

U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-348 and 50-364

License Nos.: NPF-2 and NPF-8

Report Nos.: 50-348/98-08 and 50-364/98-08

Licensee: Southern Nuclear Operating Company, Inc.

Facility: Farley Nuclear Plant, Units 1 and 2

Location: 7388 N. State Highway 95
Columbia, AL 36319

Dates: November 29, 1998 - January 9, 1999

Inspectors: T. P. Johnson, Senior Resident Inspector
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D. B. Forbes, DRS Inspector (Sections R1.1-1.3,2.1,2.2,7.1)
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Enclosure

EXECUTIVE SUMMARY

Farley Nuclear Power Plant Units 1 and 2 NRC Inspection Report 50-348/98-08 and 50-364/98-08

This integrated inspection to assure public health and safety included aspects of licensee operations, maintenance, engineering, and plant support. The report covers a six week period of inspection by Resident Inspectors from November 29, 1998 to January 9, 1999. In addition, the report includes regional announced inspections of radwaste, chemistry, transportation, environmental and meteorological monitoring; and maintenance, in-service inspection and, flow accelerated corrosion programs.

Operations

- Operator performance during routine observations, during Unit 1 restart activities, and during secondary plant transients was excellent, with noted effective oversight and excellent communications and good procedure compliance (Sections O1.1-1.3).

Maintenance

- The licensee's PM program effectively identified degraded equipment conditions that had a potential to cause a significant plant transient. Due to this identification, the licensee was able to take corrective actions prior to any effect on safe plant operations (Section M2.1).
- The licensee continued to implement an effective Flow Accelerated Corrosion program to maintain piping wall thickness within acceptable limits (Section M2.3).

Engineering

- Engineering support for the Unit 1 outage was effectively communicated, coordinated, and implemented (Section E2.1).

Plant Support

- The licensee was effectively labeling, controlling, and storing radioactive material. All radioactive material storage areas observed were appropriately posted to specify the radiological conditions (Section R1.1).
- The licensee's most recent formal Quality Assurance Audit identified items of substance and auditors used checklists to effectively assess the transportation program (Section R7.1).

REPORT DETAILS

Summary of Plant Status

At the beginning of this report period, Unit 1 was shutdown continuing the cycle 15 refueling outage. The unit restarted on December 26 and achieved full power on January 3, 1999. The unit operated at or near full power the remainder of the period, except for a load reduction to 52% on January 9, 1999, to repair the isophase bus duct cooling fan.

Unit 2 operated at or near full power during the report period.

I. Operations

O1 Conduct of Operations

O1.1 Routine Observations of Control Room Operations (71707 and 40500)

The inspectors observed that the control room operators were professional, attentive to annunciator alarms, and responsive to emergent issues. The operating crew consistently demonstrated a high level of awareness of existing plant conditions and ongoing plant activities.

The inspectors routinely reviewed the Technical Specification (TS) Limiting Conditions for Operation (LCO) tracking sheets. All tracking sheets for Units 1 and 2 reviewed by the inspectors were consistent with plant conditions and TS requirements. This included Unit mode changes.

O1.2 Unit 1 Outage recovery and Startup Operations (60710, 71707 and 71711)

During the inspection period, the licensee returned Unit 1 to service from its cycle 15 refueling outage. Activities observed by the inspectors included core reload, reactor vessel mid-loop operations, mode changes, startup, and power ascension.

The inspector monitored selected Unit 1 activities and concluded them to be conservatively controlled with very good oversight. Operators demonstrated excellent communication skills and procedure compliance. These observations included operator actions taken on December 29 during a manual main turbine trip due to a loss of condenser vacuum.

O1.3 Secondary Plant Transients (71707)

During the period, each unit experienced a secondary plant transient caused by supply valve closures on the extraction steam to feedwater heater lines. Operators responded to the transients and reduced reactor power to 98.5% as required by procedures.

The inspector observed operations and maintenance activities associated with each of these occurrences. Maintenance reviewed the work history of the failed components and concluded that the failures were not the result of recent work or a lack of

maintenance. The inspector concluded that operators responded promptly to the transients and maintenance was conducted appropriately.

O1.4 Freeze Protection (71714)

On January 5, local area temperatures fell below freezing. The inspectors conducted a walkdown of selected safety-related components to assess freeze protection systems. The inspectors noted that the heat tracing on several safety-related components was not functioning; however, the affected components were not frozen. These conditions were provided to the Shift Supervisor for corrective action. The inspectors concluded that freeze protection functioned adequately.

O2 Operational Status of Facilities and Equipment

O2.1 General Tours and Inspections of Safety Systems (71707)

General tours of safety-related areas were performed by the inspectors to observe the physical condition of plant equipment and structures, and to verify that safety systems were properly maintained and aligned. The inspectors verified that selected, risk-significant safety systems and equipment were properly maintained and aligned. The inspectors also verified that selected tagouts were properly implemented.

O8 Miscellaneous Operations Issues

O8.1 (Closed) Violation (ViO) 50-348,364/97-03-01, Multiple Examples of Failure to Follow Procedures (92901)

This VIO was previously reviewed in IR 98-04, and left open pending the completion of additional licensee corrective actions and NRC assessment of personnel performance during the fall Unit 1 cycle 15 refueling outage. The inspector verified selected corrective actions associated with personnel and procedural errors. In addition, the inspectors observed a reduction in the number and significance of the errors during this outage.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments (61726 and 62707)

The inspectors witnessed or reviewed portions of the selected maintenance and surveillance test activities in progress. This included the Unit 1 testing and maintenance associated with the end of the refueling outage. For those maintenance and surveillance activities observed or reviewed, the inspectors determined that the activities were effectively conducted and that the work was properly performed.

M2 Maintenance and Material Condition of Facilities and Equipment**M2.1 Preventive Maintenance (PM) Activities****a. Inspection Scope (62707)**

The inspectors observed on-line maintenance due to potential equipment failures identified during routine preventive maintenance.

b. Observations and Findings

On December 28, low voltage readings on the Unit 2 1BD rod control power cabinet DC power supply PS-3 were noted. Additional voltage measurements were taken which indicated a continued power supply degradation. The licensee decided to replace the power supply online. The replacement successfully occurred on January 1, 1999. The licensee's replacement activities were well planned and conservatively implemented given the risk significance of the work.

On January 8, maintenance personnel noted high vibration on the Unit 1 isophase bus duct cooling fan. The cause of the high vibration was determined to be a failed bearing. Based on potential failure of the isophase bus duct cooling fan, the licensee elected to replace the fan bearing. On January 9, Unit 1 power was reduced to 52% and the bearing replacement was successfully accomplished. Unit 1 was returned to full power following post-maintenance testing.

c. Conclusions

The inspectors concluded that the licensee's PM program effectively identified degraded equipment conditions that had a potential to cause a significant plant transient. Due to this identification, the licensee was able to take corrective actions prior to any effect on safe plant operations.

M2.2 Inservice Inspection (73753)

The inspectors evaluated the licensee's Inservice Inspection (ISI) program and the program's implementation. The inspectors reviewed procedures and selected records. Observations were compared with applicable procedures, the Updated Final Safety Analysis Report and ASME B&PV Code Sections V and XI, 1989 Edition, No Addenda (89NA).

The inspectors determined that the procedures reviewed were concise and well written. Inservice examinations reviewed were conducted in accordance with properly approved procedures, by qualified and properly certified examiners using properly certified/calibrated equipment and materials.

M2.3 Flow Accelerated Corrosion (FAC) Program (49001)

The inspectors reviewed procedures records and documents related to the monitoring of FAC in secondary piping systems. The Unit 1 FAC inspection included approximately 65 inspection locations. No components were found to be below code allowable minimum wall thickness limits. FAC evaluations were appropriately conducted. No pipe replacement due to FAC was required or accomplished this outage. UT examination personnel were properly qualified and the equipment used was properly calibrated.

M8 Miscellaneous Maintenance Issues

M8.1 (Closed) Unresolved Item (URI) 50-348/97-15-03, Adequacy of Welder Performance Qualification Using Undersized Bend Test Specimens (92902)

The inspectors determined that no violation of licensee commitments or NRC regulations had occurred.

III. Engineering

E2 Engineering Support of Facilities and Equipment

E2.1 Engineering Support For the Unit 1 Outage (37551)

During the Unit 1 cycle 15 refueling outage, the inspectors reviewed and assessed onsite and offsite engineering support activities. These included direct and indirect support of and project oversight of core alterations and physics testing by reactor engineering, steam generator inspections and repairs, modification support, maintenance, reactor vessel baffle former bolt inspections and repairs, and unit startup and power ascension.

The inspectors concluded that engineering personnel provided prompt and effective support to Operations, Maintenance, and contractor groups. Engineering functions and activities were effectively communicated, coordinated, and implemented.

E8 Miscellaneous Engineering Issues

E8.1 (Closed) LER 50-348/98-007-00, Steam Generator (SG) Tube Degradation and Tube Status (90712 and 92700)

The licensee reported the results of the Unit cycle 15 refueling outage SG tube inspections and repairs in the LER. 10CFR50.72 notifications were previously made on November 6 and on December 17, 1998, and a meeting at NRR was held also on December 17, 1998. IR 98-07 reviewed the SG inspection program and results. The licensee committed to shut down Unit 1 if confirmed SG leakage exceeds 25 or 50 gallons per day (g.p.d.). The inspector verified that procedure FNP-1-AOP-2.0, SG Tube Leakage, revision 21, implemented these committed requirements. Unit 1 operation was currently evaluated as satisfactory for eight months; however, final assessment and analysis results are pending. When Unit 1 achieved 85% power, the main steam line

radiation monitor indicated a small leak of 2 g.p.d. Confirmatory chemical samples also indicated a small leak. The licensee was continually monitoring this condition.

E8.2 (Closed) LER 50-348/97-008-00, Outside of Design Basis Due to RCS Support Gaps Not Being Consistent With Design (92700)

This issue was previously reviewed and documented in IR 97-05. No violations of NRC requirements were identified.

E8.3 (Closed) LER 50-364/98-07-00, ESF Actuation During Diesel Generator (EDG) 1000kw Load Rejection Test due to Poor Jumper Electrical Connection (92700)

On November 16, 1998, an unplanned actuation of train A ESF equipment occurred during the performance of an EDG surveillance test. The licensee's root cause investigation determined that the most likely cause of the event was a poor electrical connection of a temporary jumper installed for the test. The inspectors reviewed the licensee's root cause investigation and planned corrective actions and determined they were adequate.

E8.4 (Closed) LER 50-348, 364/98-006-00, Penetration Room Filtration System Suction Damper Outside Design and Licensing Basis (92700)

This event was discussed in IR 98-07. No new issues were revealed by the LER.

E8.5 (Closed) IFI 50-348, 364/97-015-05, Pump Seal Design Weakness For Major Safety-Related Pumps (92903)

The inspector reviewed the corrective actions for the associated Occurrence Report (OR) and concluded it adequately addressed the specific issues associated with the root cause.

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

R1.1 Tour of Radiological Protected Areas (84750 and 86750)

The inspectors reviewed implementation of selected elements of the licensee's radiation protection program. Based on observations and independent review of radiation and contamination survey results, the inspector determined that the licensee was effectively labeling, controlling, and storing radioactive material. All radioactive material storage areas observed were appropriately posted to specify the radiological conditions.

R1.2 Water Chemistry Controls (84750)

The inspectors reviewed implementation of selected elements of the licensee's water chemistry control program for monitoring primary and secondary water quality. The review included examination of program guidance and implementing procedures and analytical results for selected chemistry parameters. The inspectors reviewed selected analytical results, recorded for Units 1 and 2, taken between September 2, 1998 and December 7, 1998 and secondary samples taken between September 1, 1998 and December 7, 1998. Those primary parameters reviewed were maintained well within the relevant TS limits for power operations. Those secondary parameters reviewed were maintained according to station procedures. The inspectors concluded that the licensee's water chemistry control program for monitoring primary and secondary water quality had been effectively implemented.

R1.3 Transportation of Radioactive Materials (86750)

To evaluate the licensee's implementation of revised transportation regulations for shipment of radioactive materials, the inspectors observed the preparation of a shipment of radioactive material and reviewed applicable procedures. No deficiencies were identified. The inspectors also verified personnel performing shipments of radioactive material had met the recurrent training requirements of 49CFR172.704. Licensees' records for the eight shipments of radioactive material were reviewed and the inspectors determined the shipping papers contained the required information. The inspectors also determined the licensee had maintained records of shipments of licensed material for the required three year period.

Based on the above reviews and observations, the inspectors determined that the licensee had effectively implemented a program for shipping radioactive materials required by NRC and DOT regulations.

R2 Status of Radiation Protection and Chemistry Facilities and Equipment

R2.1 Environmental Samplers (84750)

The inspectors observed environmental samplers at ten air sampling stations and two liquid sampling stations and discussed sampling procedures with laboratory personnel. The inspectors determined that the environmental sampling equipment was calibrated and functional at the time of the inspection. The inspectors also verified locations were consistent with their descriptions in the Offsite Dose Calculation Manual (ODCM) and FSAR and that the samples performed were in accordance with procedures. The inspectors concluded environmental monitors were being maintained in an operational condition to monitor the radiation and radionuclides in the environs.

R2.2 Meteorological Monitoring Equipment (84750)

The inspectors observed licensee meteorological monitoring equipment and reviewed calibration records for wind speed and wind direction equipment described in the

Updated Final Safety Analysis Report. The inspectors determined the equipment was properly calibrated and maintained operational at the time of the inspection. The location of the equipment was as described by TS.

R2.3 Radiologically Controlled Area (RCA) Tour (71750)

The inspectors toured the RCA and Unit 1 containment prior to restart. Overall cleanliness of the RCA remained good. Plant personnel observed working in the RCA generally demonstrated appropriate knowledge and application of radiological control practices. Health physics technicians provided positive control and support of work activities in the RCA.

R7 Quality Assurance in Radiation Protection and Chemistry

R7.1 Quality Assurance Audits (86750)

Licensee periodic audits of the RP program were reviewed to determine the adequacy of problem identification and corrective actions. The inspectors reviewed the licensee's most recent audit reports in the areas of chemistry, radwaste, and transportation of radioactive material. Four recommendations included in the audit reports were reviewed by the inspectors. The inspectors determined the licensee had appropriately dispositioned the recommendations based on a review of the corrective actions taken.

S1 Conduct of Security and Safeguards Activities

S1.1 Routine Observations of Plant Security Measures (71750)

The inspectors verified that portions of site security program plans were being properly implemented. Disabled vital area doors were properly manned and controlled. Security personnel activities observed during the inspection period were performed well. Site security systems were adequate to ensure physical protection of the plant.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on January 14, 1999. The licensee acknowledged the findings presented.

The licensee did not identify any materials examined during the inspection as proprietary.

Partial List of Persons Contacted

Licensee

R. V. Badham, Safety Audit Engineering Review
 C. L. Buck, Jr. Unit Superintendent
 C. D. Collins, Operation Support Superintendent
 R. M. Coleman, Maintenance Manager
 G. P. Crone, Engineering Support Performance Supervisor
 K. C. Dyar, Security Manager
 T. H. Esteve, Planning and Control Superintendent
 R. S. Fucich, Engineering Support Manager
 S. Fulmer, Plant Training and Emergency Preparedness Manager
 J. S. Gates, Administration Manager
 D. E. Grissette, Assistant General Manager - Operations
 J. G. Horn, Outage Planning Supervisor
 J. R. Johnson, Operations Manager
 D. H. Jones, SNC - Configuration Management Manager
 R. A. Livingston, Chemistry Supervisor
 R. C. Lulling, Planning Supervisor
 R. R. Martin, Maintenance Team Leader
 M. W. Mitchell, HP Superintendent
 R. L. Monk, Engineering Support Supervisor
 C. D. Nesbitt, Assistant General Manager - Plant Support
 J. E. Odom, Unit Superintendent
 W. D. Oldfield, Nuclear Operations Training Supervisor
 L. M. Stinson, Plant General Manager - FNP
 R. J. Vanderbye, Emergency Preparedness Coordinator
 G. S. Waymire, Technical Manager
 R. L. Winkler, Engineering Group Supervisor, Plant Modification and Maintenance Support
 B. R. Yance, Plant Modification and Maintenance Support Manager

Other licensee employees contacted included construction craftsmen, engineers, technicians, operators, mechanics, and electricians.

List of Inspection Procedures (IP) Used

IP 37551:	Onsite Engineering
IP 40500:	Effectiveness of Licensee Controls in Identifying, Resolving, and Prevent Problems
IP 49001:	Flow Accelerated Corrosion
IP 60710:	Refueling Activities
IP 61726:	Surveillance Observations
IP 62707:	Maintenance Observations
IP 71707:	Plant Operation
IP 71711:	Plant Restart From Refueling
IP 71714:	Cold Weather Preparations

IP 71750: Plant Support Activities
 IP 73753: Inservice Inspection
 IP 84750: Radioactive Waste Treatment, and Effluent and Environmental Monitoring
 IP 86750: Solid Radwaste Management and Transportation of Radioactive Materials
 IP 90712: In office Review of Written Reports
 IP 90713: Review of Periodic Reports
 IP 92700: Onsite Follow up of Written Reports
 IP 92901: Follow up - Operations
 IP 92902: Follow up - Maintenance
 IP 92903: Follow up - Engineering

List of Opened, Closed, and Discussed Items

<u>Type</u>	<u>Item Number</u>	<u>Description and Reference</u>
<u>Closed</u>		
VIO	50-348,364/97-03-01	Multiple Examples of Failure to Follow Procedures (Section O8.1)
URI	50-348/97-15-03	Adequacy of Welder Performance Qualification Using Undersized Bend Test Specimens (Section M8.1)
LER	50-348/98-007-00	SG Tube Degradation (Section E8.1)
LER	50-348/97-008-00	Outside of Design Basis Due to RCS Support Gaps Not Being Consistent With Design (Section E8.2)
LER	50-364/98-007-00	ESF Actuation During Diesel Generator Load Rejection Test due to Poor Jumper Electrical Connection (Section E8.3)
LER	50-348, 364/98-006-00	Penetration Room Filtration System Suction Damper Outside Design and Licensing Basis (Section E8.4)
IFI	50-348, 364/97-015-05	Pump Seal Design Weakness For Major Safety-Related Pumps (Section E8.6)