



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

Report Nos.: 50-348/85-25 and 50-364/85-25

Licensee: Alabama Power Company  
600 North 18th Street  
Birmingham, AL 35291

Docket Nos.: 50-348 and 50-364

License Nos.: NPF-2 and NPF-8

Facility Name: Farley Nuclear Plant

Inspection Conducted: June 3 - 7, 1985

Inspection at Farley site near Dothan, Alabama

Inspector: M. F. Runyan  
M. F. Runyan

7/15/85

Date Signed

Accompanying Personnel: M. A. Scott, Region II

Approved by: C. M. Upright  
C. M. Upright, Section Chief  
Division of Reactor Safety

7/15/85

Date Signed

SUMMARY

Scope: This routine, unannounced inspection entailed 68 inspector-hours on site in the areas of surveillance testing and calibration control program, measuring and test equipment program, and licensee action on previously identified inspection findings.

Results: Four violations were identified - Failure to Perform Evaluation of Out-of-Tolerance Measuring and Test Equipment, Failure to Establish Environmental Controls for Calibration of Measuring and Test Equipment, Failure to Confirm Adequacy of Calibration Frequency of Measuring and Test Equipment, Failure to Control Access and Assure Accountability of Measuring and Test Equipment.

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## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- B. Badham, Safety Audit and Engineering Review (SAER) Staff
- \*T. Cherry, I&C Supervisor
- \*R. Coleman, Systems Support Supervisor
- L. Enfinger, Administrative Superintendent
- T. Esteve, Planning Supervisor
- \*H. Garland, Maintenance Superintendent
- C. Hanks, I&C Control Technician
- D. Heartline, Generating Plant Supervisor
- \*R. Hill, Operations Superintendent
- D. Morey, Assistant Plant Manager, Operations
- \*C. Nesbitt, Technical Superintendent
- J. Odom, Unit 1 Supervisor, Operations
- \*W. Shipman, Assistant Plant Manager, Support
- J. Stutchman, I&C Planner
- L. Ward, Maintenance Superintendent
- \*W. Ware, SAER Supervisor
- L. Wiger, I&C Engineer
- \*J. Woodard, Plant Manager

Other licensee employees contacted included technicians and office personnel.

#### NRC Resident Inspector

- \*W. Bradford, Senior Resident Inspector

\*Attended exit interview

### 2. Exit Interview

The inspection scope and findings were summarized on June 7, 1985, with those persons indicated in paragraph 1 above. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection. The inspector described the areas inspected and discussed in detail the inspection findings listed below.

Violation: Failure to Perform Evaluations of Out-of-Tolerance Measuring and Test Equipment, paragraph 5.a.

The licensee accepted the failure to evaluate mechanical equipment found out of tolerance but did not agree that similar evaluations were required for permanently installed plant instrumentation found out of calibration.

Violation: Failure to Establish Environmental Controls for Calibration of Measuring and Test Equipment, paragraph 5.b.

Violation: Failure to Confirm Adequacy of Calibration Frequency of Measuring and Test Equipment, paragraph 5.c.

Violation: Failure to Control Access and Assure Accountability of Measuring and Test Equipment, paragraph 5.d.

Inspector Followup Item: Certification of Individuals Qualified to Calibrate Measuring and Test Equipment, paragraph 5.e.

### 3. Licensee Action on Previous Enforcement Matters

This subject was not addressed in the inspection.

### 4. Surveillance Testing and Calibration Control (61725)

- References:
- (a) 10 CFR 50, Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants
  - (b) Regulatory Guide 1.33, Quality Assurance Program Requirements (Operation)
  - (c) ANSI N18.7-1972, Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants
  - (d) Technical Specifications, Section 4

The inspector reviewed the licensee surveillance testing and calibration control program required by references (a) through (d) to verify that the program had been established in accordance with regulatory requirements, industry guides and standards, and Technical Specifications. The following criteria were used during this review to determine the overall acceptability of the established program:

- A master schedule for surveillance testing and calibration delineated test frequency, current status, and responsibilities for performance.
- The master schedule reflected the latest revisions of the Technical Specifications and operating license.
- Responsibilities were assigned to maintain the master schedule up-to-date and to ensure that required tests were performed.
- Detailed procedures with appropriate acceptance criteria had been approved for all surveillance testing requirements.

- The program defined responsibilities for the evaluation of surveillance test data as well as the method of reporting deficiencies and malfunctions.

The inspector also verified that similar controls had been established for calibration of instruments used to verify safety functions but not specifically identified in the Technical Specifications. The documents listed below were reviewed to verify that these criteria had been incorporated into the surveillance testing and calibration control program:

QAM, Chapter 5	Instructions, Procedures, and Drawings, Revision 22
QAM, Chapter 10	Inspection, Revision 22
QAM, Chapter 11	Test Control, Revision 22
QAM, Chapter 16	Corrective Action, Revision 22
QAM, Appendix A	Q-List, Revision 20
AP-5	Surveillance Program Administrative Control, Revision 7
AP-11	Control and Calibration of Test Equipment, Test Instrumentation, and Plant Instrumentation, Revision 5
AP-15	Maintenance Conduct of Operations, Revision 8
AP-51	Instrumentation and Control Group Conduct of Operations, Revision 6
AP-57	Preservice and Inservice Inspections, Revision 3

The following site audit reports were reviewed to identify those areas in which the licensee had discovered problems with the surveillance testing and calibration program:

84-15, Maintenance STPs, June 12, 1984  
 84-17, Operations STPs, July 11, 1984  
 84-21, Health Physics STPs, October 5, 1984  
 84-22, Chemistry STPs, October 19, 1984  
 84-24, Systems Performance STPs, January 2, 1985  
 85-06, Inservice Inspection - Unit 2, April 23, 1985  
 85-08, Technical Group STPs, May 2, 1985

The more significant problems were identified as noncompliances while those of lesser importance were addressed as comments by the QA staff. Among the types of noncompliances of greatest concern were:

- Failure to comply with notes or line items in the TS.

- Procedural errors while performing surveillance tests.
- Certification of qualification expired for persons performing surveillance tests.

Corrective action on these and other items appeared to be complete and expedient. Several of the comments appeared to be borderline noncompliances but the inspector determined that corrective action was satisfactory in these cases.

To verify implementation of the surveillance test program, the master test schedule was reviewed. This schedule was broken into two parts; Schedule A for test frequencies greater than one month, and Schedule B for monthly and more frequent tests. These manual schedules were updated monthly and sent to the control room where test scheduling and compliance was monitored. Test completion was documented on the schedules which were returned to the Planning Group at the end of the month. This was a unique but apparently effective system for ensuring that all required tests were performed as prescribed by the TS. The schedules were randomly checked against the TS for test inclusion and scheduling frequency as well as proper use of grace periods.

The following surveillance test procedures and packages which include inservice pump tests were reviewed for completeness and adequacy:

FNP-1-STP-215.3B	Main Feedwater FT-486 Functional Test, performed October 8, 1984
FNP-1-STP-416	Boron Concentration Determination of the Refueling Water Storage Tank, performed July 9, 1984
FNP-1-STP-408	Dissolved Oxygen Determination for the Reactor Coolant System, performed August 24, 1984
FNP-1-STP-121	Power Range Axial Offset Calibration, performed March 9, 1985
FNP-2-STP-121	Power Range Axial Offset Calibration, performed December 12, 1984
FNP-2-STP-23.5	Component Cooling Water Pump 2B Annual Inservice Test, performed November 22, 1983
FNP-2-STP-23.4	Component Cooling Water Pump 2A Annual Inservice Test, performed March 2, 1985
FNP-2-STP-4.4	Charging Pump 2A Annual Inservice Test, performed February 20, 1985
FNP-2-STP-4.1	Charging Pump 2A Inservice Test, performed January 14, 1985



FNP-1-STP-201.18B Reactor Coolant System TE-412A and TE-412D Functional Test, performed November 25, 1984

FNP-1-STP-215.3A Main Feedwater FT-486 Loop Calibration, performed October 8, 1984

FNP-1-STP-201.18A Reactor Coolant System TE-412A and TE-412D Loop Calibration, performed November 25, 1984

Reference values for pump differential pressure and component vibration datum (Pr and Vr, respectively) established during design and preoperational testing in accordance with Sections III and XI of the ASME Boiler and Pressure Vessel Code were not found in the surveillance tests examined. These values are an integral part of component test acceptance criteria. Pr and Vr values were indicated as being located in the surveillance test data book in the control room. Existing site procedures did not identify use, control, or alteration of the surveillance test data book.

In reviewing the test data package for surveillance test FNP-2-STP-23.5 (performed November 22, 1983), it was identified that new post-repair baselines for Pr and Vr were established for component cooling water pump (CCWP) 2B. The Inservice Test Program Manual, FNP-2-M-019, and the Inservice Plan for Pump and Valve Testing Manual, FNP-2-M-008, reference Section XI of the ASME Boiler and Pressure Code but do not contain all of the testing and testing time requirements of Section XI. Although site procedures do not contain the specific 96-hour retest requirement for new baseline of Article IWP-3000 of Section XI, CCWP 2B was retested during the time allowed.

The licensee is required to establish a calibration program for installed process instrumentation associated with safety-related systems or functions. The calibration of these instruments was controlled within the preventive maintenance program. The following plant instruments were chosen at random from several surveillance test procedures to verify their inclusion in the calibration program:

Charging Pump 2B	
Charging Flow	FI-122
Suction Pressure	PI-152A
Discharge Pressure	PI-152B
RHR Pump 2A	
Flow	FI-605A
Suction Pressure	PI-601A
Discharge Pressure	PI-600A
Auxiliary Feedwater Pump 2B	
Suction Pressure	PI-3211BB
Discharge Pressure	PI-3213BB

Containment Spray Pump 2B  
 Suction Pressure PI-946A  
 Discharge Pressure PI-946B

The above instruments were included in the program. Scheduled calibration frequencies appeared consistent with good engineering practice.

Within this area, no violations or deviations were identified.

5. Measuring and Test Equipment (M&TE) Program (61724)

- References:
- (a) 10 CFR 50, Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants
  - (b) Regulatory Guide 1.33, Quality Assurance Program Requirements (Operations)
  - (c) ANSI N18.7-1972, Administrative Controls and Quality Assurance of the Operational Phase of Nuclear Power Plants
  - (d) Regulatory Guide 1.30, Quality Assurance Requirements for the Installation, Inspection, and Testing of Instrumentation and Electric Equipment, August 11, 1972
  - (e) ANSI N45.2.4-1972, IEEE Standard, Installation, Inspection, and Testing Requirements for Instrumentation and Electric Equipment During the Construction of Nuclear Power Generating Stations

The inspector reviewed the M&TE program required by references (a) through (e) to verify that the program had been established in accordance with regulatory requirements and industry guides and standards. The following criteria were used during this review to determine the overall acceptability of the established program:

- Responsibility was delegated and criteria established to assign and adjust calibration frequency for each type of M&TE.
- An equipment inventory list identified all M&TE used on safety-related components, the calibration frequency and standard, and the calibration procedure.
- Formal requirements existed for marking the latest calibration date on each piece of equipment.
- The program assured that each piece of equipment was calibrated on or before the date required or stored in a location separate from inservice M&TE.

- Written requirements prohibited the use of M&TE which had not been calibrated within the prescribed frequency.
- When M&TE was found out of calibration, the program required documented evaluations to determine the cause of the out-of-calibration condition and the acceptability of items previously tested.
- The program assured that new M&TE was added to the inventory lists and calibrated prior to use.

The documents listed below were reviewed to verify that these criteria had been incorporated into the M&TE program:

FNP FSAR, Section 17.2.12	Control of Measuring and Test Equipment
QAM, Chapter 12	Control of Measuring and Test Equipment, Revision 22
QAM, Chapter 16	Corrective Action, Revision 22
AP-11	Control and Calibration of Test Equipment, Test Instrumentation, and Plant Instrumentation, Revision 5
AP-15	Maintenance Conduct of Operations, Revision 8
AP-51	Instrumentation and Control Group Conduct of Operations, Revision 6

The inspector reviewed site audit report 84-18, Control of Measuring and Test Equipment, July 23, 1984, to identify problems the licensee had found with their program. The findings included improper storage of instruments, not marking contaminated tools, a test procedure not requiring the recording of test equipment used and calibration due date, and the test equipment master schedule not containing the calibration procedure number or the last calibration date. It appeared that the licensee had corrected these deficiencies.

Implementation of the licensee's M&TE program was assessed in the I&C and Mechanical calibration labs. In the I&C lab, the following items of M&TE were selected randomly to determine the adequacy of storage and the effectiveness of documentation accounting for the equipment:

FNP-IRD-6003	Vibration Meter
FNP-LNRS-0150	Ratio Test Set
FNP-FDM-1139	DVM Fluke 8020A
FNP-LNK-3030	Kelvin Bridge L&N
FNP-LNC-3055	Control Loop Tester
FNP-GRS-5000	Strobotac



FNP-BFM-5141 2.5 gpm Flowmeter  
 FNP-FDM-1155 DVM Fluke 8600A  
 FNP-ATTG-8345 100 psi Gauge

The above equipment was either properly stored or documented as being checked out or at another location with the exception of the 100 psi gauge. This piece of equipment was listed as missing. This appeared to be an isolated case.

The following calibration procedures were reviewed:

IMP-021 Fluke 8600A DMM Calibration Check, Revision 3  
 IMP-007 Heise Gauge Calibration, Revision 0  
 IMP-012 Hickok 3300 Digital Multimeter, Revision 0  
 IMP-031 Keithley Picoampere Source Model 261 Calibration Check, Revision 2  
 IMP-061 Wallace and Tiernan FA-187 Precision Manometer Calibration, Revision 1

The above calibration procedures appeared adequate in that they clearly defined a step-by-step procedure and criteria by which to determine the acceptability of the device. A problem concerning test conditions for calibration is discussed as a violation below.

The licensee is required to evaluate previous tests performed with M&TE later found out of tolerance during calibration. The following evaluations were reviewed:

<u>ID No.</u>	<u>Instrument Type</u>	<u>Date Found Out-of-Tolerance</u>	<u>Evaluation Completed</u>
HTG-8501	Heise Test Gauge	9/18/84	1/18/85
ATG-8573	Ashcroft Gauge	1/25/85	4/08/85
HTG-8507	Heise Test Gauge	1/27/85	5/08/85
HTG-8096	Heise Test Gauge	4/02/85	Open
HTG-8586	Heise Test Gauge	5/12/85	Open

The timeliness of conducting these reviews is discussed as a portion of a violation described below.

A similar inspection was performed in the Mechanical Tool Room where the following tools were randomly selected from the master index:

SMI6760 Outside Micrometer  
 BSD6301 Dial Indicator  
 BSJB6216 Jo Block

SDG6209	Depth Gauge
BCT6726	Crimping Tool
STW6420	Torque Wrench
PDT6700	Power Dyne Torque Wrench

Storage of the above equipment appeared adequate and items not located in the shop were well documented as to their status. Calibration stickers agreed with the information provided on the master index. The following calibration procedures were reviewed:

- GMP-33.0 Torque Tester, Model TT-7045 Calibration Check Instructions, Revision 1
- GMP-33.1 Torque Tester, Model TT-7085 Calibration Check Instructions, Revision 0
- GMP-34.1 Calibration Check for Metric Dial Indicators (Strain Gauge), Revision 0
- GMP-35.0 Calibration Check of Outside Micrometers and Micrometer Depth Gauges, Revision 1
- GMP-35.1 Calibration Check of Inside Micrometers, Revision 0
- GMP-36.0 Torque Wrench Calibration Check Instructions, Revision 0

These procedures appeared adequate to control the quality of calibration activities with the exception of environmental controls as discussed in a violation below.

Within this area, four violations and one inspector followup item were identified and are discussed in the following paragraphs.

- a. Failure to Perform Evaluations of Out-of-Tolerance Measuring and Test Equipment

The licensee is committed to ANSI N45.2.4-1972. Section 2.5.2 states that when inspection and testing equipment are found out of calibration, an evaluation shall be made of the validity of previous inspection or test results and of the acceptability of items previously inspected or tested. The following areas of noncompliance with this requirement were identified and are discussed in the following paragraphs:

Required evaluations are not typically performed for mechanical equipment such as torque wrenches and micrometers. The controlling procedure AP-11, Control and Calibration of Test Equipment, Test Instrumentation and Plant Instrumentation, Revision 5, only requires evaluations as such to be performed by

the I&C Group. AP-15, Maintenance Conduct of Operations, Revision 8, Section 7.4, mentions the requirement to perform the evaluation but does not provide guidance or a format for their performance. As a result, evaluations were only occasionally performed and they were not maintained as quality records.

Evaluations are not performed when an installed process instrument is found out of tolerance. In this case, an installed instrument used to verify acceptance criteria for a safety-related surveillance test is performing the same function as a portable item of M&TE and subject to this requirement. As an example, if a pump discharge pressure gauge is found out of tolerance, the validity of the last pump operability test is in question and an evaluation is required to determine whether the test should be re-performed. Test results derived from installed process instrumentation determined to be out of tolerance could, when reevaluated, identify an unsafe condition which requires further action in accordance with 10 CFR 50 regulations or TS requirements.

Measures have not been established to assure that out-of-tolerance evaluations are completed within a reasonable time period. Though ANSI N45.2.4 does not specify timeliness of evaluations, this is an important consideration because invalid settings, test data, or calibrations could invoke TS limiting conditions for operation. The I&C Control Technician in charge of the lab has determined on his own that these evaluations should be completed in three weeks. However, this time limit is not in a procedure and the issue has not been evaluated by higher levels of management. Also, this informal time constraint is often exceeded as several evaluations were observed to have taken approximately three months to complete. Some plants have established a seven-day limit which has been generally accepted as a reasonable time to screen out-of-calibration M&TE results to determine prior use and immediate action needed on safety-related components.

Failure to perform and control evaluations of out-of-tolerance M&TE is identified as violation 348, 364/85-25-01.

b. Failure to Establish Environmental Controls for Calibration of Measuring and Test Equipment

10 CFR 50, Appendix B, Criterion II, states that activities affecting quality shall be accomplished under suitable environmental conditions. For the calibration of certain items of M&TE, vendor manuals specify conditions under which calibration activities should take place. However, in the I&C and the maintenance calibration facilities, measures had not been established to assure proper environmental controls for calibration.

In the I&C calibration lab, two examples of vendor calibration requirements were given for the Fluke 8600A and 8120A digital multimeters. Calibration test conditions were  $23 \pm 5$  degrees C at less than 80 percent humidity and  $25 \pm 5$  degrees C at less than 70 percent humidity, respectively. Although temperature and humidity were continuously measured on a strip chart recorder, administrative limits had not been established and personnel who perform calibrations do not check or record conditions while performing calibrations. On at least one occasion in the last year, humidity exceeded 70 percent in the lab. Though Fluke test conditions were almost always met based on strip chart records, measures had not been established to preclude calibration in the event that they were not met. Also, there may be other pieces of equipment that were sensitive to temperature and humidity and which may require conditions not currently being provided. A complete review of all potentially affected equipment should be completed as well as the establishment of administrative limits to control environmental conditions during calibration.

In the maintenance shop, the same problem existed with the exception that temperature and humidity indication was not provided. Provisions had not been established to control temperature for the calibration of precision measuring equipment nor were requirements in place to ensure that the internal temperature of the field instrument and shop standard had stabilized and equalized prior to calibration. In addition, calibration was performed in three separate locations each with its own environmental characteristics. Failure to control environmental conditions for the calibration of M&TE is identified as violation 348, 364/85-25-02.

c. Failure to Confirm Adequacy of Calibration Frequency of Measuring and Test Equipment

The licensee is committed to ANSI N18.7-1972 which states in Section 5.3.6 that procedures shall be provided for proper control and periodic calibration and adjustment of measuring and test equipment to maintain accuracy within necessary limits, and to confirm the adequacy of calibration frequency. Procedure AP-11, Section 4.6.2.2, states that equipment data obtained from calibration checks shall be analyzed to optimize calibration check intervals. This implies that calibration records should be examined periodically to determine whether items of M&TE should be calibrated more frequently or, in the case where failures are very rare, less frequently. The licensee had failed to establish measures to assure the performance of this function in a systematic or effective manner. The calibration history of a device was not compiled tabularly and calibration records were scattered throughout the document control system. A method of analyzing calibration history was not prescribed and, as a result, calibration trend analysis was not performed. A specific example of this problem involves the Keithley Picoampere Source Model 261. The vendor manual



informs the user to calibrate this device every three months. The licensee changed the frequency to every six months in 1978, evidently because it had to be sent off site for a month to be calibrated. Thus, by increasing the time between calibrations, it had a higher use factor. However, the licensee did not have a technical evaluation or trend analysis to support this change. The inspector reviewed the following calibration certificates for Kiethley Model 261 M&TE:

<u>Serial No.</u>	<u>Calibration Date</u>	<u>As Found Condition</u>
86962	4/03/80	Out of tolerance
86962	10/20/80	Wires burned open
86962	10/22/82	Out of tolerance
4028	07/16/84	In tolerance

Although this was a small sample of the total (six calibrations were performed on three sources yearly), it clearly indicated that a six-month frequency may not be acceptable. Failure to confirm the adequacy of calibration frequency of M&TE is identified as violation 348, 364/85-25-03.

d. Failure to Control Access and Assure Accountability of Measuring and Test Equipment

10 CFR 50, Appendix B, Criterion XII, states that measures shall be established to assure that measuring and testing devices used in activities affecting quality are properly controlled. In the I&C calibration lab, access control is not provided. As a result, reliability of equipment documentation and shop standard security were not assured. The lab was unlocked around the clock and staffed by I&C personnel only periodically on the day shift. The lab is located in an area where visitors and contractor personnel had unescorted access. This created several situations that could be adverse to quality. Equipment checkout documentation was vulnerable to an honor system which may be violated by plant personnel or by personnel working for another organization. When equipment was found out of calibration, the licensee does not have assurance that every prior use of that equipment was identified which is needed for the required evaluation. Extremely sensitive shop calibration standards were left unattended on desk tops without any security against potential tampering. Tampering with a shop standard, whether advertently or not, may not be known for several years depending on the calibration frequency. A countless number of flawed calibrations of field equipment may occur and seriously degrade the safety of the plant. M&TE could be removed from the lab without being signed out and used after exceeding its calibration interval without a means of locating it. Failure to control access and assure accountability of M&TE is identified as violation 348, 364/85-25-04.



e. Certification of Individuals Qualified to Calibrate Measuring and Test Equipment

The licensee could not demonstrate a qualification program or formal training for personnel who routinely calibrate M&TE. In the I&C lab, journeymen perform the calibrations by using procedures and by observing others. In the mechanical lab, any mechanic was assumed to be qualified to calibrate M&TE. This informal approach to training and qualification may not be sufficient to assure the repeatability and accuracy of M&TE calibrations. The licensee acknowledged this concern and provided the following response to the inspector following the inspection:

Intracompany correspondence, FNP-85-0624, Certification and Re-Certification of Personnel Performing Calibration of Equipment or Instruments, dated June 12, 1985. This response stated that personnel performing calibrations meet the Level II Qualification requirements of FNP-O-AP-31 and are certified to perform activities associated with their respective classification, including calibrating or establishing the validity of calibration of measuring equipment. The response further stated that calibration activities performed by these personnel fall well within the skills of the classification; therefore, no periodic training is necessary.

Until the qualification requirements of FNP-O-AP-31 are reviewed and are observed to be adequate, the item is identified as Inspector Followup Item 348, 364/85-25-05.

7. Licensee Action On Previously Identified Inspection Findings (92701)

(Open) Inspector Followup Item 348, 364/85-21-02: Cheater Bar Usage.

At the time of this inspection, a composite audit report had been issued with the cheater bar noncompliance identified as an open item. The appropriate corporate and site personnel had not responded.

(Open) Inspector Followup Item 348, 364/85-21-03: 10 CFR 21 Requirements.

Administrative Procedure 62 had been amended to incorporate the necessary changes. The procedure is at the corporate office for approval.