



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

Report Nos.: 50-348/89-31 and 50-364/89-31

Licensee: Alabama Power Company
 40 Inverness Center Parkway
 P. O. Box 1295
 Birmingham, AL 35101

Docket Nos.: 50-348 and 50-364

License Nos.: NPF-2 and NPF-8

Facility Name: Farley 1 and 2

Inspection Conducted: November 11 - December 10, 1989

Inspection at Farley site near Dothan, Alabama

Inspectors:	<u><i>G. F. Maxwell</i></u>	<u>1/4/90</u>
	G. F. Maxwell, Senior Resident Inspector	Date Signed
	<u><i>W. H. Miller, Jr.</i></u>	<u>1/4/90</u>
	W. H. Miller, Jr., Resident Inspector	Date Signed
Approved by:	<u><i>F. S. Cantrell</i></u>	<u>1/4/90</u>
	F. S. Cantrell, Section Chief	Date Signed
	Division of Reactor Projects	

SUMMARY

Scope:

This routine onsite inspection involved a review of operational safety verification, monthly surveillance observation, monthly maintenance observation, engineered safety system inspection, licensee's fitness for duty training and licensee event reports. Selected tours were conducted on deep backshift or weekends, these tours were conducted on November 18 and December 1 (deep backshift inspections occur between 10 p.m. and 5 a.m.).

Results:

Unit 1 began the reporting period operating at low power for testing following the Fall 1989 refueling outage. On November 12, Unit 1 tripped and experienced a safety injection due to low steam line pressure caused by a malfunction in the digital electro-hydraulic (DEH) system. Unit 1 was returned to power on November 14, and remained at mid-power level for testing until November 18. On November 18, power was reduced to 10 percent to repair two governor valves which were found uncoupled. Unit 1 was returned to 100 percent power on November 22, and operated at this level through the remainder of the reporting period. Unit 2 operated at approximately 100 percent reactor power throughout the reporting

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period except for November 18 and 19. Unit 2 tripped on November 18 due to a malfunction in the DEH system and was returned to 100 percent power on November 20 (Paragraph 2b).

The inspectors reviewed the licensee's initial fitness for duty training (paragraph 6). The inspector noted that electrical maintenance program enhancement for General Electric type HFA relays has been completed. The licensee initiated inspection, testing and replacement program for the HFA type relays. This was an aggressive step to improve the reliability of various electrical circuits throughout the plant (Paragraph 4b).

In the area of operational safety verification the licensee identified a personnel error for failing to follow procedures which led to a failure to maintain Unit 1 containment integrity through an open airlock. This item will be tracked as a non-cited violation (paragraph 2b.). High winds caused damage to electrical buses from the switchyard to the first tower of the 500 KV transmission line. Electrical equipment containing PCBs, was damaged and PCB material was spilled in the switchyard. there was no interruption of the plant's offsite power supplies and no threat to any of the plant's safety-related equipment. The licensee made proper notifications, repaired the damage and removed PCB contaminated soil and switchyard materials (paragraph 2).

REPORT DETAILS

1. Licensee Employees Contacted

R. G. Berryhill, Systems Performance and Planning Manager
C. L. Buck, Plant Modification Manager
L. W. Enfinger, Administrative Manager
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 14-15, 1989, NRR/ME inspection for compliance with Bulletin 88-09.

November 13-17, 1989, Report 89-20, Confirmatory measurement inspection.

November 20-21, 1989, RES/HFB Review of plant working hours.

November 28, 1989, NRC Senior Management Survey of NRC activities on safe operation of nuclear power plants.

2. Operational Safety Verification (71707, 92700)

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. Inspections were conducted at various times including week-days, nights, weekends and holidays. 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, 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 (RWPs) 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) Safety Injection on Low Steam Line Pressure - Unit 1

On November 12, at 4:58 p.m., Unit 1 tripped from 34 percent power and a safety injection occurred due to low steam line pressure. Prior to this event the testing of the Unit 1 main turbine governor valves was in progress. An oscillation problem had been identified with governor valve No. 3. A maintenance work request was initiated to perform a valve test on this valve to determine if the cause of the oscillation was a defective control valve in the electro-hydraulic fluid system (Moog valve) or an electrical card in the DEH system. A spare control valve and spare DEH card calibrated for governor valve No. 3 were obtained prior to the test. Governor valve 3 was opened and the existing card for governor valve No. 3 was replaced with the spare card. As soon as this card was replaced governor valve No. 4 began to oscillate and governor valves 1 and 2 began to ramp open. The opening of governor valves 1 and 2 resulted in low steam line pressure. This was the initiating event for the reactor trip and safety injection.

After the trip it was discovered that the card placed in the DEH slot for governor valve No. 3 had been addressed for governor valve No. 4. This apparently resulted in false DEH readings for all of the governor valves. Further evaluation by the licensee using the site simulator and placing a mis-addressed card in the DEH panel slot for governor valve 3 resulted in the DEH system becoming very erratic. Numerous simulation attempts did not reproduce the ramping of the governor valves observed during the trip. However, based on the different erratic responses observed during the simulations it appears that the DEH system was malfunctioning at the time of the trip. The original oscillation problem of governor valve No.3 was corrected by replacing the Moog valve. Until a procedure is established for DEH maintenance, the licensee is requiring that the systems performance manager or computer services supervisor be notified for work planning and sequence approval prior to conducting any on line maintenance for the DEH system.

This event caused activation of the licensee's emergency operating procedures. The plant was placed in a "Notice of Unusual Event" emergency classification at 4:58 p.m. and the NRC and State authorities were notified.

The safety injection was terminated at 5:09 p.m. on November 12. Charging and letdown flows were re-established at 5:11 p.m. The main steam isolation valves were manually closed at 5:27 p.m. due to reactor coolant system pressure and temperature concerns. Unit 1 was returned to service on November 14 at 6:08 a.m.

The licensee plans to submit an LER on this event following completion of their evaluation.

(2) Unit 1 Containment Air Lock

On November 13, at approximately 7:50 p.m., maintenance and health physics personnel entered the Unit 1 containment to repair the pressurizer missile shield. A ramp was placed inside containment at the inner door of the personnel airlock to allow a dolly to be rolled into containment. The ramp was left in place at the door while the personnel were in containment. The outer door was closed but the ramp would not permit the inner door to be closed. At approximately 8:00 p.m. another group of maintenance technicians and health physics personnel attempted to enter containment. They observed three indicating lights on the airlock door position panel. These lights indicated that the inner door was open. Attempts to contact personnel inside containment were not successful. Attempts were then made to electrically close the inner door from outside the containment.

DEH computer panel. Unit power was reduced from 94 to 77 percent power when this valve closed. The DEH system was placed in "operator automatic turbine" mode at 4:33 p.m. on November 18. In this mode all of the governor valves move together as one valve. The DEH system adjusted the governor valves for the indicated power and reduced power to 52 percent. Power was finally reduced to approximately 11 percent and turbine was taken off line to recouple the governor valve at 6:55 p.m. on November 18. After the turbine was taken off line the remaining governor valves were inspected. Governor valve No. 2 was also found to be almost uncoupled.

Preliminary investigation by the licensee determined that the primary cause of this uncoupling was due to a wrong pin size installed in the valve stem coupling to the actuators. A 1/4 inch pin was installed in both governor valves where a 1/2 inch pin was recommended for each valve. This concern is being evaluated by the licensee and vendor (Westinghouse) to determine the appropriate corrective action to prevent future problems. Further investigation also found incorrectly sized pins in valves 3 and 4.

Repairs to the governor valves were completed and the turbine was returned to normal operation on November 21 at 3:30 a.m.

The licensee is reviewing Unit 2 to determine if similar conditions exists for the Unit 2 main turbine governor valves.

(5) Storm Damage to Electrical Switchyard

High winds caused damage to the electrical switchyard on November 15 at about 9:15 p.m. Electrical buses from the switchyard to the first tower for the 500 KV transmission line to Snowdown, south of Montgomery, and some electrical equipment ("line trap pedestals") containing concentrated polychlorinated bi-phenyl (PCBs) were damaged. Approximately three gallons of PCB material spilled into the switchyard. Four off-site electrical power supplies remained available to the plant, which met TS requirements. There was no threat to the plant's safety-related equipment and the plant continued electrical power transmission through the undamaged portion of the switchyard.

The licensee notified the National Response Center, EPA, Alabama Department of Environmental Management and NRC of the damage associated with this event.

The storm damaged equipment was repaired or replaced and Snowdown transmission line was returned to service on November 23 at 4:48 p.m. The switchyard was sampled and the soil and yard materials contaminated with PCBs were removed from the site and disposed of as contaminated waste.

The wind damage was attributed to apparent deficient welds on the "line trap pedestals." The "line trap pedestals," were unable to withstand the high winds, fell and knocked down the Snowdown transmission lines. On November 27 the "line trap pedestals" on the Tifton 500 KV transmission line were inspected and found to have similar deficient welds and were also replaced.

The inspectors reviewed the licensee's actions on this event and have no further questions at this time.

(6) Security Computer Failure

On December 1, at 4:15 a.m., a portion of the security computer system failed due to a malfunction of an electrical computer card. The licensee immediately initiated the compensatory measures required by the Security Plan. These measures were verified by the inspectors. The malfunctioned card was replaced by a new card and the computer system was restored to service at 11:15 a.m., on December 1.

The inspectors reviewed the event, and confirmed that the licensee took the appropriate actions.

No violations or deviations were identified in this area.

3. Monthly Surveillance Observation (61726)

The inspectors witnessed the licensee conducting maintenance surveillance test activities on safety-related systems and components to verify that the licensee performed the activities 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 approved procedures. Other observations included ascertaining that test instrumentation used was calibrated, data collected was within the specified requirements of TS, any identified discrepancies were properly noted, and the systems were correctly returned to service. The following specific activities were observed:

0-STP-80.1	Diesel Generator 1-2A Operability Test
0-STP-80.2	Diesel Generator 1-C Operability Test
1-STP-9.0	RCS Leakage Test
1-STP-27.1	Auxiliary Feedwater Pump 1A Quarterly IST
1-STP-27.2	Auxiliary Feedwater Pump 1B Quarterly IST
2-STP-9.0	RCS Leakage Test
2-STP-24.1	Service Water Pumps 2A, 2B and 2C IST
2-STP-201.08	PORV Position Indication and Relay Logic Contact Verification
2-STP-627.2	Leak Testing of Containment Purge System

On November 15, during the performance of surveillance test 2-STP-627.2, the licensee identified excessive leakage in the test boundary between main and mini purge valves 3197, 2866D, 2866C and 3198D. This is the supply piping for the Unit 2 containment purge system. At 9:04 a.m. on November 15, the purge system was declared inoperable due to excessive leakage. The licensee opened the pipe, adjusted the 48" containment purge supply valve 3198D and retested the penetration. The retest found the leakage to be within the limits of TS 4.6.1.7.2. However, to adjust the valve required that valve 3198D be opened to permit a maintenance employee to access the piping between valves 3197 (inside containment) and 3198D (outside containment). By opening this valve with the valve inside containment in an unknown leakage situation placed the plant outside the design basis and the TS. The licensee plans to submit a 30 day report on this event. The inspectors witnessed portions of the maintenance on these valves and verified that the licensee took appropriate action in the restoration of this system to service.

The Unit 2 PORV's were tested on November 17 by procedure 2-STP-201.28 to verify operation of relay logic contacts, and valve position indication of PORV PCV-444B and PCV-445A on the main control board. The valves tested satisfactorily except for valve PCV-445A. The indicator in the control room indicated that this valve was only partly open. On November 18 following the Unit 2 reactor trip a containment entry was made and the valve indicator was found to be out of adjustment. Repairs were made and both valves were satisfactorily retested.

On December 1 the inspectors witnessed operations personnel performing the surveillance tests on service water pumps 2A and 2B. The inspectors noted that operators recorded the pump motor vibration readings from the incorrect locations, i.e. bottom of motor instead of the top of motor. The inspectors had previously pointed out that the applicable procedure 1/2-STP-24.1 and .2 should have been revised to include better details for locations where the vibration readings are required to be taken. Since this recommended procedure enhancement has not been done and operations continues to take vibration reading from the wrong location, Inspector Followup Item 348,364/89-31-01, Revise Service Water IST Procedures to Indicate Location That Pump Vibration Readings Are To Be Taken, is being formally initiated.

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 Observation (62703)

a. Observations

The inspectors reviewed the licensee's 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 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, no maintenance activities reviewed violated any limiting conditions for operation during the specific evolution, the required QA/QC reviews and QC hold points were implemented, post-maintenance testing activities were completed, and equipment was properly returned to service after the completion of work activities. Activities reviewed included:

MWR 182735 Repair leak on Unit 2 containment purge valve 3198D.
 MWR 20372 Replacement of pump and motor for river water pump No. 4 QSP25P004.
 MWR 214633 Replacement of service water pump 1B using procedure 1-MP-42.0, Maintenance of Byron Jackson Service Water Pumps.
 MWR 215249 Replace chlorine analyzer drive motor and gear assembly.
 WA-W00301839 Inspect and test Unit 1 electrical breaker N2R169RK EQ-02 per EMP-1322.01.
 WA-W00319401 Inspection of Unit 2A inverter per EMP-1335.01.

b. HFA Relay Inspection Program

As reported in Report 348,364/89-05, the licensee initiated a reliability improvement test program in late 1988 on all General Electric HFA type relays installed at Farley. This program was completed in October 1989. A total of 527 HFA relays were inspected and tested in accordance with procedure, 0-MP-68.0, HFA Relay Inspection, of these Relays, 271 failed to meet the acceptance criteria of the procedure primarily due to armature binding. However, the relays were considered to be operable. The relays which failed the inspection program were replaced with new relays. This licensee initiated inspection, testing and replacement program was an aggressive step to improve the reliability of various electrical circuits.

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.

5. Engineered Safety System Inspection Unit 2 (71710)

The inspectors performed a complete walkdown of the accessible portions of the Unit 2 component cooling water system to verify operability. Major components were checked for leakage and general conditions that could degrade performance or prevent fulfillment of functional requirements were inspected. Particular attention was directed towards verifying that hangers and supports were in place and properly made up and that the primary valves and electrical breakers were correctly aligned. Equipment identification tags were reviewed and found to be in place. Calibration

of gauges and instrumentation was also found to be up to date. Satisfactory housekeeping and cleanliness were found to be maintained in the vicinity of the equipment. The inspectors used drawing D-205002 Sheets 1 through 3 and procedure 2-STP-23.7, Component Cooling Water System Flow Path Verification Test, in the walkdown inspection. These drawings and procedure were the most current revisions. The system was found to be operable in accordance with the TS and FSAR.

No violations or deviations were identified.

6. Initial Licensee Fitness For Duty (FFD) Training TI 2515/104

The inspectors observed portions of the licensee FFD training activities. NRC Temporary Instruction 2515/104 was used for guidance during the observations. The temporary instruction recommended that the resident inspectors evaluate three sections of the Licensee FFD Training Program using checklists which were attached to the TI. Those three sections which were identified by the TI for evaluation included "Policy Awareness Training," "FFD Training For Supervisors" and "FFD Escort Training." The inspectors found that the licensee has not separated their FFD program into three distinct sections. Their program addresses the FFD issue by providing "Policy Awareness" and "FFD Escort" training during one presentation; which was given to site personnel during the week of December 4, 1989. The licensee program which covers "FFD Training For Supervisors" has been administered to site supervisors at various times prior to December 1989. The licensee training program which outlines the "FFD Training For Supervisors" is outlined in the APCO manual titled "Behavioral Reliability Training." This manual is supplemented by a training film.

To evaluate the FFD program required the inspectors to attend one of the licensee's training sessions for "Policy Awareness" and "FFD escort" training. This allowed the inspectors to utilize the checklists which were provided with MC 2515/104 for "Policy Awareness" and "FFD Escort" training. The third section, "FFD Training For Supervisors," was completed by evaluating the licensee's manual for "Behavioral Reliability Training" and by watching the video which supplemented the manual. These FFD activities were evaluated by the inspectors between November 30 and December 4, 1989.

The areas of the FFD training program which were evaluated included the following:

- FFD program requirements and objectives.
- Individual and group responsibilities.
- Policies concerning use, sale or possession of illegal drugs.
- Possession of illegal drugs.
- Policy on abuse of selected drugs and alcohol.
- Indicators of mental stress, fatigue and illness.
- Policy for employee refusal of drug testing.
- Type drug testing including those requiring testing.
- Licensee sanctions for drug and alcohol abuse.

Behavioral observation techniques for recognizing effects of chronic alcohol and drug use.

Procedures for reporting FFD concerns to supervision and security.

Policies and procedures which govern; confronting an employee, removing an employee, referral of an employee to employee assistant program, and the basis for initial and for cause testing.

Identification of chemical and street names of selected drugs.

As directed by the TI the resident inspectors completed the TI checklists and forwarded them to NRC security personnel for further review and/or comment.

7. Licensee Event Reports (92703, 10714)

The following Licensee Event Reports (LERs) were reviewed for potential generic problems to determine trends, to determine whether information included in the reports met the NRC reporting requirements and to consider whether the corrective action discussed in the reports appears appropriate. The licensee's action was reviewed to verify that the events were reviewed and evaluated as required by the Technical Specifications; that corrective action was taken; and that safety limits, limiting safety settings and LCOs were not exceeded. The inspector examined the incident reports, logs and records, and interviewed selected personnel. The following reports are considered closed:

Unit 1

LER 89-05 Containment integrity breach caused by personnel error.

Unit 2

LER 89-12 Reactor trip caused by design error in digital electro-hydraulic control system.

LER 89-13 Personnel error caused reactor trip on Lo-Lo steam generator level.

LER 88-01 Special Report: Fire damper inoperable due to failure to close with air flow.

LER-88-03 Special Report: Fire dampers inoperable due to failure to close with air low.

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 11, with the plant manager and selected members of his staff. The inspection findings

listed below were discussed in detail. The licensee acknowledged the inspection findings and did not identify as proprietary any material reviewed by the inspection during this inspection. Licensee was informed that the items discussed in paragraph 7 were closed.

<u>NUMBER</u>	<u>DESCRIPTION AND REFERENCE</u>
348,364/89-31-01	(Open) Inspector Followup Item: Revise Service Water IST Procedures To Indicate Location Pump Vibration Readings Are To Be Taken
348/89-31-02	(Closed) Non-cited Violation: Failure to maintain containment integrity via open containment airlock.

10. Acronyms and Abbreviations

AFW	-	Auxiliary Feedwater
AOP	-	Abnormal Operating Procedure
AP	-	Administrative Procedure
APCO	-	Alabama Power Company
CFR	-	Code of Federal Regulations
CCW	-	Component Cooling Water
DC	-	Design Change
DR	-	Deviation Report
DEH	-	Digital Electro - Hydraulic Control System
ECP	-	Emergency Contingency Procedure
EIP	-	Emergency Plant Implementing Procedure
EQ	-	Environmental Qualifications
ESF	-	Engineered Safety Features
EWB	-	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
PORV	-	Power Operated Relief valve
QA	-	Quality Assurance
QC	-	Quality Control
RCP	-	Radiation Control and Protection Procedure
RCS	-	Reactor Coolant System
RHR	-	Residual Heat Removal
SI	-	Safety Injection

SAER - Safety Audit and Engineering Review
S/G - Steam Generator
SSPS - Solid State Protection System
SOV - Solenoid Operated Valve
STP - Surveillance Test Procedure
SW - Service Water
TS - Technical Specification
TSC - Technical Support Center
WA - Work Authorization