UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
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ATLANTA, GEORGIA 30303-8931

July 23, 2003

Southern Nuclear Operating Company, Inc.
ATTN: Mr. J. B. Beasley, Jr.
Vice President
P. O. Box 1295
Birmingham, AL 35201-1295

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT - NRC INTEGRATED INSPECTION REPORT 05000348/2003003 AND 05000364/2003003

Dear Mr. Beasley:

On June 28, 2003, the US 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 results, which were discussed on July 1, 2003, with Mr. Randy Johnson 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 the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents one NRC-identified finding of very low safety significance (Green) which was determined to involve a violation of NRC requirements. However, because of the very low safety significance and because it was entered into your corrective action program, the NRC is treating this violation as a non-cited violation (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy. Additionally, one licensee-identified violation of very low safety significance is listed in Section 4OA7 of this report. If you contest any NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the United States Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Farley.

In accordance with 10 CFR 2.790 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/***

James H. Moorman, III, Acting Chief
Reactor Projects Branch 2
Division of Reactor Projects

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

Enclosure: Inspection Report 05000348/2003003,
05000364/2003003
w/Attachment: Supplemental Information

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| DATE | 7/22/2003 | 7/23/2003 | 7/23/2003 | 7/23/2003 | 7/22/2003 | 7/22/2003 | 7/22/2003 |
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**U. S. NUCLEAR REGULATORY COMMISSION**

REGION II

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|---|---|
| Docket Nos.: | 50-348, 50-364 |
| License Nos.: | NPF-2, NPF-8 |
| Report Nos.: | 05000348/2003003 and 05000364/2003003 |
| Licensee: | Southern Nuclear Operating Company, Inc. |
| Facility: | Farley Nuclear Plant |
| Location: | 7388 N. State Highway 95<br>Columbia, AL 36319 |
| Dates: | April 6, 2003 - June 28, 2003 |
| Inspectors: | T. Johnson, Senior Resident Inspector<br>S. Rose, Resident Inspector<br>C. Patterson, Senior Resident Inspector, Turkey Point<br>C. Rapp, Senior Project Engineer<br>J. Blake, Senior Project Manager (Section 1R08)<br>B. Crowley, Senior Reactor Inspector (Section 4OA5) |
| Approved by: | James H. Moorman, III, Acting Chief<br>Reactor Projects Branch 2<br>Division of Reactor Projects |

Enclosure

## SUMMARY OF FINDINGS

IR 05000348/2003-003, 05000364/2003-003; 04/06/2003 - 06/29/2003; Joseph M. Farley Nuclear Plant, Units 1 & 2; Maintenance Risk Assessments and Emergent Work Control.

The report covered a three month period of inspection by resident inspectors and a regional senior project engineer, and announced inspections by a regional senior project manager and senior reactor inspector. One Green non-cited violation (NCV) was identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after 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 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a non-cited violation of 10 CFR 50.65 a(4) because the licensee failed to properly assess the risk associated with planned maintenance on the 2B residual heat removal (RHR) pump with concurrent work in the high voltage switch yard.

  This finding is greater than minor because it resulted in an increased risk threshold ("green" to "yellow"). The failure to properly manage the increase in risk during maintenance has a credible impact on the configuration control attribute of the mitigating systems cornerstone. Accurate maintenance risk assessments are necessary to trigger management controls that ensure sufficient operating equipment remains available to respond to an initiating event. This finding is of very low safety significance because of the short duration of the increased risk condition, no other equipment was removed from service, and the RHR Technical Specification (TS) requirements were met. (Section 1R13).

B. Licensee-Identified Violations

A violation of very low safety significance, which was identified by the licensee, has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. The violation and corrective action tracking number are listed in Section 4OA7.

# REPORT DETAILS

## Summary of Plant Status

Unit 1 began the period shutdown for a planned refueling outage. On May 1, the unit was restarted and achieved 100 percent rated thermal power (RTP) on May 7. On May 9, the unit reduced power to 60 percent RTP due a loss of the 1B steam generator feedwater pump (SGFP). On May 28, the unit reduced power to 81 percent RTP to remove the 1B cooling tower from service due to a header joint leak. The unit operated at or near 100 percent RTP for the remainder of the period.

Unit 2 operated at or near 100 percent RTP for the entire inspection period, except for a ramp down to 60 percent RTP on May 11 to remove the 2B SGFP from service in order to swap oil coolers.

## 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

### 1R01 Adverse Weather Protection

a. Inspection Scope

The inspectors evaluated the implementation of Procedures FNP-0-AOP-21.0, "Severe Weather," and FNP-0-EIP-9.0, "Emergency Classification and Actions," prior to the hurricane and hot weather seasons to verify the required planning and compensatory measures for equipment affected by high temperature, winds, and flooding were satisfactorily completed. In addition, the inspectors reviewed the licensee's implementation of river water flood protection measures. The inspectors walked down safety-related, risk significant, and fire protection equipment to verify adequate adverse weather protection measures were taken. The inspectors interviewed selected personnel to assess their training and knowledge relative to adverse weather preparedness. The inspectors also reviewed open work orders to verify the work orders did not adversely affect hot weather, hurricane, or river flooding readiness for the following systems:

- Building sumps and related pumping systems
- Off site power and switch yard
- On site emergency diesel generators (EDGs)
- DC and AC distribution systems
- Turbine Driven Auxiliary Feedwater (TDAFW) systems
- River Water Intake Structure

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

a. Inspection Scope

Partial System Walk Down: The inspectors performed five partial system walk downs to verify the systems listed below were properly aligned when redundant systems or trains were out of service. The walk downs were performed using the criteria in Procedures FNP-0-AP-16, "Conduct of Operations - Operations Group," and FNP-0-SOP-0, "General Instructions to Operations Personnel." The walk downs included checks of control room and plant valves, switches, components, electrical power line-ups, support equipment, and instrumentation. Documents reviewed are listed in the Attachment.

- Unit 1 Auxiliary feedwater (AFW) system after equipment maintenance and system tagouts during the Unit 1 refueling outage
- Unit 1 Service Water (SW) system during equipment outages
- Unit 1 Component Cooling water (CCW) system after equipment outages
- Unit 2 SW system during equipment outages
- Unit 2 CCW system after equipment outages

Complete System Walk Down: The inspectors performed a complete system walk down to verify that the Unit 1 and 2 AFW systems and support systems were properly aligned in accordance with site procedures. The walk downs included a review of plant normal operating and abnormal/emergency operating procedures, drawings, design documents and vendor manuals, the Updated Final Safety Analysis Report (UFSAR), and control room and infield checks of valves, switches, components, electrical power, support equipment, and instrumentation. In addition, open maintenance work orders, outstanding design issues, operator work arounds, temporary modifications, hangers and supports, general area housekeeping, and material condition were reviewed. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

Fire Area Walkdowns: The inspectors walked down the six fire areas listed below to verify the licensee's control of transient combustibles, the operational readiness of the fire suppression system, and the material condition and status of fire dampers, doors, and barriers. The inspectors also checked that compensatory measures, including fire watches, were in place for degraded fire barriers. The inspectors reviewed 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.

- Auxiliary Building Fire Area 1-19A
- Auxiliary Building Fire Area 2-40A

- Auxiliary Building Fire Area 2-6
- Service Water Structure Fire Area 72A
- Diesel Building Fire Area 56A
- Diesel Building Fire Area 56B

Fire Drill Observation: The inspectors observed a fire drill conducted on June 13. The inspectors observed the drill conduct, critique, and documentation of corrective actions to verify the drill was conducted per drill package FNP-0-TCP-17.21, "Fire Brigade Drills."

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

a. Inspection Scope

The inspectors reviewed plant design features that protect against external flooding and related procedures to verify the licensee's flood mitigation plans and equipment were consistent with the design requirements and risk analysis assumptions. This included inspection of underground valve boxes. The inspectors also reviewed condition reports and maintenance work orders to verify the licensee was identifying and resolving problems. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R08 Inservice Inspection (ISI) Activities

a. Inspection Scope

The inspectors observed in-process ISI work activities and reviewed selected ISI records during the first outage of the 2nd interval for the 3rd ISI period. The observations and records were reviewed for compliance with the TS and the applicable Code (ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition, with no Addenda). Portions of the following Unit 1 ISI examinations were observed:

- Ultrasonic (UT) - Chemical & Volume Control System (CVCS) supply line from the Refueling Water Storage Tank (RWST) - 14" dia. X 0.375" wt. SS, Elbow to Pipe weld, ALA2-4605-10

- Liquid Penetrant (PT) - CVCS supply line from the RWST - 14" dia. X 0.375" wt. SS, Elbow to Pipe weld, ALA2-4605-10

Qualification and certification records for examiners, equipment and consumables, and nondestructive examination (NDE) procedures for the above ISI examination activities were reviewed. In addition, an ISI issue in the licensee's corrective action program was reviewed for adequacy. The following records/documents were reviewed:

- NDE Examiner/QC Inspector Qualification Certification and Visual Acuity Records were examined for all Level II and Level III NDE examiners active during the U1 ISI examinations.
- PT: Weld ALA2-4604-6 (Pipe to Elbow)
- PT: Weld ALA1-4204-51-R248 (W8 - Pipe Lugs)
- UT: Weld ALA2-4605-14 (Pipe to Elbow)
- UT: Weld ALA2-4604-7 (Elbow to Pipe)
- UT: Weld ALA2-4604-6 (Pipe to Elbow)
- UT: Weld ALA2-4605-12 (Elbow to Pipe)
- UT: Weld ALA2-4605-11 (Pipe to Elbow)
- UT: Weld ALA2-4610-8 (Valve to Pipe)
- Engineering and work packages for the Code repair of three recordable liquid penetrant indications in the elbow base material adjacent to Weld ALA2-4604-6.
- Condition Report 2003000825 for the pinhole leak discovered on a drain line associated with the Service Water Supply to the 1C CTMT Cooler.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

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 Operator Continuing Training Program." The inspectors observed scenarios conducted in the licensee's simulator for a loss condenser vacuum, loss of feedwater, abnormal secondary chemistry, loss heat sink, rapid load reduction, and reactor trip with no safety injection. The inspectors observed operator ability to take timely actions that were risk significant, emergency plan classification and implementation, use of procedures, alarm response, group dynamics and communications, self-critiques, training feedback, and management oversight to verify operator performance was evaluated against the performance standards of the licensee's scenario. In addition, the inspectors observed implementation of the applicable emergency operating procedures to verify the requirements of FNP-0-AP-16 and FNP-0-TCP-17.6 were met. 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 following two maintenance issues to verify implementation of Procedures FNP-0-M-87, “Maintenance Rule Scoping Manual;” FNP-0-SYP-19, “Maintenance Rule Performance Criteria;” and FNP-0-M-89, “FNP Maintenance Rule Site Implementation Manual;” and compliance with 10 CFR 50.65. The inspectors assessed the licensee’s evaluation of appropriate work practices, common cause failures, functional failures, maintenance preventable functional failures, repetitive failures, availability and reliability monitoring, trending and condition monitoring, and system specialist involvement. The inspectors also interviewed maintenance personnel, system specialists, the maintenance rule coordinator, and operations personnel to assess their knowledge of the program.

- CR 2003001103, 1B Steam Generator Feed Pump (SGFP) speed control
- CR 2003001178, 2B Residual Heat Removal (RHR) motor breaker stop bolt failure

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors assessed the licensee’s planning and control for the following seven planned risk related licensee activities to verify the requirements in Procedures FNP-0-ACP-52.1, “Guidelines for Scheduling of On-Line Maintenance;” AP-FNP-0-AP-52, “Equipment Status Control and Maintenance Authorization;” and FNP-0-AP-16, “Conduct of Operations - Operations Group,” and the Maintenance Rule risk assessment guidance in 10CFR50.65 a(4) were met. The inspectors reviewed the risk assessment and observed actions to minimize overall risk, configuration control, work controls, pre-job briefings, management involvement, job planning and execution, and problem identification and resolution.

- Unit 1 - RHR pump inspections
- Unit 1 - 1C Charging pump outage concurrent with high voltage switch yard (HVSY) testing
- Unit 1 - AFW pump testing concurrent with HVSY work
- Unit 2 - 2B RHR pump outage concurrent with HVSY work
- Unit 2 - process cabinet 8 power supply failure
- Unit 2 - TDAFW testing concurrent with HVSY work
- Control room radiation monitor (R35) inoperability during 1-2A EDG outage

b. Findings

Introduction: The inspectors identified a Green NCV for failure to properly assess the increase in risk associated with planned maintenance activities on Unit 2.

Description: On May 13, planned maintenance was performed on the 2B RHR pump concurrent with HVSY work in progress. This condition lasted for 9.5 hours. The licensee initially evaluated the increase in plant risk (mitigating system unavailable with increase in initiating event frequency) as "green" with a risk achievement worth (RAW) value of 2.77. This RAW value was below the 3.72 threshold for increased "yellow" risk. The inspectors independently evaluated the risk as "yellow" with a RAW value of 6.77. When questioned about this discrepancy, the licensee reviewed their risk evaluation and determined that they failed to include the HVSY work in their risk evaluation. With HVSY work included, the licensee also obtained a RAW value of 6.77.

Analysis: The failure to properly assess risk was greater than minor because it resulted in an increased risk threshold ("green" to "yellow"). The failure to properly manage the increase in risk during maintenance has a credible impact on the configuration control attribute of the mitigating systems cornerstone. Accurate maintenance risk assessments are necessary to trigger management controls that ensure sufficient operating equipment remains available to respond to an initiating event. This finding is of very low safety significance because of the short duration of the increased risk condition, no other equipment was removed from service, and the RHR Technical Specification requirements were met. The inspectors determined the root cause of this incorrect assessment involved the cross-cutting area of human performance.

Enforcement: 10 CFR 50.65 a(4) requires that before performing maintenance, the licensee assess and manage the increase in risk that may result from the proposed maintenance activities. Contrary to the above, the licensee failed to properly assess the risk associated with 2B RHR pump maintenance and concurrent HVSY work. Because the finding is of very low safety significance and has been entered into the licensee's corrective action program (CR 2003001181), this violation is being treated as a NCV in accordance with Section VI.A.1 of the NRC Enforcement Policy and is identified as NCV 050000364/2003003-01, Failure to Follow Maintenance Risk Assessment Requirements.

1R14 Personnel Performance During Non-routine Plant Evolutions

a. Inspection Scope

For the four non-routine events described below, the inspectors assessed the licensee's use of operating procedures, surveillance test procedures, annunciator procedures, abnormal and emergency operating procedures, control room actions, command and control, post event recovery, management involvement, training expectations, previous CRs, maintenance work history, and communication. The inspectors reviewed operator logs, plant computer data, control room strip charts, post event/trip report, and discussed actions with operations personnel. Documents reviewed are listed in the Attachment.

- Unit 1 loss of the 1B SGFP at 4 percent RTP on May 2
- Unit 1 unplanned and rapid load reduction to 60 percent RTP due a loss of the 1B SGFP on May 9
- Unit 1 unplanned load reduction to 81 percent RTP due removal of the 1B cooling tower from service on May 28
- Unit 1 SW leak in containment on June 25

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following five operability evaluations to verify that they met the requirements of Procedures FNP-0-AP-16 and FNP-0-ACP-9.2, "Operability Determination" (OD). This review included an assessment of 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 Functional System Descriptions (FSD), to verify system operability was not affected.

- 2B CCW lube oil abnormalities
- Unit 1 Digital Rod Position Indicating (DRPI) System
- CR 2003001342, 1-2A EDG ventilation exhaust fans
- CR 2003001493, Unit 1D Containment cooler leak and Containment integrity
- OD-03-04, Unit 1B AFW pump motor lugs

b. Findings

No findings of significance were identified.

1R16 Operator Work-Arounds (OWAs)

a. Inspection Scope

Significant OWAs: The inspectors reviewed the following two operator work-arounds to determine if the functional capability of the related system or human performance in responding to an initiating event were not affected and the prioritization of required actions met the requirements of licensee procedure FNP-0-ACP-17, "Operator Work-Arounds."

- Unit 1 TDAFW condensate drain pot manual blowdown
- Unit 1 letdown temperature control valve

Cumulative Review: The inspectors reviewed the cumulative effects of the operator work-arounds to verify they did not affect the operator's ability to perform actions in both abnormal and emergency operating procedures, did not increase initiating event frequency, and did not affect multiple mitigating systems.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications

a. Inspection Scope

The inspectors reviewed the following three plant modifications to verify the implementation of Procedure FNP-0-AP-8, "Design Modification Control." This included verification that the design bases, licensing bases, and performance capability of risk significant structures, systems, and components (SSCs) would not be degraded through the modifications and the modifications would not place the plant in an unsafe condition. The inspectors also observed the Plant Review Board (PRB) approval of these Design Change Packages (DCPs), discussed the modifications with the engineering and operations personnel, and reviewed the related procedures and drawings.

- 95-1-8947, Unit 1 Hard Wired Sequencer
- 99-1-9506, Provide Safety Injection Bypass for Unit 1 HHSI MOV 8803B
- 98-1-9430, Unit 1 AFW Flow transmitter Replacement

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing

a. Inspection Scope

The inspectors reviewed the criteria contained in Procedures FNP-0-ACP-52.1 and AP-FNP-0-AP-52 to verify post-maintenance test procedures and test activities for the following seven items were adequate to verify system/component operability and functional capability.

- Unit 1 DRPI system
- FNP-0-ETP-3643, Verification of Control Rod Operability
- FNP-0-MP-6, Disassembly, Inspection, and Assembly of the RHR Pumps
- FNP-0-MP-7, TDAFW Pump Inspection
- 1B SGFP repair
- 1B charging pump minimum flow valve 256B (WO0689625)
- 1-2A EDG post outage testing

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities

a. Inspection Scope

The inspectors reviewed the following activities related to the Unit 1 refueling outage to verify implementation of Procedures FNP-0-UOP-4.0, "General Outage Operations Guideline," and FNP-1-UOP-4.1, "Refueling Outage Operation." Shut down risk, management oversight, procedural compliance, and operator awareness were evaluated for each of the following activities. Documents reviewed are listed in the Attachment.

- Refueling risk plans, contingencies, schedules, and implementation
- Decay heat removal and spent fuel pool cooling (SFP) system operations
- Core refueling reload operations
- Reactor vessel reassembly and head lift activities
- Core upper internals lift
- Outage-related surveillance tests
- Reactor coolant drain down and midloop activities
- Mode changes, heat up and cooldown limits, and TS compliance
- Work and test control, task manager conduct, outage control center oversight and communications, clearance activities, inventory and reactivity control, and operations outage conduct
- Refueling outage risk and safety oversight
- Electrical system alignments and availability
- System return to service activities
- Initial criticality, low power physics tests, and power ascension testing
- Problem identification and resolution activities

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 completed test records for the following five surveillance tests to determine if the test adequately demonstrated equipment operability and met the TS requirements. The inspectors reviewed the activities to assess for preconditioning of equipment, procedure adherence, and valve alignment following completion of the surveillance. The inspectors reviewed Procedures FNP-0-AP-24, "Test Control;" FNP-0-M-050, "Master List of Surveillance Requirements;" and FNP-0-AP-16. The inspectors attended selected briefings to determine if procedure requirements were met.

- FNP-2-STP-22.2, 2B Auxiliary Feedwater Pump Quarterly Inservice Test (IST)
- FNP-2-STP-22.19, Auxiliary Feedwater Normal Flow Path Verification
- FNP-1-STP-11.2, 1B RHR Pump Inservice Test (IST)
- FNP-2-STP-10.3, Emergency Core Cooling and PORV Block Valve Stroke Test
- FNP-1-STP-627, Local Leak Rate Testing of Containment Penetrations (Containment Isolation Valve Test)

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed the following three temporary modifications, and associated 10 CFR 50.59 screening criteria, against the system design bases and the licensee's guidelines for temporary modifications in Procedure FNP-0-AP-8, "Design Modification Control." The inspectors reviewed implementation, configuration control, post-installation test activities, drawing and procedure updates, and operator awareness for these temporary modifications. The review included minor design changes (MDC), DCPs, and requests for engineering review (RER).

- MDC for Unit 2 main generator hydrogen temporary leak repair
- RER 03-193, 1B SGFP tach pack replacement
- DCP 01-1-9762 and RER 03-227 for temporary repair for a steam leak on the 1B main steam drain pot

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation

a. Inspection Scope

The inspectors observed an emergency plan drill on June 18 to verify the licensee was properly classifying the event, making required notifications, and making protective action recommendations as required by Procedure FNP-0-EIP-9.0, "Emergency Classification And Actions." The drill included activation of selected emergency response facilities. The inspectors observed or reviewed the emergency plan drill scenario, team work and communications, identification of weaknesses and deficiencies, corrective action documentation, conduct of self-assessments, management involvement, and overall performance to verify that these activities were conducted in accordance with the guidance in Procedure FNP-0-EIP-15.0, "Emergency Drills."

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

a. Inspection Scope

The inspectors sampled licensee submittals for the PIs listed below for the period from April 2002 through March 2003. To verify the accuracy of the PI data reported during the period, PI definitions and guidance contained in Procedure FNP-0-AP-54, "Preparation and Review of NRC Performance Indicator Data," and NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 2, were used.

Mitigating Systems Cornerstone

- Unit 1 and Unit 2 AFW safety system unavailabilty (heat removal systems)
- Unit 1 and Unit 2 EDG safety system unavailabilty (emergency power systems)
- Unit 1 and Unit 2 safety system functional failures

The inspectors reviewed a selection of LERs, portions of Unit 1 and Unit 2 operator log entries, daily morning reports (including the daily CR descriptions), the monthly operating reports, and PI data sheets to determine whether the licensee adequately identified the unavailable hours for the selected systems that occurred during the previous four quarters. This data was compared to the number reported for the PI during the current quarter. The inspectors also reviewed this data to verify the accuracy of the number of critical hours reported and the licensee's basis for crediting the data. In addition, the inspectors interviewed licensee personnel associated with the PI data collection, evaluation, and distribution.

b. Findings

No findings of significance were identified.

4OA2 Problem Identification and Resolution

a. Inspection Scope

The inspectors reviewed the following two root cause reports: Unit 2 Pressurizer PORV Block Valve Packing Leak (CR 2003000496) and Unit 1 Reactor Head Set With Greater Than 1 Charging Pump Available event (CR 2003001008) to verify that equipment, human performance, and program issues were being identified and corrected as required by Procedures FNP-0-AP-30, "Preparation and Processing of Condition Reports Program;" FNP-0-ACP-9.1, "Root Cause;" and FNP-0-ACP-9.3, "Focused Self Assessments." These samples were selected based on their importance to risk, nuclear safety, and personnel safety. The inspectors attended several management meetings

which reviewed the issues and corrective actions, reviewed the reports and related CRs, and discussed the reports with root cause team members.

b. Findings and Observations

No findings of significance were identified. The inspectors noted that the root cause evaluations were thorough and timely. Corrective actions appeared to be effective, and addressed the root causes.

4OA3 Event Follow-up

1. (Closed) Licensee Event Report (LER) 05000348/20030002: Reactor Vessel Head (RVH) Set in Place with Technical Specification (TS) 3.4.12 Not Met

On April 22, the licensee determined that Unit 1 was in violation of TS 3.4.12. All three charging pumps were capable of injecting into the reactor coolant system (RCS) with the RVH set. This condition was caused by a procedure inadequacy and existed for five hours. The TS allows a maximum of one operable charging pump while in Mode 6 with the RVH set. The enforcement aspects of this issue are discussed in section 4OA7. This LER is documented in the licensee corrective action program as CR 2003001008. No additional findings of significance were identified. This LER is closed.

2. (Closed) Licensee Event Report (LER) 05000348/2003003: Unplanned AFW Actuation upon Trip of SGFP

On May 2, with Unit 1 at 4 percent RTP, a trip of the operating 1B SGFP resulted in automatic actuation of the AFW system. The licensee determined that the event was caused when the SGFP speed sensing circuit randomly failed. The circuit was re-calibrated and returned to service. This event was reviewed in Section 1R14 of this report. This LER is documented in the licensee's corrective action program as CR 2003001096. No findings of significance were identified. This LER is closed.

4OA4 Cross Cutting Aspects of Findings

Section 1R13 of this report includes a finding that was determined to be related to the human performance cross-cutting area.

4OA5 Other Activities

1. (Closed) NRC Temporary Instruction 2515/150: Reactor Pressure Vessel Head and Head Penetration Nozzles (NRC Bulletin 2002-02)

a. Inspection Scope

The inspectors observed activities relative to inspection of the reactor vessel head penetration (RVHP) nozzles in response to NRC Bulletins 2001-01, 2002-01, 2002-02 and NRC Order EA-03-009 Modifying Licenses dated February 11, 2003. The inspection included review of nondestructive examination (NDE) procedures, assessment of NDE personnel training and qualification, and observation and

assessment of visual (VT), ultrasonic (UT), and eddy current (ET) examinations. Discussions were also held with contractor representatives and other licensee personnel. The activities were examined to verify licensee compliance with regulatory requirements and gather information to help the NRC staff identify possible further regulatory positions and generic communications. Specifically, the inspectors reviewed or observed the following:

- reviewed bare metal VT inspection results from remote video of RVHP Nozzle Nos. 15, 20, 21, 22, 30, 31, 38, 39, 58, and 59 - also reviewed results for part of inspection (at least one quadrant) of penetrations 10, 13, 23, 25, 26, 40, 45, 63, 64, and 69, in order to verify absence of boron crystals and to verify the integrity of the RPV head.
- observed UT in-process scanning and analysis of results for RVHP Nozzle Nos. 12, 15, 19, 30, 31, 39, 59, and 63 - also reviewed the UT results for RVHP Nozzle Nos: 14, 20, 49, and 54
- observed ET in-process scanning of RVHP Nozzle Nos. 12, 15, 19, 30, 31, 39, 59, and 63 - also reviewed ET results for Nozzle Nos. 12, 14, 15, 19, 20, 31, 49, and 63
- observed Liquid Penetrant (PT) inspection of Head Vent Line Nozzle J-groove weld

The inspectors discussed with licensee personnel the susceptibility ranking calculation and reviewed the results of the calculation. The basis for head temperature input was reviewed to verify appropriate plant specific information was used in the time-at-temperature model for determining RPVH susceptibility ranking.

The inspectors reviewed UT results intended to assess for leakage into the interference fit zone of the nozzles.

The inspectors reviewed licensee procedures and inspection results for visual examinations to identify potential boric acid leaks from pressure-retaining components above the RPVH.

b. Findings and Observations

1) Verification that the examinations were performed by qualified and knowledgeable personnel.

The inspectors found that visual and NDE inspections were being performed in accordance with approved and demonstrated procedures with trained and qualified inspection personnel. All examiners had significant experience, including experience inspecting RVHPs. In addition to qualification to Code requirements, UT and ET personnel had additional training on RPVH inspections.

2) Verification that the examinations were performed in accordance with approved procedures.

The Farley Unit 1 RV head has 56 full length nozzles, five partial length nozzles, 4 instrument nozzles, four spare nozzles, and one vent nozzle or a total of 70 nozzles. The bare head remote visual inspection was performed in accordance with Westinghouse Procedure MRS-SSP-1447. The procedure used crawler mounted

cameras which scanned one quadrant at a time for each of the 70 nozzles. The entire bare metal surface was covered with these scans.

All 70 nozzles received remote mechanized UT and ET open bore (thermal sleeves removed) examination from the inside surface in accordance with Westinghouse approved Procedures WDI-ET-003, WDI-ET-004, WDI-UT-010, WDI-UT-011(vent nozzle only) and WDI-UT-013. All probes (UT and ET) were mounted in a single inspection module and scanning was in the axial direction (vertical up and vertical down). The ET examination used a cross wound probe and collected data at two frequencies. For all nozzles except the vent nozzle, the UT examination employed the 'time of flight' technique using two sets of 5 MHz, 55 degree, L (longitudinal) wave transducers with one set examining in the axial direction and the other in the circumferential direction. In addition, the nozzle volume was scanned using two zero degree (one 5 MHZ and one 2.25MHz) L wave transducers. For the vent nozzle, a 45 degree shear wave transducer was used scanning in the vertical down direction. The inspection area extended from a minimum of 2" above the J-groove weld to the bottom of the nozzle.

The inspectors reviewed the Westinghouse procedures and observed in-process examinations as noted above. Approved acceptance criteria and/or critical parameters for RVHP leakage were applied in accordance with the procedures.

UT examination could not be performed to the bottom of the nozzles (all nozzles except the vent nozzle), as described in the Order, because of nozzle configuration (external threads and internal taper). This limitation was documented in Southern Nuclear Operating Company Letter of Relaxation request (NL-03-0390) to NRR dated March 3, 2003. In addition, 13 RVHP nozzles did not receive full (360 degree) UT coverage below the weld to the extent expected (i.e. down to just above the external threads). The reduced coverage for the 13 nozzles was in a non-pressure boundary portion near the bottom of the nozzles. In all cases, the actual UT coverage was at least 2 inches above the J-groove weld and at least 1.1 inches below the weld. Complete ET examination coverage down to the internal taper was obtained for all nozzles. The coverage limitation for the 13 nozzles was documented in Southern Company Letter of Relaxation (Letter NL-03-0865) dated April 18,2003.

The licensee performed liquid penetrant examination of the surface of the RPVH vent nozzle J-groove weld to assess if leakage had occurred through the weld. The inspectors observed this examination, which did not identify relevant indications.

3) Verification that the licensee was able to identify, disposition, and resolve deficiencies.

All potential crack indications were required to be reported for further inspection and disposition. Based on observation of the inspection process, the inspectors considered deficiencies would be appropriately identified, dispositioned and resolved. No cracks were identified.

4) Verification that the licensee was capable of identifying the primary water stress corrosion cracking (PWSCC) phenomenon described in the bulletins.

The licensee performed NDE examinations on all of the RPVH nozzles during the outage. The inspection techniques had been previously demonstrated under the MRP Inspection Demonstration Program as capable of detecting PWSCC type manufactured cracks as well as cracks from actual samples from another site.

5) Evaluate condition of the reactor vessel head (debris, insulation, dirt, boron from other sources, physical layout, viewing obstructions).

Although boric acid and other debris was observed, the inspectors noted that the boric acid was loose, small particles and it was evident these were not associated with nozzle leakage. The debris was easily removed, allowing visual inspection of 100 percent of each of the 70 RPVH nozzles during the remote visual inspection of the head. No significant examples of insulation, leakage sources, debris, or dirt, impeded the examination. The licensee was able to view 100 % of each of the 70 RPVH nozzles during the visual examinations. However, a small portion of the head where the CRDM shroud support structure meets the surface of the head could not be inspected. This limitation was documented in Southern Nuclear Operating Company letter of relaxation request (NL-03-0390) to NRR dated March 3, 2003.

6) Evaluate ability for small boron deposits, as described in NRC Bulletin 2001-01, to be identified and characterized.

The inspectors observed that the resolution of the video camera provided capability of detecting any debris or small boron deposits on the bare metal head. There were no obstructions to preclude a 100% visual inspection of the RPVH penetrations. As noted above, only loose boron particles were noted at the head to penetration area, but were easily removed. However, boron deposits, not associated with the head to penetration area, were noted on the penetrations and the overhead insulation, which appeared to have originated from above the head. As noted below, the licensee had taken samples from these deposits and concluded they had not resulted from any recent leaks.

7) Determine extent of material deficiencies (associated with the concerns identified in the three bulletins) which were identified that required repair.

No examples of RVHP leakage or material deficiencies were identified during the visual or NDE examinations.

8) Determine any significant items that could impede effective examinations.

The thermal sleeve containing centering rings were removed prior to the examination. No significant items that could impede the examination process were noted during observation of the visual or NDE examinations.

9) Determine the basis for the temperatures used in the susceptibility calculation.

Farley Unit 1 has thermocouples installed in the RPVH, which are monitored by the plant computer. The temperatures used in the susceptibility calculation were actual measured temperatures taken from these thermocouples.

10) Determine if the methods used for disposition of NDE identified flaws were consistent with NRC flaw evaluation guidance.

No flaws were identified.

11) Determine if procedures existed to identify potential boric acid leaks from pressure-retaining components above the RPVH and if the licensee performed proper followup for indications of boric acid leaks.

The licensee had two procedures to inspect for leakage of components above the RPVH each refueling outage. Operating Procedure FNP-1-UOP-2.2 requires inspection of the RPVH for boron deposits prior to shutdown. Maintenance Procedure FNP-1-MP-1.0 requires inspection of the head area (vessel flange to head flange, conoseals, graylocks, etc.) for evidence of boron buildup or leakage after removal of cavity panels. The inspectors reviewed the completed copies of these two procedures for the current Unit 1 outage. The licensee did not identify any evidence of current leakage. As noted above, there was indication of previous leakage as evidenced by boron deposits on the insulation and CRDM nozzles and loose boron particles. Based on analysis of samples taken from the deposits, the licensee had attributed the deposits to be from old leakage. There was a history of previous conoseal leakage.

Although procedures were provided for inspection for evidence of leakage from pressure-retaining components above the head, the inspectors noted that the procedures could be enhanced to provide additional details of what components to inspect and actions to take if leaks are identified. The licensee agreed and indicated that the procedures would be enhanced.

In addition, the inspectors noted that evaluation of the analysis of samples taken from the old boric acid deposits, which showed the deposits to be from old leakage, was not formally documented. The licensee indicated that the evaluation would be formally documented.

2. Operator Licensing Initial Examination Security

a. Inspection Scope

NRC examiners conducted operator licensing initial examinations in accordance with the guidance in NUREG-1021, Draft Revision 9, “Operator Licensing Examination Standards for Power Reactors,” during the period May 19 - May 27, 2003. The NRC examiners prepared and validated the examination materials during the week of May 5, 2003. The written examinations and the operating tests were developed by the NRC. The examiners reviewed the licensee’s examination security measures while preparing and administering the examinations to ensure examination security and integrity complied with 10 CFR 55.49, “Integrity of examinations and tests.”

b. Findings and Observations

No findings of significance were identified.

On Wednesday, May 7, 2003, the NRC examiners and facility training staff reviewed the systems portion of the walk-through examination in the Farley simulator. At the end of this session, one of the NRC examiners inadvertently left a copy of the simulator job performance measures (JPMs) and the operating test outline on the Shift Supervisor's (SS) desk which is located in the rear of the simulator. On Friday morning, May 16, 2003, a training instructor noticed the stack of papers on the SS desk and notified licensee management, who promptly notified the NRC. The NRC and licensee generated a new systems walk-through outline and validated the new test material. The written, simulator, and administrative portions of the walk-through examination were not affected.

The overall recovery effort had no impact on the applicants and did not delay completion of the exam. The licensee generated a condition report CR Number 2003001258 in response to the occurrence. Actions taken by the licensee and the NRC prevented the examination from being compromised. Therefore, examination integrity was maintained as required by 10 CFR 55.49.

4OA6 Meetings, Including Exit

On July 1, the inspectors presented the inspection results to Mr. Randy Johnson and other members of his staff who acknowledged the findings. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

4OA7 Licensee Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which met the criteria of Section VI of the NRC Enforcement Policy, NUREG 1600, for being dispositioned as a non-cited violation.

- TS 3.4.12 allows a maximum of one operable charging pump while in Mode 6 with the RVH set. Contrary to this, on April 22, 2003, three charging pumps were operable in Mode 6 with the RVH set for a period of five hours. The RVH was set, but not bolted. This violation is identified in the licensee corrective action program as CR 2003001008. The violation was considered to have very low safety significance because of the short exposure (five hours) duration and due to the ability of the RVH to lift off its seating surface if two or more charging pumps had injected.

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

Licensee Personnel:

R. Badham, Administration Manager
C. Buck, Chemistry/Health Physics Manager
R. Coleman, Outage and Modification Manager
C. Collins, Assistant General Manager - Plant Support
K. Dyar, Security Manager
D. Grissette, Plant General Manager
J. Johnson, Assistant General Manager - Operations
R. Martin, Engineering Support Manager
B. Moore, Maintenance Manager
C. Nesbitt, Training and Emergency Preparedness Manager
W. Oldfield, Quality Assurance Supervisor
L. Stinson, Nuclear Support General Manager, Farley Project
R. Vanderbye, Emergency Preparedness Coordinator
T. Youngblood, Operations Manager
P. Crone, Licensing Supervisor
P. Harlos, Health Physics Superintendent
T. Livingston, Chemistry Manager
R. Wells, Operations Superintendent

NRC Personnel:

B. R. Bonser, Chief, Division of Reactor Projects, Branch 2

### LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Opened and Closed

| | | |
|---|---|---|
| 05000364/2003003-01 | NCV | Failure to Follow Maintenance Risk Assessment Requirements. (Section 1R13) |

Closed

| | | |
|---|---|---|
| 05000348/2003002 | LER | Reactor Vessel Head Set in Place with Technical Specification (TS) 3.4.12 Not Met. (Sections 4OA3 and 4OA7) |

| | | |
|---|---|---|
| 05000348/2003003 | LER | Unplanned AFW Actuation upon Trip of SGFP. (Section 4OA3) |
| 2515/150 | TI | Reactor Pressure Vessel Head and Head Penetration Nozzles (Section 4OA5) |

Discussed

None

## LIST OF DOCUMENTS REVIEWED

**Section 1R04: Equipment Alignment**

Procedures

FNP-1(2)-SOP-22, AFW System
FNP-1(2)-SOP-22A, AFW System
FNP-1(2)-AOP-1, RCS Leakage
FNP-1(2)-SOP-24, SW System
FNP-1(2)-SOP-23, CCW System
FNP-1(2)-ARP-0001, Main Control Board Annunciator Panel
FNP-1(2)-AOP-9, Loss CCW
FNP-1(2)-AOP-10, Loss of SW

Other Documents

AFW System Functional System Description (FSD) - A181010
SW System Functional System Description (FSD) - A181001
CCW System Functional System Description (FSD) - A181002
Technical Specifications 3.7
UFSAR Section 9
PI&D D-175003, 205003, 170119, 200013

**1R06: Flood Protection Measures**

Procedures

FNP-0-AOP-21.0, Severe Weather, Appendix I
FNP-0-AOP-21.0, Severe Weather, Appendix IV
FNP-0-AP-30, Preparation and Processing of Condition Reports and Licensee Event Reports

Other Documents

UFSAR Sections 2.4 and 9.2
CR 2002001004
CR 2003001208
CR 2002002791
CR 2002002901
CR 2003001417
CR 2000508413
CR 2001001914

**Section 1R08: Inservice Inspection Activities**

FNP-0-NDE-100.5, Liquid Penetrant Examination (Color Contrast and Fluorescent), Version 7.0, January 31, 2003
FNP-0-NDE-100.43, Manual Ultrasonic Examination of Full-Penetration Ferritic Piping Welds (Appendix VIII), Version 1.0, February 7, 2003
FNP-0-NDE-100.44, Manual Ultrasonic Examination of Full-Penetration Austenitic Welds (Appendix VIII), Revision 0. August 17, 2000

**Section 1R11: Licensed Operator Requalification**

Procedures

FNP-1-ARP-0001, Main Control Board Annunciator Panel
FNP-1-ESP-0.1, Reactor Trip Recovery
FNP-1-EEP-0, Reactor Trip or SI
FNP-1-FRP-H.1, Response to Loss of Secondary Heat Sink
FNP-0-AP-30, Preparation and Processing of Condition Reports and Licensee Event Reports
FNP-0-AOP-13, Loss of Feed Water
FNP-0-AOP-8, Loss of Condenser Vacuum
FNP-0-AOP-17, Rapid Load Reduction
FNP-0-AOP-25, Abnormal Secondary Chemistry
FNP-0-TCP-17.6, Simulator Training Evaluation/Documentation

Other Documents

Licensed Operator Continuing Training Simulator Exercise Guide, OPS-56400A

**Section 1R14: Personnel Performance During Non-routine Plant Evolutions**

Procedures

FNP-2-ARP-0001, Main Control Board Annunciator Panel
FNP-1-AOP-13, Loss of Main Feedwater
FNP-1-AOP-17, Rapid Load Reduction

Other Documents

CR 2003001096 and Root Cause Report
CR 2003001103
CR 2003001493
Control Room Operator Logs for May 9, 28, and June 25

**Section 1R20: Refueling and Outage Activities**

FNP-1-FHP-5.15, Spent Fuel Bridge Crane
FNP-1-SOP-7, Residual Heat Removal
FNP-1-SOP-54, SFP Cooling and Purification
Westinghouse Unit 1 Cycle 19 Core Reload Manual
FNP-1-STP-101, Initial Criticality
FNP-1-STP-627, LLRT Testing
FNP-1-STP-40.0, Safety Injection with a Loss of Off-site Power
FNP-1-STP-40.7, ECCS Branch Line Flow Verification
FNP-0-SOP-103, Return to Service Checklist and Return to Service Systems Lineup
FNP-1-STP-34, Containment Inspection
FNP-1-STP-35, RCS Pressure and Temperature Limits

FNP-1-SOP-1.6, Draining the RCS
FNP-0-ACP-47, Outage Implementation
FNP-0-ACP-47.4, Outage Execution and Critique
FNP-0-AP-94, Outage Nuclear Safety
FNP-0-UOP-4.0, General Outage Operations Guideline
FNP-1-UOP-4.1, Refueling Outage Operation
FNP-1-UOP-4.3, Midloop Operations
FNP-1-MP-1.10, Installation and Removal of Reactor Vessel Cover