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

Report Nos.: 50-348/89-16 and 50-364/89-16

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: July 11 - July 31, 1989

Inspectors: for G. F. Maxwell, Senior Resident Inspector — 8/17/89 Date Signed

for W. H. Miller, Jr., Resident Inspector — 8/17/89 Date Signed

Approved by: for F. S. Cantrell, Section Chief — 8/17/89 Date Signed

SUMMARY

Scope:

This routine onsite inspection involved a review of operational safety verification, monthly surveillance observation, and monthly maintenance observation.

Results:

Within the areas inspected, no violations or deviations were identified.

Certain tours were conducted on deep backshift or weekends, these tours were conducted on July 13 (deep backshift inspections occur between 10:00 p.m. and 5:00 a.m.).

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, except power was reduced on July 24 to approximately 55 percent due to excessive vibration alarm on steam generator main feedwater pump 2A. Power was increased to 65 percent on July 2[illegible] and remained at that level until modifications were completed to eliminate the excessive vibration alarm. The unit was returned to 100 percent power on July 28.

Other Inspections

Report No. 89-17 Design Engineering and Technical Support Inspection, July 24-28.

Report No. 89-18, Routine Security Inspection, July 31 - August 4.

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 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. Steam Generator Feed Pump (SGFP) 2A

The inspectors reviewed the circumstances associated with the high vibrations on turbine driven SGFP 2A that required this pump to be removed from service on July 24. At 4:30 a.m. on

July 23, the control room received a high vibration alarm from SGFP 2A. An investigation was initiated by operations and maintenance which by using a portable vibration detector found that the pump shaft vibrations were approximately 2.8 mils with spikes that exceeded 3.0 mils. The control room alarm set point is 3.0 mils. The maintenance group began taking vibration readings each hour on July 23. The shaft vibrations remained constant until about 6:00 p.m. on July 23. At this time the vibrations began to increase and eventually reached 11 mils at midnight on July 23. To prevent damage to the pump or turbine, operations decided to remove the pump from service. Reactor power was reduced to approximately 55 percent at 12:29 a.m. on July 24 and the pump was taken off line at 4:22 a.m. Reactor power was maintained at approximately 65 percent from July 24 until July 28. Maintenance removed the inboard turbine bearing and found some wear. In general the bearing was satisfactory and was apparently not the cause of the high vibration, but was replaced as a precaution.

On July 25 the pump was disconnected from the turbine. The turbine was run and high vibrations were found to still exist. The vendor's technical representative and Southern Company's engineering group were on site and involved with the investigations and the pump test runs. These investigations found that the most probable cause of the vibration was a change in the pumps' resonance frequency. To correct this problem a new bearing support bracket or stiffener was added to the inboard bearing housing. This modification was reviewed and approved by the vendor (Westinghouse) and by Minor Departure 89-2088. The modification was completed and SGFP 2A was restored to service at 3:08 a.m. on July 28. An increase of reactor power was initiated at 3:35 p.m. and reactor was returned to 100% power at 6:45 p.m. on July 28.

The licensee continues to review this event and plans further investigation of the pump and turbine drive during the next refueling outage, which is scheduled to begin in September 1989. The inspectors will continue to monitor the licensee's investigation, but have no further concerns or questions at this time.

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:

1-STP-3.1	Borated Water Source Operability Test
2.STP-8.0	RCP Seal Controlled Leakage Test
2-STP-16.1	Containment Spray Pump 2A Quarterly IST
1-STP-17.0	Containment Cooling System Train B Operability Test
1-STP-20.1	Penetration Room Filtration Alignment Verification
2-STP-20.2	Penetration Room Filtration System Train B Monthly Operability Test
2-STP-27.3	Auxiliary Building DC Distribution System Verification
2-STP-31.0	Accumulator MOV Power Isolation Verification
2-STP-34.1	Containment Inspectior (Post Maint nance - Replacement of Incore Drive C Detector)
1-STP-41.3	Power Range Functional Test - Channel N-42
1-STP-50.0	Radiation Monitor Monthly Source Check
2-STP-63.0	Area Temperature Monitoring

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 183104	Disassemble and repair relief valve to CCW heat exchanger.
MWR 187386	Replace relay for control room filtration fan BOP annunciator.
MWR 189730	Repair high vibration on inboard bearing to steam generator feed pump 2A.
MWR 190051	Repair inlet gas pressure control valve to Unit 2A recombiner.
MWR 210119	Repair emergency lights in Unit 2 diesel generator tunnel.

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.

6. Exit Interview

The inspection scope and findings were summarized during management interviews throughout the report period and on August 3, 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 inspection during this inspection.

7. Management Meeting Summary

A management meeting was held at the Region II office on July 31, 1989, to discuss issues related to inspection findings documented in Inspection Report 348, 364/OL 89-01. The issues involved were the licensee's excessive use of overtime by licensed operators and the licensee's requalification training program. Attachment 1 is a list of attendees at the meeting and Attachment 2 is a copy of the handout presented at the meeting.

The licensee representatives discussed their present method of scheduling licensed operator crews for shift work and explained that during periods when one unit was in an outage that they maintained essentially the same schedule but extended shifts from eight to twelve hours such that crews worked 84 hours in one week. They opposed any changes to their scheduling method because it would be disruptive to crew morale and have possible ALARA considerations.

The NRC representatives generally agreed with the licensee's position but expressed concern about several cases in which operators used overtime excessively. The licensee agreed with this concern and committed to tighten control of overtime approval to eliminate isolated excessive overtime.

The licensee representatives presented their response to the generic operator weaknesses identified during the requalification examinations. Procedure changes were outlined for EEP 1.0 and the Emergency Plan Implementing Procedures. The NRC representatives agreed that changes to these procedures are necessary. Techniques for improving the operator's performance of Immediate Operator Actions and the implementation of Technical Specifications Limiting Conditions for Operations were also presented. The NRC will evaluate operator performance in these areas during future examination visits.

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

ATTACHMENT 1

List of Attendees
Management Meeting
July 31, 1989

Alabama Power Company

J. Woodard, Vice President Nuclear
D. Morey, General Manager, Farley Nuclear Plant (FNP)
J. Osterholtz, Operations Manager, FNP
L. Williams, Training Manager, FNP

U.S. Nuclear Regulatory Commission

Region II

M. Ernst, Deputy Regional Administrator
B. Grimes, Acting Deputy Regional Administrator
W. Hehl, Deputy Director, Division of Reactor Projects (DRP)
E. Merschoff, Deputy Director, Division of Reactor Safety (DRS)
D. Verrelli, Chief, Reactor Projects Branch 1, DRP
T. Peebles, Chief, Operations Branch, DRS
C. Julian, Chief, Engineering Branch, DRS
F. Cantrell, Chief, Reactor Projects Section 1B, DRP
C. Casto, Acting Chief, Operator Licensing Section 1, DRS
P. Kellogg, Chief, Operational Programs Section, DRS
G. Maxwell, Senior Resident Inspector - Farley, DRP
W. Miller, Jr., Resident Inspector - Farley, DRP
L. Lawyer, Reactor Inspector, DRS
P. Balmain, Project Engineer, DRP
R. Baldwin, Reactor Engineer, DRS
B. Breslau, Reactor Engineer, DRS

Office of Nuclear Reactor Regulations

E. Adensam, Director, Project Directorate II-1
E. Reeves, Senior Project Manager
C. Goodman, Technical Reviewer

ATTACHMENT 2

ALABAMA POWER COMPANY

FARLEY NUCLEAR PLANT

NRC MANAGEMENT MEETING

July 31, 1989

MANAGEMENT OF OVERTIME

TRAINING PROGRAM

AGENDA

- Introduction and Opening Remarks
- Overtime Presentation
  - Questions and Answers
- Training Program Presentation
  - Questions and Answers
- Final Remarks

J. M. FARLEY
TECHNICAL SPECIFICATIONS
6.2.2.f

f. "Administrative procedures shall be developed and implemented to limit the working hours of unit staff who perform safety-related functions; e.g., Senior Reactor Operators, Reactor Operators, Health Physics Technicians, Auxiliary Operators, and key maintenance personnel. Adequate shift coverage shall be maintained without routine heavy use of overtime.

> The objective shall be to have operating personnel work a nominal 40-hour week while the plant is operating.

In the event that unforeseen problems require substantial amounts of overtime to be used, or during extended periods of shutdown for refueling, major maintenance or major plant modifications, on a temporary basis, the following guidelines shall be followed:

1. An individual will not be permitted to work more than 16 hours straight (not including shift turnover time).
2. There will be a break of at least 8 hours (which can include shift turnover time) between work periods.
3. An individual will not work more than 16 hours in any 24 hour period, nor more than 24 hours in any 48 hour period,

> nor more than 72 hours in any 7-day period

(all excluding shift turnover time).

4.

> Except during extended shutdown periods, the use of overtime should be considered on an individual basis and not for the entire staff on a shift.

5. Any deviation from the above guidelines for the minimum shift complement defined in Technical Specification Table 6.2-1 and health physics technicians shall be reviewed and approved by the General Manager - Nuclear Plant, his designee (Emergency Director) or higher authority. Any deviation from the above guidelines for key maintenance personnel shall be reviewed and approved by the Maintenance Manager or his designee (group supervisor)"

PLANT OPERATORS SCHEDULE

	APR 24 – APR 30	MAY 01 – MAY 07	MAY 08 – MAY 14	MAY 15 – MAY 21	MAY 22 – MAY 28
	M T W T F S S	M T W T F S S	M T W T F S S	M T W T F S S	M T W T F S S
DAY PRIME.....	1 1 1 1	2 2 2 2	3 3 3 3	4 4 4 4	5 5 5 5
DAYS.....	4 1 5 5 5 5 5	5 2 1 1 1 1 1	1 3 2 2 2 2 2	2 4 3 3 3 3 3	3 5 4 4 4 4 4
EVENINGS.....	3 3 3 4 4 4 4	4 4 4 5 5 5 5	5 5 5 1 1 1 1	1 1 1 2 2 2 2	2 2 2 3 3 3 3
NIGHTS.....	2 2 2 2 2 3 3	3 3 3 3 3 4 4	4 4 4 4 4 5 5	5 5 5 5 5 1 1	1 1 1 1 1 2 2

NRC INSPECTION REPORT
50-364/80-27
(7.b(4))

(4) "APCo has informed the inspectors that it is in total agreement with and fully supports the commission's requirement to limit maximum work hours of personnel performing safety related functions. They have stated that they are able to commit to working personnel under normal conditions to no more than

72 hours in any seven day work period

and to working these personnel no more than 14 consecutive days without at least two consecutive days off. However, APCo has also informed the inspectors that at the present time, it is unable to commit to limit the work of personnel to 12 hours off between work periods. APCo stated that its inability to make this commitment is due primarily to a binding contract with the International Brotherhood of Electrical Workers (IBEW) which does not provide for such scheduling of personnel.

APCo has informed the inspectors that it is initiating negotiations with the IBEW to meet the overtime limits required the NRC. APCo has also advised the inspector that newly constituted training and licensing requirements raise uncertainties about total manpower needs which make the overtime limits difficult to meet at this time.

This item will remain open pending further review by the NRC and the review of procedural controls placed on overtime during a subsequent inspection (364/80-27-03)"

50-384 & 50-364/88-05
Paragraph 5.a(8)

"The inspectors reviewed time sheets for Operations personnel for the period between December 12, 1987 through February 21, 1988. During that time frame both units were operational. Only one person was noted to have exceeded the overtime guidelines. That occurred when more than 72 hours were worked in a seven day period. The Emergency Director, as specified in FNP-0-AP-64, granted approval for that overtime. When the plant is operating at power, Operations personnel appeared to work a nominal 40 hour week with occasional overtime required due to sickness or absences of other staff members.

The inspectors also reviewed time sheets for the last refueling outage. Numerous examples were noted of Operations personnel exceeding, with the Emergency Director's approval, 72 hours in a 7 day period. During outages, the Operation's staff rotates through two, seven day, 12 hours per day periods, i.e.,

two periods of 84 hours in seven days every 5 weeks.

Although this exceeds the guidelines of Technical Specification 6.2.2.f.3 and FNP-0-AP-64, the benefits of this schedule are that when additional outage related overtime is required, the operatingstaff continues to receive the normal days off, resulting in 10 days off during the 5 week period. Operators also rotate on the same schedule as during normal operations. The change is that each person works either a 12 hour day or night shift in place of his normal 8 hour work period.

The licensee has been able to maintain short outage durations in the past; therefore, it appears that the structure of approved overtime during outages is acceptable.

No violations or deviations were identified"

NRC CONCERNS

- Generic Weakness from the Examination
  - Transition from EEP 1.0 for Secondary break
  - Emergency Classifications
  - Immediate Operator Actions
  - Technical Specification Application
- Back log of ungraded examinations
- Post exam changes
- Training staffing

SOURCES & SCHEDULE OF REMEDIAL TRAINING

SOURCES

Knowledges

- FNP written exams
- NRC written exams
- JPM questions
- Generic weaknesses

Skills

- Simulator Performance
- JPMs
- Generic weaknesses

SCHEDULE

	Written	Simulator
Armstrong	07/16/89	07/20/89
Olson	07/06/89	--------
Arute	07/14/89	07/20/89
Cumbee	07/21/89	07/20/89
Forrester	--------	07/20/89
Ware	--------	To be scheduled
Vanlandingham	--------	To be scheduled
Wynn	--------	To be scheduled

POST EXAM CHANGES

17 total changes, 9 substantive

11 Total changes for week 1, 7 substantive

6 Total changes for week 2, 2 substantive

1 question deleted

1 comment not accepted

Week 2 exams received additional validation and verification

Future exam questions will receive additional validation and verification

- Training staff
- Operations supervision
- Simulator setup verification

Root Cause

- Insufficient Validation & Verification

BACKLOG OF UNGRADED EXAMINATIONS

06/01/89 & 06/02/89	20 week 1 exams administered
06/30/89	Week 1 exams graded - 21 working days
06/08/89 & 06/09/89	26 week 2 exams administered
07/07/89	Week 2 exams graded - 21 working days
06/15/89 & 06/16/89	23 week 3 exams administered
07/14/89	Week 3 exams graded - 21 working days
06/19/89	11 week 4 NRC exams administered
07/04/89	Week 4 exams graded - 8 working days
06/26/89	11 week 5 NRC exams administered
07/04/89	Week 5 exams graded - 2 working days
07/07/89	9 week 6 exams administered
07/12/89	Week 6 exams graded - 4 working days

PROGRAMATIC ENHANCEMENTS

- COMPREHENSIVE REVIEW
- SCHEDULE

  Revised Presentation Schedule
  Eliminate non-licensed topics
  Expanded Schedule

- INSTRUCTIONAL METHODOLOGY

  Support new examination process
  Develop additional Operator capabilities

- EXAM QUESTION VERIFICATION & VALIDATION

REMEDIAL TRAINING TOPICS

Armstrong

RCP operation in mode 5, RIL limit at power, RCP operation in EEP-3, manipulator crane interlocks, FRP rules of usage, 1/m plots, AFW operation in EEP-3, symptoms of loss of a RCP at power, ESP-0.0 usage, SDM requirements on RHR, electrical alignment during LOSP, loss of CCW cooling effect on CVCS, effect of penetration room high pressure, AFW flow control valve interlocks, natural circulation indications, LOSP sequencer functions, FRP-Z.1 red path criteria, ERG flow path for EEP-3, CCW operation with system leakage, source range operation with intermediate range failures, RCP operation with seal failures, accumulator operation during abnormal conditions, operation of ICCMS, CETC functions, AMSAC autostart of TDAFW pump, reasons for seal isolation during loss of all AC, EEP-1 transition of steam break

Olson

RCP restart criteria, steam dump operation, rod speeds, RCS drain down when solid, SGFP speed control, SGFP suction pressure versus SG feed flow, pressurizer pressure control during loss of air, solid plant pressure control, CCW pump auto trips, emergency boron requirements during LOCA, ESP-1.3 usage, FRP-H.1 usage, ESF sequencer operation after MCB SI reset, D/G response during LOSP, QPTR calculations, AFW flow control valve interlocks, VCT pressure effects on RCP seal leakoff, FRP-P.1 application, AOP-34 application, seal oil system operation, RMS operation during LOSP, source range operation with intermediate range failure, PORV lift set point, orifice isolation interlocks, EEP-1 transition for steam break

Arute

EEP-3 usage, service water alignment to fire protection, RCP operation in EEP-3, Tech Spec application EEP usage, FCV-122 response, CCW pump trip logic, D/G sequencer operation during LOSP, containment spray operation during large steam break, RCP support systems, VCT level control, AOP-2.0 usage, AOP-34 application, EEP-1 transition for steam break, EIP-9 classifications

Cumbee

Notification requirement for oil spill, RCS solid pressure control, RCP operation in EEP-3, Tech Spec application, 1/m plots, FCV-122 response, CCW pump trip logic, AFW operation during accident conditions, SOP-0.4 application, plant response during high penetration room pressure, NIS failure effects on rod control, STP-70 application with RCDT inoperable, RCP seal isolation, EEP-1 transition for steam break, EIP-9 classification

Cumbee, Armstrong, Forrester

Immediate operator actions, steam breaks, feedwater breaks, LOCA, SGTR, Technical Specification applications, communications, EIP-9 classification and notifications, AOP and ARP usage

Ware, Vanlandingham, Wynn

Communication, rod misalignment, EEP-1 branching criteria immediate operator actions, Tech Spec application, EIP-9 classification and notification