



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II  
SAM NUNN ATLANTA FEDERAL CENTER  
61 FORSYTH STREET, SW, SUITE 23T85  
ATLANTA, GEORGIA 30303-8931**

April 30, 2009

Mr. J. Randy Johnson  
Vice President - Farley  
Southern Nuclear Operating Company, Inc.  
7388 North State Highway 95  
Columbia, AL 36319

**SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT - NRC INTEGRATED INSPECTION  
REPORT 05000348/2009002 AND 05000364/2009002**

Dear Mr. Johnson:

On March 31, 2009, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Joseph M. Farley Nuclear Plant, Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed on April 2, 2009, with yourself and other members of your staff.

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

This report documents one self-revealing finding of very low safety significance (Green) which was determined to be a violation of NRC requirements. Also, licensee-identified violations, which were determined to be of very low safety significance, are listed in this report. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section VI.A.1 of the NRC Enforcement Policy because of the very low safety significance of the violations and because they are entered into your corrective action program. If you contest any of these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis of your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington DC 20555-0001; and the NRC Resident Inspector at the Farley Nuclear Plant. In addition, if you disagree with the characterization of any finding 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 Regional Administrator, Region II, and the NRC Resident Inspector at the Farley Nuclear Plant. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, if any, will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Scott M. Shaeffer, Chief  
Reactor Projects Branch 2  
Division of Reactor Projects

Docket No.: 50-348, 50-364  
License No.: NPF-2, NPF-8

Enclosure: Inspection Report 05000348/2009002 and 05000364/2009002  
w/Attachment: Supplemental Information

cc w/encl.: (See page 3)

SNC

2

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, if any, will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Scott M. Shaeffer, Chief  
Reactor Projects Branch 2  
Division of Reactor Projects

Docket No.: 50-348, 50-364  
License No.: NPF-2, NPF-8

Enclosure: Inspection Report 05000348/2009002 and 05000364/2009002  
w/Attachment: Supplemental Information

cc w/encl.: (See page 3)

☒ PUBLICLY AVAILABLE

☐ NON-PUBLICLY AVAILABLE

☐ SENSITIVE

☒ NON-SENSITIVE

ADAMS: ☐ Yes

ACCESSION NUMBER: \_\_\_\_\_

☒ SUNSI REVIEW COMPLETE **SMS**

OFFICE	RII:DRP	RII:DRP	RII:DRP	RII:DRP	RII:DRS	RII:DRS	RII:DRS
SIGNATURE	via email	SMS	via email	via email	via telecon		
NAME	CRapp	SShaeffer	ECrowe	SSandal	T. Lighty		
DATE	4/30/2009	4/30/2009	4/27/2009	4/25/2009	4/30/2009		
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

OFFICIAL RECORD COPY

DOCUMENT NAME: I:\RPB2\FARLEY\REPORTS\09-02\2009002 IIR.DOC

SNC

3

cc w/encl:

Angela Thornhill  
Managing Attorney and Compliance Officer  
Southern Nuclear Operating Company, Inc.  
Electronic Mail Distribution

Jim Sommerville  
(Acting) Chief  
Environmental Protection Division  
Department of Natural Resources  
Electronic Mail Distribution

B. D. McKinney  
Licensing Services Manager  
B-031  
Southern Nuclear Operating Company, Inc.  
Electronic Mail Distribution

Jeffrey T. Gasser  
Executive Vice President  
Southern Nuclear Operating Company, Inc.  
Electronic Mail Distribution

William D. Oldfield  
Quality Assurance Supervisor  
Southern Nuclear Operating Company  
Electronic Mail Distribution

L. Mike Stinson  
Vice President  
Fleet Operations Support  
Southern Nuclear Operating Company, Inc.  
Electronic Mail Distribution

David H. Jones  
Vice President  
Engineering  
Southern Nuclear Operating Company, Inc.  
Electronic Mail Distribution

Moanica Caston  
Vice President and General Counsel  
Southern Nuclear Operating Company, Inc.  
Electronic Mail Distribution

Dr. D. E. Williamson  
State Health Officer  
Alabama Dept. of Public Health  
Electronic Mail Distribution

Mr. Mark Culver  
Chairman  
Houston County Commission  
P. O. Box 6406  
Dothan, AL 36302

SNC

4

Letter to J. Randy Johnson from Scott M. Shaeffer dated April 30, 2009

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT - NRC INTEGRATED INSPECTION  
REPORT 05000348/2009002 AND 05000364/2009002

Distribution w/encl:

C. Evans, RII

L. Slack, RII

OE Mail

RIDSNRRDIRS

PUBLIC

RidsNrrPMFarley Resource

**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket Nos.: 05000348, 05000364

License Nos.: NPF-2, NPF-8

Report No.: 05000348/2009002 and 05000364/2009002

Licensee: Southern Nuclear Operating Company, Inc.

Facility: Joseph M. Farley Nuclear Plant, Units 1 and 2

Location: Columbia, AL

Dates: January 1, 2009 through March 31, 2009

Inspectors: E. Crowe, Senior Resident Inspector  
S. Sandal, Resident Inspector  
T. Lighty, Project Engineer

Approved by: Scott M. Shaeffer, Chief  
Reactor Projects Branch 2  
Division of Reactor Projects

Enclosure

## SUMMARY OF FINDINGS

IR 05000348/2009-002 and 05000364/2009-002; 01/01/2009 – 03/31/2009; Joseph M. Farley Nuclear Plant, Units 1 and 2; Post Maintenance Testing

The report covered a three-month period of inspection by the resident inspectors and one project engineer. One Green NCV was identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter (IMC) 0609, Significance Determination Process (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

### Cornerstone: Mitigating Systems

- Green: A self-revealing, Green non-cited violation of TS 5.4.1 was identified for inadequate work instructions used to perform corrective maintenance on the Unit 2 TDAFW pump 'A' UPS which resulted in an inoperability of the TDAFW pump. This finding has been entered into the licensee's CAP as condition report (CR) 2009101467.

Failure to provide appropriate work sequence instructions related to the maintenance on the 'A' UPS is a performance deficiency. This finding is more than minor because it is associated with the Procedure Quality attribute of the Mitigating Systems cornerstone and adversely impacted the cornerstone objective because the inadequate work instructions resulted in loss of redundant and diverse control power sources to the TDAFW pump which affected the ability of the pump to respond to initiating events to prevent undesirable consequences. This finding was assessed using the Phase 1 screening worksheet of the SDP and determined to be of very low safety significance (Green) because it did not result in an actual loss of safety function of a single train for greater than the TS allowed outage time and was not potentially risk-significant due to external events. This finding is assigned a cross-cutting aspect in the Resources component of the Human Performance area (H.2(c)) because the work sequence instructions used to perform the corrective maintenance did not contain complete guidance necessary for proper operation of the UPS breakers. (Section 1R19)

Violations of very low safety significance, which were identified by the licensee have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's CAP. These violations and their corrective actions are listed in Section 4OA7 of this report.

Enclosure

## REPORT DETAILS

### Summary of Plant Status

Unit 1 started the report period at 100 percent Rated Thermal Power (RTP). The unit was at 90 percent RTP and coasting down in power for a scheduled refueling outage at the end of the inspection period.

Unit 2 started the period near 100 percent RTP. On March 22, the unit was ramped down in power and taken off of the electrical grid due a main condenser tube leak. On March 29, the reactor was made critical and the unit achieved 12 percent RTP at the end of the inspection period.

### **1. REACTOR SAFETY**

#### **Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity**

#### 1R01 Adverse Weather Protection

##### a. Inspection Scope

Seasonal Readiness Review. The inspectors evaluated implementation of the licensee's Cold Weather Contingency procedure, FNP-0-SOP-0.12, and conditions for entry into the procedure. The inspectors examined protective coverings of the grating on the Main Steam (MS) Valve Rooms, circulating water piping, heat tracing lines on the condensate storage tanks, reactor makeup water storage tanks, and Refueling Water Storage (RWS) tanks to verify these protections for cold weather conditions were functional. The Emergency Diesel Generator (EDG) building was also evaluated to ensure provisions were implemented to compensate for any known deficiencies. Documents reviewed are listed in the Attachment.

Impending Adverse Conditions. The inspectors evaluated implementation of adverse weather preparation procedures and compensatory measures for the following two adverse weather conditions. The inspectors walked-down portions of the MS systems, Condensate Storage systems, RWS systems, and the EDGs. These systems were selected because their safety-related functions could be affected by freezing weather. The inspectors verified the applicable portions of procedure FNP-0-SOP-0.12, Cold Weather Contingencies, were performed. Documents reviewed are listed in the Attachment.

- Projected freezing temperatures for January 7-9
- Projected freezing temperatures for January 16-17

##### b. Findings

No findings of significance were identified.

Enclosure



#### 1R04 Equipment Alignment

##### a. Inspection Scope

Partial Walk-Down. The inspectors performed partial walk-downs of the following three systems to verify the operability of redundant or diverse trains and components when safety equipment was inoperable. The inspectors attempted to identify discrepancies impacting the function of the system and therefore, potentially increasing risk. The walk-downs were performed using the criteria in licensee procedures NMP-OS-007, Conduct of Operations, and FNP-0-SOP-0.0, General Instructions to Operations Personnel. The walk-downs included reviewing the Updated Final Safety Analysis Report (UFSAR), plant procedures and drawings, checks of control room and plant valves, switches, components, electrical power, support equipment, and instrumentation. Documents reviewed are listed in the Attachment.

- Unit 2 B Train EDG
- Unit 2 A Train Residual Heat Removal (RHR)
- Unit 1 Motor-Driven Auxiliary Feedwater (MDAFW) Pumps

Complete Walk-Down. The inspectors conducted a complete walk-down of the accessible portions of the following system. The inspectors used licensee procedure FNP-2-SOP-22.0, Auxiliary Feedwater (AFW) System, and Functional System Description A181010 to verify the system alignment of on-service equipment. The inspectors also reviewed personnel, reviewed control room logs, Maintenance Rule (MR) monthly reports, CRs, quarterly system health reports, outstanding work orders (WO), and industry operating experience to verify alignment and equipment discrepancies were being identified and appropriately resolved. Documents reviewed are listed in the Attachment.

- Unit 2 AFW

##### b. Findings

No findings of significance were identified.

#### 1R05 Fire Protection

##### a. Inspection Scope

Fire Protection Area Tours. The inspectors conducted a tour of the four fire areas listed below to assess the material condition and operation status of the fire protection equipment. The inspectors verified combustibles and ignition sources were controlled in accordance with the licensee's administrative procedures; fire detection and suppression equipment was available for use; passive fire barriers were maintained in good material condition, and compensatory measures for out-of-service, degraded, or inoperable fire protection equipment were implemented in accordance with the requirements of licensee procedures FNP-0-AP-36, Fire Surveillance and Inspection; FNP-0-AP-38, Use of Open

Enclosure

Flame; FNP-0-AP-39, Fire Patrols and Watches; and the associated Fire Zone Data sheets. Documents reviewed are listed in the Attachment.

- Unit 1 Component Cooling Water (CCW) Pump Room, Fire Zone 6
- Unit 1 RHR Pump Room 1B, Fire Zone 1
- Unit 2 'A' Train direct current (DC) Switchgear Room Fire Zone 18
- Unit 2 RHR Pump Room 2B, Fire Zone 1

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

a. Inspection Scope

The inspectors reviewed selected risk-important plant design features and licensee procedures intended to protect the plant and its safety-related equipment from internal flooding events. The inspectors reviewed flood analysis and design documents, including the UFSAR, engineering calculations and abnormal operating procedures for licensee commitments. The inspectors walked-down the area listed below to verify plant design features and plant procedures for flood mitigation were consistent with design requirements and internal flooding analysis assumptions. The inspectors reviewed flood protection barriers, which included plant floor drains, condition of room penetrations, condition of the sumps in the rooms, and condition of water-tight doors. The inspectors also reviewed CRs to verify the licensee was identifying and resolving problems. Documents reviewed are listed in the Attachment.

- Unit 1 'A' MDAFW Pump Room.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Regualification Program

a. Inspection Scope

Resident Inspector Quarterly Review. The inspectors reviewed documentation, interviewed licensee personnel, and observed the administration of job performance measures (JPM) in accordance with the licensee's operator requalification program to assess the effectiveness of the licensee in implementing requalification requirements identified in 10 CFR Part 55, Operators' Licenses. The evaluations were also performed to determine if the licensee effectively implemented operator requalification guidelines established in NUREG-1021, Operator Licensing Examination Standards for Power Reactors. The JPMs were inspected using the criteria in Inspection Procedure 71111.11. Documents reviewed are listed in the Attachment.

Enclosure

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Effectiveness

a. Inspection Scope

The inspectors reviewed the two following activities for (1) appropriate work practices; (2) identifying and addressing common cause failures; (3) scoping in accordance with 10 CFR 50.65(b) of the MR; (4) characterizing reliability issues for performance; (5) trending key parameters for condition monitoring; (6) charging unavailability for performance; (7) classification and reclassification in accordance with 10 CFR 50.65(a)(1) or (a)(2); and (8) appropriateness of performance criteria for structures, systems, and components (SSCs)/functions classified as (a)(2) and/or appropriateness and adequacy of goals and corrective actions for SSCs/functions classified as (a)(1). In addition, the inspectors specifically reviewed events where ineffective equipment maintenance resulted in invalid automatic actuations of Engineered Safeguards Systems affecting the operating units. Documents reviewed are listed in the Attachment.

- Unit 1, Service Air Compressor 'C'
- 1-2A EDG Automatic Fuel Oil Transfer Pump

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

The inspectors reviewed the following three activities to verify appropriate risk assessments were performed prior to taking equipment out of service for maintenance. The inspectors verified risk assessments were performed as required by 10 CFR 50.65(a)(4), and were accurate and complete. When emergent work was performed, the inspectors verified appropriate use of the licensee's risk assessment and risk categories in accordance with requirements in licensee procedures FNP-0-ACP-52.3, Mode 1, 2, & 3 Risk Assessment; FNP-0-UOP-4.0, General Outage Operations Guidance; NMP-GM-006, Work Management; and NMP-OS-007, Conduct of Operations.

- Unit 2, January 22, YELLOW Risk Condition during scheduled equipment outages for the 1-2A EDG and 2A RHR Pump
- Unit 1, January 26, YELLOW Risk Condition during scheduled equipment outages for the 1-2A EDG room louvers, the 1A Charging Pump, and the 1B Instrument Air Dryer
- Unit 1, March 2, GREEN Risk Condition during scheduled equipment outages for the 1A Service Air Compressor and 1A Instrument Air Dryer concurrent with a nonfunctional 1B Emergency Air Compressor (EAC)

Enclosure

b. Findings

No findings of significance were identified.

1R15 Operability Evaluationsa. Inspection Scope

The inspectors reviewed the following six operability evaluations to verify they met the requirements of licensee procedures NMP-OS-007, Conduct of Operations and NMP-AD-012, Operability Determinations and Functionality Assessments. The scope of this inspection also included a review of the technical adequacy of the evaluations, the adequacy of compensatory measures, and the impact on continued plant operation.

- CR 2008113413, Orex material found in containment
- CR 2008113602, metal shavings found in the CCW side of the 1C High Head Safety Injection (HHSI) pump gear oil cooler
- CR 2009100602, 1-2A EDG damage to the #7 cylinder fuel injector cam lobe
- CR 2009100768, 1-2A EDG automatic fuel oil transfer pump failed to start with the day tank level below set point
- CR 2009102140, 1B EAC tripped during surveillance testing
- CR 2009102485, TDAFW pump warm-up valve failed to stroke closed

b. Findings

No findings of significance were identified.

1R18 Plant Modificationsa. Inspection Scope

The inspectors reviewed the following two plant modifications to ensure safety functions of important safety systems have not been affected. Also, the inspectors verified the design bases, licensing bases and performance capability of risk-significant SSCs have not been degraded through modifications. The inspectors verified that any modifications performed during increased risk-significant configurations did not place the plant in an unsafe condition. The inspectors evaluated system operability, availability, configuration control, post-installation test activities, documentation updates, and operator awareness of the modifications. Documents reviewed are listed in the Attachment.

Temporary Plant Modification

- Unit 1/2 Temporary Fuel Oil Storage Tanks

Permanent Plant Modification

- Unit 1, Minor Design Change (MDC) 1090687701, Service Water (SW) Supply to 1C Containment Cooler Drain

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

The inspectors reviewed the criteria contained in licensee procedures FNP-0-PMT-0.0, Post-Maintenance Test Program, to verify post-maintenance test procedures and test activities for the following four systems/components were adequate to verify system operability and functional capability. The inspectors also witnessed the test or reviewed the test data to verify test results adequately demonstrated restoration of the affected safety function(s). Documents reviewed are listed in the Attachment.

- FNP-2-SOP-36.4, 120V alternating current (AC) Distribution Systems, following restoration of the 'A' TDAFW pump UPS
- WO 1090106001, Unit 1 Pressurizer Pressure Control Station card replacement and subsequent functional test of the control station
- WO 2082256801/FNP-2-STP-938 Unit 2 Pressurizer Heater Capacity Check following Pressure Spray Valve Control Station card replacement
- WO 2090433101, Unit 2 MOV3134 Torque/Limit Switch

b. Findings

Introduction. A self-revealing, Green non-cited violation of TS 5.4.1 was identified for inadequate work instructions used to perform corrective maintenance on the Unit 2 TDAFW pump 'A' UPS which resulted in an inoperability of the TDAFW pump.

Description. WO 2082478601 was generated to perform corrective maintenance on the 'A' UPS due to abnormal synchronization indications. The work sequence was written so that the 'B' UPS would remain on-service to provide the TDAFW pump control system with redundant and diverse sources of control power. Work instructions failed to include the requirement for 'A' UPS rectifier/charger output to be greater than 20 volts before closing the battery input breaker. This was necessary to prevent an electrical transient on the 'A' UPS from potentially impacting the 'B' UPS. As a result of closing the battery input breaker prior to reaching 20 volts on the rectifier/charger output, the 'B' UPS lost its DC source of control power. This condition was self revealing because it resulted in a UPS trouble alarm in the control room that would not clear as expected. The control room staff evaluated the alarm, stopped maintenance work on the 'A' UPS, and determined the 'B' UPS had bypassed the DC source of control power due to improper operation of the 'A' UPS battery input breaker. The DC control power source was required to provide diverse power for the turbine driven train of AFW control systems from AC control power and for the pump to provide its safety function during a station blackout event. The licensee determined the TDAFW pump was inoperable due to loss

Enclosure

of attendant equipment. Approximately two hours later, the licensee restored the 'B' UPS DC control power source alignment using SOP guidance which returned the TDAFW pump to operable status.

Analysis. Failure to provide appropriate work sequence instructions related to the maintenance on the 'A' UPS is a performance deficiency. This finding is more than minor because it is associated with the Procedure Quality attribute of the Mitigating Systems cornerstone and adversely impacted the cornerstone objective because the inadequate work instructions resulted in loss of redundant and diverse control power sources to the TDAFW pump which affected the ability of the pump to respond to initiating events to prevent undesirable consequences. This finding was assessed using the Phase 1 screening worksheet of the SDP and determined to be of very low safety significance (Green) because it did not result in an actual loss of safety function of a single train for greater than the TS allowed outage time and was not potentially risk-significant due to external events. This finding is assigned a cross-cutting aspect in the Resources component of the Human Performance area (H.2(c)) because the work sequence instructions used to perform the corrective maintenance did not contain complete guidance necessary for proper operation of the UPS breakers.

Enforcement. TS 5.4.1 states, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide (RG) 1.33, Revision 2, Appendix A, February 1978. Section 9 of Appendix A to RG 1.33 states maintenance that can affect the performance of safety-related equipment should be properly pre-planned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances. Contrary to the above, on February 10, 2009, work sequence instructions for the conduct of maintenance activities affecting the Unit 2 TDAFW pump 'A' UPS were not appropriate to the circumstances in that WO 2082478601 did not provide adequate instructions to prevent the on-service side of the UPS from bypassing the DC control power source rendering the TDAFW pump inoperable for approximately two hours. Because this failure to develop adequate maintenance instructions is of very low safety significance and has been entered into the CAP as CR 2009101467, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 05000364/2009002-01 Inadequate Maintenance Instructions Results in Inoperability of the TDAFW Pump.

## 1R20 Other Outage

### a. Inspection Scope

The inspectors evaluated licensee outage activities to verify shutdown risk management was properly managed. The inspectors evaluated management oversight, procedural compliance, and operator awareness to ensure conformance to licensee procedure FNP-0-UOP-4.0. The inspectors reviewed licensee procedures FNP-2-UOP-3.1, Power Operation and FNP-2-UOP-4.1, Shutdown of Unit From Minimum Load to Hot Standby. The inspectors performed plant walkdowns to ensure electrical system alignments, safety systems and clearance activities were in accordance with the above procedures

Enclosure

and TS. The inspectors monitor reactor coolant temperature controls and control of reactivity to ensure TS temperature requirements were met.

- Unit 2 forced outage due to damaged main condenser tubes on March 22

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors reviewed the following four surveillance tests and either observed the test or reviewed test results to verify that testing adequately demonstrated equipment operability and met TS requirements. The inspectors reviewed the activities to assess for preconditioning of equipment, procedure adherence, and valve alignment following completion of the surveillance. The inspectors reviewed licensee procedures FNP-0-AP-24, Test Control; FNP-0-M-050, Master List of Surveillance Requirements; and NMP-OS-007; and attended selected briefings to determine if procedure requirements were met. Documents reviewed are listed in the Attachment.

Surveillance Tests

- FNP-1-STP-934.1, Emergency Bus Degraded Voltage Relay Response Time Test
- FNP-2-STP-45.11, Miscellaneous Cold Shutdown Valves Inservice Test (IST) for main steam line atmospheric vent valves Q2N11PV3371A, Q2N11PV3371B, Q2N11PV3371C

IST

- FNP-1-STP-24.2, 1C, 1D, and 1E SW Pump Quarterly IST

Containment Isolation Valve

- FNP-2-STP-24.16, Containment Core Lateral Restraint (CLR) and RCP MTR Air CLR SW Valves IST

b. Findings

No findings of significance were identified.

**4. OTHER ACTIVITIES**

4OA1 Performance Indicator (PI) Verification

a. Inspection Scope

The inspectors sampled licensee data for the Performance Indicators (PIs) listed below to verify the accuracy of the PI data reported during the period listed. Nuclear Energy

Enclosure

Institute (NEI) 99-02, "Regulatory Assessment Indicator Guideline," Rev. 5, was used to verify the basis in reporting for each data element. Documents reviewed are listed in the Attachment.

Initiating Events Cornerstone

- Unplanned Scrams per 7,000 Critical Hours
- Unplanned Power Changes per 7,000 Critical Hours
- Unplanned Scrams with Complications

The inspectors reviewed samples of raw PI data, Licensee Event Reports (LERs), and Monthly Operating Reports for the period covering January 2008 through December 2008. The data reviewed from the LERs and Monthly Operating Reports was compared to graphical representations from the most recent PI report. The inspectors also examined a sampling of operations logs and procedures to verify the PI data was appropriately captured for inclusion into the PI report, as well as ensuring the individual PIs were calculated correctly.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems

.1 Daily CR Reviews

As required by Inspection Procedure 71152, "Identification and Resolution of Problems," and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the NRC performed a daily screening of items entered into the licensee's CAP. This review was accomplished by reviewing hard copies of CRs, attending daily screening meetings, and accessing the licensee's computerized database.

.2 Selected Issue Follow-up Inspection

a. Inspection Scope

In addition to the routine review, the inspectors selected the issue listed below for a more in-depth review. The inspectors considered the following during the review of the licensee's actions: (1) complete and accurate identification of the problem in a timely manner; (2) evaluation and disposition of operability/reportability issues; (3) consideration of extent of condition, generic implications, common cause, and previous occurrences; (4) classification and prioritization of the resolution of the problem; (5) identification of root and contributing causes of the problem; (6) identification of CRs; and (7) completion of corrective actions in a timely manner. Documents reviewed are listed in the Attachment.

Enclosure



- CR 2009100230, Unit 2 Emergency Core Cooling System (ECCS) gas voiding in the RHR supply to the HHCP suction

b. Findings and Observations

No findings of significance were identified. The inspectors determined the CR contained complete and accurate identification of the problem and the issue was identified in a timely manner. The inspectors evaluated the licensee's operability determination and determined affected equipment was promptly returned to an operable status, and extent of condition, generic implications, and common cause were properly evaluated by the licensee. The inspector's evaluation of the licensee's gas monitoring program determined it was adequate to detect and monitor gas intrusion into the ECCS system to prevent conditions that may cause future operability concerns. The inspectors reviewed the licensee cause determination and determined it adequately identified the root cause and properly characterized the problem commensurate with station procedures. The inspectors reviewed the licensee CR database and determined other gas voids had been identified and properly addressed by the licensee. Enforcement aspects associated with this issue are discussed in Section 4OA7.

4OA3 Event Follow-up

.1 Loss of Unit 1 4160 Volt 'H' Bus

a. Inspection Scope

On February 16, the Unit 1 normal supply breaker to the 'H' 4160 Volt bus tripped due to actuation of a protective phase differential relay. The normal supply breaker trip resulted in the loss of the 'H' bus and an automatic start of the 1C EDG. The protective relay actuation occurred when a maintenance helper moved an equipment cart and inadvertently caused an impact to the local control panel for the 'H' bus. The mechanical shock from the impact actuated the differential phase protective relay and the normal supply breaker subsequently opened on a sensed fault condition. No plant transient occurred as a result of the event. The inspectors interviewed operations, engineering, and licensee management personnel to gain an understanding of the event, verify plant equipment performed as designed in response to the loss of the electrical bus, and assess licensee follow-up actions. The inspectors monitored licensee compensatory and recovery actions and verified actions taken by the licensee were in accordance with TS. The inspectors also reviewed the initial licensee notification to verify the requirements specified in NUREG-1022, Event Reporting Guidelines, were met.

b. Findings

No findings of significance were identified.

#### 4OA5 Other Activities

##### .1 Quarterly Resident Inspector Observations of Security Personnel and Activities

###### a. Inspection Scope

During the inspection period, the inspectors conducted observations of security force personnel and activities to ensure the activities were consistent with licensee security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours. These quarterly resident inspector observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status reviews and inspection activities.

###### b. Findings

No findings of significance were identified.

##### .2 (Closed) Temporary Instruction (TI) 2515/176, EDG TS Surveillance Requirements Regarding Endurance and Margin Testing

###### a. Inspection Scope

Inspection activities for TI 2515/176 were previously completed and documented in inspection report 05000348, 364/2008004, and this TI is considered closed at Farley Nuclear Plant; however, TI 2515/176 will not expire until August 31, 2009. The information gathered while completing this temporary instruction was forwarded to the Office of Nuclear Reactor Regulation for review and evaluation.

###### b. Inspection Findings

No findings of significance were identified.

#### 4OA6 Meetings, Including Exit

On April 2, 2009, the NRC presented the inspection results to members of your staff who acknowledged the findings. The NRC confirmed proprietary information was not provided or examined during the inspection.

#### 4OA7 Licensee-Identified Violations

The following violations of very low safety significance were identified by the licensee and are violations of NRC requirements which meet the criteria of Section VI.A.1 of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as an NCV.

- 10 CFR 50.65 (a)(4) requires in part before performing maintenance activities, the licensee shall assess and manage the increase in risk that may result from the

Enclosure

proposed maintenance activities. Contrary to this, on January 26, 2009, the licensee underestimated the Unit 1 maintenance risk category when it failed to update its maintenance risk assessment upon discovery on January 24, 2009 when the 1-2A EDG automatic fuel oil transfer pump would not automatically start in response to a low fuel oil day tank level. The licensee evaluated the Unit 1 risk category on January 26, 2009 as 'Green' when the actual risk category was 'Yellow' for performed work activities concurrent with the 1-2A EDG automatic transfer pump unavailable to perform its automatic function. This was identified in the licensee's CAP as CR 2009100820. This finding is of very low safety significance because the incremental core damage probability deficit as a result of the flawed risk assessment was less than  $1\text{E-}6$  and the incremental large early release probability deficit was less than  $1\text{E-}7$  when assessed by Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process" of Inspection Manual Chapter 0609, "Significance Determination Process".

- Licensee TS 5.4.1 requires written procedures be established, implemented, and maintained covering applicable procedures recommended in RG 1.33, Revision 2, Appendix A, February 1979. RG 1.33, Appendix A, Section 9 states in part maintenance that can affect the performance of safety-related equipment should be properly preplanned and performed in accordance with written procedures. Contrary to the above, on December 22 and 23, 2008, the licensee returned to service a portion of the RHR to HHSI pump suction piping without properly filling that portion of piping. This activity resulted in a 3.9 cubic foot void in the suction piping. The section of piping was promptly refilled using a vacuum refill process. The licensee determined the procedure for returning the system to service was inadequate because it did not provide proper guidance for ensuring this section of ECCS piping was properly refilled. This was identified in the licensee's CAP as CR 2009100230. This finding was assessed using Inspection Manual Chapter 0609 "Significance Determination Process" Phase 1 screening worksheet and determined to be of very low safety significance because it did not result in an actual loss of safety function of a single train for greater than the TS allowed outage time and was not potentially risk-significant due to external events.

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee personnel**

K. Armstrong, Emergency Preparedness Supervisor  
M. Caldwell, CCW System Engineer  
C. Collins, Plant Manager  
J. Cox, Southern Nuclear Corporate SW HX Program Manager  
M. Dove, Southern Nuclear Corporate Alloy 600 Program Manager  
M. Goocher, SW System Engineer  
A. Gray-Performance Improvement Supervisor  
B. Grinder, Engineering Support Manager  
P. Hayes, Engineering Director  
L. Hogg, Security Manager  
J. Horn, Training Manager  
J. Jerkins, Performance Improvement Senior Engineer  
J.R. Johnson, Site Vice President  
M. Johnston, ISI Coordinator  
W. Lee, Emergency Planning Supervisor, Corporate  
T. Livingston, Chemistry Manager  
G. Lofthus, Southern Nuclear Corporate Level III  
H. Mahan, Licensing Engineer  
B.D. McKinney, Licensing Supervisor  
C. Medlock, Site Design Manager  
B.L. Moore, Site Support Manager  
K. Moore, Equipment Reliability Supervisor  
D. Morrow, Engineering Support Program Supervisor  
W. Oldfield, Fleet Oversight Supervisor  
C. Peters, HP Manager  
R. Retherford, Engineering Support (Acting Supervisor)  
J. Swartzwelder, Work Control Superintendent  
G. Terry, Southern Nuclear Corporate HX/Cooler Eddy Current Testing Program Manager  
C. Thornell, Maintenance Manager  
R. Wells, Operations Manager  
C. Wimberly, Emergency Preparedness Assistant

#### **NRC personnel**

Scott M. Shaeffer, Chief, Branch 2, Division of Reactor Projects

### **LIST OF REPORT ITEMS**

#### **Opened and Closed**

05000364/2009002-01	NCV	Inadequate Maintenance Instructions Results in Inoperability of the TDAFW Pump (Section 1R19)
---------------------	-----	---

#### **Closed**

2515/176	TI	EDG TS Surveillance Requirements Regarding Endurance and Margin Testing (Section 4OA5)
----------	----	--

Attachment

## **LIST OF DOCUMENTS REVIEWED**

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

Condition Reports: 2009100515

Documents:

UFSAR Section 9.4.7, Diesel Generator Building  
UFSAR Section 6.3, Emergency Core Cooling System  
UFSAR Section 6.5, Auxiliary Feedwater System

Procedures:

FNPP-0-SOP-0.12, Cold Weather Contingencies, Version 15.0  
FNPP-1-EMP-1383.01, Freeze Protection Inspections, Version 15.0  
FNPP-2-EMP-1383.01, Freeze Protection Inspections, Version 13.0

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

Condition Reports: 2008113828, 2008111870, 2008110049, 2008108021, 2009101467

Documents:

A-181005, Functional System Description – Diesel Generator System, Version 35.0  
A-181002, Functional System Description – Residual Heat Removal/Low Head Safety Injection, Version 37.0  
A-181010, Functional System Description – Auxiliary Feedwater System, Version 18.0  
Updated Final Safety Analysis Report, Section 8.3.1.1.7, Onsite Emergency Power Systems  
Updated Final Safety Analysis Report, Section 6.3.2.2, System Components  
Farley Memo, 'Plant Joseph M. Farley Response to NRC IN 2008-13: Main Feedwater System Issues and Related 2007 Reactor Trip Data', dated October 22, 2008

Procedures:

FNPP-0-SOP-38.0, Diesel Generators, Version 104.0  
FNPP-0-SOP-38.0E, 2B Diesel Generator, Version 10.0  
FNPP-2-SOP-7.0, Residual Heat Removal System, Version 74.0  
FNPP-2-SOP-7.0A, Residual Heat Removal System, Version 7.0  
NMP-ES-005-001, Scoping and Importance Determination for Equipment Reliability – Single Point Vulnerability, Version 2.0

### **Section 1R05: Fire Protection**

Plant Drawings:

A-508650, Sheet 6, Version 1.0  
A-508650, Sheet 12A, Version 1.0  
A-509018, Sheet 6, Version 1.0  
A-509018, Sheet 20, Version 16.0

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

Condition Reports: 2000005856, 200507978, 2000508029, 2001002781, 2002001067, 2005103250, 2005105919, 2005109410, 2005112177, 2005111381, 2005112718, 2006103479, 2006106440, 2007106812, 2008102485, 2008105316, 2009100525, 2009100535, 2009102797, 2009103286

Documents:

A181010, Functional System Description – Auxiliary Feedwater System, Version 18.0  
BM-99-1932-001

Work Orders:

1053062701, 1062708501, 1071848101, 1090143601, 2050973201

**Section 1R11: Licensed Operator Requalification**Documents:

CRO-258, Start a Diesel Generator  
CRO-333D, Perform the Required Actions for Cold Leg Recirculation  
CRO-359E, Start 1C DG from the EPB and Align to Supply 1F 4160V Bus  
CRO-406A, Verify CTMT Isolation Phase “A” is Actuated and Aligned  
CRO-406C, Perform the Required Actions for a Reactor Trip and Safety Injection  
SO-058A, Align ‘A’ Train Power to HHSI to RCS Cold Leg Isolation MOV8803B  
SO-191, Operate Main Turbine Generator Trip Mechanism Locally  
SO-351B, Manual Emergency Start a 4075 KW Diesel Generator  
SO-556B, Isolate Letdown Locally for a Loss of all AC Power  
SO-590, Place the SJAЕ Filtration Unit in Service

**Section 1R12: Maintenance Rule Effectiveness**

Action Items: 2006201768

Condition Reports: 2006101502, 2006102251, 2006102305, 2006102523, 2006103105,  
2006110211, 2007112413, 2006103843, 2006111173, 2008107014, 2006104003, 2006111245,  
2008107086, 2006105740, 2007108699, 2009101574, 2006102980, 2006106716, 2007112088,  
2009100820, 2009100768, 2009100948, 2009100829, 2008100212, 2008106833, 2008107809,  
2008102800, 2008110454, 2007102404, 2007102575, 2007102597, 2007112563

Documents:

June 2006, A1 SSC Monthly Status Report  
A-181005, Functional System Description Diesel Generator System, Version 35.0  
D-172963, Elementary Diagram Diesel Generator Storage Tank Fuel Pumps, Revision 4

Procedures:

FNP-0-SOP-42.0, Diesel Generator Fuel Oil Storage and Transfer System, Version 42.0

Work Orders: 1060866901, 1072193701, 1072889701, 1081412201, 1081412701,  
1081432301, 1081469601, 1082483801, S090169901

**Section 1R15: Operability Evaluations**

Condition Reports: 2008113413, 2008113602, 2009100257, 2005107375, 2009102140,  
2008100222, 2009100768, 2009100602, 2009102485

Documents:

T.S. 3.5.2, ECCS – Operating  
T.S. 3.6.6, Containment Spray and Cooling Systems  
T.S. 5.4.1, Procedures

T.S. 3.7.4, Atmospheric Relief Valves (ARVs)  
 T.S. 3.7.5, Auxiliary Feedwater (AFW) System  
 T.S. 3.8.1, AC Sources – Operating  
 T.S. 3.8.3, Diesel Fuel Oil, Lube Oil, and Starting Air  
 Engineering Reportability Evaluation associated with CR 2008113413  
 Formal Functionality Assessment associated with CR 2009102140  
 Farley FSAR Table 9.5-1, Failure Mode and Effects Analysis of Diesel Generator Fuel Oil System

Procedures:

FNP-2-STP-34.0, Containment Inspection (General), Version 22.0  
 FNP-2-STP-34.1, Containment Inspection (Post Maintenance), Version 23.0  
 FNP-1-STP-65.1, Emergency Air Compressor 1A Operability Test, Version 8.0  
 FNP-1-STP-65.2, Emergency Air Compressor 1B Operability Test, Version 11.0

Work Orders:

1052059001, 1052059002, 1081386401

**Section 1R18: Plant Modifications**

Condition Reports: 2009102621

Documents:

MDC Request 1090687701, Unit 1 Service Water Drain Line Repair, Revision 1.0  
 10 CFR 50.59 Screening/Evaluation 1090687701, Unit 1 Service Water Drain Line Repair, Revision 1.0  
 D-175003, P&ID Service Water System, Sheet 1, Version 46.0  
 D-518216, Service Water System – P16 Piping Isometric, Sheet 1, Version 0.0  
 Operability Determination OD-09-04, Revision 0  
 Technical Specification 3.7.8, Service Water System

Procedures:

FNP-0-AP-13, Temporary Alterations, Version 7

Work Orders:

1090687701, 1090687702

**Section 1R19: Post Maintenance Testing**

Condition Reports: 2009101467, 2009101938, 2007103277

Documents:

TS 3.7.5, Auxiliary Feedwater (AFW) System  
 Unit 2 Control Room Logs dated February 10, 2009 through February 11, 2009  
 RER 1050692801 Gearing Change for MOVs Q1P16MOV3131, 3134, 3135

Procedures:

FNP-2-SOP-36.4, 120V A.C. Distribution Systems, Version 52.0  
 FNP-0-ACP-52.1, Guidelines for Scheduling of On-Line Maintenance, Version 49.0  
 FNP-2-STP-627, Local Leak Rate Test Record Valve Data sheet, Version 46.0

FNP-0-EMP-1501.11 MOV Inspection & Adjustment, Version 17.0  
 FNP-0-GMP-27.0 Disassembly and Reassembly of Safety Related and Non-Safety Related Valves, Version 26.0

Work Orders: 2082478601, 2090433101, 2071001902, 2071997401, 2070827101, 1050692801, 2053030801, 2053025101

### **Section 1R22: Surveillance Testing**

Condition Reports: 207104549, 2008106447, 2008113705, 2009100385, 2009101092, 2009101938, 2007103277

#### Procedures:

FNP-1-STP-24.1, 1A, 1B, 1C Service Water Pump Quarterly Inservice Test, Version 62.0  
 FNP-1-STP-24.2, 1C, 1D, 1E Service Water Pump Quarterly Inservice Test, Version 60.0  
 FNP-1-STP-24.2, 1C, 1D, 1E Service Water Pump Quarterly Inservice Test, Version 62.0  
 FNP-1-STP-24.12, 1A, 1B, and 1C Service Water Pump Biennial Comprehensive Pump Test (CPT), Version 18.0  
 FNP-1-STP-24.12, 1C, 1D, and 1E Service Water Pump Biennial Comprehensive Pump Test (CPT), Version 19.0  
 FNP-1-STP-24.12, 1C, 1D, and 1E Service Water Pump Biennial Comprehensive Pump Test (CPT), Version 21.0  
 FNP-1-STP-934.1, Emergency Bus Degraded Voltage Relay Response Time Test, Version 8.0  
 FNP-2-STP-45.11, Miscellaneous Cold Shutdown Valves Inservice Test, Version 15.0  
 FNP-2-STP-24.16, CTMT CLR and RCP MTR Air CLR Service Water Valves Inservice Test

Work Orders: 1042290601, 1060224601, 1070188901, 1070457001, 1070670701, 1070935501, 1071353901, 1071835701, 1072365001, 108193201, 1090406101, 2060172901, 2071997401, 2053030801, 2053030801, 2071001902,

### **Section 40A1: Performance Indicator Verification 71151**

Condition Reports: 2008112610, 2008103703, 2008107914, 2008107290

#### Documents:

Selected Unit 1 Control Room Logs from January 1, 2008 through December 31, 2008  
 Selected Unit 2 Control Room Logs from January 1, 2008 through December 31, 2008

#### Procedures:

FNP-0-AP-54, Preparation and Reporting of NRC Performance Indicator Data and NRC Operating Data, Version 12.0

### **Section 40A2: Identification and Resolution of Problems**

Condition Reports: 2008110235, 2008110239, 2008110418, 2008111657, 2008112085, 2008112319, 2008113379, 2008113412, 2008113507, 2008113608, 2009100123, 2009100125, 2009100230, 2009100259, 2009100260, 2009100302, 2009102016, 2009102044, 2009102104, 2009102149, 2009102894, 2009102938

#### Documents:

ALA-08-113, Westinghouse letter to Mr. J.R. Johnson titled "Transmittal of Evaluation of Suction  
 Attachment



Side Gas Void Volume Calculation" dated 12/11/2008  
 Calculation CN-SEE-III-08-42, Evaluation of Suction Side Gas Void Volumes for J.M. Farley  
 Units 1 & 2 to Address GL-2008-01  
 DOEJ-SM-1051731701-001, Hydrogen Accumulation 2A Charging/HHSI Pump  
 NL-08-1340, Nine-Month Response to NRC Generic Letter 2008-01 and enclosures  
 Station Drawing, D-205039, Sheet 6, Version 3.0  
 Station Drawing, D-205039, Sheet 7, Version  
 Station Drawing, F2-CVC-DWG-02, Sheet 1, Revision 0  
 Tagout Clearance 2-DT-08-E21-00709

Procedures:

NMP-ES-024-515, Ultrasonic Examination Procedure for Liquid Level Measurement, Version 2.0

Work Orders: 2082348301

**Section 4OA3: Event Follow-up**

Condition Reports: 2009101710

Documents:

Unit 1 Control Room logs, dated February 16, 2009  
 Farley Nuclear Plant Event Notification Form, dated February 16, 2009  
 Farley Reactor Plant Event Notification Worksheet, dated February 16, 2009  
 TS 3.8.1, AC Sources – Operating  
 TS 3.8.9, Distribution Systems – Operating

Procedures:

FNP-0-EIP-8.0, Non-Emergency Notifications, Version 105