



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

Report Nos.: 50-348/90-33 and 50-364/90-33

Licensee: Alabama Power Company
600 North 18th Street
Birmingham, AL 36291

Docket Nos.: 50-348 and 50-364

License Nos.: NPF-2 and NPF-8

Facility name: Farley 1 and 2

Inspection Conducted: November 10 through December 29, 1990

Inspection at Farley site near Dothan, Alabama

Inspectors:	<u>G. F. Maxwell</u>	<u>1/4/91</u>
	G. F. Maxwell, Senior Resident Inspector	Date Signed
	<u>G. F. Maxwell FOR</u>	<u>1/4/91</u>
	M. J. Morgan, Resident Inspector	Date Signed
Approved by:	<u>F. S. Cantrell</u>	<u>1/4/91</u>
	F. S. Cantrell, Section Chief	Date Signed
	Reactor Projects Branch 1	
	Division of Reactor Projects	

SUMMARY

Scope:

This routine onsite inspection involved a review of operational safety verification, monthly surveillance observation, monthly maintenance observation, fire protection and prevention, cold weather preparations, licensee event reports, and action on previous inspection findings. Certain tours were conducted on deep backshift or weekends, these tours were conducted November 12, 16 and December 20, 1990 (deep backshift inspections occur between 10:00 p.m. and 5:00 a.m.).

Results:

Unit 1 operated at approximately 100 percent reactor power throughout the reporting period.

Unit 2 continues to be in scheduled refueling outage number 7 which is expected to continue until approximately January 6, 1991. A violation was identified concerning inadequate procedures for mid-loop operations, paragraph 2.b.(2).

An inadvertent SI occurred on November 16, 1990 during routine testing of train "A" SSPS, paragraph 2.b.(1). The plant fire protection system is experiencing problems with the pre-action sprinkler valves and yard loop piping, paragraph 6.0. Problems have been identified by the licensee during post-maintenance test activities on MOVs, paragraph 4.0.

REPORT DETAILS

1. Licensee Employees Contacted

R. G. Berryhill, Systems Performance and Planning Manager
R. M. Coleman, Modification Manager
L. W. Enfinger, Administrative Manager
S. Fulmer, Supervisor Safety Audit and Engineering Review
R. D. Hill, Assistant General Manager - Plant Operations
D. N. Morey, General Manager - Farley Nuclear Plant
C. D. Nesbitt, Technical Manager
J. K. Osterholtz, Operations Manager
L. M. Stinson, Assistant General Manager - Plant Support
J. J. Thomas, Maintenance Manager
L. S. Williams, Training Manager

Other licensee employees contacted included technicians, operations personnel, maintenance and I&C personnel, security force members, and office personnel.

Acronyms and abbreviations used throughout this report are listed in the last paragraph.

Other Inspections:

November 26 - 30, Report 50-348,364/90-34, Routine health physics and radiation protection inspection.

December 10 - 11, Member of United Kingdom (UK) NII, Mr. David Anderson, and Mr. Floyd Cantrell, Section Chief, RII, visited the facility to evaluate applicability of MOVAT testing for UK facilities.

2. Operational Safety Verification (71707, TI 2515/103 and TI 2515/94)

a. Plant Tours

The inspectors conducted routine plant tours during this inspection period to verify that the licensee's requirements and commitments were being implemented. These tours were performed to verify that systems, valves, and breakers required for safe plant operations were in their correct position; fire protection equipment, spare equipment and materials were being maintained and stored properly; plant operators were aware of the current plant status; plant operations personnel were documenting the status of out-of-service equipment; there were no undocumented cases of unusual fluid leaks, piping vibration, abnormal hanger or seismic restraint movements; all reviewed equipment requiring calibration was current; and in general, housekeeping was satisfactory.

Tours of the plant included review of site documentation and interviews with plant personnel. The inspectors reviewed the control room operators' logs, tag out logs, chemistry and health physics logs, and control boards and panels. During these tours the inspectors noted that the operators appeared to be alert, aware of changing plant conditions and manipulated plant controls properly. The inspectors evaluated operations shift turnovers and attended shift briefings. They observed that the briefings and turnover provided sufficient detail for the next shift crew and verified that the staffing met the TS requirements.

Site security was evaluated by observing personnel in the protected and vital areas to ensure that these persons had the proper authorization to be in the respective areas. The inspectors also verified that vital area portals were kept locked and alarmed. The security personnel appeared to be alert and attentive to their duties, and those officers performing personnel and vehicular searches were thorough and systematic. Responses to security alarm conditions appeared to be prompt and adequate.

Selected activities of the licensee's radiological protection program were reviewed by the inspectors to verify conformance with plant procedures and NRC regulatory requirements. The areas reviewed included: operation and management of the plant's health physics staff, ALARA implementation, radiation work permits for compliance to plant procedures, personnel exposure records, observation of work and personnel in radiation areas to verify compliance to radiation protection procedures, and control of radioactive materials.

b. Plant Events and Observations

(1) Inadvertent Safety Injection - Unit 2

On November 16, 1990, Farley Unit 2 experienced an inadvertent "A" Train Safety Injection (SI). The event occurred while the plant was in Mode 6 (refueling). The licensee staff was conducting routine surveillance tests on the "A" Train Solid State Protection System (SSPS).

The operators were making preparations for performing SI/LOSP test procedure, 2-FNP- STP-40.0, Safety Injection with Loss of Site Power. Even though the test switches were in the correct positions, i.e.; the "inhibit positions", the plant experienced an SI when the "A" Train SSPS mode selector switch was placed in the "operate" position. The operators promptly responded to the SI, regained control of the SI equipment and secured such equipment as necessary. I&C personnel determined that the cause of the inadvertent SI signal was a frayed electrical conductor (a single strand of wire) becoming grounded to the SSPS cabinet. This strand of wire was removed, the contact re-soldered, and

other conductors in the SSPS cabinet were inspected for similar conditions before the equipment was returned to service. Subsequently, test STP-40.0, was performed satisfactorily.

The licensee reported the event to the NRC and documented the conditions, causes and corrective action in LER 90-04.

(2) Procedures for Mid-Loop Operation - Unit 2 (TI 2515/103)

On 12/9/90, the Farley Unit 2 Shift Supervisor identified, during discussions with field personnel, that the nozzle dams were installed in both the hot and cold legs of all three steam generators, and that maintenance personnel had installed the reactor head studs and hand-tightened the stud nuts and washers to the head flange surface in accordance with maintenance procedure FNP-2-MP-1.0, Maintenance Refueling Procedure, Revision 13. This was contrary to requirement contained in the operating procedure for mid-loop operations, FNP-2-SOP-1.11, Mid-Loop Operations, Revision 3.

SOP-1.11, required that when in mid-loop operations with all nozzle dams installed a vent path be provided by: 1) fully de-tensioning the head and further loosening the stud nuts to allow for at least a 0.17 inch deflection, or 2) removal of the pressurizer manway, or 3) removal of at least one pressurizer safety valve. These vent paths were prescribed to prevent RCS over-pressurization in the event of a loss of core cooling. (NRR has been requested to evaluate the adequacy of the vent paths.)

When informed, the operations shift supervisor immediately dispatched operations personnel to establish containment integrity and maintenance personnel were directed to back-off the stud nuts for a distance of approximately 0.25 inches. This condition, the nuts being hand-tightened against the washers and the vessel flange surface, existed for about 8 hours.

While SOP-1.11 provided operational guidance to require the placement of stud nuts in a position which allowed for proper head deflection and subsequent RCS venting, the procedure was found to be inadequate since it failed to provide specific guidance to maintenance personnel, to ensure that the stud nuts were appropriately loosened to the prescribed position of 0.17 inches deflection, or to fully define what is intended by "at least a 0.17 inch deflection."

The maintenance procedure, MP-1.0, was also found to be inadequate in that it failed to provide instructions for control of maintenance activities involving the vessel head when in mid-loop operation as prescribed by SOP-1.11.

Prior to recognition of the incident, operations personnel assumed that the reactor vessel head was serving as the RCS vent path because pressurizer safety valves and the manway cover were in place.

After the incident, the licensee determined that there had been other lesser methods in effect for venting the RCS, even though at the time of the event, 12/9/90, they were unaware of these specific vent paths. These vent paths consisted of a PZR block valve which had been previously removed and an open vessel head vent valve.

The licensee documented the event on incident report 2-90-403, and on December 11, a temporary change notice (TCN 31) was written for FNP-2-SOP-1.11. The TCN was more specific and detailed about the vessel head stud nut placement. A similar TCN was written for maintenance procedure FNP-2-MP-1.0 (TCN 13F) on December 10. This TCN requires verification of the distance between the nuts and the stud washers/head flange. After this incident, the inspectors observed an increased awareness on the part of operations and maintenance personnel in maintaining proper RCS vent paths while in mid-loop operations. The licensee has not yet completed corrective actions which would preclude similar mid-loop operation problems from occurring due to procedural inadequacies.

Based on the above, procedures were not in place to ensure that the RCS was capable of relieving pressure. This is a violation and will be identified as 364/90-33-01, Inadequate procedures for mid-loop operation.

(3) PWR Moderator Dilution Control (TI 2515/94)

The inspectors reviewed information provided to NRR BY APCo dated August 1, 1989, concerning Unit 1 core reloading; Westinghouse document W-CAP 12704; other site documents which address the concern about boron dilution control. The licensee has established administrative controls which should reduce the likelihood of excessive boron dilution while shutdown and on RHR. The controls included restricting the use of reactor make-up pumps during refueling, improved graphs for minimum boron concentrations at hot and cold shutdown conditions at various RHR flow rates and increased operator awareness for system operations which could cause excessive boron dilution.

No other violations or deviations were identified. The results of the inspections in this area indicate that the program was effective with respect to meeting the safety objectives in the other areas.

3. Monthly Surveillance Observation (61726)

The inspectors witnessed maintenance surveillance test activities on safety-related systems and components to verify that these activities were performed in accordance with TS and licensee requirements. These observations included witnessing selected portions of each surveillance, review of the surveillance procedures to ensure that administrative controls and tagging procedures were in force, determining that approval was obtained prior to conducting the surveillance test, and that individuals conducting the test were qualified in accordance with plant-approved procedures. Other observations included ensuring test instrumentation used was calibrated, data collected was within the specified requirements of TS, any identified discrepancies were properly noted, and systems were correctly returned to service. The following activities were observed:

- 0-STP-80.1 Diesel Generator 1-2A Operability Test
- 0-STP-80.12 Diesel Generator 1C 1200KW Load Rejection Test
- 0-STP-80.2 Diesel Generator 1C Operability Test
- 0-STP-51 Water Storage Supply Check For Fire Protection System
- 0-STP-52.2 1B Diesel Fire Pump Operability Test
- 1-STP-109 Power Range Neutron Flux Channel Calibration
- 2-STP-15 Containment Air Lock Door Seal Operability Test
- 2-STP-48 Steam Generator Pressure/Temperature Verification
- 2-STP-117 Containment Integrated Leak Rate Test

No violations or deviations were identified. The results of the inspections in this area indicate that the program was effective with respect to meeting the safety objectives.

4. Monthly Maintenance Observations ()

The inspectors reviewed maintenance activities to verify the following: maintenance personnel were obtaining the appropriate tag out and clearance approvals prior to commencing work activities; correct documentation was available for all requested parts and material prior to use; procedures were available and adequate for the work being conducted; maintenance personnel performing work activities were qualified to accomplish these tasks; activities reviewed were not violating any limiting conditions for

operation during the specific evolution; post-maintenance testing activities were completed; and that equipment was properly returned to service after the completion of work activities.

Activities reviewed included:

- MWR-231296 Overload setting for SW valve MOV-3130A
- MWR-218637 Diesel fire pump battery equalization charge
- EMP-1346.02 Diesel fire pump battery inspection (Monthly)
- ~~MWR~~-218661 Replace 1A-132 preaction sprinkler diaphragm

Concerning MWR-231296, the licensee has a program for evaluating various MOV overload setpoints. This evaluation is being conducted in response to IE Bulletin 85-03. The licensee has also experienced slower stroke times for many of the Unit 2 safety-related valve SMB-type Limitorque actuators. Several SMB-type actuators were subsequently replaced with SB-type actuators. The licensee is currently updating their MOVATS setpoint data to reflect the recent changes in both actuators and torque value setpoints.

The inspectors routinely evaluated, and are continuing to examine, the effectiveness of licensee's program as it relates to IE Bulletin 85-03, Motor-Operated Valve Common Mode Failures During Plant Transients Due to Improper Switch Settings, and Generic Letter (GL) 89-10, Safety-Related Motor Operated Valve Testing and Surveillance.

The inspectors reviewed the Region II quarterly activities schedule for the facility and noted that Farley is listed for an MOV team inspection by NRR February 11 - 15, 1991. Licensee implementation of GL 89-10 and IE Bulletin 85-03 is scheduled to be evaluated by the NRR team during the inspection.

No violations or deviations were identified. Results of the inspections in this area indicate that the program was effective with respect to meeting the safety objectives.

5. Fire Protection/Prevention Program (64704)

a) LER 90-07 Failure of Grinnell Clapper Valves to Actuate

The inspectors examined specific facility problems associated with the Model A-4 Grinnell Preaction (Multimatic) Sprinkler valves. This inspection activity included examination of diaphragms and clapper plunger assemblies and their actual operation within the system. It was noted that all diaphragms removed from these valves exhibited the same signs of wear and dimpling, and such deformations on these diaphragms could effect proper valve actuation and operation.

It should be noted that while the licensee attributes this problem to "age-weakened, deteriorated, and/or deformed diaphragms...", (See LER 90-07), and implies that such a problem could be attributed to design. Prolonged operation in wet-pipe rather than the preferable dry-pipe configuration might also be an underlying cause. The inspectors also noted in the past that the licensee routinely placed such systems into wet-pipe whenever auto or manual actuation failed to trip the clappers. Such actuation failures could also be seen as a potential cause of diaphragm deformation.

This LER (90-07) will remain open pending further evaluation of licensee's corrective action as it pertains to operation of the Grinnell Pre-action Sprinkler valves.

b) Fire Protection Yard Piping, Isolation Valves and Hydrants

The inspectors conducted a walkdown of the licensee's fire protection system yard loop piping and examined the condition of system isolation valves and hydrants. The inspectors noted what appeared to be wet spot areas in the soil surrounding some areas of the yard loop and also noted that two seal repairs have been performed on yard loop piping joints during this inspection period.

During November, 1990, the licensee excavated an area around two system isolation valves and, as of December 29, the hole remains uncovered until replacement parts are received for the valve repair. The inspectors also observed that hydrant repair is on-going and progress in this area is limited by parts procurement.

The licensee has scheduled ultrasonic testing (UT) of exposed areas of the yard loop piping early in 1991. This action was taken after the licensee had experience a breakdown in yard loop cast piping earlier this year.

No violations or deviations were identified. Results of the inspections in this area indicate that the program was effective with respect to meet the safety objectives.

6. Cold Weather Preparations (71714)

The inspectors conducted a review of the licensee's cold weather preparations to ascertain if effective measures were implemented for protection of safety related systems from extreme cold weather.

Procedures 1/2-EMP-1383.01, Freeze Protection Inspections, were completed by WA-333876 for Unit 1 and by WA-333995 for Unit 2 on October 29, 1990.

These procedures require inspections and tests to demonstrate the operability of the freeze protection heat tracing, heaters and insulation installed to protect the system from freezing during severe cold weather. The licensee identified a number of discrepancies during these inspections and work orders were issued to correct the discrepancies. The inspectors verified that the maintenance work orders for these items were completed, and that the equipment was functionally accepted. The inspectors conducted a walkdown inspection of the freeze protection system and verified that the system for the following areas were operational:

- Unit 1 Condensate storage tank
- Unit 2 Condensate storage tank
- Unit 1 Circulating water pump structure
- Units 1&2 Emergency diesel generator building

Licensee actions indicate that they have an adequate program in place which can mitigate plant systems and components from being damaged during severe cold weather.

7. Action on Previous Inspection Findings (64704)

(Closed) Inspector Followup Item 348, 364/90-29-01, Grinnell preaction sprinkler valves. The inspectors received a copy of the licensee's report from Grinnell concerning preaction sprinkler valve operation. Based upon receipt of this report, this item is closed. Additional followup will be tracked under LER 90-07.

8. Licensee Event Reports (90712)

The following Licensee Event Reports (LERs) were reviewed for potential generic problems to determine trends, to determine whether information included in the reports meets the NRC reporting requirements and to consider whether the corrective actions discussed in the reports appears to be appropriate. The Licensee action was reviewed to verify that the events have been reviewed and evaluated by the licensee as required by the technical specifications; that corrective actions were taken by the licensee; and that safety limits, limiting safety setting and LCOs were not exceeded. The inspector examined the incident reports, logs and records, and interviewed selected personnel.

The following reports are considered closed:

LER-90-03 Technical Specification 3.0.3 Entered due to both Intermediate
(Unit 2) Range Nuclear Detectors Declared Inoperable

LER-90-04 Actuation of Engineered Safety Feature Equipment Caused by an
(Unit 2) Electrical Ground in the Solid State Protection System

LER-90-06 Notification of Unusual Event (NOUE) Declared Based on
(Unit 1) Calculated Site Boundary Dose Rate

LER-90-08 Diesel Generator Trip due to Defective Hand Switch
(Unit 1)

LER-88-08 Fire Damper Inoperable due to Failure to Close with Air Flow
(Unit 2)

The following report remains open, refer to paragraph 5:

LER-90-07 Failure of Preaction Fire Protection System Clapper Valves to
(Unit 1) Trip

No violations or deviations were identified.

9. Exit Interview

The inspection scope and findings were summarized during management interviews throughout the report period, and on December 21, 1990, with the plant manager and selected members of his staff. The inspection findings were discussed in detail. The licensee acknowledged the inspection findings and did not identify as proprietary any material reviewed by the inspectors during this inspection.

Licensee was informed that the item discussed in paragraph 7 was closed; however, 348/90-07 remains open to track followup on fire protection problems.

<u>ITEM NUMBER</u>	<u>DESCRIPTION AND REFERENCE</u>
364/90-33-01 (Vio.)	Inadequate procedures to control plant configuration.

10. Acronyms and Abbreviations

AFW	-	Auxiliary Feedwater
AOP	-	Abnormal Operating Procedure
AP	-	Administrative Procedure
APCO	-	Alabama Power Company
CFR	-	Code of Federal Regulations
CVCS	-	Chemical and Volume Control System
CCW	-	Component Cooling Water
ECP	-	Emergency Contingency Procedure
EIP	-	Emergency Plant Implementing Procedure
EQ	-	Environmental Qualifications
ESF	-	Engineered Safety Features
EWR	-	Engineering Work Request
F	-	Fahrenheit
GPM	-	Gallons Per Minute
ISI	-	Inservice Inspection
IST	-	Inservice Test
LCO	-	Limiting Condition for Operation
MOV	-	Motor-Operated Valve
MOVATS	-	Motor-Operated Valve Actuation Testing

MWR - Maintenance Work Request
NCR - Nonconformance Report
NRC - Nuclear Regulatory Commission
NRR - NRC Office of Nuclear Reactor Regulation
PMD - Plant Modifications Department
RCP - Radiation Control and Protection Procedure
RCS - Reactor Coolant System
RHR - Residual Heat Removal
SI - Safety Injection
SAER - Safety Audit and Engineering Review
SSPS - Solid State Protection System
SPDS - Safety Parameter Display System
STP - Surveillance Test Procedure
SW - Service Water
TS - Technical Specification
TSC - Technical Support Center
WA - Work Authorization