



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

Report Nos.: 50-348/89-14 and 50-364/89-14

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: June 11 - July 10, 1989

Inspectors:	<u><i>G. F. Maxwell</i></u>	<u>7/26/89</u>
	G. F. Maxwell, Senior Resident Inspector	Date Signed
	<u><i>W. W. Miller, Jr.</i></u>	<u>7/26/89</u>
	W. W. Miller, Jr., Resident Inspector	Date Signed
Approved by:	<u><i>F. S. Cantrell</i></u>	<u>7/26/89</u>
	F. S. Cantrell, Section Chief Division of Reactor Projects	Date Signed

SUMMARY

Scope:

This routine onsite inspection involved a review of operational safety verification, monthly surveillance observation, monthly maintenance observation, operator training and work schedule, and licensee event reports.

Results:

Within the areas inspected, the following unresolved items were identified involving inadequate design calculations on the service water system - paragraph 3.b.(1) and apparent excessive work hours for licensed operators - paragraph 7.b.

Certain tours were conducted on deep backshift or weekends, these tours were conducted on June 19 and July 7 (deep backshift inspections occur between 10 p.m. and 5 a.m.).

Calculations are not available to substantiate that the site service water systems will deliver adequate water to emergency safeguard equipment in the event of certain design base accidents. The licensee promptly revised plant procedures to specify appropriate manual actions in the event of these deficient conditions. However, the licensee did not incorporate these changes in all control room documents in a timely manner.

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.

2. Plant Status

Unit 1

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

Unit 2

Unit 2 operated at approximately 100 percent reactor power throughout the reporting period.

Other Inspections

Report No. 89-10, Maintenance Team Inspection, exit conducted on June 29.

Report No. OL 89-01, Operator Licensee Requalification Training Inspection, June 17 - 28.

On June 15, the Region II Deputy Director Reactor Project and NRR Deputy Director's Assistant visited the site.

During the week of June 16, the site was visited by the Region II Regional Administrator, the NRR Farley Project Director, the NRR Farley License Project Manager, the Region II Director of Division of Reactor Safety, the RII Engineering Branch Chief, and the Region II Reactor Projects Section Chief for Farley.

3. 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.

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 requirement. 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) Service Water System

The licensee is performing a self-initiated safety system assessment of the service water system. During this assessment a concern was identified in that for the following scenarios

adequate service water may not be provided to emergency safeguard equipment: Loss of site power, without safety injection, with only one train of service water available. (Under these conditions inadequate service water flow may result since an automatic isolation of non-safety service water loads will not occur, and the loss of instrument air caused by the loss of off-site power would cause several service water air-operated valves to fail in their full open position.)

Seismic event with a break of service water in the turbine building below the automatic isolation setpoint. (The seismic event is assumed to cause non-seismic instrument air lines and service water lines to break, and service water pump miniflow valves and other air operated valves to fail in the open position. This would result in reduced flow to the emergency safeguards equipment.)

The licensee was unable to locate calculations to indicate that sufficient service water flow would be available to emergency safeguards equipment under these postulated conditions. Therefore, on the afternoon of June 16, the licensee initiated compensatory measures to assure adequate flow will be provided until the original design calculations are located or new calculations are performed. Temporary changes were made to Procedures 1/2 - ESP-0.1, Reactor Trip Response, 1/2 - AOP-5.0, Loss of Electrical Train A and/or B, and 1/2 - AOP-10, Loss of Train A or B Service Water. These changes indicated the actions required to manually isolate service water to non-safety loads to ensure adequate flow will be available to the emergency diesel generators and other safety related components. These procedure changes were written and approved on the evening of June 16. A training instruction procedure discussing the above problems and compensatory measures were provided in the control room on June 16, for all licensee operators, shift supervisors and other operations personnel. The changes to the procedures were completed by document control and sent to the control room on June 17. However, on the morning of June 19, the resident inspectors noted that procedures AOP-5 and AOP-10 had not been placed in the control room controlled document files. Procedure ESP-0.1 had been placed in only four of the six documents inspected. The revised procedures were promptly placed in the documents when this discrepancy was identified.

The licensee's identification of this problem and initiation of compensatory actions were very good, however, the failure to incorporate the revised implementing procedures within the control documents in the control room in a timely manner is considered a weakness in management's attention to detail. This concern was discussed with the licensee's site management.

The potential service water system discrepancies are identified as Unresolved Item 348,364/89-14-02, Licensee's Reevaluation of Service Water System for Adequacy of Design. This item will be reevaluated during a subsequent NRC inspection.

- (2) Accumulator 2B Nitrogen Pressure Dropped Below Low Limits (IR No. 2-89-83)

The inspectors reviewed the circumstances associated with the drop in nitrogen pressure in Unit 2 accumulator "B". The licensee's review of this event was completed on June 13.

On March 21, 1989, while attempting to add nitrogen to the accumulators, the pressure in accumulator 2B dropped below the TS low limit of 601 psig. The operators initially attempted to raise the pressure to all three accumulators at the same time to correct a low pressure alarm. This resulted in a slight pressure gain to accumulator 2A, pressure in accumulator 2C remained constant and the pressure in accumulator 2B decreased. Operations personnel immediately began an investigation to determine why the pressure in accumulator 2B could not be increased. The investigation failed to identify the problem and at 12:10 a.m. on March 22, the pressure dropped below the TS limit of 601 psig. The pressure continued to drop and eventually reach a low point of 530 psig. The pressure of the nitrogen supply was increased to maintain the pressure in all three of the accumulators. A containment entry for investigation was made and air operated accumulator common vent valve Q2E21HCV936 (V0092) was found to be approximately 50 percent open. Instrument air was removed from the valve operator and the valve closed. When the valve closed the common relief valve for the nitrogen supply header to the accumulators opened due to high system pressure. By tapping on the relief valve the relief valve seated. Upon closing these open valves pressure was restored to the accumulator at approximately 2:20 a.m. on March 22. This removed the plant from the action statement of the TS.

Maintenance's investigation found that the failure of valve Q2E21HCV936 was caused by the positioner feedback arm becoming detached from the valve actuator. Procedure IMP-0.11, Instrument Airline and Pressure Regulator Preventive Maintenance, requires routine preventive maintenance to be performed on this valve each 18 months during refueling. This Unit 2 procedure and the Unit 1 procedure are to be revised prior to the next refueling outage for each unit to require an inspection of the positioner mounting and feedback arm. Maintenance's investigation also found that the set point of the relief valve was in error. On January 25, 1988, the licensee discovered that the test gauge used to set the relief valve was out of tolerance even though it

was still within its calibration interval, and suspected that this relief valve was set at 660 psig instead of 700 psig. The relief valve was removed and tested on April 3, and was found to be set at 660 psig. The relief valve was properly reset and reinstalled on April 4.

The TS requires all three accumulators to be inservice continuously. If one accumulator becomes inoperable, the accumulator must be restored to operable status within one hour or the plant must be in at least hot standby within the next 6 hours. Accumulator 2B was inoperable (pressure less than 601 psig) for approximately 2 hours and 20 minutes, but was restored to service before the 6 hour hot shutdown requirement. The other two accumulators remained operable during this time period. Therefore, the licensee determined that this event was not required to be reported to the NRC. The inspectors have no further questions concerning this incident.

(3) Security Access Violation

The licensee identified a security access violation on June 20. An unprotected access path was found from outside the protected area into the service water intake structure. The licensee promptly initiated the compensatory measures specified by the Farley Security Plan and promptly notified the NRC. The inspectors reviewed the licensee's actions and had no further questions. The NRC Region II Physical Security Section was informed and will provide appropriate followup action during a subsequent inspection.

(4) Contaminated Control Room Carpet

On June 21, the inspectors noted that six 18"X18" carpet squares had been removed from the shift foremen's office in the control room. An investigation revealed that during a routine health physics survey of the control room complex on June 21, these six carpet square were found to have contamination level from 2,000 dpm/scan to 7,000 dpm/scan. This contamination was outside the radiation control area of the plant and was below the NRC limits. However, due to the licensee's procedural requirements and general practice of maintaining areas outside of the radiation control area (RCA) at a nondetectable contamination level, the contaminated carpet was promptly removed and properly disposed.

The licensee stated that there had been no recent contaminated shoe/foot instances identified of personnel exiting the RCA. However, this event is to be further evaluated by the licensee in an attempt to initiate appropriate action to prevent recurrence.

(5) Component Cooling Water System

During this inspection period the inspectors reviewed the preventive maintenance program, system flow balance methods, and general arrangement of the CCW systems for Unit 1 and 2. A walkdown inspection was made of the system to verify that the valve alignments conformed to the systems operating procedures, and to check major components for leakage and any general condition that would degrade performance.

The inspectors noted a number of valves in the system which were throttled to maintain proper component cooling water flow. For Unit 1 procedure 1-SOP-23.0, CCW System, indicates the valves to be throttled, the throttled position (i.e., amount or percent opened/closed) and requires the valves to be "seal wired" in that position. For Unit 2 procedure 2-SOP-23.0, indicates the valves to be throttled but does not indicate the actual amount that the valves are to be throttled. Plant Operators through experience have established the throttle position, but procedures do not indicate the required position of the valves. This problem has also been identified by the licensee and procedure 2-SOP-23.0 is being reevaluated to determine the appropriate corrective action. On July 11, the licensee performed flow checks of the Unit 2 CCW system to verify that the flows for normal operations conformed to the flow requirements of the FSAR and pre-operational tests. No major discrepancies were identified. This item is identified as Inspector Followup Item 364/89-14-03, Procedure 2-SOP-23.0 To Be Revised To Include Position of Throttled Valves in CCW System. This procedure is proposed to be revised by the end of the next Unit 2 refueling outage since several of the valves are not accessible during normal plant operation.

During the system walkdown leaks were noted on the Unit 1, Train A spent fuel pool heat exchanger. Boron seepage was coming from the east end of the heat exchanger and from the flanges to inlet valve to the heat exchanger. These leaks had previously been identified by the licensee, reported and maintenance work request 168396A issued to correct the problem. The inspectors suggested that the licensee reevaluate these leaks to determine if the maintenance request should be assigned a high priority for correction of the leaks.

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 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 the individuals conducting the test were qualified in accordance with plant-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:

2-STP-1	Operations Daily and Shift Surveillance Requirements
1-STP-5.0	Full Length Control Rod Operability Test
1-STP-9.0	RCS Leakage Test
2-STP-9.0	RCS Leakage Test
2-STP-11.12	RHR Pump 2B Operability Test
1-STP-27.2	On Site AC Distribution Inspection
2-STP-27.2	On Site AC Distribution Inspection
1-STP-27.2	On Site DC Distribution Inspection
2-STP-27.3	On Site DC Distribution Inspection
2-STP-33.0 B	Solid State Protection Train "B" Operability Test
2-STP-33.1 B	Safeguards Test Cabinet Train "B" Functional Test
2-STP-71	Main Control Room Remote Valve Verification
2-STP-72	Safety Parameter Display System Functional Check
0-STP-80.1	Diesel Generator 1-2A Operability Test
0-STP-80.2	Diesel Generator 1C Operability Test
2-STP-109	Power Range Neutron Flux channel Calibration
1-STP-913	Reactor Coolant Pump 1A and 1C Under Frequency 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.

5. Monthly Maintenance Observation (62703)

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 were violating 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 189253	Recalibrate Unit 1 RCS temperature transmitter TE-432B-1
MWR 189274& 198333	Investigate and correct problem causing slow start on diesel generator 2B from air header Nos. 1 and 2

MWR 192912 Investigate and correct problem causing Unit 2 rod control system urgent failure alarmd
 MWR 192914 Recalibrate speed indicator for diesel generator 2B
 MWR 197731& Repair Oil leak on RHR pump 2B
 197732
 MWR 200095 Recalibrate discharge gage to RHR pump 2A
 MWR 200765 Repair/replace unit selector switch for diesel generator 1C
 WA 00300889 Containment purge exhaust fan breaker preventive maintenance using procedure OEM - 1322.01
 WA 00302706 Containment purge supply fan breaker preventive maintenance using procedure OEM - 1322.01.

The inspectors reviewed the licensee's corrective action on MWR 197732 involving an oil leak to the motor of RHR pump 2B. During the refueling outage this pump motor lost lubrication oil during long run times. The licensee's investigation indicated that a possible cause was due to overfilling the oil reservoir. This resulted in the oil for shaft bearing developing a siphoning action that pulled oil from the oil reservoir and discharged the oil down the motor shaft. The oil reservoir and bearing were recleaned and motor relubricated and satisfactorily run for 18 hours. The outage pump's functional performance during long term cooling runs should be verified during the next long term shutdown, such as the refueling outage scheduled for the Fall of 1990. This is identified as Inspector Followup Item 364/89-14-04, Verification of RHR pump 2A operability following long run times, and will be reviewed during a subsequent NRC inspection.

No violation 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.

6. Licensee Event Reports (92700, 90714)

The following Licensee Event Report (LER) was reviewed for potential generic problems to determine trends, to determine whether information included in the report meets the NRC reporting requirements and to consider whether the corrective action discussed in the report appears appropriate. The licensee action was reviewed to verify that the event has been reviewed and evaluated by the licensee as required by the Technical Specifications; that corrective action was taken by the licensee; and that safety limits, limiting safety setting and LCOs were not exceeded. The inspector examined the incident report, logs and records, and interviewed selected personnel. The following report is considered closed:

Unit 1

LER/89-01 Special Report: Fire doors inoperable for more than seven days

Unit 2

LER/89-07 Reactor trip caused by a loose electrical connector on the 2A steam generator feed pump thrust bearing wear cable

LER/89-08 Reactor trip caused by inadequate procedure for verifying proper insulation after reassembly of bearing oil piping

No violations or deviations were identified.

7. Operation Training and Work Schedule (71707 and 41701)

a. Operator Training

During the week of June 26, the inspectors were informed by the Region II Operators Licensing Section that some of the plant's licensed operators had failed their operator requalification examinations. The inspectors verified that the licensee employes a method of formal notification to all licensed operators who failed requalification examinations. The operators are first informed orally that they failed the exam and they are not allowed to perform any licensed duties until they successfully pass the requalification examinations. This oral notification is then followed by a formal written notification which requires a confirmation signature. The operators are then required to attend special requalification training and upon completion they will be eligible to take another requalification examination. Upon successfully passing the re-exam they will be formally notified, in writing, that they can return to conduct licensed duties.

b. Operator Work Schedule

The inspectors evaluated the licensed operator's time sheets for April, May and June 1989. The evaluation was done to determine if the operators' work hours during the outage may have impacted their ability to successfully pass the requalification exams which were recently administered. The evaluation included reviewing selected individuals time sheets, evaluating the shift work schedule (for March - May, 1989), interviewing licensed operators and discussions with plant supervision and management. The time sheets and the shift work schedule which authorized the work hours were compared to those administrative controls outlined by TS Section 6.2.2. The inspectors did not determine a correlation between the work schedule during the outage and the requalification exam results. However, as a result of the evaluation the inspectors noted the following:

The approved work schedule (for March - May, 1989) included the recent Unit 2 outage. The schedule indicated that the operation's staff for both units was required to rotate through two, seven day, 12 hour per day periods. That would schedule two periods of 84 hours in seven days every five weeks. This schedule placed the staff into

a rotation which routinely required the operators to apparently deviate from the maximum time allowed to work by TS 6.2.2.f.3 (72 hours in any seven day period). The inspectors discussed this concern with the licensee site management and was informed that this type schedule provides benefits to the operators of both units. Specifically, when additional outage overtime is required the operation's staff would continue to be allowed normal days off, resulting in ten days off during a five week period. The time sheets for the operators selected during the March - May period showed that operators worked one seven day period, 12 hours per day and were allowed two days off; and then they would shift to another period. This cycle through the schedule resulted in ten days allowed off during a five week period. The inspectors noted that when the operators were placed in training their work weeks consisted of four days of eight hours each for training and one 12 hour work day whereby operators were assigned to one of the units for normal work duties.

The operator time sheets revealed that there were numerous examples where operators worked in excess of 72 hours during a seven day period. Two of the operators and one Senior Reactor Operator (SRO) were selected by the inspectors as examples to understand how the schedule worked.

The first operator was a Reactor Operator who coincidentally failed the most recent operator requalification examination. He was assigned to crew five on the operating unit (Unit 1). During the outage he worked two 84 hour periods within two separate seven day time frames. He worked eight consecutive days without taking a day off even though the work schedule permitted him to take two days off between work periods. This occurred between April 8 and 14, 1989.

The second operator was a Reactor Operator assigned to crew one on the operating unit. During the outage period he worked three 84 hour periods during three scheduled seven day time frames. Between April 6 and April 21 he worked 12 hours per day for eight days. He had one day off and returned for seven additional 12 hour days. On May 11 - 25, he worked each day for 12 hours except for May 24 and 25. On those days he worked eight hours per day. The work schedule permitted this operator to take at least two days off between each of those seven day periods which were included during the above dates.

The SRO was assigned duties as shift supervisor and other supervisory tasks for the operations shift. He was assigned to crew three for Unit 2. From April 20 through May 5, he worked sixteen days without taking any days off. The first seven days he worked 12 hours per day. He then worked two days for eight hours per day followed by seven additional 12 hour days.

The above items appear to be in violation of TS Section 6.2.2.f requirements concerning operating personnel on Unit 1 working in excess of 40 hour nominal work week and operating personnel on Unit 2 routinely working more than 72 hours during any seven day period. The inspectors discussed these concerns with site licensee management personnel and a meeting has been scheduled between licensee management and Region II management on July 31, 1989.

At that time this item will be discussed further. This is an Unresolved Item 50-348,364/89-14-01 Apparent Excessive Work Hours for Licensed Operators.

No other violations or deviations were identified.

8. Exit Interview

The inspection scope and findings were summarized during management interviews throughout the report period and on July 11, with the plant manager and selected members of his staff. The inspection findings were discussed in detail. A licensee representative stated that he did not agree with inspector's interpretation of overtime limits and requested a management meeting with the NRC to discuss this matter. The licensee acknowledged the other inspection findings and did not identify as proprietary any material reviewed by the inspector during this inspection.

Licensee was informed that the items discussed in paragraph 6 were closed.

<u>ITEM NUMBER</u>	<u>DESCRIPTION AND REFERENCE</u>
348,364/89-14-01	(Open) Unresolved Item: Excessive work hours for Licensed Operator - paragraph 7.
348, 364/89-14-02	(Open) Unresolved Item: Licensee's reevaluation of service water system for adequacy of design - paragraph 3.b.(1).
364/89-14-03	(Open) Inspector Followup Item: Procedure 2-SOP-23.0 to be revised to include position of throttled valves in CCW system - paragraph 3.b.(5).
364/89-14-04	(Open) Inspector Followup Item: Verification of RHR pump 2A operability following long run times - paragraph 5.

9. 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
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
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 - Scleroid Operated Valve
STP - Surveillance Test Procedure
SW - Service Water
TS - Technical Specification
TSC - Technical Support Center
WA - Work Authorization