



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

October 17, 2008

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 SUPPLEMENTAL INSPECTION
REPORT 05000348/2008013**

Dear Mr. Johnson:

On September 26, 2008, the U.S. Nuclear Regulatory Commission (NRC) completed a supplemental inspection, in accordance with Inspection Procedure 95001, (Inspection for One or Two White Inputs in a Strategic Performance Area), at your Joseph M. Farley Nuclear Plant (FNP) Unit 1. The purpose of the inspection was to examine the causes for and actions taken related to the Mitigating Systems Performance Index, Emergency AC Power System Performance Indicator (PI) crossing the threshold from Green (within expected range) to White (low to moderate safety significance) for Unit 1 in the first quarter of 2008 due to two independent run failures of the 1B Emergency Diesel Generator (EDG). The inspection also examined the causes and actions taken related to a White Inspection Finding issued for inadequate work instructions associated with one of these failures. The enclosed inspection report documents the inspection results, which were discussed on September 26, 2008, 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, and interviewed personnel.

Based on the results of this supplemental inspection, no findings of significance were identified. The inspectors determined that, in general, the problem identification, root cause, and corrective actions were adequate. However, the inspectors noted that extent of cause for the inadequate post maintenance test associated with the EDG exhaust manifold failure was narrowly focused. In addition, weaknesses were identified in the system health and monitoring programs related to trending and equipment reliability.

SNC

2

In accordance with the Code of Federal Regulations 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 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
License Nos.: NPF-2

Enclosure: Inspection Report 05000348/2008013
w/Attachment: Supplemental Information

cc w/encl: (See page 3)

SNC

3

In accordance with the Code of Federal Regulations 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
License Nos.: NPF-2

Enclosure: Inspection Report 05000348/2008013
w/Attachment: Supplemental Information

cc w/encl: (See page 3)

X PUBLICLY AVAILABLE NON-PUBLICLY AVAILABLE SENSITIVE X NON-SENSITIVE
ADAMS: Yes ACCESSION NUMBER: _____ X SUNSI REVIEW COMPLETE **/SMS/**

| | | | | | | | |
|--------------|------------|-------------|------------|-----------|-----------|-----------|-----------|
| OFFICE | RII:DRP | RII:DRP | RII:DRP | | | | |
| SIGNATURE | TKM /RA/ | via telecon | SMS /RA/ | | | | |
| NAME | TMorrissey | TLighty | SShaeffer | | | | |
| DATE | 10/16/2008 | 10/14/2008 | 10/17/2008 | | | | |
| 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\08-13\FARLEY 2008013.DOC

SNC

2

cc w/encl:
B. D. McKinney
Licensing Services Manager
B-031
Southern Nuclear Operating Company, Inc.
Electronic Mail Distribution

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

M. Stanford Blanton, Esq.
Balch and Bingham Law Firm
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

3

Letter to J. Randy Johnson from Scott M. Shaeffer dated October 17, 2008

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT - NRC SUPPLEMENTAL INSPECTION
REPORT 05000348/2008013

Distribution w/encl:

C. Evans, RII
L. Slack, RII
OE Mail
RIDSNRRDIRS
PUBLIC
K. Feintuch, NRR

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 50-348

License No.: NPF-2

Report No.: 05000348/2008013

Licensee: Southern Nuclear Operating Company Inc.

Facility: Joseph M. Farley Nuclear Plant

Location: Columbia, AL

Dates: September 22, 2008 – September 26, 2008

Inspectors: T. Morrissey, Senior Resident Inspector, Crystal River Nuclear
Plant (Inspection Leader)
T. Lighty, Project Engineer

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

Enclosure

SUMMARY OF FINDINGS

IR 05000348/2008013; 09/22/2008 – 09/26/2008; Joseph M. Farley Nuclear Plant, Unit 1; Supplemental Inspection IP 95001 for a White Mitigating Systems Performance Index, Emergency AC Power System Performance Indicator; and a White Inspection Finding.

This inspection was conducted by a senior resident inspector and a project engineer. No findings of significance were identified. 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

This supplemental inspection was conducted in accordance with Inspection Procedure 95001, Inspection for One or Two White Inputs in a Strategic Performance Area, in response to a White Performance Indicator (PI) associated with the Emergency AC Power System and a White inspection finding.

The Mitigating Systems Performance Index, Emergency AC Power System Performance Indicator (PI) crossed the threshold from Green to White in the first quarter 2008 due to two run failures of 1B emergency diesel generator (EDG). The first failure occurred when the EDG tripped during surveillance testing due to a failed signal generator. The second failure was due to improper installation of the exhaust manifold. This failure also resulted in a self-revealing White inspection finding. Additional details are described in NRC Inspection Report Nos. 05000348/2008011 and 05000348/2008012.

Based on the results of this inspection, the inspectors determined that the cause evaluations were generally adequate and corrective actions were comprehensive and properly prioritized. The licensee's root cause evaluation on EDG reliability identified a weakness with system monitoring. Corrective actions included having each system engineer review their respective system monitoring plan with their supervisor to ensure the plan was adequate and that system monitoring was being performed. However, through interviews with system engineers who had completed this review, the inspectors determined that they did not fully understand their responsibilities related to system monitoring. Also, the inspectors identified the extent of cause for the second failure was limited to a review of condition reports associated with EDGs over the last several years.

Given the licensee's overall acceptable performance in addressing both the White PI and the White inspection finding, consistent with the guidance in IMC 0305, "Operating Reactor Assessment Program," the PI will only be considered in assessing plant performance until it returns to a Green characterization and the White inspection finding will be counted for four consecutive quarters. The implementation and effectiveness of the licensee's corrective actions will be reviewed during future inspections.

A. NRC-Identified and Self-Revealing Findings

None.

B. Licensee-Identified Violations

None.

Enclosure

REPORT DETAILS

01 INSPECTION SCOPE

The purpose of this supplemental inspection was to assess the licensee's evaluation of a White Mitigating System Performance Index (MSPI), Emergency AC Power System performance indicator (PI) for Unit 1 and a White inspection finding in the Mitigating Systems cornerstone. The PI crossed the Green to White threshold during the first quarter of 2008 due to two run failures of the 1B EDG. The second run failure also resulted in a self-revealing White inspection finding associated with inadequate installation work instructions for the EDG exhaust manifold. The inspectors reviewed the licensee's actions associated with the two failures and conducted interviews with licensee personnel to ensure that the root cause and contributing causes of the events were identified and understood and that appropriate corrective actions to prevent recurrence were initiated.

- Failure 1: On March 3, 2008, the 1B EDG automatically tripped during a full load surveillance due to problem with the speed sensing circuitry. The low speed signal generator for 1B EDG failed and was replaced. This resulted in a 1B EDG run failure. (Condition report (CR) 2008102092)
- Failure 2: On March 13, 2008, during a two hour surveillance run of the 1B EDG, the control room received fire alarms for the 1B EDG room and reports that the room was full of smoke and the carbon dioxide (CO₂) fire suppression system had discharged. The licensee determined the cause of the event was exhaust manifold separation at a flanged connection. (CR 2008102490)

The inspectors also reviewed an EDG reliability root cause evaluation. This evaluation reviewed the EDG engineering reliability program to identify programmatic and organizational weaknesses that resulted in the White PI. This evaluation included the review of two EDG run failures as well as jacket water leakage, rocker arm lube oil issues, and the EDG air compressors problems. (CR 2008102507)

02 EVALUATION OF INSPECTION REQUIREMENTS

02.01 Problem Identification

- a. Determination that the evaluation identifies who and under what conditions the issue was identified

The inspectors determined that the evaluation for each failure was sufficiently detailed to identify who and under what conditions the issue was identified. Both events were self-revealing and identified in the associated condition report.

- b. Determination that the evaluation documents how long the issue existed and prior opportunities for identification

The inspectors determined that the evaluation for each failure documented how long the issue existed and prior opportunities for identification.

The speed signal generator failure was an instantaneous failure and could not have been predicted.

The EDG exhaust manifold failure was a result of inadequate exhaust manifold installation in February 2008. The exhaust manifold was installed without completion of required welding. The licensee's root cause revealed potential opportunities to identify the adverse condition during the post-maintenance test (PMT) prior to returning the EDG to service. The licensee performed the PMT with the exhaust manifold heat shields installed to minimize unavailability. During the maintenance run, a puff of smoke was seen from the manifold but was attributed to oil burnoff. Also, the licensee's root cause stated that a maintenance inspection of the flange connections for leaks was not performed. Interviews with the licensee revealed leakage detected from the tack welded joints adjacent to the flange connections could have been identified with a flange leak inspection.

- c. Determination that the evaluation documents the plant-specific risk consequences (as applicable) and compliance concerns associated with the issues

The inspectors determined that the evaluations for Failures 1 and 2 documented the risk consequences and compliance concerns. The cause evaluations documented that Farley entered the required technical specification action statement as a result of each failure. An evaluation for common mode failures was not required because no other stainless steel exhaust headers had been installed on the diesel generators.

02.02 Root Cause and Extent-of-Condition Evaluation

- a. Determination that the problem was evaluated using systematic methods to identify root causes and contributing causes

The systematic method for each failure is listed below:

- Failure 1 – Events and Casual Factors Analysis, Fault Tree Analysis, Management Oversight and Risk Tree Analysis
- Failure 2 – Events and Casual Factors Analysis, Management Oversight and Risk Tree Analysis
- EDG Reliability Root Cause - Events and Casual Factors Analysis, Management Oversight and Risk Tree Analysis

The inspectors determined that systematic methods used were adequate for both failures and the EDG reliability evaluation.

- b. Determination that the root cause evaluation was conducted to a level of detail commensurate with the significance of the problem

The inspectors determined the level of detail was adequate for both failures.

- a. Determination that the root cause evaluation included a consideration of prior occurrences of the problem and knowledge of prior operating experience

The inspectors determined that the evaluations for both failures and the diesel generator reliability evaluation considered prior occurrences and operating experience.

- b. Determination that the root cause evaluation addresses the extent of condition and the extent of cause of the problem

The inspectors determined the evaluations for both failures adequately addressed extent of condition. The extent of cause was adequate for Failure 1; however, the extent of cause review for Failure 2 was narrowly focused on EDG condition reports and did not include a review of PMTs for other safety related systems. A condition report was initiated to address the narrowness of the PMT extent of cause review for Failure 2 (CR 2008109725).

- c. Determination that the root cause evaluation, extent of condition, and extent of cause appropriately considered the safety culture components as described in IMC 0305

The inspectors determined that the safety culture components were appropriately considered and reviewed for Failures 1 and 2. The EDG reliability evaluation also included a comprehensive safety culture assessment. Each safety culture component was related to the identified contributing factors.

02.03 Corrective Actions

- a. Determination that appropriate corrective action(s) are specified for each root/contributing cause or that there is an evaluation that no actions are necessary

The inspectors determined that appropriate root/contributing causes were specified and the corrective actions were appropriate for the identified root and contributing causes for all three root cause evaluations. Corrective actions for the two failures included the following:

Failure 1: The licensee installed new signal generators on all of the EDGs. A modification was developed to provide a back-up signal to prevent an EDG trip while the unit is running. The modification has been implemented on two diesels, and was scheduled for the other three diesels. In addition, single point vulnerability (SPV) studies are being performed on the EDGs and all safety-related systems to determine if other SPVs exist that were not identified by the vendor or the licensee.

Failure 2: New exhaust manifolds were properly installed and tested per vendor instructions on all EDGs. Planning and work control procedures were updated to incorporate lessons learned from the exhaust manifold failure. Corrective actions were created to increase the number of personnel in the planning department. The maintenance diesel engineer position was filled by an experienced individual. In addition, corrective actions to develop and implement procedures that incorporate risk and consequence into the work control process have been scheduled.

Enclosure

Diesel generator reliability evaluation corrective actions included the following:

- New station focus on reliability instead of unavailability is being communicated by management.
- Require Apparent Cause Determinations be performed for Critical 1 & 2 component failures.
- Require effectiveness review for root cause corrective actions
- Develop a Comprehensive risk-informed diesel generator work schedule
- Designate a Performance Improvement Group resource to search CRIT 1 or CRIT 2 component failure condition reports for repeat issues
- Develop a process that formalizes and facilitates the risk assessment aspect of decision making for deferrals of corrective actions
- Each system engineer will review their respective system monitoring plan with their supervisor to ensure plan was adequate and that system monitoring was being performed.

The inspectors had interviewed system engineers that had already discussed their monitoring plans with supervision and determined that some system engineers did not fully understand their responsibilities related to system monitoring. A condition report was initiated to address the system engineers lack of understanding (CR 2008109722).

- b. Determination that the corrective actions have been prioritized with consideration of the risk significance and regulatory compliance

The inspectors determined that the corrective actions for failures 1, 2 and the diesel generator reliability evaluation were appropriately prioritized.

- c. Determination that a schedule has been established for implementing and completing the corrective actions

The inspectors determined that the corrective actions for failures 1, 2 and the diesel generator reliability evaluation have been scheduled or completed.

- d. Determination that quantitative or qualitative measures of success have been developed for determining the effectiveness of the corrective actions to prevent recurrence

The inspectors determined that corrective action effectiveness reviews using the evaluation criteria established in the corrective action program procedures were scheduled.

03 Regulatory Issues

03.01 Findings

No findings of significance were identified.

Enclosure

04 MANAGEMENT MEETINGS

Exit Meeting Summary

The inspectors presented the results of the supplemental inspection to Mr. Randy Johnson and other members of licensee management and staff on September 26, 2008. The inspectors confirmed that no proprietary information was provided or examined during the inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

C. Barefield- Shift Manager, EDG Reliability RCE Team Leader
D. Bell- EDG System Engineer
M. Boggs- Vendor Oversight, Supply Chain Superintendent
C. Collins- Plant Manager
H. Cooper- RHR/charging System Engineer
B. Griner- Engineering Support Manager
D. Hall- Nuclear Ops Lead Plant Instructor, exhaust manifold RCE team leader
J. Holloway- Scheduling Coordinator
R. Johnson- Plant Vice President
S. Mask- Senior Nuclear Specialist, Maintenance EDG specialist
C. McCain- Design Engineer
B. Moore- Site Support Manager
K. Moore – Equipment & Reliability Supervisor
J. Reed- System Engineer
R. Rykard- Planning Supervisor
W. Sims- OE Coordinator
E. Stephenson- Engineer PI RCE Analysis, Speed Signal RCE Team Leader
R. Smith- Engineering Supervisor MSPi System
C. Thornell- Maintenance Manager
C. Westberry- Engineering Supervisor

NRC personnel:

E. Crowe, Senior Resident – Farley
S. Sandal, Resident Inspector - Farley
S. Shaeffer, Chief, Projects Branch 2

LIST OF DOCUMENTS REVIEWED

Completed Action Items

2008202942, 2008202961, 2008202972, 2008202973, 2008202977, 2008202981, 2008202982,
2009202983, 2008202984, 2008202985, 2008202986, 2008202988, 2008202989, 2008202994,
2008202995, 2008202996, 2008202998, 2008203014, 2008203371, 2008203372, 2008203373,
2008203376, 2008203378, 2008203379, 2008203380, 2008203401, 2008203402, 2008203405,
2008203408, 2008203409, 2008203411, 2008203417, 2008203590, 2008203591, 2008203788,
2008203790, 2008203791, 2008203794, 2008203799, 2008203800, 2008203801, 2008203802,
2008203804, 2008203805, 2008203807, 2008203810, 2008203828, 2008203829, 2008203830,
2008203832, 2008203833, 2008203837, 2008203838, 2008203840, 2008203841, 2008203842,
2008203843, 2008203844, 2008203845, 2008203846, 2008203847, 2008203916, 2008203954

Procedures

FNP-0-ACP-47.6, Emergency Diesel Generator Outage Preparation and Implementation
FNP-0-ACP-52.1, Guidelines for Scheduling of On-Line Maintenance
NMP-GM-006, Work Management
NMP-GM-006-GL01, Work Planning, Packaging, and Closure

Attachment

NMP-ES-020 – Equipment Reliability Board
NMP-ES-002 – System Monitoring & Health Reporting
FNP-0-SOP-38.0 – Diesel Generators
NMP-GM-008 – Operating Experience Program
NMP-GM-008-GL04 – Guideline for Screening Internal OE for Posting
U184852 – Diesel Generators 1-2A, 1B, & 2B Operations and Maintenance Manual

Maintenance Work Orders

1052028501, Replace 1B EDG Exhaust System
2052029101, Replace 2B EDG Exhaust System
Database: Open emergency diesel generator work orders

Condition Reports

2008109412 2008109416 2008102490 2008203792 2007108631 2008109492
2006109254 2004102220 2007104092 2008102092 2008107290 2008102507

Self Assessments

FNP 2008 Excellence Assessment
FNP 2006 Excellence Assessment
Mentoring & System Health Reporting Self-Assessment (CR 2008105273)
Operating Experience Self-Assessment (CR 2008100520)

Miscellaneous

Root Cause grading sheet: CR 2008102490
Root Cause training documentation of team members for CR's 20081022092, 2008102490 and 2008102507
P12606526, original exhaust manifold installation instructions provided by Fairbanks Morse
Minor Design Change Package 1080727401 Version 1
Common Cause Analysis Diesel Performance Report (Supplement to CR 2008102507)
Emergency Diesel Generator System Health Report
Emergency Diesel Generator System Monitoring Plan
Service Water System monitoring Plan
Residual Heat Removal System Monitoring plan
Charging Pump System Monitoring Plan

Plant Review Board Meeting Minutes

2008-0011, 2008-0013, 2008-0015, 2008-0016, 2008-0019, 2008-0021