration and appropriateness of measuring and test equipment,
- procedure adherence, and
- equipment alignment following completion of the surveillance.

Additionally, the inspectors reviewed a sample of significant surveillance testing problems documented in the licensee's corrective action program to verify the licensee was identifying and correcting any testing problems associated with surveillance testing.

#### Routine Surveillance Tests

- FNP-1-STP-33.0A, Solid State Protection System Train A Operability Test, Ver. 57.2

#### In-Service Tests (IST)

- FNP-2-STP-22.2, 2B Auxiliary Feedwater Pump Quarterly Inservice Test, Ver. 32

#### RCS Leakage Detection

- FNP-2-STP-9.0, RCS Leakage Test, Ver. 51.4

#### Containment Isolation Valve Testing

- FNP-2-STP-627.2, Leak Testing of the Containment Purge System, Ver. 26.1

#### b. Findings

No findings were identified.

### 2. RADIATION SAFETY (RS)

#### 2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06) (Six Inspection Samples Completed)

##### a. Inspection Scope

Radioactive Effluent Treatment Systems: The inspectors walked down selected components of the gaseous and liquid radioactive waste (radwaste) processing and effluent discharge systems. To the extent practical, the inspectors observed and evaluated the material condition of in-place waste processing equipment for indications of degradation or leakage that could constitute a possible release pathway to the environment. Inspected components included effluent monitoring equipment, waste gas decay tanks, monitor tanks, waste processing equipment, and associated piping and valves. The inspectors interviewed licensee staff regarding equipment configuration and effluent monitor operation. The inspectors also walked down and reviewed surveillance test records for the Unit 1 Penetration Room Filtration system.

Effluent Sampling and Discharge: The inspectors observed the collection and processing of gaseous effluent samples from the Unit 2 Plant Vent Stack. Technician proficiency in collecting, processing, and preparing the applicable release permits was evaluated. The inspectors reviewed recent liquid and gaseous release permits including pre-release sampling results, effluent monitor alarm setpoints, and public dose calculations. For the U2 Liquid Waste Processing Effluent Monitor (2RE-18), U1 and U2 Steam Jet Air Ejector Effluent Monitors (1/2RE-15), and the U2 Plant Vent Stack Effluent

Monitor (2RE-14), the inspectors reviewed calibration records for radiation detection and flow monitoring elements and evaluated the adequacy of radioactive sources used during testing. The inspectors reviewed and discussed with licensee staff the methodology used to determine stack flow rates and compared current vent flows to design basis values.

The inspectors reviewed the 2015 and 2016 Annual Radioactive Effluent Release Reports (ARERR) to evaluate reported doses to the public, review unplanned releases, and to review Offsite Dose Calculation Manual (ODCM) changes. The inspectors also reviewed compensatory sampling data for time periods when selected radiation monitors were out of service. The inspectors reviewed the results of interlaboratory cross-checks for laboratory instruments used to analyze effluent samples. The inspectors also reviewed licensee effluent source term characterizations and changes to effluent release points. In addition, the inspectors evaluated recent land use census results.

Problem Identification and Resolution: The inspectors reviewed and discussed selected Corrective Action Program (CAP) documents associated with gaseous and liquid effluent processing and release activities including licensee sponsored assessments. The inspectors evaluated the licensee's ability to identify and resolve issues.

Inspection Criteria: Radwaste system operation and effluent processing activities were evaluated against requirements and guidance documented in the following: 10 CFR Part 20; 10 CFR Part 50 Appendix I; ODCM; Updated Final Safety Analysis Report (UFSAR) Section 11; Regulatory Guide (RG) 1.21, "Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants"; RG 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50 Appendix I"; and TS Section 5. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings were identified.

2RS7 Radiological Environmental Monitoring Program (REMP) (71124.07)  
(Three Inspection Samples Completed)

a. Inspection Scope

REMP Implementation: The inspectors reviewed the 2014, 2015, and 2016 ARERRs and the 2014, 2015, and 2016 Annual Radiological Environmental Operating Reports (AREOR). Selected environmental measurements were reviewed for consistency with licensee effluent data, evaluated for radionuclide concentration trends, and compared with detection level sensitivity requirements as described in the ODCM. The inspectors assessed the licensee's response to any missed or anomalous environmental samples. The inspectors also reviewed the results of interlaboratory cross-checks for laboratory instruments used to analyze environmental samples. Any changes to the ODCM, Land Use Census, or environmental program processes were discussed with licensee staff.

The inspectors observed routine collection of airborne particulate and iodine air samples, a surface water sample, and verified placement of environmental dosimeters and sampling equipment at selected locations as required by the licensee's ODCM. The inspectors noted the material condition of the continuous air samplers, water samplers, and environmental dosimeters. The inspectors also reviewed calibration and maintenance records for selected the environmental sampling equipment.

Meteorological Monitoring Program: The inspectors observed the physical condition of the meteorological tower and its instrumentation and discussed equipment operability and maintenance history with licensee staff. The inspectors evaluated transmission of locally generated meteorological data to other licensee groups such as emergency operations personnel and main control room operators. Calibration records for the meteorological measurements of wind speed, wind direction, and temperature were reviewed. The inspectors also reviewed meteorological measurement data recovery for 2015 and 2016.

Ground Water Protection: The inspectors reviewed the licensee's continued implementation of the industry's Ground Water Protection Initiative (Nuclear Energy Institute (NEI) 07-07) and discussed any changes to the program. The inspectors discussed program guidance for dealing with spills, leaks, and unexpected discharges with licensee staff and reviewed recent monitoring well results and any voluntary communications. The inspectors also reviewed recent entries into the 10 CFR 50.75(g) decommissioning file. The inspectors reviewed and discussed the licensee's program for monitoring of structures, systems, and components with the potential to release radioactive material to the environment. Potential effluent release points due to onsite surface water bodies were also evaluated.

Problem Identification and Resolution: The inspectors reviewed CAP documents in the areas of radiological environmental monitoring and meteorological tower maintenance. The inspectors evaluated the licensee's ability to identify and resolve the issues. The inspectors also reviewed recent self-assessment results.

Inspection Criteria: The inspectors evaluated REMP implementation and meteorological monitoring against the requirements and guidance contained in: 10 CFR Part 20; Appendices E and I to 10 CFR Part 50; TS Section 5.0; Offsite Dose Calculation Manual for Joseph M. Farley Nuclear Plant, Version 25.0; UFSAR Chapter 11; RG 4.15, Quality Assurance for Radiological Monitoring Programs (Normal Operation) - Effluent Streams and the Environment; Branch Technical Position, "An Acceptable Radiological Environmental Monitoring Program" – 1979; Safety Guide 23 "Onsite Meteorological Programs"; NEI 07-07, "Industry Groundwater Protection Initiative – Final Guidance Document"; and approved licensee procedures. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings were identified.



2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation (71124.08)(Six Inspection Samples Completed)

a. Inspection Scope

Radioactive Material: The inspectors walked down indoor and outdoor areas inside the protected area as well as the low level radioactive waste facility and steam generator storage facility. During the walk-downs, the inspectors observed the physical condition and labeling of storage containers and the radiological postings for satellite radioactive material storage areas. The inspectors also reviewed the licensee's radwaste procedures for routine surveys and waste storage.

Radioactive Waste System Walkdown, Characterization and Classification: The inspectors walked down accessible sections of the liquid and solid radwaste systems which included waste tanks and pumps in the auxiliary building, vendor provided waste processing skids and the processing and dewatering facility. The inspectors discussed the function of radwaste components with the radwaste operator. The inspectors discussed possible changes to the radwaste processing systems with radwaste staff. The processes for the dewatering of resins, spent resin tank recirculation, resin sampling, and transfer of resins from the processing pads to the shipping casks and temporary storage casks were reviewed and discussed with responsible licensee staff.

The inspectors reviewed the 2015 and 2016 Radioactive Effluent Release Reports and the 2016 radionuclide characterization and classification for the Dry Active Waste and dewatered resin waste streams. The inspectors evaluated analyses for hard-to-detect nuclides, reviewed the use of scaling factors, and examined quality assurance comparison results between licensee waste stream characterizations and outside laboratory data. The inspectors also evaluated how changes to plant operational parameters were taken into account in waste characterization.

Shipment Preparation and Records: There were no radioactive shipments available to observe during the week of the inspection. The inspectors reviewed and discussed the licensee's training and qualification program for shippers of radioactive material. The inspectors reviewed six shipping records for consistency with licensee procedures and compliance with NRC and Department of Transportation regulations. This included review of emergency response information, waste classification, radiation survey results, information on the waste manifest, and the authorization of the receiving licensee to receive shipments. Training records for selected individuals currently qualified to ship radioactive material were reviewed for compliance with 49 CFR Part 172 Subpart H.

Problem Identification and Resolution: The inspectors reviewed CAP documents in the areas of radwaste/shipping. The inspectors evaluated the licensee's ability to identify and resolve the issues. The inspectors also reviewed recent self-assessment results.

Inspection Criteria: Radioactive material and waste storage activities were reviewed against the requirements of 10 CFR Part 20. Radwaste processing activities and equipment configuration were reviewed for compliance with the licensee's Process Control Program. Waste stream characterization analyses were reviewed against regulations detailed in 10 CFR Part 20, 10 CFR Part 61, and guidance provided in the Branch Technical Position on Waste Classification (1983). Transportation program

implementation was reviewed against regulations detailed in 10 CFR Part 20, 10 CFR Part 71 (which requires licensees to comply with Department of Transportation (DOT) regulations in 49 CFR Parts 107, 171-180, and 390-397), as well as the guidance provided in NUREG-1608. Training activities were assessed against 49 CFR Part 172 Subpart H. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

a. Inspection Scope

The inspectors reviewed a sample of the performance indicator (PI) data, submitted by the licensee, for the Unit 1 and Unit 2 PIs listed below. The inspectors reviewed plant records compiled between July 2016 and June 2017 to verify the accuracy and completeness of the data reported for the station. The inspectors verified that the PI data complied with guidance contained in Nuclear Energy Institute 99-02, "Regulatory Assessment Performance Indicator Guideline," and licensee procedures. The inspectors verified the accuracy of reported data that were used to calculate the value of each PI. In addition, the inspectors reviewed a sample of related corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with PI data.

Cornerstone: Mitigating Systems

- Safety system functional failures (2)

Cornerstone: Barrier Integrity

- Reactor coolant system (RCS) leakage (2)
- RCS activity (2)

Occupational Radiation Safety Cornerstone: The inspectors reviewed the Occupational Exposure Control Effectiveness PI results for the Occupational Radiation Safety Cornerstone from September 2016 through July 2017. For the assessment period, the inspectors reviewed electronic dosimeter (ED) alarm logs and CAP documents related to controls for exposure significant areas. Documents reviewed are listed in the Attachment. (one sample completed).

Public Radiation Safety Cornerstone: The inspectors reviewed the Radiological Control Effluent Release Occurrences PI results for the Public Radiation Safety Cornerstone from September 2016 through July 2017. For the assessment period, the inspectors reviewed cumulative and projected doses to the public contained in liquid and gaseous release permits and CAP documents related to Radiological Effluent Technical Specifications/ODCM issues. The inspectors also reviewed licensee procedural guidance for collecting and documenting PI data. Documents reviewed are listed in the Attachment. (one sample completed).

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152)

.1 Routine Review

The inspectors screened items entered into the licensee's corrective action program in order to identify repetitive equipment failures or specific human performance issues for follow-up. The inspectors reviewed condition reports, attended screening meetings, or accessed the licensee's computerized corrective action database.

b. Findings and Observations

No findings were identified.

.2 Annual Followup of Selected Issues

a. Inspection Scope

The inspectors conducted a detailed review of condition report CR 10364598, PRF Boundary Door propped open.

The inspectors evaluated the following attributes of the licensee's actions:

- complete and accurate identification of the problem in a timely manner
- evaluation and disposition of operability and reportability issues
- consideration of extent of condition, generic implications, common cause, and previous occurrences
- classification and prioritization of the problem
- identification of root and contributing causes of the problem
- identification of any additional condition reports
- completion of corrective actions in a timely manner

b. Findings

No findings were identified.

4OA3 Follow-up of Events (71153)

.1 (Closed) Licensee Event Report (LER) 05000364/2017-001-00: 2B Emergency Diesel Generator Rendered Inoperable Due to a Jacket Water Leak without Makeup Capability

a. Inspection Scope

On April 21, 2017, the 2B DG was declared inoperable due to a jacket water leak that occurred during a surveillance test. The jacket water leak was repaired on April 23, 2017. The NRC inspectors reviewed the annunciator response procedure

(ARP) and questioned the ability to refill the jacket water expansion tank. Two diverse means to refill the expansion tank were designed and discussed in the ARP. The preferred source is to use demineralized water, while the backup source would use service water. On June 23, 2017, it was determined that both methods to refill the JW expansion tank would not be available to support DG operability. As a result, the 2B DG was considered inoperable since March 3, 2017 until repaired on April 22, 2017.

The inspectors discussed the jacket water leak with licensee staff and reviewed the corrective maintenance and post-maintenance testing. The inspectors also reviewed the root cause report (CAR 270387) associated with the 2B DG jacket water leak. This LER and apparent violation (AV) 05000364/2017002-03 is closed.

b. Findings

Introduction: The NRC identified a non-cited violation (NCV) of Technical Specification (TS) 5.4.1.a, "Procedures," for the licensee's failure to implement corrective maintenance work order instructions to identify and replace piping as necessary for a degraded threaded joint on the 2B emergency diesel generator (EDG) jacket water keep warm system piping. As a result, a leak occurred at this threaded pipe joint during surveillance testing which rendered the 2B EDG inoperable. The inspectors determined that the failure to follow work order instructions to replace degraded jacket water system piping during corrective maintenance on the 2B EDG on March 3, 2017, was a performance deficiency.

Description: During a monthly surveillance test of the 2B EDG on April 21, 2017, the inspectors observed a leak on the 2B EDG jacket water keep warm pump discharge piping. Following the leak discovery, the EDG was shut down (test aborted) and Condition Report (CR) 10356955 was initiated to document the condition. A degraded threaded joint downstream of the jacket water keep warm pump discharge nozzle was the apparent cause of the leak. A work order was implemented on March 3, 2017 to repair a previous leak at the same threaded pipe joint. The work order instructions required the maintenance staff to disconnect piping where the leak(s) are identified, inspect and clean piping threads, and replace piping as necessary. The inspectors noted that the work order instructions to replace piping had not been performed and was marked "N/A" in the work order. Following identification of the leak, the licensee implemented WO SNC859060 and repaired the 2B EDG on April 22, 2017, and satisfactory post maintenance testing was completed.

The jacket water system removes heat generated in the engine cylinders and turbocharger housings and maintains jacket coolant out of the engine in the 145°F to 165°F range. The jacket water system is a closed cooling/heating system including a heat exchanger, an electric standby jacket water heater, pumps, and an expansion tank (manually filled with demineralized water or service water as a backup). Without jacket water cooling, potentially catastrophic engine failure can result. Technical Specification 5.4.1 required written procedures be established, implemented, and maintained covering the applicable procedures recommended in RG 1.33, Rev. 2, Appendix A, February 1978. Section 9.a of RG 1.33 required in part that maintenance that can affect the performance of safety-related (SR) equipment should be properly pre-planned and performed in accordance with documented instructions appropriate to the circumstances. The inspectors concluded that the licensee's failure to follow work order

instructions resulted in inadequate corrective maintenance on March 3, 2017, on the 2B EDG jacket water keep warm pump discharge piping which led to an uncontrolled jacket water leak during the monthly surveillance test of the 2B EDG on April 21, 2017.

Analysis: The inspectors determined that the failure to follow work order instructions to replace degraded jacket water system piping during corrective maintenance on the 2B EDG on March 3, 2017, was a performance deficiency. The finding was more than minor because it was associated with the equipment reliability attribute of the mitigating systems cornerstone and adversely affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The significance of this finding was evaluated using IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012. Initial screening by the resident inspectors using the Sapphire Farley 1 & 2 SPAR Model resulted in a potentially greater-than-green significance. Therefore, a detailed risk analysis was performed by a regional senior reactor analyst (SRA). The NRC Farley SPAR model was used for internal events, seismic and tornado/high winds risk estimates and the licensee's Farley fire probabilistic risk assessment model was used for fire risk estimation. The major analysis assumptions included: a 51 day exposure period, EDG 2B operation at nominal failure to run probability until 8 hours when EDG assumed to fail due to the PD, PD treated as having common cause failure to run potential, no recovery of the 2B EDG was assumed, and no credit for FLEX equipment was assumed. The operation of the EDG for 8 hours prior to failure and remaining mitigating equipment limited the risk. The dominant sequence was a station blackout sequence consisting of a site-wide weather-related loss of offsite power, successful reactor shutdown, random failure to run of the 1/2A and 1C EDGs, failure of the 2B EDG due to the PD, failure to manually operate the turbine driven auxiliary feedwater pump long term, and failure to recover offsite power or an EDG leading to loss of core heat removal and core damage. The DRE determined that the increase in core damage frequency due to the PD was  $<1.0 \text{ E-6}$  per year, a Green finding of very low safety significance. The finding had a cross-cutting aspect of Conservative Bias in the Human Performance area, because the decision to leave the diesel in a degraded condition following maintenance on March 3, 2017, was neither conservative nor prudent when additional action could have been taken to adequately repair or evaluate the threaded pipe joint [H.14].

Enforcement: Technical Specification 5.4.1 required, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in RG 1.33, Revision 2, Appendix A, February 1978. Section 9.a of RG 1.33 required, in part, that maintenance that can affect the performance of safety-related (SR) equipment should be properly pre-planned and performed in accordance with documented instructions appropriate to the circumstances. Work Order (WO) SNC837488 was implemented on March 3, 2017, to repair a leak at the 2B EDG jacket water keep warm pump discharge piping. The WO instructions required the maintenance staff to disconnect piping where the leak(s) are identified, inspect and clean piping threads, and replace piping as necessary. Contrary to the above, on March 3, 2017, the licensee failed to conduct maintenance affecting SR equipment in accordance with documented instructions appropriate to the circumstances. Specifically, the licensee did not implement work order instructions to replace piping associated with a degraded threaded joint on the jacket water keep warm system. As a result, the 2B EDG was rendered inoperable until corrected on April 22, 2017.

The licensee initiated CR 10356955 to document the condition. This finding is identified as NCV 05000364/2017003-01, "Failure to perform adequate corrective maintenance on the 2B EDG."

.2 (Closed) LER 05000348/2017-001-00: Entry into Mode of Applicability with Component Cooling Water Isolation Valve Inoperable due to a Configuration Error

a. Inspection Scope

On July 31, 2017, it was identified that valve switch Q1P17HS2229 – Norm/Block Switch was out of position with Unit 1 at 100 percent power. It was found in the "SI Block" position. This is a key operated switch which controls the operation of valve Q1P17HV2229, CCW supply to sample coolers. HV-2229 has a safety function to close to automatically isolate the non-seismic portion of the CCW system which includes the reactor coolant system sample coolers. The Norm/Block switch allows a safety injection signal to be blocked, which will allow valve HV2229 to open so CCW can be aligned to the RCS sample coolers for post-accident RCS sampling. The Norm/Block switch was returned to the "Normal" position on August 1, 2017. The inspectors reviewed the LER, the causal checklist product (CAR 271053) and discussed the issue with plant staff.

b. Findings

A licensee identified violation was documented in section 4OA7 of this report.

4OA5 Other Activities

.1 (Closed) Unresolved Item (URI) 05000348, 364/2014007-10, Potential Misapplication of Void Transport Empirical Correlations (ML14209A904)

a. Inspection Scope

An unresolved item (URI) was opened regarding the potential misapplication of void transport empirical correlations. Specifically, the licensee developed suction void acceptance criteria using questionable empirical correlations. The 2014 component design bases inspection team had noted the acceptance criteria methodology Farley used for assessing voids found in suction piping potentially misapplied empirical correlations for void transport. Specifically, the empirical correlations Farley had been using were developed from a test known as "Purdue test" and were a set of correlations that preceded the ones reviewed by Nuclear Energy Institute (NEI) 09-10, "Guidelines for Effective Prevention and Management of System Gas Accumulation." The NRC endorsed the industry guidance contained in NEI 09-10 in Regulatory Issue Summary (RIS) 2013-09, "NRC Endorsement of NEI 09-10, Revision 1a-A, Guidelines for Effective Prevention and Management of System Gas Accumulation". The URI was opened to provide for further Office of Nuclear Reactor Regulation (NRR) review of the acceptability of the licensee's methodology for determining suction void acceptance criteria and determination of further NRC actions to resolve the issue to determine if a performance deficiency existed.

Subsequent to the issuance of URI 05000348, 364/2014007-10, the licensee, in consultation with Westinghouse, further reviewed the methodologies they were using

and performed a comparison between the acceptable gas void size their methodology permitted and the gas void sizes that would be acceptable using more recent industry guidance. The guidance had been created to define a means to apply the correlations in a manner which would meet the limitations imposed by the NRC in the safety evaluation for NEI 09-10. The licensee initially determined that there were 12 locations (24 operating cases) where Farley's test acceptance criteria was potentially non-conservative. The licensee, along with Westinghouse, further refined their evaluation of acceptable void sizes and determined that the gas volumes allowed by their gas void monitoring procedure, FNP-0-ETP-4574.0, "Gas Accumulation Monitoring and Trending," would not have compromised operability of the associated systems. An NRR subject matter expert performed an independent review of the acceptance criteria Farley had been using in comparison to the updated industry guidance, and determined the licensee's acceptance criteria would have determined system operability requirements in an acceptable manner. The URI identified as 05000348, 364/2014007-10 is now closed.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On October 18, 2017, the resident inspectors presented the inspection results to Dennis Madison and other members of the licensee's staff. The inspectors confirmed that proprietary information provided or examined during the inspection period was properly controlled.

4OA7 Licensee-Identified Violations

The following violations of very low safety significance (Green) or Severity Level IV were identified by the licensee and are violations of NRC requirements which meet the criteria of the NRC Enforcement Policy, for being dispositioned as a Non-Cited Violation.

- Technical Specification (TS) 3.7.7, "Component Cooling Water System" required two trains of CCW to be operable in Modes 1, 2, 3 and 4. Surveillance Requirement (SR) 3.0.1 required in part that failure to meet a surveillance, whether such a failure is experienced during the performance of the surveillance or between performances of the surveillance shall be failure to meet the LCO. Contrary to those requirements, LCO 3.7.7 was not met on Unit 1 because CCW valve Q1P17HV2229 did not meet the requirements of SR 3.7.7.2 from October 29, 2016 when Unit 1 entered Mode 4 until August 1, 2017. SR 3.7.7.2 required in part that each automatic valve actuates to the correct position on an actual or simulated actuation signal. On October 1, 2016 switch HS2229B was repositioned from the "Normal" position to the "SIS Block" position in order to obtain an RCS sample. This switch was left in the "SIS Block" position until discovered by an operator on August 1, 2017. With the handswitch in the "SIS Block" position, the requirement for valve Q1P17HV2229 to close upon receipt of a safety injection actuation could not be met. Closure of this valve will prevent CCW inventory loss by isolating non-seismic piping in the CCW system.

The inspectors determined this finding was of very low safety significance (Green) because an additional actuation signal on a CCW surge tank level transmitter would close the valve at a low level setpoint and maintain the valve's function. This issue was documented in the licensee's corrective action program as CR 10393270.

ATTACHMENT: SUPPLEMENTAL INFORMATION



## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee Personnel:

K. Baity, Site Design Manager  
S. Briggs, Plant Manager  
J. Carroll, Operations Support Manager  
B. Freeman, Engineering Supervisor  
S. Harris, Shift Operations Manager  
J. Horn, Operations Director  
N. Koteel, Operations  
D. Madison, Site Vice President  
J. Short, Maintenance Director  
D. Simmons, EP Supervisor  
J. Summy, Engineering Director  
G. Surber, Licensing Supervisor  
R. Wells, Site Projects Manager  
E. Williford, Regulatory Affairs Manager  
J. Collier, Site Licensing  
I. De Jong, CCW System Engineer  
J. Junkin, SW System Engineer  
V. Flowers, Chemistry Manager  
J. Maddox, Chemistry Supervisor  
N. McGilvary, Radiation Protection Supervisor  
B. Shaw, Chemistry Specialist  
R. Vierkandt, Radiation Protection Manager

## LIST OF REPORT ITEMS

### Opened and Closed

NCV 2017003-001                      Failure to perform adequate corrective maintenance on the 2B EDG (4OA3)

### Closed

LER 05000364/2017-001-00                      2B Emergency Diesel Generator Rendered Inoperable Due to a Jacket Water Leak without Makeup Capability (4OA3.1)

LER 05000348/2017-001-00                      Entry into Mode of Applicability with Component Cooling Water Isolation Valve Inoperable due to a Configuration Error (4OA3.2)

URI 05000348, 364/2014007  
-10                      Potential Misapplication of Void Transport Empirical Correlations (4OA5)

AV 05000364/2017002-03                      Failure to perform adequate corrective maintenance on the 2B EDG (4OA3.1)

## LIST OF DOCUMENTS REVIEWED

### **Section 1R01: Adverse Weather Protection**

#### Procedures:

FNP-0-AOP-21, Ver. 46.0  
NMP-EP-141-001, Ver. 1.0  
NMP-OS-017, Ver. 1.1

#### Condition Reports:

10406852

### **Section 1R04: Equipment Alignment**

#### Drawings:

D-170801, Ver. 18  
D-170803, Ver. 10  
D-170805, Ver. 25  
D-170807, Ver. 21  
D-170809, Ver. 9  
D-175007, Sheet 1, Ver. 36.0  
D-175038, Sheet 1, Ver. 44.0  
D-175038, Sheet 2, Ver. 23.0  
D-175041, Sheet 1, Ver. 18.0  
D-177001, Unit 1 Single Line – Electrical Auxiliary System (Emergency 4160V & 600V), Ver. 23.0  
D-177005, Unit 1 Single Line Protection and Metering - 4160V Switchgear Bus 1F (Emergency), Ver. 17.0  
D-177006, Unit 1 Single Line Protection and Metering - 4160V Switchgear Bus 1G (Emergency), Ver. 16.0  
D-177018, Unit 1 Single Line Protection and Metering - 4160V Switchgear Bus 1H (Emergency), Ver. 13.0  
D-177027, Unit 1 Single Line Protection and Metering - 4160V Switchgear Bus 1J (Emergency), Ver. 2.0  
C-177043, Unit 1 Single Line Protection and Metering - 4160V Switchgear Bus 1K (Emergency), Rev. 5  
C-177044, Unit 1 Single Line Protection and Metering - 4160V Switchgear Bus 1L (Emergency), Rev. 5

#### Procedures:

FNP-1-SOP-36.0, Plant Electrical Distribution Line Up, Ver. 17.0  
FNP-1-SOP-36.3A, 600, 480 and 208/120 Volt AC Electrical Distribution System, Ver. 29.0  
FNP-0-SOP-38.0, Diesel Generators, Ver. 126.1  
FNP-0-SOP-38.0C, 1C Diesel Generator, Ver. 14

FNP-1-SOP-7.0, Ver. 108.1  
 FNP-1-SOP-7.0A, Ver. 10.0  
 FNP-1-SOP-22.0A, Auxiliary Feedwater System, Ver. 18.0

Documents:

WO SNC823763  
 CAR 263820, 256066, 259759, 264492, 266624, 269184, 266837  
 TE 949996, 955266, 955269, 955271, 959047, 958519, 967207, 968683, 97091, 981856,  
 991992

Condition Reports:

758014, 10081338, 10181846, 10195448, 10209365, 10221111, 10265379, 10272397,  
 10283967, 10290847, 10345386, 10391185, 10391644, 10412604, 10412608, 10412615

**Section 1R05: Fire Protection Annual/Quarterly**

Drawings:

D513639, Unit No. 1 – Fire Barriers and Fire Boundaries – U1 Auxiliary Building and  
 Containment El. 121', 127' & 129', Ver. 1.0  
 D513641, Unit No. 1 – Fire Barriers and Fire Boundaries – U1 Auxiliary Building and  
 Containment El. 130' & 139', Ver. 1.0

Documents:

A-181805, NFPA 805 Fire Protection Program Design Basis Document, Ver. 1.0  
 WO SNC657471, 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  
 WO SNC634558, FNP-1-FSP-63.18, Visual Inspection of Penetration Fire Barriers (Auxiliary  
 Building – Electrical Penetration Rooms, Contaminated Storage Area) B Train, Ver. 1.0  
 WO SNC665285, FNP-1-FSP-63.18A, Visual Inspection of Penetration Fire Barriers (Auxiliary  
 Building – Electrical Penetration Rooms, Contaminated Storage Area) A Train, Ver. 2.0  
 WO SNC363748, FNP-1-FSP-65.0A, Fire Dampers Functional Inspection Auxiliary Building –  
 Diesel Building – Service Water Building Train “A”, Ver. 1.1  
 WO SNC363749, FNP-1-FSP-65.0, Fire Dampers Functional Inspection Auxiliary Building - Diesel  
 Building – Service Water Building (Non-Train Related), Ver. 18.1  
 WO SNC517737, FNP-1-FSP-65.0A, Fire Dampers Functional Inspection Auxiliary Building –  
 Diesel Building – Service Water Building Train “A”, Ver. 5.0  
 SNC791058, FNP-0-FSP-58.0, Fire Hose Stations, Ver. 12.0  
 SNC644359, FNP-1-FSP-207.0, Hose Station Flow and Valve Operability Test, Ver. 4.0  
 WO-SNC563241, FNP-1-FSP-65.2, Fire Doors Functional Inspection Auxiliary Building, Ver. 12.0  
 WO-SNC737915, FNP-1-FSP-65.2B, Fire Doors Functional Inspection Auxiliary Building – Diesel  
 Building – Service Water Building Train “B”, Ver. 7.0  
 WO SNC580704, FNP-1-FSP-307.0, Smoke Detector – Biennial Operability and Adjustment,  
 Ver. 23.1  
 WO SNC605759, FNP-1-FSP-307.0, Smoke Detector – Biennial Operability and Adjustment,  
 Ver. 23.1  
 WO SNC638010, FNP-1-FSP-307.0, Smoke Detector – Biennial Operability and Adjustment,  
 Ver. 23.1  
 WO SNC539087, FNP-1-FSP-405.0, Preaction Sprinkler System (Annual), Ver. 16.0  
 WO SNC722888, FNP-1-FSP-405.0, Preaction Sprinkler System (Annual), Ver. 18.0

Procedures:

FNP-1-FPP-1.0, Unit 1 Auxiliary Building Pre-Fire Plan, Ver. 1.0

Condition Reports:

10407452

**Section 1R06: Flood Protection Measures**Procedures:

FNP-0-AOP-79.0, Plant Flooding, Rev. 3.1

Condition Reports:

CR 10099355, 10274842, 10366827, 10385760

Documents:

FNP FSAR, Rev. 28, Sections 3.4.1, 3.4.2, 3.8.4.1

**Section 1R07: Heat Sink Performance**Procedures:

FNP-0-CCP-708.0, Chemical Addition/Control of the Service Water System, Ver. 93.0

FNP-0-EMP-1213.01, Equipment Room Coolers General Inspection (1A MDAFW Pump Room Cooler), dated 4-7-16

FNP-0-EMP-1213.01, Equipment Room Coolers General Inspection (1A RHR Pump Room Cooler), dated 1-20-15

FNP-0-EMP-1213.01, Equipment Room Coolers General Inspection (2A MDAFW Pump Room Cooler), dated 11-20-15

FNP-0-ETP-4381.0, Service Water Storage Pond Piezometer Well Readings, Ver. 10.1

FNP-0-ETP-4384.0, Service Water Pond Deformation Monument Readings, Ver. 3.1

FNP-0-ETP-4389.0, Service Water Pond Dam Biennial Inspection, Ver. 7.1

FNP-0-M-82.0, Service Water Plan, Ver. 15.0

FNP-0-STP-125.0, Service Water Pond Seepage Test, dated 3/23/2016

FNP-0-STP-125.0, Service Water Pond Seepage Test, Ver. 16.0

NMP-AP-001, Development and Control of Southern Nuclear Procedures, Ver. 16.0

NMP-CH-001, SNC Closed Cooling Water Program, Ver. 6.0

NMP-CH-001-GL01, SNC Closed Cooling Water Program – Farley Closed Cooling Water Strategy, Ver. 1.1

NMP-ES-009-002, Engineering Programs – Health Reports and Notebooks, Ver. 23.0

NMP-ES-012, Heat Exchanger Program, Ver. 10.2

NMP-ES-012-001, Inspection of Heat Exchangers, Ver. 1.4

NMP-ES-012-002, Cleaning of Heat Exchangers, Ver. 1.3

NMP-ES-012-GL01, Heat Exchanger Program Heat Exchanger Inspection, Testing and Condition Assessment, Ver. 4.0

NMP-ES-012-GL02, Heat Exchanger Program Data Management Guideline, Ver. 2.1

NMP-ES-012-GL03, Heat Exchanger Program Eddy Current Testing (ECT) Strategic Plan or Plant Farley, Ver. 1.0

NMP-ES-024-701, Eddy Current Testing of Heat Exchanger Tubing, Ver. 3.1

NMP-ES-077-GL01, Processing ASME Class 2 and 3 Pressure Boundary Integrity Challenges, Ver. 2.0

Drawings:

D-175003, P&ID – Service Water System, Ver.57.0

Work Orders/Work Requests:

WO 344236, Perform Service Water Pond Seepage Test per FNP-0-STP-125.0, dated 3/16/2016

WO 560396, Inspect 1A RHR Room Cooler per FNP-0-EMP-1213.01, dated 1/6/2015

WO 638211, Inspect 2A AFW Pump Room Cooler per FNP-0-EMP-1213.01, dated 10/21/2015

WO 828154, Replace Inlet and Outlet Carbon Steel Bolting of the 1A RHR Pump Room Cooler

Condition Reports:

\*CAR 270616, Procedure Update Needed for NMP-ES-012-001, dated 7/25/2017

\*CR10388744, Procedure Update Needed for FNP-0-M-82, dated 7/19/2017

\*CR10388800, Procedure Update Needed for FNP-0-STP-125.0, dated 7/20/2017

\*CR10388847, Procedure Update Needed for NMP-ES-077-GL01, dated 7/20/2017

\*CR10389057, Procedure Update Needed for FNP-0-ETP-4381, dated 7/20/2017

\*CR10389218, Procedure Updated Needed for FNP-0-EMP-1213.01, dated 7/20/2017

\*CR10389341, HX Cleaning PMs Need Additional Information, dated 7/20/2017

\*CR10392044, Concrete Spalling Location at SWIS, dated 7/27/2017

\*CR10412548, NRC UHS Inspection – Need to Evaluate Safety-Related Room Cooler Maintenance Strategy, dated 09/25/2017

\*CR20388733, Plastic Flange Broken for Chemical Feed Line Going to SW, dated 7/20/2017

CAR 248891, 2A MDAFW Pump Room Cooler Did Not Auto-Start, dated 12/13/2014

CAR 267319, Minor Surface Corrosion Noted during ISI Pressure Test, dated 10/26/2016

CR 10388946, Loss of Level in the Unit 1 CCW Surge Tank, dated 07/20/2017

Miscellaneous Documents:

\*LTAM-F-17-0163, Long-Term Asset Management Action: Draining/Flushing Stagnant SW Lines for EDG JW Expansion Tanks, dated 7/25/2017

NL-15-1958, Letter from C.R. Pierce to U.S. Nuclear Regulatory Commission, “Joseph M. Farley Nuclear Plant Updated Final Safety Analysis Report, 10 CFR 50.59 Report, Fire Hazard Analysis Changes, Technical Specifications Bases Changes, Technical Requirements Manual Changes, and Revised NRC Commitments Report,” dated November 3, 2015

TE 977922, Perform a 100% Review of all System Monitoring & Trending Data, dated 1/24/2017

TE 977923, Ensure Monitoring Plans and Trends are Updated after TE 977922 Completed, dated 1/24/2017

**Section 1R11: Licensed Operator Regualification Program**Documents:

F-LT-SG-17-S0601, Licensed Operator Continuing Training Simulator Exercise Guide, Aug. 31, 2017

Procedures:

NMP-TR-416, Licensed Operator Continuing Training Program Administration, Ver. 7

NMP-OS-007, Conduct of Operations, Ver. 11

NMP-OS-007-001, Conduct of Operations Standards and Expectations, Ver. 15

NMP-EP-110-GL01, Ver. 10.1

NMP-EP-141-001, Ver. 1.0

FNP-1-STP-33.2A, Ver. 41.1

**Section 1R12: Maintenance Effectiveness**Documents:

NUMARC 93-01, Rev. 4A

MR functional scoping document for function P19-F01

MR functional scoping document for function E21-F03

MR functional scoping document for function E21-F04

MR functional scoping document for function R43-F01

MR functional scoping document for function R43-F04

MR functional scoping document for function R43-F11

EVT-P19-2017-20531

EVAL-F-P19-00848

CARs: 270119, 270296, 270752

F-17-036, IRT forms for 2B charging pump

F-17-040, IRT forms for 1-2A DG jacket water keep warm piping leak

Technical Evaluations:

985634, 987697

Work Orders:

SNC878159

Condition Reports:

10364380, 10374768, 10376236, 10380928, 10381432, 10394218

Procedures:

NMP-ES-027, Maintenance Rule Program, Ver. 6.0

NMP-ES-027-001, Maintenance Rule Implementation, Ver. 8.0

**Section 1R13: Maintenance Risk Assessments and Emergent Work Evaluation**Procedures:

NMP-GM-031, On-Line Configuration Risk Management Program, Ver. 4.0

NMP-GM-031-001, Online Maintenance Rule (a)(4) Risk Calculations, Ver. 3.0

NMP-OS-010, Protected Train/Division and Protected Equipment Program, Ver. 7.3

Documents:

Unit 2 Operator's EOOS Risk Report, 8/8/2017

Unit 1 Operator's EOOS Risk Report, 8/8/2017

Unit 2 Operator's EOOS Risk Report, 9/19/2017

**Section 1R15: Operability Determinations and Functionality Assessments**Drawings:

D-175022, Unit 1 P&ID, HVAC – Penetration Room Filtration System, Ver. 30

B-177556, Sheet 1D, Ver. 22

A-177541, Sheet 9H, Rev. 0

D-175002, Sheet 1 - Ver. 49, Sheet 2 – Ver. 28, Sheet 3 – Ver. 14

Documents:

Unit 2 Fourth 10-Year Testing Interval Valve IST Basis Document, Ver. 4  
 Main Control Room Operating Logs, Oct. 1, 2016, Oct. 26, 2016, Aug. 1, 2017

Procedures:

FNP-1-SOP-60.0, Ver. 36  
 FNP-1-SPETP-001, Vers. 1 and 2  
 FNP-1-ARP-1.2, Ver. 46  
 FNP-0-PMP-506, Rev. 22.1  
 FNP-2-FRP-H.1, Rev. 27.1  
 FNP-1-STP-40.0A, Ver. 5  
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**Section 1R19: Post Maintenance Testing**Condition Reports:

10390347, 10400199

Procedures:

NMP-MA-014-001, Post Maintenance Testing Guidance, Ver. 4.2  
 FNP-2-STP-628.24, Component Cooling Water Heat Exchanger Jacket Safety Relief Valve Set  
 Pressure and Seat Tightness Testing, Ver. 3.1  
 FNP-0-GMP-3.0, Relief Valve Setpoint Record, Ver. 16.0

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Documents:

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 FNP-0-STP-80.2, Ver. 66.1  
 FNP-0-SOP-38.0, Ver. 126.1  
 FNP-0-EMP-1402.01, Ver. 22.0  
 NMP-ES-024-202, Ver. 5.4, Visual Leakage Examination Report (VT-2)  
 FNP-0-GMP-40.0, Ver. 16.0, System Leakage Test Data Sheet  
 FNP-0-GMP-0.2, Ver. 26.0, Repair/Replacement Program

Drawings:

D-175022, Ver. 30  
 U-419830, Ver. 9.0

**Section 1R22: Surveillance Testing**Procedures:

FNP-1-STP-9.0, RCS Leakage Test, Ver. 51.4  
 FNP-2-STP-22.2, 2B Auxiliary Feedwater Pump Quarterly Inservice Test, Ver. 32



Documents:

Work Order SNC818850

U518250, Volumetric Model 14376 Leak Rate Monitor Operation Manual, Ver. B

Drawings:

D205007, Sheet 1, Ver. 29.0

Documents:

ASME OM Code-2001, Code for Operation and Maintenance of Nuclear Power Plants  
WO SNC817848

**Section 2RS6: Liquid and Gaseous Effluents**Procedures, Guidance Documents, and Manuals:

NMP-GM-002-001, Corrective Action Program Instructions, Ver. 35.4

NMP-CH-003, Chemistry Quality Assurance and Control Program, Ver. 6.0

NMP-CH-003-003, Counting Room Cross Checks, Ver. 2.0

FNP-1-CCP-212.0, Detailed Guidance for WMT Releases, Ver. 27

FNP-1-CCP-212.1, Liquid Effluent Radiation Monitoring System Setpoints, Ver. 12.1

FNP-1-CCP-213.1, Gaseous Effluent Radiation Monitoring System Setpoints, Ver. 20.0

FNP-2-CCP-643.0, Sampling Points for Potential Radiological Effluents, Ver. 55.0

NMP-EP-305-GL01, FNP Equipment Important to the EP Function, Ver. 2.0

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Records and Data:

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Liquid Permit Post-Release Data, L-20170726-0460-C, 8/2/17

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Work Order SNC380063, Penetration Room Filtration Performance Test, Unit 1B, 5/16/14

Work Order SNC380077, Penetration Room Filtration Performance Test, Unit 1A, 5/16/14

Work Order SNC438735, 2RE-15, SJAЕ Lo-Range Rad Monitor Calibration, 5/15/14

Work Order SNC519052, Vent Stack Flow Loop Calibration, Unit 1, 7/9/15

Work Order SNC530994, 1RE-15C, SJAЕ Hi-Range Rad Monitor Calibration, 6/23/14

Work Order SNC533767, 1RE-15B, SJAЕ Mid-Range Rad Monitor Calibration, 7/14/15

Work Order SNC537148, Vent Stack Flow Loop Calibration, Unit 2, 3/5/15

Work Order SNC553873, 2RE-18, Waste Processing Effluent Rad Monitor Calibration, 9/3/15

Work Order SNC574038, 2RE-14, Plant Vent Stack Operational Check, 6/17/15

Work Order SNC574139, 2RE-14, Plant Vent Stack Rad Monitor Calibration, 1/8/16  
 Work Order SNC593409, Penetration Room Filtration Performance Test, Unit 1B, 4/7/16  
 Work Order SNC593672, 1RE-15, SJAЕ Lo-Range Rad Monitor Calibration, 8/28/15  
 Work Order SNC594302, Penetration Room Filtration Performance Test, Unit 1A, 3/1/16  
 Work Order SNC609093, 2RE-15, SJAЕ Lo-Range Rad Monitor Calibration, 3/23/16  
 Work Order SNC670769, Vent Stack Flow Loop Calibration, Unit 2, 9/16/16  
 Work Order SNC645936, 1RE-15C, SJAЕ Hi-Range Rad Monitor Calibration, 11/20/15  
 Work Order SNC703068, Vent Stack Flow Loop Calibration, Unit 1, 12/22/16  
 Work Order SNC705533, 1RE-15, SJAЕ Lo-Range Rad Monitor Calibration, 2/2/17  
 Work Order SNC718213, 1RE-15B, SJAЕ Mid-Range Rad Monitor Calibration, 2/17/17  
 Work Order SNC720146, 2RE-18, Waste Processing Effluent Rad Monitor Calibration, 6/7/17  
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Procedures, Guidance Documents, and Manuals:

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 FNP-0-ENV-12.0, NRC Comparative Program, Version 11.0  
 FNP-0-ENV-17.0, Meteorological Tower, Version 36.0  
 FNP-0-ENV-101.0, Schedule Environmental Monitoring Program, Version 34.0  
 FNP-0-ENV-791.0, Air Particulates and Iodine Sampling, Version 9.0  
 FNP-0-ENV-793.0, River Water Sampling, Version 6.0  
 FNP-0-ENV-799.0, Land Use Census, Version 3.0  
 FNP-0-ENV-798.0, On-site Ground Water Monitoring Program, Version 4.0  
 FNP-0-IMP-255.2, Environmental Air Monitoring Station Preventive Maintenance and  
 Calibration, Version 16.0  
 FNP-0-STP-255.0, Calibration of Primary Meteorological Station Instrumentation, Version 33.1  
 NMP-EN-002, Radiological Groundwater Protection Program, Version 7.0  
 NMP-EN-002-GL01, Farley Nuclear Plant Groundwater Monitoring Plan for Radionuclides,  
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 NMP-EN-002-GL04, Radiological Groundwater Protection Program Technical Bases, Version  
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 NMP-EN-003, The Radiological Environmental Monitoring Program (REMP), Version 3.0  
 NMP-EN-003-GL01, Environmental Support of the REMP, Version 3.0  
 NMP-EN-003-001, Radiological Environmental Monitoring Program (REMP) Data Management  
 and Special Reporting, Version 3.0  
 NMP-EN-003-002, Radiological Environmental Operating Report (REOR) Preparation and  
 Submittal, Version 3.0

NMP-GM-002, Corrective Action Program, Version 14.2  
 NMP-GM-002-001, Corrective Action Program Instructions, Version 35.4  
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Memorandum, Collection Schedule for the REMP samples during the week of 8-22-17

Memorandum, EV-15-2238, REMP Direct Radiation OSLD Relocation, 12/11/2015

REMP Air Sampler Maintenance/Calibration Records: Station 0501, River Water Structure, W/O SNC579112, 8/28/2015; Station 0701, SSE Perimeter, Work Order (W/O) SNC496086, 5/22/2015; Station 1101, Main Gate at Plant Entrance, W/O SNC543429, 5/15/2015, and SNC627435, 3/28/2016; Station 1601, North Boundary, W/O SNC496089, 3/25/2016; Station 1108, Ashford, AL, W/O SNC596617, 12/4/2015 and SNC695897, 5/17/2017; Station 1605, Columbia, AL, W/O SNC573710, 6/1/2016, and SNC726242, 5/30/2017; Station 0703, Georgia-Pacific Paper Mill, W/O SNC671110, 7/3/2015; Station 1218, Dothan, AL, W/O SNC523646, 8/28/2015, and SNC646852, 6/16/2016; Station 0215, Blakely, GA, W/O SNC621700, 12/31/2015, and SNC746912, 1/2/2017

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W/O SNC696160, Perform FNP-0-STP-255.0, Calibration of Primary Meteorological Station Instrumentation, 2/25/2016

W/O SNC726576, Perform FNP-0-STP-255.0, Calibration of Primary Meteorological Station Instrumentation, 8/24/2016

W/O SNC768271, Perform FNP-0-STP-255.0, Calibration of Primary Meteorological Station Instrumentation, 2/24/2017

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**Section 2RS8: Radioactive Material Processing and Transportation**Procedures, Instructions, and Reports:

ET-01-009, Engineering Test Instruction for Determination of Filter Water Content, Rev. 0  
 FO-AD-02, Operating Guidelines for Use of Polyethylene High Integrity Containers, Rev. 34  
 FO-OP-073, Removing Free Standing Water from Energy Solutions FEXM HICs, Rev. 0  
 FNP-0-M-30, Process Control Program, Ver. 17  
 FNP-0-RCP-800, Solidifications and Dewatering, Ver. 14.1  
 FNP-0-RCP-805, Utilization of High Integrity Containers, Rev. 19  
 FNP-0-RCP-853, Container Dewatering, Ver. 2.0  
 NMP-GM-002, Corrective Action Program, Version 14.2  
 NMP-GM-002-001, Corrective Action Program Instructions, Version 35.4  
 NMP-HP-405, Shipment of Radioactive Waste and Radioactive Material, Ver. 2.2  
 NMP-HP-408, Solid Radioactive Waste Scaling Factor Determination and Implementation and Waste Classification, Ver. 2

Records and Data:

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 ETI -01-009 Result and Conclusions of Filter Tests, 07/06/2001  
 Plant Farley Radiation Survey #123581, 07/08/2017  
 Plant Farley Radiation Protection Work Plan for Moving Resin Liners to PDF

Shipping Records and Radwaste Data:

Farley Annual Radioactive Effluent Release Reports for 2015 and 2016  
 Part 61 Waste Stream Analyses for: DAW, 06/09/2016 and 03/24/2017; Resin, 07/01/2016; Mixed Media, 07/01/2016; Decon Pit Liner, 02/29/2016; U1 and U2 RCS Filters, 09/06/2016; U1 and U2 SFP Filters, 09/16/2016; and U2 RCS Filters, 03/19/2017  
 Radioactive Waste Shipment (RWS) Documents: RWS 15-02, Type B, Resin; RWS 15-08, LSA, Resin; RWS 16-04; RWS 16-09; and RWS 17-02  
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**Section 40A1: Performance Indicator Verification**Procedures:

FNP-0-AP-54.0, Preparation and Reporting of NRC Performance Indicator Data and NRC Operating Data, Ver. 15  
 FNP-1-STP-746, Primary Coolant System Dose Equivalent Iodine-131 Determination, Ver. 28  
 FNP-0-CCP-25, Dose Equivalent Iodine-131 Determination, Ver. 15  
 FNP-1-CCP-42, Primary Coolant Liquid Gamma Spectroscopy Analysis, Ver. 26.2  
 FNP-1-CCP-651.1, Routine Sampling of the Reactor Coolant System, Ver. 18.1  
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 FNP-1-STP-9.0, RCS Leakage Test, Ver. 54.1  
 FNP-2-STP-9.0, RCS Leakage Test, Ver. 47.4  
 CRs 10407722, 10273130, 10272397, 10340143, 10364323, 10410626, 10410814  
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**Section 40A2: Problem Identification and Resolution**Procedures:

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SM-03-0018-004, Offsite and control room LOCA doses, Ver. 1

**Section 4OA3: Follow-up of Events and Notices of Enforcement Discretion**Documents:

CAR 270709

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Procedures:

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FNP-2-CCP-651.0, Ver. 41

FNP-0-M-50, Ver. 30

FNP-1-STP-40.0A, Ver. 5

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**Section 4OA5: Other Activities**Calculations:

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## LIST OF ACRONYMS AND ABBREVIATIONS

CAP	Corrective Action Program
CR	Condition Report
DOT	Department of Transportation
ED	Electronic Dosimeter
NEI	Nuclear Energy Institute
ODCM	Offsite Dose Calculation Manual
PI	Performance Indicator
Radwaste	Radioactive Waste
REMP	Radiological Environmental Monitoring Program
RG	Regulatory Guide
RP	Radiation Protection
RWS	Radioactive Waste Shipment
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report