



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION II  
SAM NUNN ATLANTA FEDERAL CENTER  
61 FORSYTH STREET, SW, SUITE 23T85  
ATLANTA, GEORGIA 30303-8931

October 30, 2007

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

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT - NRC INTEGRATED INSPECTION  
REPORT 05000348/2007004 AND 05000364/2007004 AND AUGMENTED  
INSPECTION TEAM EXIT MEETING SUMMARY

Dear Mr. Johnson:

On September 30, 2007, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Joseph M. Farley Nuclear Plant, Units 1 and 2. The enclosed integrated inspection report documents the inspection findings, which were discussed on October 4, 2007, with you and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel. Based on the results of this inspection, no findings of significance were identified by the NRC.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, 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 the NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site 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 Nos.: 50-348 and 50-364  
License Nos.: NPF-2 and NPF-8

Enclosure: Inspection Report 05000348/2007004 and  
05000364/2007004  
w/Attachment: Supplemental Information

cc w/encl: (See page 2)

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NAME	ECrowe	SSandal	CRapp	SShaeffer			
DATE	10/15/2007	10/22/2007	10/23/2007	10/30/2007			
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

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Letter to J. Randy Johnson from Scott M. Shaeffer dated October 30, 2007

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT - NRC INTEGRATED INSPECTION  
REPORT 05000348/2007004 AND 05000364/2007004 AND AUGMENTED  
INSPECTION TEAM EXIT MEETING SUMMARY

Distribution w/encl:

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**U. S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket Nos.: 50-348, 50-364, 72-42

License Nos.: NPF-2, NPF-8

Report Nos.: 05000348/2007004 and 05000364/2007004

Licensee: Southern Nuclear Operating Company, Inc.

Facility: Joseph M. Farley Nuclear Plant

Location: Columbia, AL 36319

Dates: July 1 - September 30, 2007

Inspectors: E. Crowe, Senior Resident Inspector  
S. Sandal, Resident Inspector

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

Enclosure

## SUMMARY OF FINDINGS

IR 05000348/2007-004 and 05000364/2007-004; 07/01/2007-09/30/2007; Joseph M. Farley Nuclear Plant, Units 1 & 2, Routine Integrated Report.

The report covered a three-month period of inspection by the resident inspectors. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealing Findings

No findings of significance were identified.

B. Licensee-Identified Violations

None.

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## REPORT DETAILS

### Summary of Plant Status

Unit 1 began the inspection period at full Rated Thermal Power (RTP) and operated at full power until August 29 when the unit was ramped down to 50% RTP for cooling issues related to the isophase bus. The unit returned to 100% RTP on August 30 and remained there until September 29 when the unit was shutdown down for scheduled refueling outage.

Unit 2 began the inspection period at full RTP and operated at full power until August 10 when the unit was ramped down to 20% RTP to add oil to the 2C reactor coolant pump. The unit returned to 100% RTP on August 11 and remained there for the duration of the inspection report period.

### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

#### 1R01 Adverse Weather Protection

##### a. Inspection Scope

Impending Adverse Weather Conditions. The inspectors evaluated implementation of adverse weather preparation procedures and compensatory measures for the following weather condition. The inspectors walked down portions of the main control room and sensitive electrical equipment, monitored internal containment temperatures, and plant air handling units. These systems were selected because their safety related functions could be adversely affected by high outside temperatures. The inspectors verified the applicable portions of procedure FNP-0-AOP-21.0, Severe Weather, were performed.

- Sustained high outside temperatures during the week of August 6

##### b. Findings

No findings of significance were identified.

#### 1R04 Equipment Alignment

##### a. Inspection Scope

Partial System Walkdowns. The inspectors performed partial walk-downs of the following two systems to verify the operability of redundant or diverse trains and components when safety equipment was inoperable. The inspectors attempted to identify any discrepancies that could impact the function of the system, and, therefore, potentially increase risk. The walk-downs were performed using the criteria in licensee procedures FNP-0-AP-16, Conduct of Operations - Operations Group, and FNP-0-SOP-0, General Instructions to Operations Personnel. The walk-downs included

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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 1 'A' Train Spent Fuel Pool (SFP) Cooling with 1B SFP pump equipment outage and new fuel movement
- Unit 1 'A' Train 4160 volt safety related electrical buses and emergency diesel generators (EDG) 1-2A and 1B during starting air compressor maintenance of 1-2A EDG

Complete Walk-down. The inspectors conducted a complete walk-down of the accessible portions of the following system. The inspectors used licensee procedures FNP-1-SOP-9.0, Containment Spray System, FNP-1-SOP-9.0A, Containment Spray System, and Functional System Description (FSD) A181008, Containment Spray System, to verify the system alignment of on-service equipment. The inspectors also interviewed personnel and reviewed control room logs, Maintenance Rule (MR) monthly reports, condition 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 1 Containment Spray

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

Fire Area Tours. The inspectors conducted a tour of the six fire areas listed below to assess the material condition and operation status of fire protection features. The inspectors verified that combustibles and ignition sources were controlled in accordance with the licensee's administrative procedures; fire detection and suppression equipment was available for use; that passive fire barriers were maintained in good material condition, and that 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 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 Auxiliary Feed Water (AFW) Pump Rooms, Fire Zone 6
- Unit 1 Service Water Intake Structure (SWIS), Fire Zones 72, 75 and 76
- Unit 1 safety-related battery rooms, Fire Zones 16, 17, 18, and 19
- Unit 2 SWIS, Fire Zones 72, 75, and 76
- Unit 2 AFW Pump Rooms, Fire Zone 6
- Unit 2 safety-related battery rooms, Fire Zones 16, 17, 18, and 19



Fire Drill. On August 22, the inspectors observed a fire drill for a simulated fire in combustible storage room on the 131' elevation of the Auxiliary Building. The inspectors observed licensee reponse in the fire equipment staging area, entry into the radiation controlled area, and the combustible storage room was in accordance with plant procedures. The inspectors verified station personnel utilized proper fire fighting techniques and equipment was properly restored to operating status following the fire drill. The inspectors reviewed procedures FNP-0-AOP-29.0, Plant Fire, FNP-0-EIP-13.0, Fire Emergencies, and FNP-0-FVP-14.0, Auxiliary Building Smoke and CO<sub>2</sub>/Halon Removal (Portable Equipment), to verify these procedures were properly implemented. The inspectors discussed inspector observations with station personnel.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance

a. Inspection Scope

Annual Resident Review. The inspectors reviewed maintenance results of WO1061667001 and 1061667601 for cleaning and eddy current testing of the following heat exchanger to verify the licensee had adequately identified and resolved any potential heat exchanger deficiencies which could mask degraded performance, common cause heat sink performance problems that could increase risk, and heat sink performance problems that could result in initiating events or affect multiple heat exchangers in mitigating systems. The inspectors verified the licensee utilized the periodic maintenance method outlined in Electric Power Research Institute report NP-7552, Heat Exchanger Performance Monitoring Guidelines. The inspectors also reviewed the licensee's CR database to verify heat exchanger problems were being identified and resolved.

- Unit 1 1C component cooling water (CCW)

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

Resident Inspector Quarterly Review. On August 2, the inspectors observed portions of the licensed operator training and testing program to verify implementation of procedures FNP-0-AP-45, Farley Nuclear Plant Training Program, FNP-0-TCP-17.6, Simulator Training Evaluation/Documentation, and FNP-0-TCP-17.3, Licensed Retraining Program Administration (Classroom). The inspectors observed simulator scenario 2006/2008 S4-S704 conducted in the licensee's simulator for cool down from a steam generator tube rupture (SGTR) using the backfill method, pressure transmitter

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402 failure, and a small break loss-of-coolant accident concurrent with an ALERT emergency declaration. The inspectors observed high risk operator actions, overall performance, self-critiques, training feedback, and management oversight to verify operator performance was evaluated against the performance standards of the licensee's scenario. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed the two samples listed below for items such as: (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 has resulted in invalid automatic actuations of Engineered Safeguards Systems affecting the operating units. Documents reviewed are listed in the Attachment.

- Unit 1 solid state protection system (SSPS) card failures
- Unit 1 Train 'A' and 'B' CCW system pumps failing to start when demanded from the main control board

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors reviewed the following four activities to verify appropriate risk assessments were performed prior to removing equipment for work. 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 the appropriate use of the licensee's risk assessment and risk categories in accordance with the requirements in licensee procedures FNP-0-ACP-52.3, Mode 1, 2, & 3 Risk Assessment, NMP-GM-006, Work Management, and FNP-0-AP-16, Conduct of Operations - Operations Group.

- Unit 2, July 6 - AMSAC in bypass condition and subsequent effect on SSPS Surveillance
- Unit 2, July 9 - Main Steam Valve Room maintenance
- Unit 1, September 10 - 7300 process pre-outage calibrations coincident with Unit 2 SW breaker replacements and high voltage switchyard inspections
- Unit 2, September 27 - Turbine Driven AFW Pump speed sensor maintenance

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the operability evaluations for the following seven CRs to verify they met the requirements of licensee procedures FNP-0-AP-16, Conduct of Operations - Operations Group and FNP-0-ACP-9.2, Operability Determination for technical adequacy, consideration of degraded conditions, and identification of compensatory measures. The inspectors reviewed the evaluations against the design bases, as stated in the UFSAR and FSDs to verify system operability was not affected.

- CR 2007106566, Unit 2 B Steam Generator Main Steam Isolation Valve Bypass, Q2N11V0003B, Bonnet Leak
- CR 2007108020, Unit 1 and Unit 2 Pressurizer Safety Relief Valve Test Frequency
- CR 2007108616, Unit 1 normal reactor trip breaker failure to open by undervoltage relay
- CR 2007108726, EDG 1-2A 'B' air compressor failure to raise air start system pressure
- CR 2007108903, seismic restraint gap for 4160 volt breakers in the "TEST" or "DISCONNECT" larger than gap allowed by design basis
- CR 2007109222, micro switches on new Cutler-Hammer 4160 volt breakers becoming mal-adjusted during transportation to breaker cubicle
- CR 2007104525, identifying improper maintenance planning and sequencing of maintenance to the Unit 2 turbine driven auxiliary feedwater pump steam supply warmup isolation valve Q2N12HV3234B

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 three systems/components were adequate to verify system operability and functional capability. The inspectors also witnessed the test or reviewed the test data to verify that test results adequately demonstrated restoration of the affected safety function(s). Documents reviewed are listed in the Attachment.

- FNP-1-STP-33.0A following failure of Unit 1 reactor trip breaker 'B' to close when demanded
- FNP-1-STP-23.2 following maintenance to 1B and 1C CCW Pump
- WO 1072141801 following maintenance to 1A CCW Pump

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors reviewed surveillance test procedures and either witnessed the test or reviewed test records for the following surveillance tests to determine if the tests adequately demonstrated equipment operability and met the technical specification 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 FNP-0-AP-16, Conduct of Operations - Operations Group, and attended selected briefings to determine if procedure requirements were met.

Surveillance Tests

- FNP-1-STP-114.1, Moderator Temperature Coefficient Determination for  $C_B \leq 300$  ppm

In-Service Test (IST)

- FNP-2-STP-4.1, 2A Charging Pump Quarterly In-service Test

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 PIs listed below to verify the accuracy of the PI data reported during the period listed. Nuclear Energy 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.

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### Mitigating Systems Cornerstone

- Safety System Functional Failure (SSFF)
- Mitigating System Performance Index (MSPI) Cooling Water Support System
- MSPI Emergency AC Power

The inspectors reviewed samples of raw PI data, Licensee Event Reports (LERs), and Monthly Operating Reports for the period covering October 2006 through September 2007. 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 that the individual PIs were calculated correctly.

#### b. Findings

No findings of significance were identified.

#### 4OA2 Identification and Resolution of Problems

Daily CR Review. As required by Inspection Procedure 71152, "Identification and Resolution of Problems," and to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's CAP. This review was accomplished by reviewing daily hard copy summaries of CRs and by reviewing the licensee's electronic CR database.

#### 4OA6 Meetings, Including Exit

##### .1 Exit Meeting

On October 4, 2007, the inspectors presented the inspection results to Mr. Randy Johnson and the other members of his staff who acknowledged the findings. The inspectors confirmed that any proprietary information provided by the licensee was returned to the licensee at the completion of the inspection.

##### .2 Augmented Inspection Team (AIT) Public Exit Meeting Summary

On September 20, a public exit meeting was held to present the results of an AIT inspection of the failure of two CCW pump motor breakers. Members of the public and local news media were in attendance. The attendance list is publicly accessible in ADAMS as accession number ML072670144.

ATTACHMENT: SUPPLEMENTAL INFORMATION

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## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

#### Licensee personnel

W.L. Barger, Plant Manager  
W. R. Bayne, Performance Analysis Manager  
S. H. Chestnut, Engineering Support Manager  
C. Collins, Plant Manager (future)  
P. Harlos, Health Physics Manager  
L. Hogg, Security Manager  
J. Horn, Training and Emergency Preparedness Manager  
J. Jerkins, Performance Analysis Engineer  
R.J. Johnson, Site Vice President  
T. Livingston, Chemistry Manager  
B. Moore, Site Support Manager  
W. Oldfield, Quality Assurance Supervisor  
J. Swartzwelder, Work Control Superintendent  
C. Thornell, Maintenance Manager  
R. Vanderbye, Emergency Preparedness Coordinator  
R. Wells, Operations Manager  
T. Youngblood, Plant Special Projects, Project Manager

### LIST OF DOCUMENTS REVIEWED

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

Technical Specifications 3.6.6, 3.7.13, 3.7.14, 3.7.15, 3.8.1  
P&ID Drawing D-175038, Sheet 3, Version 22.0  
FNP-1-SOP-54.0A, Spent Fuel Pit Cooling and Purification System, Version 11.0  
UFSAR Section 6.2.2.1, Containment Spray System, Revision 21

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

##### Plant Drawings

A-508651, Sheet 7 Revision 8  
A-508651, Sheet 8, Revision 5  
A-508651, Sheet 17, Revision 1  
A-508650, Sheet 14, Revision 2  
A-508650, Sheet 22, Revision 1  
A-508650, Sheet 38, Revision 3  
A-508650, Sheet 43, Revision 2  
A-509018, Sheet 12, Revision 3  
A-509018, Sheet 14 Revision 2  
A-509018, Sheet 18 Revision 11  
A-509018, Sheet 22 Revision 1  
A-509018, Sheet 30 Revision 15  
A-509018, Sheet 35 Revision 1  
A-509018, Sheet 36 Revision 13  
A-509018, Sheet 44 Revision 2

**Section 1R11: Licensed Operator Requalification**

FNP-1-EEP-3.0, Steam Generator Tube Rupture, Revision 24.0

FNP-1-ESP-3.1, Post-SGTR Cooldown Using Backfill, Revision 20.0

FNP-1-ECP-3.1, SGTR with Loss of Reactor Coolant, Subcooled Recovery Desired, Revision 22.0

FNP-1-AOP-34.0, Malfunction of RCS Wide Range Pressure Indication, Revision 5.0

**Section 1R12: Maintenance Effectiveness****Condition Reports:**

2006102085, 2006102177, 2006102559, 2006102682, 2006102928, 2006102995,  
 2006103046, 2006103099, 2006103285, 2006103376, 2006103424, 2006103602,  
 2006103759, 2006103900, 2006104050, 2006104343, 2006105381, 2006105517,  
 2006105589, 2006105590, 2006105591, 2006105592, 2006105593, 2006105594,  
 2006105595, 2006105596, 2006105597, 2006108149, 2006108174, 2006108236,  
 2006108352, 2006108471, 2006108885, 2006109903, 2006109899, 2006111182,  
 2007100537, 2007100962, 2007101642, 2007101708, 2007101711, 2007102021,  
 2007102895, 2007103104, 2007103409, 2007103460, 2007103484, 2007103507,  
 2007103509, 2007103512, 2007103721, 2007104284, 2007104319, 2007104611,  
 2007104624, 2007106708, 2007104732, 2007104782, 2007106430, 2007107126,  
 2007107270, 2007107280, 2007107375, 2007107830, 2007107944, 2007108171,  
 2007109901

**Procedures:**

FNP-0-EMP-1313.03, "Maintenance of Siemens-Allis 4.16KV Circuit Breakers Type MA-350"  
 Revision 29

FNP-0-SOP-36.0, "Circuit Breaker Racking Procedure" Revision 42

FNP-1-STP-33.0A, "Solid State Protection System Train A Operability Test" Revision 36

Work Orders: 1072141201, 1072145501, 1072146101

**Section 1R19: Post Maintenance Testing**

Work Orders: 1060363301, 1072141201, 1072141801, 1072145501, 1072146101

**Procedures:**

FNP-0-EMP-1313.03, "Maintenance of Siemens-Allis 4.16 Circuit Breakers Type MA-350"  
 Revision 29

FNP-0-EMP-1313.4, "Maintenance of Siemens-Allis 4.16KV Metal-Clad Switchgear" Revision  
 17

FNP-0-EMP-1313.11, Installation and Maintenance of Cutler-Hammer 4.16KV Circuit Breakers  
 Type MA-VR350" Revision 9

FNP-0-SOP-36.6, "Circuit Breaker Racking Procedure" Revision 42

FNP-1-STP-33.0A, "Solid State Protection System Train A Operability Test" Revision 36

**Section 4OA1: Performance Indicator Verification**

FNP-0-AP-54.0, Preparation and Reporting of NRC Performance Indicator Data and NRC  
 Operating Data, Revision 8.0

Selected Unit 1 Control Room Logs, October 2006 through September 2007

Selected Unit 2 Control Room Logs, October 2006 through September 2007

Selected Unit 1 and Unit 2 MSPI Derivation Reports, Cooling Water System, Unavailability Index, October 2006 through September 2007

Selected Unit 1 and Unit 2 MSPI Derivation Reports, Emergency AC Power System, Unavailability Index, October 2006 through September 2007

Licensee Event Report 2007-001-00, Technical Specification 3.8.1 Violation Due to Failure of Breaker/Mechanism-Operated Cell Switch