



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

December 31, 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 PROBLEM IDENTIFICATION  
AND RESOLUTION INSPECTION REPORT 05000348/2009007 AND  
05000364/2009007**

Dear Mr. Johnson:

On November 20, 2009, the U. S. Nuclear Regulatory Commission (NRC) completed an inspection at the Farley Nuclear Station. The enclosed inspection report documents the inspection findings, which were discussed on November 20, 2009, with you and other members of your staff during an exit meeting.

The inspection was an examination of activities conducted under your license as they relate to the identification and resolution of problems, and compliance with the Commission's rules and regulations and with the conditions of your operating license. Within these areas, the inspection involved examination of selected procedures and representative records, observations of plant equipment and activities, and interviews with personnel.

On the basis of the samples selected for review, the team concluded that in general, problems were properly identified, evaluated, and corrected. There was one Green self-revealing finding identified during this inspection associated with an inadequate surveillance test procedure. Specifically, the finding was related to the licensee's failure to maintain adequate procedures for testing the 'B' train solid state protection system. Additionally, a licensee-identified violation (LIV), which was determined to be of very low safety significance, is listed in this report. These findings were determined to be violations of NRC requirements. However, because of their very low safety significance and because they have been entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy. If you wish to contest these non-cited violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-001; 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 Senior Resident Inspector at the Farley Nuclear Station.

In addition, examples of minor problems were identified by the team, such as equipment issues that were not entered into the corrective action program, and corrective action item closures that did not implement the actions required to be performed.

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 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/*

Daniel Merzke, Acting Chief  
Reactor Projects Branch 7  
Division of Reactor Projects

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

Enclosure: Inspection Report 05000348/2009007 and 05000364/2009007  
w/Attachment: Supplemental Information

cc w/encl: (See page 3)

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

Angela Thornhill  
Managing Attorney and Compliance Officer  
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  
Fleet Support Supervisor  
Southern Nuclear Operating Company  
Electronic Mail Distribution

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

Paula Marino  
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

John G. Horn  
Site Support Manager  
Joseph M. Farley Nuclear Plant  
Southern Nuclear Operating Company, Inc.  
Electronic Mail Distribution

Aimee J. Gray  
Performance Improvement Supervisor  
Joseph M. Farley Nuclear Plant  
Southern Nuclear Operating Company, Inc.  
Electronic Mail Distribution

C. Howard Mahan  
Principal Licensing Engineer  
Joseph M. Farley Nuclear Plant  
Southern Nuclear Operating Company, Inc.  
Electronic Mail Distribution

Senior Resident Inspector  
U.S. Nuclear Regulatory Commission  
Joseph M. Farley Nuclear Plant  
U.S. NRC  
7388 N. State Highway 95  
Columbia, AL 36319

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

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

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

SNC

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Letter to J. Randy Johnson from Daniel Merzke dated December 31, 2009

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT - NRC PROBLEM IDENTIFICATION  
AND RESOLUTION INSPECTION REPORT 05000348/2009007 AND  
05000364/2009007

Distribution w/encl:

C. Evans, RII  
L. Slack, RII  
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R. Martin, NRR

**U. S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket Nos.: 50-348, 50-364

License Nos.: NPF-2, NPF-8

Report No.: 05000348/2009007, 05000364/2009007

Licensee: Southern Nuclear Operating Company Inc.

Facility: Joseph M. Farley Nuclear Plant

Location: Columbia, AL

Dates: November 2 - 6, 2008, and November 16 - 20, 2009

Inspectors: R. Taylor, Senior Project Inspector  
S. Ninh, Senior Project Engineer  
T. Lighty, Project Engineer  
S. Sandal, Resident Inspector, Farley

Accompanying Personnel: W. Deschaine, Project Engineer (in training)

Approved by: Daniel Merzke, Acting Chief  
Reactor Projects Branch 7  
Division of Reactor Projects

Enclosure

## SUMMARY OF FINDINGS

IR 05000348/2009007, 05000364/2009007; 11/02/2009 – 11/20/2009; Farley Nuclear Plant, Units 1 and 2; biennial inspection of the identification and resolution of problems.

The inspection was conducted by a senior project inspector, senior project engineer, project engineer, and a resident inspector. One Green self-revealing finding was identified. The significance of most findings is indicated by its color (Green, White, Yellow, Red) using the Significance Determination Process in Inspection Manual Chapter (IMC) 0609, Significance Determination Process (SDP). The cross-cutting aspect was determined using IMC 0305, Operating Reactor Assessment Program. Findings for which the Significance Determination Process does not apply may be Green or be assigned a severity level after NRC 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.

### Identification and Resolution of Problems

The team concluded that, in general, problems were properly identified, evaluated, prioritized, and corrected. Generally, the threshold for initiating condition reports (CRs) was appropriately low, as evidenced by the types of problems identified and the large number of CRs entered annually into the Corrective Action Program (CAP). Employees were encouraged by management to initiate CRs. However, the team did identify some examples where plant issues were not appropriately entered into the CAP.

Generally, prioritization and evaluation of issues were consistent with the licensee's CAP guidance, formal root cause evaluations for significant problems were adequate, and corrective actions specified for problems were acceptable. Overall, corrective actions developed and implemented for issues were generally timely, effective, and commensurate with the safety significance of the issues. However, the team did identify some examples where plant issues were not appropriately evaluated consistent with the licensee's CAP guidance.

The team determined that, overall, audits and self-assessments were adequate in identifying deficiencies and areas for improvement in the CAP, and appropriate corrective actions were developed to address the issues identified. The licensee's operating experience (OE) usage was found to be generally acceptable and integrated into the licensee's processes for performing and managing work, and plant operations.

Based on discussions and interviews conducted with plant employees from various departments, the inspectors determined that personnel at the site felt free to raise safety concerns to management and use the CAP to resolve those concerns.

### A. NRC Identified and Self-Revealing Findings

#### **Cornerstone: Mitigating Systems**

Green. A self-revealing violation of 10 CFR 50 Appendix B, Criterion V "Instructions, Procedures, and Drawings," was identified for an inadequate

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procedure for testing the 'B' train solid state protection system (SSPS) (FNP-1-STP-33.3). While Unit 1 was in Mode 5 and N31 source range instrumentation was tagged out and unavailable, the licensee performed step 5.6.1.1B of FNP-1-STP-33.3, resulting in N32 source range instrument being de-energized. Procedure FNP-1-STP-33.3 inadvertently de-energized the only operable source range instrument for Unit 1. TS 3.3.1 required a minimum of one source range neutron flux monitor with the plant in this condition. When the licensee recognized this condition, they immediately restored power to N32 and exited the TS action. The licensee initiated condition report (CR) 2009105672 to address this issue.

The issue was more than minor because it was associated with the procedure quality attribute of the mitigating systems cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the SSPS procedure resulted in a total loss of source range instrumentation during testing. This affected the safety function of source range neutron flux indication in Mode 5. This finding was assessed using the Phase 1 and 2 Shutdown Operations screening worksheet of the SDP and was determined to require a Phase 3 analysis because the finding involved a loss of source range monitors while shutdown. This finding was determined to be of very low safety significance because the dominant sequence is a boron dilution event and de-energizing the source range for less than a minute would not prevent an operator from taking the necessary actions to address potential boron dilution. No cross-cutting issue was identified. (Section 4OA2.a.(3))

B. Licensee Identified Violations

A violation of very low safety significance, identified by the licensee, has been reviewed by the NRC. Corrective actions taken or planned by the licensee have been entered into the licensee's CAP. The violation and corrective action tracking number is listed in Section 4OA7 of this report.

## REPORT DETAILS

### 4. OTHER ACTIVITIES

#### 4OA2 Problem Identification and Resolution

##### a. Assessment of the Corrective Action Program

##### (1) Inspection Scope

The inspectors reviewed the licensee's CAP procedures which described the administrative process for initiating and resolving problems primarily through the use of condition reports (CRs). To verify that problems were being properly identified, appropriately characterized, and entered into the CAP, the inspectors reviewed CRs that had been issued between August 2008 and November 2009, including a detailed review of selected CRs associated with four risk-significant systems: Auxiliary Feedwater (AFW), Service Water (SW), Diesel Generators (DGs), and Radiation Monitors. Where possible, the inspectors independently verified that the corrective actions were implemented as intended. The inspectors also reviewed selected common causes and generic concerns associated with root cause evaluations to determine if they had been appropriately addressed. To help ensure that samples were reviewed across all cornerstones of safety identified in the NRC's Reactor Oversight Process (ROP), the team selected a representative number of CRs that were identified and assigned to the major plant departments, including operations, maintenance, engineering, emergency preparedness, health physics, chemistry, and security. These CRs were reviewed to assess each department's threshold for identifying and documenting plant problems, thoroughness of evaluations, and adequacy of corrective actions. The inspectors reviewed selected CRs, verified corrective actions were implemented, and attended meetings where CRs were screened for significance to determine whether the licensee was identifying, accurately characterizing, and entering problems into the CAP at an appropriate threshold.

The inspectors conducted plant walkdowns of equipment associated with selected systems and other plant areas to assess the material condition and to look for any deficiencies that had not been previously entered into the CAP. The inspectors reviewed CRs, maintenance history, completed work orders (WOs) for the systems, and reviewed associated system health reports. These reviews were performed to verify that problems were being properly identified, appropriately characterized, and entered into the CAP. Items reviewed generally covered a 16-month period of time; however, in accordance with the inspection procedure, a five-year review was performed for selected systems for age-dependent issues.

Control Room walkdowns were also performed to assess the main control room (MCR) deficiency list and to ascertain if deficiencies were entered into the CAP. Operator Workarounds and Operator Burden screenings were reviewed, and the inspectors verified compensatory measures for deficient equipment were being implemented in the field.

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The team conducted a detailed review of selected CRs to assess the adequacy of the root-cause and apparent-cause evaluations of the problems identified. The inspectors reviewed these evaluations against the descriptions of the problem described in the CRs and the guidance in licensee procedures. The inspectors assessed if the licensee had adequately determined the cause(s) of identified problems, and had adequately addressed operability, reportability, common cause, generic concerns, extent-of-condition, and extent-of-cause. The review also assessed if the licensee had appropriately identified and prioritized corrective actions to prevent recurrence.

The team reviewed selected industry operating experience items, including NRC generic communications, to verify that they had been appropriately evaluated for applicability and that issues identified through these reviews had been entered into the CAP.

The team reviewed site trend reports, to determine if the licensee effectively trended identified issues and initiated appropriate corrective actions when adverse trends were identified.

The inspectors attended various plant meetings to observe management oversight functions of the corrective action process.

Documents reviewed are listed in the Attachment.

(2) Assessment

Identification of Issues

The team determined that the licensee was generally effective in identifying problems and entering them into the CAP and that there was a low threshold for entering issues into the CAP. This conclusion was based on a review of the requirements for initiating CRs as described in licensee procedure NMP-GM-002-001, "Corrective Action Program Instructions," management expectation that employees were encouraged to initiate CRs for any reason, and a review of system health reports. Generally, the threshold for initiating (CRs) was appropriately low, as evidenced by the types of problems identified and the large number of CRs entered annually into the CAP. Trending was generally effective in monitoring equipment performance. Site management was actively involved in the CAP and focused appropriate attention on significant plant issues.

However, the team identified deficiencies which were not entered into the licensee's CAP. Specifically:

- During a walk down of the EDG system, the team identified residue on the 1C EDG under the fuel compartment. Additionally, during a walk down of the SW system, the team identified minor leaks, and other housekeeping issues that were not entered into the CAP. No CRs or WOs had been initiated in the CAP to correct or evaluate the observed conditions. The licensee entered CRs 2009113334, 2009113337, and 2009113318 to address these conditions. The licensee's failure to enter conditions adverse to quality into the corrective action program was a performance deficiency. This performance deficiency was assessed using IMC 0612

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Appendix B and was screened as Minor because the observed conditions did not challenge system or component operability and no safety consequences to the plant had occurred as a result. The failure to comply with the requirements of NMP-GM-002-001, "Corrective Action Program Instructions," constituted a violation of minor significance that was not subject to enforcement action in accordance with the NRC's Enforcement Policy.

### Prioritization and Evaluation of Issues

Based on the review of audits conducted by the licensee and the assessment conducted by the inspection team during the onsite period, the team concluded that the licensee was generally effective in the prioritization and evaluation of identified problems. Problems were generally prioritized and evaluated in accordance with the licensee's CAP procedures as described in the CR severity level determination guidance in NMP-GM-002, "Corrective Action Program." Each CR written was assigned a severity level at the CAP coordinator meeting, and adequate consideration was given to system or component operability and associated plant risk.

The team determined that the licensee had conducted root cause and apparent cause analyses in compliance with the site CAP procedures, and assigned cause determinations were appropriate considering the significance of the issues being evaluated. A variety of causal-analysis techniques were used depending on the type and complexity of the issue consistent with licensee procedure NMP-GM-002-GL03, "Cause Determination Guideline." The licensee had performed evaluations that were technically accurate and of sufficient depth. The team further determined that operability, reportability, and degraded or non-conforming condition determinations had been completed consistent with the guidance contained in NMP-AD-012, "Operability Determinations and Functionality Assessments for Resolution of Degraded and Nonconforming Conditions." However, the team did make the following observations in the area of prioritization and evaluation of issues:

- CR 2009104096 identified that the motor-operated valve (MOV) torque switch actuation point for Q2P16MOV3134 (service water from reactor coolant pump motor air coolers) appeared to be set at a spring pack displacement of 0.146 inches and that the target displacement should be 0.242 inches to ensure that there is adequate margin to prevent dual-indication issues during the performance of required in-service surveillance tests. The condition report spawned action item (AI) 2009203977 to modify reptasks associated with FNP-0-EMP-1501.17 to set an appropriate limit to minimize potential for dual indication-type closing stroke results. CR 2009104096 and AI 2009203977 were coded as severity level 5 issues.

The team concluded that CR 2009104096 described a condition adverse to quality as defined by NMP-GM-002, Corrective Action Program. Additionally, the team concluded that the CR and associated action item should have, at minimum, been assigned a severity level 4 as specified by NMP-GM-002 section 6.4.

The team also noted that during performance of a time stroke test of Q2P16MOV3134 on November 6, 2009, the MOV failed to meet test acceptance criteria due to dual position indication. The team also noted that this was a repeat issue for this valve and that corrective actions specified by AI 2009203977 had not been implemented prior to the November failure. This issue was documented in the CAP as CR 2009113404 and 2009113410.

- CR 2009107346 identified that WO 2053045701 to repair inoperable core exit thermocouple (CETC) Q2B14TI2302-B was voided in error. Because all previous corrective actions to repair the CETC had been closed or voided in the CAP, the CR spawned elective WO 2091590701 to effect repairs. CR 2009107346 was coded as a severity level 5 issue.

The team concluded that CR 2009107346 described a condition related to TS LCO 3.3.3 for Post Accident Monitoring Instrumentation and therefore instrument inoperability would constitute a condition adverse to quality as defined by NMP-GM-002, Corrective Action Program. Additionally, the team concluded that the CR and associated action item should have been assigned a severity level 4 as specified by NMP-GM-002 section 6.4.

The team noted that the CETC was first identified to be inoperable on March 1, 2000 and is being tracked by open LCO 2-2000-006. The team also noted that this condition may represent an operable but degraded nonconforming (OBDN) condition for Unit 2 CETC channel B as specified by NMP-AD-012, Operability Determinations and Functionality Assessments, Section 4.14.3. The team did not find evidence that this issue is currently being tracked as OBDN for Unit 2 CETC channel B.

- The team noted that the maintenance preventable functional failure (MPFF) evaluation for the 1-2L 600V load center failure documented in CR 2008103720 concluded that the bus bar failure was not an MPFF. The team reviewed both the apparent cause determination and root cause evaluation and concluded that the event should have been classified as an MPFF. This conclusion was based on the lack of preventive maintenance (pre-event) that allowed degradation to go undetected and the substantial amount of industry OE that existed indicating the need to perform these preventive maintenance inspections. The team concluded that maintenance rule failure determination was contrary to FNP-0-M-89, Maintenance Rule Site Implementation Manual, Appendix 1, MPFF Determination Guidelines. This issue was entered into the CAP as CR 2009113291.
- CR 2009112319 identified air leaking from the diaphragm for Q2N12HV3226 (steam admission valve to the U2 TDAFW pump). An initial determination of operability was completed that concluded that the valve was OBDN and compensatory actions were identified to monitor the valve for continued degradation that may challenge pump operability. The team reviewed the condition report and current list of OBDN equipment and noted that this valve was not included on the OBDN list. The team also noted that the equipment field listed Q2N12HV3226 as "Operable." The team concluded that designating the valve as Operable in the equipment field instead of OBDN as required by NMP-AD-012, Operability Determinations and Functionality

Assessments, Section 6.3.3.1 prevented the capture of this issue in the OBDN list for periodic review by operations. The team acknowledged that an administrative tracking item was created to monitor the valve condition. This issue was entered into the CAP as 2009113795 and corrective actions were taken to include Q2N12HV3226 on the current list of OBDN equipment.

The team also noted that 2 WOs written to address the leaking actuator (2092556701 and 2092556701) were coded as elective maintenance. The team concluded that coding these WOs as elective maintenance was not consistent with NMP-AD-012, Operability Determinations and Functionality Assessments, Section 6.3.3.4 which states that all OBDN work orders should be coded as corrective maintenance.

- CR 2009112150 and CR 2009112166 identified leak-by through valve Q2P17HV3096B (component cooling water (CCW) to waste evaporator packages and H2 recombiners). An initial determination of operability (IDO) was completed that concluded that the aligned CCW train would be OBDN and compensatory actions were identified to maintain a basis for reasonable assurance that the train of CCW aligned to the miscellaneous header could be established in the event of a line break downstream of the valve. The team reviewed the condition reports and noted that elective maintenance WO 2092528101 was spawned from CR 2009112150 to effect repairs to Q2P17HV3096B. The team concluded that coding this WO as elective maintenance was contrary to the NMP-AD-012, Operability Determinations and Functionality Assessments, Section 6.3.3.4 which states that all OBDN work orders should be coded as corrective maintenance.

The team acknowledged that an administrative tracking item had been established to brief operating crews on procedures used for filling the CCW expansion tank in the event of a downstream line break. However, the team also noted that no compensatory actions were established to ensure that the make-up water sources to CCW or expansion tank level indication would not be removed from service without prior evaluation given the existing degraded condition of Q2P17HV3096B.

#### Effectiveness of Corrective Actions

Based on a review of corrective action documents, interviews with licensee staff, and verification of completed corrective actions, the team determined that overall, corrective actions were timely, commensurate with the safety significance of the issues, and effective, in that conditions adverse to quality were corrected and non-recurring. For significant conditions adverse to quality, the corrective actions directly addressed the cause and effectively prevented recurrence in that a review of performance indicators, all CRs, and effectiveness reviews demonstrated that the significant conditions adverse to quality had not recurred. Effectiveness reviews for corrective actions to prevent recurrence were sufficient to ensure corrective actions were properly implemented and were effective.

(3) Findings

Introduction. A Green self-revealing NCV was identified for failure to comply with 10 CFR 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings. The procedure used for testing the 'B' train solid state protection system (SSPS), FNP-1-STP-33.3, resulted in all source range instrumentation being de-energized, which was not appropriate for plant conditions.

Description. On April 29, 2009, while Unit 1 was in Mode 5 and the N31 source range instrument was tagged out and unavailable, N32 was the only operating source range instrument and was required by TS 3.3.1 to be operable. When performing procedure FNP-1-STP-33.3, step 5.6.1.1 B, the operating N32 source range instrument was de-energized, resulting in Unit 1 entering TS 3.3.1 condition L, "required source range neutron flux channel inoperable." The licensee immediately recognized this condition and returned the input error inhibit switch to its normal position which restored power to N32 and stopped the surveillance test. The licensee exited TS 3.3.1 Condition L once power was restored to N32.

In 2001 the licensee revised FNP-1-STP-33.3 to allow testing of the 'B' SSPS system with or without inhibits in effect. The team determined that the procedure change was inadequate to deal with existing plant conditions on April 29, 2009. The use of inhibits allowed the licensee to test the SSPS system in a test mode configuration without initiating safety system actuations. However, placing the SSPS system in inhibit de-energized a source range monitor.

Analysis. The failure to include adequate guidance in procedure FNP-1-STP-33.3 which resulted in all source range instruments being inadvertently de-energized was a performance deficiency. The issue was more than minor because it was associated with the procedure quality attribute of the mitigating systems cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the SSPS procedure inadvertently de-energized the source range monitor and did not verify the availability of source range instrumentation during testing. This affected the safety function of source range neutron flux indication in Mode 5. This finding was assessed using the Phase 1 and 2 Shutdown Operations screening worksheet of the SDP and was determined to require a Phase 3 analysis because the finding involved a loss of source range monitors while in Mode 5. This finding was determined to be of very low safety significance because the dominant sequence is a boron dilution event, and de-energizing the source range for less than a minute would not prevent an operator from taking the necessary actions to address potential boron dilution. No cross-cutting issue was identified.

Enforcement. 10 CFR 50 Appendix B, Criterion V, Instructions, Procedures, and Drawings, states in part that activities affecting quality shall be prescribed by documented procedures of a type appropriate to the circumstances. Contrary to the above, since 2001, the licensee failed to provide adequate guidance in Procedure FNP-1-STP-33.3, resulting in loss of all source range instrumentation during testing of the 'B' train SSPS system. The shift supervisor immediately directed the operator to return the

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switch to its normal position and power was restored to N32. Because of the very low safety significance and because this finding has been entered into the licensee's CAP as CR 2009105672, this violation is being treated as an NCV consistent with Section VI.A of the NRC Enforcement Policy and is identified as NCV 05000348/2009007-01, Inadequate Procedure for the 'B' Train SSPS System Testing.

b. Assessment of the Use of Operating Experience (OE)

(1) Inspection Scope

The team examined licensee programs for reviewing industry operating experience and reviewed licensee procedure NMP-GM-008, "Operating Experience Program," to assess the effectiveness of how external and internal operating experience data was handled at the plant. In addition, the team selected operating experience documents (e.g., NRC generic communications, 10 CFR Part 21 reports, licensee event reports, vendor notifications, and plant internal operating experience items, etc.), which had been issued since August 2008 to verify whether the licensee had appropriately evaluated each notification for applicability to the Farley plant, and whether issues identified through these reviews were entered into the CAP. Documents reviewed are listed in the Attachment.

(2) Assessment

Based on a review of documentation related to the review of OE issues, the team determined that the licensee was generally effective in screening OE for applicability to the plant. The inspectors verified for selected issues that industry OE was evaluated at either the corporate or plant level depending on the source and type of document. Relevant information was then forwarded to the applicable department for further action or informational purposes. OE issues requiring action were entered into the CAP for tracking and closure. In addition, operating experience was included in each root cause evaluation reviewed by the inspectors in accordance with licensee procedure NMP-GM-002-GL03, "Cause Determination Guideline."

(3) Findings

No findings of significance were identified.

c. Assessment of Self-Assessments and Audits

(1) Inspection Scope

The team reviewed audit reports and self-assessment reports, including those which focused on problem identification and resolution, to assess the thoroughness and self-criticism of the licensee's audits and self-assessments, and to verify that problems identified through those activities were appropriately prioritized and entered into the CAP for resolution in accordance with licensee procedure NMP-GM-003, "Self Assessment."

(2) Assessment

The team determined that the scopes of assessments and audits were adequate. Self-assessments were generally detailed and critical, as evidenced by findings consistent with the team's independent review. The team verified that CRs were created to document all areas for improvement and findings resulting from the self-assessments, and verified that actions had been completed consistent with those recommendations. Generally, the licensee performed evaluations that were technically accurate. Site trend reports were thorough and a low threshold was established for evaluation of potential trends, as evidenced by the CRs reviewed that were initiated as a result of adverse trends.

(3) Findings

No findings of significance were identified.

d. Assessment of Safety-Conscious Work Environment

(1) Inspection Scope

During normal interactions with plant employees during the course of this inspection, the inspectors informally interviewed plant personnel regarding their knowledge of the CAP at Farley and their willingness to write CRs or raise safety concerns. The inspectors conducted interviews to develop a general perspective of the safety-conscious work environment at the site to determine if any conditions existed that would cause employees to be reluctant to raise safety concerns. The inspectors reviewed the licensee's Concerns Program Procedure and interviewed the Concerns Coordinator. Additionally, the inspectors reviewed a sample of employee concern issues which had been entered into the CAP to verify concerns were being properly reviewed and deficiencies were being resolved.

(2) Assessment

Based on the interviews conducted and the CRs reviewed, the team determined that licensee management emphasized the need for all employees to identify and report problems using the appropriate methods established within the administrative programs, including the CAP and concerns program. These methods were readily accessible to all employees. Based on discussions conducted with a sample of plant employees from various departments, the inspectors concluded that employees felt free to raise issues, and that management encouraged employees to place issues into the CAP for resolution. The inspectors did not identify any reluctance on the part of the licensee staff to report safety concerns.

(3) Findings

No findings of significance were identified.

4OA3 Event Follow-up.1 (Closed) LER 05000364/2008-001-00, Condition Prohibited by TS 3.8.6 Battery Cell Parameters

On February 11, 2008, the licensee incorrectly approved a quarterly surveillance test on the Unit 2 Auxiliary Building B-Train Battery for Cell number 33 with 2.06 V as satisfactory. This quarterly surveillance test was repeated on May 7, 2008, and Cell number 33 of B-Train Battery was determined to have a voltage of 2.06 V which was below the minimum allowed cell voltage of 2.08 V per TS Table 3.8.6-1. If one or more required batteries with one or more battery cell parameters are not within Category B, TS 3.8.6 Action statements were required to verify battery cell parameters meet Table 3.8.6-1 Category C limits ( $\geq 2.02V$ ) once per 7 days thereafter and to restore battery cell parameters to Category B limits ( $\geq 2.08 V$ ) within 31 days. This error resulted in the B-Train Battery being inoperable between February 11 and May 7, 2008, due to not completing the required TS Action statements. The licensee determined that the apparent cause was the journeymen taking the voltage reading failed to follow the procedure and compare the voltage to the correct acceptance criteria, and the supervisor also failed to ensure the procedure was correctly completed. Corrective actions included replacing Cell Number 33 on June 3, 2008, providing additional supervisor personnel reviews of TS battery surveillance test packages, and coaching personnel involved in the event on the importance of attention-to-detail when using procedures and legibility of recorded test data. The inspectors determined that this finding was more than minor because it affected the objective of the equipment performance attribute under the Mitigating Systems cornerstone in that the Unit 2 Auxiliary Building B-Train Battery was degraded. The inspectors evaluated this finding against NRC SDP Phase I screening worksheets and determined it to be of very low safety significance (Green) because the battery cell was well above the 2.02 V Category C limits during the entire period and therefore, the battery remained available to perform its safety function. This licensee-identified finding involved a violation of TS 3.8.6, Train A and B Auxiliary Building and Service Water Intake Structure (SWIS) Batteries. The enforcement aspects of the violation are discussed in Section 4OA7. This LER is closed.

.2 (Closed) LER 05000348/2008-004-00, Reactor Trip Due to Loss of RCP Breaker Position

On November 19, 2008, Unit 1 was operating at 100 percent power. Due to a gradual drop in 4160 V safety-related bus voltage over several hours, Farley contacted Alabama Power - Alabama Control Center (ACC) to discuss removing the shunt reactor from service in the Farley High Voltage Switch Yard (HVSY) to raise the 230 kV grid voltage. After receiving the request, the ACC operator used an air-break disconnect switch to isolate the shunt reactor, instead of using the breakers normally used for this purpose. Opening the disconnect switch, which is not designed to break load, caused a significant electrical arc and phase-to-phase fault. The transmission protection system tripped the appropriate devices and cleared the fault in approximately 3 cycles. However, the instantaneous HVSY voltage drop resulted in loss of breaker position indication for the 1B Reactor Coolant Pump (RCP) which initiated an automatic Solid State Protection System (SSPS) reactor trip. Flow to the reactor core was never lost. The reactor

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tripped without complications and all safety systems performed normally. Unit 1 returned to power operation on November 20, 2008.

The licensee determined that the event was caused when the air-break disconnect switch was opened while still under load. The ACC operator utilized a control display that was inadequate to perform the requested operation. The man-machine interface, together with the ACC operator's experience and training were insufficient to prevent the inappropriate action by the operator. The licensee also determined that the reactor trip would not have occurred from the close-in transmission fault, had the RCP Breaker Position relay power supply been aligned to the inverters instead of the AC constant voltage source transformers. Corrective actions included alerting the ACC operator of the requirement to isolate the shunt reactor prior to operating the air-break disconnect and the requirement to use switching orders for operations at the Farley HVSY, briefing the event with Farley Operations shift personnel and ACC personnel, aligning Reactor Trip relay power supplies to the inverters for all RCPs on both Units 1 and 2, issuing OE on the event to all Southern Nuclear sites and externally to the nuclear industry, and implementing modifications to eliminate the RCP breaker position single point vulnerability on Units 1 and 2 during refueling outages 1R23 and 2R20, respectively.

The inspectors reviewed the root cause and noted that Farley had experienced numerous reactor trips prior to 2003 and two additional reactor trips since. The root cause evaluation for the 2003 event initiated an action item (AI) to issue design change requests (DCRs) to eliminate the RCP breaker open trips for Units 1 and 2. However, these DCRs were later cancelled based on the costs outweighing the benefit without addressing the AI and no formal evaluation was performed to determine the risks or other actions to mitigate the risks. The inspectors verified that the CAP and engineering process allowed the deletion of the relay design control packages without evaluating the risk and without revising the affected root cause. The inspectors determined that the RCP breaker open trips were not considered safety-related equipment and the current CAP had been improved to require risk evaluation and documentation before deferring corrective actions associated with equipment. No findings of significance were identified and no violation of NRC requirements occurred. The licensee documented the issue in CR 2008112610. This LER is closed.

#### 4OA7 Licensee Identified Violations

The following violation of very low safety significance was identified by the licensee and is a violation of NRC requirements which meets the criteria of Section VI.A.1 of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as an NCV.

- TS 3.8.6 requires that battery cell parameters for Train A and Train B Auxiliary Building and Service Water Intake Structure (SWIS) batteries shall be within the limits of Table 3.8.6-1. TS SR 3.8.6.2 requires battery cell parameters to be verified to meet TS Table 3.8.6-1. If one or more required batteries with one or more battery cell parameters are not within Category B, TS 3.8.6 Action statements are required to verify battery cell parameters meet Table 3.8.6-1 Category C limits ( $\geq 2.02$  V) once per 7 days thereafter and to restore battery cell parameters to Category B limits ( $\geq 2.08$  V) within 31 days.

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Contrary to the above, between February 11 and May 7, 2008, Unit 2 Auxiliary Building B-Train Battery Cell number 33 was 2.06 V which was below TS Table 3.8.6-1 limits and the licensee failed to restore Cell number 33 float voltage to Category B limits within 31 days as required per TS 3.8.6 Action statements. The licensee entered this condition into their CAP as CR 2009105768. This finding was evaluated against NRC SDP Phase 1 screening worksheets and determined to be of very low safety significance (Green) because the battery cell was above the 2.02 V Category C limits during the entire period and therefore, the battery remained available to perform its safety function during the affected period.

#### 4OA6 Meetings, Including Exit

On November 20, 2009, the inspectors presented the inspection results to Randy Johnson and other members of the site staff. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee Personnel**

P. Autrey, Buried Piping Program Engineer  
S. Brumfield, CAP Supervisor  
M. Byrd, Design Engineering Supervisor  
M. Caldwell, CCW System Engineer  
C. Collins, Plant Manager  
B. Deloach, Scaffolding Program Engineer  
A. Gray, Performance Improvement Supervisor  
B. Griner, Engineering Support Manager  
J.R. Johnson, Site Vice President  
B.D. McKinney, Licensing Supervisor  
H. Mahan, Principal Licensing Engineer  
R. Martin, Technical Services Manager  
J. Morris, LLRT/ILRT Program Engineer  
D. Morrow, Engineering Supervisor ILRT/ LLRT Program  
K. Haynes, SW System Engineer  
B. Smith, System Engineering Supervisor  
V. Wilherson, Corporate Engineer

#### **NRC**

D. Merzke, Branch Chief, Reactor Projects Branch 7  
S. Shaeffer, Branch Chief, Reactor Projects Branch 2  
E. Crowe, Senior Resident Inspector, Farley Nuclear Plant

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

### Opened

None

### Opened and Closed

05000348/2009007-01	NCV	Inadequate Procedure for the B train SSPS System Testing (Section 4OA2)
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### Closed

05000364/2008-001-00	LER	Condition Prohibited by TS 3.8.6 Battery Cell Parameters (Section 4OA3.1)
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05000348/2008-004-00	LER	Reactor Trip Due to Loss of RCP Breaker Position (Section 4OA3.2)
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### Discussed

None

## LIST OF DOCUMENTS REVIEWED

### Procedures

NMP-AD-012-F02, Formal Functionality Assessment, Version 1  
NMP-AD-012-GL02, Functionality Assessment Guideline, Versions 1 and 2  
NMP-GM-002, Corrective Action Program, Versions 9, 8, 6, 5, 4, 3 and 1  
NMP-GM-002-001, Corrective Action Program Instructions, Versions 14 and 13  
NMP-GM-002-F02, Apparent Cause Determination Report Format, Versions 4 and 3  
NMP-GM-002-F03, Root Cause Quality Review Sheet, Version 6  
NMP-GM-002-F03, Root Cause Grading Sheet, Version 4  
NMP-GM-002-F04, Standard Apparent Cause Quality Review Sheet, Version 5  
NMP-GM-002-F07, Effectiveness Review Form, Version 2  
NMP-GM-002-F33, Enhanced Apparent Cause Quality Review Sheet, Version 1  
NMP-GM-003, Self-Assessment Procedure, Versions 13 and 14  
NMP-GM-003-GL01, Self-Assessment Guideline, Versions 9 and 8  
NMP-GM-002-GL03, Cause Determination Guideline, Version 12  
NMP-GM-002-002, Effectiveness Review Instructions, Version 1  
NMP-GM-008, Operating Experience Program, Versions 8, 7, and 6  
NMP-AD-012, Operability Determination and Functionality Assessments, Versions 5 and 6  
NMP-AD-012-GL-01, Prompt Determination of Operability Preparation Guideline, Version 1  
NMP-ES-001, Equipment Reliability Process Description, Version 7.0  
NMP-ES-006, Preventative Maintenance Implementation and Continuing Equipment Reliability Improvement, Version 6.0  
NMP-ES-008, Component Health Monitoring, Version 7.0  
FNP-0-M-87, Maintenance Rule Scoping Manual, Version 22  
FNP-0-SYP-17.0, Maintenance Rule Monitoring and Reporting, Versions 13 and 15  
FNP-0-M-89, Maintenance Rule Site Implementation Manual, Version 13.0  
FNP-0-SYP-19, Performance Criteria for Systems under the Scope of the Maintenance Rule, Version 10  
FNP-1-SOP-24.0, Service Water System, Version 71  
A-181001, Service Water System – Functional System Description, Revision 25  
A-181000, Component Cooling Water System – Functional System Description, Revision 12  
A-181005 Diesel Generator System – Functional System Description, Version 36.0  
FNP-0-GMP-60.0, General Guidelines and Precautions for Erecting, Modifying, and Disassembling Scaffolding  
FNP-0-M-89, Maintenance Rule Site Implementation Manual, Version 13.0  
FNP-0-SYP-17.0, Maintenance Rule Monitoring and Reporting, Version 15.0  
FNP-0-SYP-19.0, Performance Criteria for Systems under the Scope of the Maintenance Rule, Version 11.0  
FNP-1-RCP-252, Radiation Monitoring System Setpoints, Version 45.0  
FNP-1-SOP-45.0, Radiation Monitoring System, Version 35.0  
FNP-2-STP-80.6 Diesel Generator 2B 24 Hour Load Test, Version 16.0, 20.0, 23.0  
FNP-0-STP-80.7 Diesel Generator 1B 24 Hour Load Test, Version 19.0, 21.0  
FNP-1-STP-33.3 Verification of Steam Dump and Generator Trip SSPS K631 and K635 Slave Relays, Versions 6.0, 7.0, 9.0

Condition Reports

2006108584	2009106465	2008111606
2006200922	2009107631	2008111826
2009108662	2009108748	2008112165
2008112610	2009108927	2008112297
2003003089	2009109094	2008112497
2006102474	2009109353	2008112593
2008111946	2009109493	2008112595
2008112610	2009110673	2008113828
2009101650	2009110823	2009100037
2009102616	2009110894	2009100319
2009109700	2009111068	2009100326
2009110325	2009111109	2009100570
2003002747	2009111180	2009100772
2007108613	2009111212	2009100971
2007108807	2009111214	2009101172
2008106447	2009111286	2009101360
2008110125	2009111356	2009101710
2008110647	2009110658	2009101938
2008110647	2009111882	2009102141
2008113602	2008109980	2009103131
2009100519	2008110156	2009104096
2009101944	2008110330	2009104144
2009102695	2008112475	2009104363
2009102812	2008113333	2009104955
2009103207	2008113470	2009105782
2009106304	2008113922	2009105918
2009107391	2009100863	2009106304
2009107473	2009100922	2009106856
2009108827	2009101696	2009106857
2009108985	2009102450	2009107127
2009109848	2009102502	2009107346
2009110151	2009104575	2009107437
2009111158	2009109027	2009107906
2009111997	2009109036	2009108664
2009112205	2009109043	2009108991
2009112198	2009109248	2009109281
2009112000	2009111010	2009110308
2008112219	2009111097	2009110732
2008112665	2009111121	2009110955
2008113705	2009112092	2009111614
2008113922	2007103277	2009111652
2009100720	2007108600	2009113410
2009101637	2007108601	2009203263
2009101848	2007112284	2009203977
2009101946	2008103720	2009205235
2009103473	2008107415	2008110880
2009106295	2008111262	2008109275

2009107314	2009111374	2009108061
2007112145	2009104259	2009110519
2008106337	2008113352	2008111019
2008113476	2009112601	2009100031
2009100602	2009111017	2009101940
2009107457	2009105539	2009400032
2009101710	2009102876	2009108231
2009112805	2009100385	2009108223
2008102490	2008112353	2009108167
2008100108	2008110475	2009108017
2007108601	2009100030	2009108018
2007100142	2009100025	2009107959
2007200550	2008112253	2009110601
2006101160	2009106719	2009108014
2006108584	2009108119	2009108247
2009103028	2009111469	2008111585
2008111262	2009111392	2009107956
2009100517	2009110580	2009104546
2009100458	2009110474	2009111469
2009101467	2009109678	2009110974
2009100768	2009103542	2009110775
2009105620	2009102352	2008107589
2009107856	2009101518	2009101917
2009105539	2009100083	2009101714
2009107823	2008113842	2009101672
2009107490	2008112737	2009100577
2009109848	2008112746	2009100577
2009109849	2008111870	2009100602
2009110033	2008110439	2009100603
2009109626	2008110049	2009100604
2009109219	2009112601	2009100607
2009109258	2009111129	2008113170
2009112391	2009108439	2008111870
2009112319	2009106725	2008111739
2009105601	2009106614	2008110101
2009100820	2008113840	2009112070
2008109171	2008113818	2009111486
2009113361	2009112601	2009111469
2009105671	2009112097	2009111353
2009111047	2009111820	2009110038
2008113021	2009111130	2009109714
2009111469	2009109219	2009109715
2009110907	2009106265	2009109716
2009107314	2009104261	2008113476
2009105149	2008110348	2008113245
2009102271	2008110344	2008112053
2008111870	2008111273	2009112573
2009112601	2009108063	2009111469

2009109808	2009112601	2009100768
2009109760	2008112196	2009105916
2008113476	2009112601	2009108366
2008113245	2009111155	2008111943
2008113081	2009108009	2009110977
2009112601	2009109713	2009100330
2009111671	2009105702	2009107584
2009108633	2009109687	2009105095
2009102954	2009111128	2009102796
2009101039	2009102813	2009101914
2008113529	2009100794	2009100777
2009112601	2008111747	2009100643
2009107785	2009111659	2009107457
2009103753	2009108450	2009102152
2009112601	2009101026	2009105259
2009110723	2009111885	2009111155
2009108682	2009101942	2009111417
2009107067	2009109711	2009103906
2009101941	2009103991	2009109553
2009100020	2009100033	2009112290
2008113061	2009100034	2009101721
2009112601	2009105460	2008112817
2009111618	2009102225	2009111137
2009110824	2009100035	2008113574
2009110724	2009101939	2008109946
2009106615	2009100052	2009200895
2009105462	2009100714	2009205521
2009100021	2009100717	2009106867
2008112429	2009100716	2006108639
2008111604	2009100734	

Work Orders

107224401  
1070145701  
1070145801  
1090212001  
1080111801  
2008112001  
2008111901  
2007146001  
2008112301  
2008112201  
S081236201  
S081196901  
2060449301  
2092457801  
S092425301  
2092427901

Self-Assessments and Audits

CRP-PA-I-09-006, Nuclear Power Group's Self-Assessment and Benchmarking Program Assessment  
 NA-SQ-09-003, Assessment of PIDP-6 Safety Culture Evaluation Process  
 SQN-PI-S-09-09, Snapshot Self-Assessment Report, Corrective Action Program  
 SQN-OPS-09-028, Focused/Snapshot Self-Assessment Report, Effectiveness of Actions Associated with PER 112718  
 SQN-M&M-S-09-025, Snapshot Self-Assessment Report, Understanding, Proficiency, and Implementation for the Corrective Action Program within MSB  
 SQN-SCH-F-09-02, Focused Self-Assessment Report, Plant Health and Work Management Inter-Relations  
 SSA903, Corrective Action Program (CAP) Audit  
 SSA0806, Maintenance Functional Area Audit  
 SSA0807, Systems Engineering Functional Area Audit

Other Documents

Farley System Health Report, Service Water, 2<sup>nd</sup> and 3<sup>rd</sup> Quarters 2009  
 Farley System Health Report, Component Cooling Water, 2<sup>nd</sup> and 3<sup>rd</sup> Quarters 2009  
 Farley System Health Report, Emergency Diesel Generators, 3<sup>rd</sup> Quarter 2009  
 Farley Nuclear Plant Safety Culture Assessment, August 2008  
 Farley Buried Pipe and Tanks Monitoring Program Health Report, July 13, 2009  
 Farley Technical Specifications (TS) Units 1 and 2, Amendment No. 146 (Unit 1) and Amendment No. 137 (Unit 2)  
 Farley's Implementation of NRC Generic Letter 89-13  
 Timeline of Events Preceding the SWP Motor Replacement Stainless Steel Cooling Coil, 11/12/09  
 Farley Quarterly CAP Trend Report, 8/7/09  
 Farley FSAR  
 Farley TS  
 1D11/2D11, System Health Report, Radiation Monitors, 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> Quarter 2009  
 A181015, Radiation Monitoring System Functional System Description, Version 11.0  
 Operating Experience Program Improvement Project Plan

NRC Identified CRs

200911334 / 2009113337 /200911339, SW System Walkdown CRs  
 2009113318, EDG System Walkdown CRs  
 2009113291, 1-2L LCC Buss Bar Not Classified as MPFF  
 2009113378 / 2009113380, Control of Equipment That is OBDN per NMP-AD-012  
 2009113795, OBDN Report Inaccuracies  
 2009113479, IDO PDO Items to Have Corrective Maintenance WOs Written  
 2009113868, CRs Assigned Severity Level 5