A-10 50-348/364-CIVP 2/19/92

APCo Exhibit 10

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

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OFFICE OF SECRETARY
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MAY 27 1981

Docket No.: 50-364

MEMORANDUM FOR: Z. R. Rosztoczy, Chief
Equipment Qualification Branch
Division of Engineering

FROM: Frank Ashe
Equipment Qualification Branch
Division of Engineering

Joel Page
Equipment Qualification Branch
Division of Engineering

William Booth
Equipment Qualification Branch
Division of Engineering

Marylee Slosson
Equipment Qualification Branch
Division of Engineering

THRU: Philip A. DiBenedetto, Section Leader
Equipment Qualification Branch
Division of Engineering

SUBJECT: TRIP REPORT - AUDIT OF ALABAMA POWER COMPANY'S TEST DATA AND/OR DOCUMENTATION CONCERNING ENVIRONMENTAL QUALIFICATION OF ELECTRICAL EQUIPMENT PER NUREG-0588 FOR FARLEY 2 NUCLEAR STATION

Plant Name:	Farley 2
Docket No.:	50-364
Licensing Stage:	Full Power License
Responsible Branch:	Licensing Branch 2
Project Manager:	L. Kintner
Requested Completion Date:	N/A
Review Status:	Continuing

On September 22-24, 1980, staff members from EQB and QAB visited the Farley 2 Nuclear Power Plant in Dothan, Alabama, for the purpose of auditing the applicant's environmental qualification documentation and/or test data for safety-related electrical equipment. A list of attendees is provided in Enclosure 1.

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NUCLEAR REGULATORY COMMISSION

Docket No 50-348/364-CIP Official Exh. No. 10

In the matter of Alabama Power Company

Staff ✓ IDENTIFIED 11:16 a.m. on 2/11

Applicant _____ RECEIVED 3:15 p.m. 2/19/92

Intervenor _____ REJECTED _____

Cont'g Off'r _____ DATE 2/19/92

Contractor _____ WITNESS _____

Other _____

Reporter _____

The applicant's NUREG-0588 review procedure was found deficient in the area of the service conditions in that no checks were made to determine if they were established in accordance with the methodology as outlined in NUREG-0588.

The applicant identified two types of electrical equipment items (98 components), limit switches and solenoid valves, as not being adequately environmentally qualified and to be replaced. These two items are explicitly identified in the enclosed Tables 1 and 2. We found their statements for action on these items too general. They agreed to provide more positive statements concerning actions to be completed. The statements would include completion of necessary design changes and purchase orders for the associated environmentally qualified replacement items. Justification for interim use of these items was based primarily on analyses of their functional requirements supplemented by preliminary test data and certificates of conformance. It was noted that this replacement program must be completed prior to June 30, 1982; however, the applicant stated that they could not provide an exact date for the replacement of each of these items due to factors outside of their control.

The documentation supporting the environmental qualification of the audited items was found satisfactory except in two cases. In one case, the applicant will ask for clarification from the manufacturer. In the other, they will supply us with the test results when they become available. Details regarding the environmental qualification documentation and/or test data for the remaining items audited are provided in Enclosure 2. The applicant agreed to submit additional information for each of the above two cases.

At the conclusion of the audit an exit interview was held with APCO management to state the preliminary findings of the staff. The following items were identified by the staff.

1. Each item identified in the Environmental Qualification Submittal, provided in response to NUREG-0588, has been walked down in the plant by the applicant.

2. Service conditions were not checked to determine if these conditions were established in accordance with the methodology as outlined in NUREG-0588. Verification of this item is needed.

3. All test reports were reviewed and found acceptable by the applicant, for both NSSS & BOP Items, with comments as noted in Section D of the Environmental Qualification Submittal.

4. The applicant is to document more positive actions concerning items to be replaced, to include statements regarding purchase orders as applicable and remove statements implying continued search for environmental qualification test data and/or documentation.

5. The applicant is to provide typical certificates of conformance and to verify that they have certificates of conformance for all open items as identified in the Environmental Qualification Submittal.

6. Three areas of concern were noted regarding the available documentation for the Limitorque motor operated valves.

   a. No information concerning aging of the actuator (motor stator excluded) was documented. completed

   b. It appears that separate effects testing was used to environmentally qualify the Reliance motors. No action

   c. Information was not available concerning the completed environmental qualification of the Peerless motors.

7. Final test results, including verification of similarity, are needed to verify that the Gems level transmitters are adequately environmentally qualified. completed

8. There was not evidence available within the allotted time to show that hardware found to be unacceptable during "bench testing" (and perhaps during pre-fuel load tests) is entered into the non-conformance system. That is, it appears the item was returned to the supplier outside the APCO/Bechtel non-conformance control program. completed

9. On the basis of a Total Plant Number System (TPNS) number, a procurement cycle was traced. Later we found that the item being traced had been returned to the supplier, repaired, returned to APCO, and stored as a spare. A different serial numbered part was given the same TPNS number and installed in the plant with QA not knowing that a change had been made. Both parts have the same model number and were apparently interchangeable. completed

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Division of Engineering

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Joel Page
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Marlee Slosson
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cc w/enclosures:

W. Johnston	M. Slosson
V. Thomas	P. DiBenedetto
W. Haass	F. Ashe
J. Spraul	J. Page
L. Kintner	APCO Attendees

TABLE 1

EQUIPMENT INSIDE CONTAINMENT LACKING
ENVIRONMENTAL QUALIFICATION

Equipment Description	Function	Number of Physical Items	Environmental Qualification Status Information
Solenoid Valve	[illegible] ve	1	Certificate of Conformance
Solenoid Valve	[illegible]	2	Certificate of Conformance
Solenoid Valve	[illegible]	1	Certificate of Conformance
Solenoid Valve	[illegible]	2	Certificate of Conformance
Solenoid Valve	[illegible]	12	Certificate of Conformance
	TOTAL: SOLENOID VALVES	18	

TABLE 2

0050094

EQUIPMENT OUTSIDE CONTAINMENT LACKING ENVIRONMENTAL QUALIFICATION

Equipment Description	Function	Number of Physical Items	Environmental Qualification Status Information
Solenoid Valve	Actuate Air-Operated Valve for Isolation	6	See Note Below
Solenoid Valve		6	Certificate of Conformance
Solenoid Valve		6	Certificate of Conformance
Solenoid Valve		6	Certificate of Conformance
Solenoid Valve		8	Certificate of Conformance
Solenoid Valve		2	Certificate of Conformance
Solenoid Valve		6	Certificate of Conformance
Solenoid Valve		3	Certificate of Conformance
	TOTAL: SOLENOID VALVES	43	
Limit Switch	Valve Position Indicator	23	Certificate of Conformance
Limit Switch		3	Certificate of Conformance
Limit Switch		3	Certificate of Conformance
Limit Switch		3	Certificate of Conformance
	TOTAL: LIMIT SWITCHES	37	

NOTE: None available. Vendor has been requested to furnish a copy of the Certificate of Conformance.

Enclosure 1

0050095

List of Attendees Present For The Farley Unit Number 2 Audit Of Environmental Qualification Documents

Name	Organization
* Ron George	APCO
W.C. Ramsey	SCS
T. L. Crawley	APCO
G.H. Langford	Bechtel
N.J. Santoro	SCS
R.E. Hollands	APCO
Joel Page	NRC-EQB
Jack Spraul	NRC-QAB
Marylee Slosson	NRC-QAB
Frank Ashe	NRC-EQB
William Booth	NRC-EQB
* Jimmie P. Mulkey	NRC-Resident
* William Bradford	NRC-Senior Resident
Carl Faust	Westinghouse

* Present Only For Exit Interview Held on September 24, 1980.

Enclosure 2

0050096

Information Concerning the Environmental Qualification Documentation and/or Test Data for the Electrical Equipment Items Audited.

Item 1: Valve Operator - Limitorque

This component is used in the feedwater system for isolation purposes. The bounding environment for this item as identified is caused by a double ended main steam line break with associated temperature (308°F) and pressure (20.5 psia). The operating time required for this item as indicated is ten seconds.

The qualification sheet for this component indicates this type item has been subjected to environmental conditions in excess of the above with satisfactory results. However, based on our audit of the available test documentation three areas of concern were noted: (a) no information was available concerning aging of the actuator motor (stator excluded), (b) it appeared that separate effects testing was used to environmentally qualify the reliance motors and (c) complete environmental qualification documentation was not available for the peerless motors. These items should be addressed.

With the exception of the above items our audit of the referenced environmental qualification documentation concluded that this documentation provides supporting information for the environmental qualification of this equipment for the specified service environments.

Item 2: Instrument Cable - Boston Insulated Wire

These cables are associated with electrical instrumentation that is part of the reactor coolant system pressurizer. Bounding environmental conditions for these cables are identified as being caused by the loss of coolant accident with associated temperature (300°F), pressure (62.2 psia), chemical addition

(concentration not explicitly stated), relative humidity (100%) and radiation (5×10^7 Rads). The indicated required operating time for this item is four hours.

The audit of the reference environmental qualification documentation verified that a sample of this cable was exposed to compatible environmental conditions as those stated above with satisfactory results. It was noted that the sample was tested in an energized state and that the $10^{o}C$ rule was used to address aging. No required chemical concentration is identified, therefore, this parameter could not be verified. In this regard, the applicant should state the required chemical concentration. With the exception of the above item our audit of the referenced environmental qualification documentation concluded that it provides supporting information for the environmental qualification of this item for the specified service environment.

Item 3: Terminal Block With NEMA 4 Enclosure - States Company

These blocks are used for electrical conductor terminations associated with the reactor coolant instrumentation system. Limiting environmental conditions are caused by the loss of coolant accident with associated temperature ($300^{o}F$), pressure (62.2 psia), relative humidity (100%), chemical addition (concentration not explicitly stated) and radiation (5×10^7 Rads). The required operating time for this item is indicated as four hours.

The audit of the reference environmental qualification documentation verified that this type item was subjected to compatible environmental conditions to those identified above with satisfactory results. No required chemical concentration is identified, therefore, this parameter could not be verified. In this regard, the applicant should state the required chemical concentration.

With the exception of the above item our audit of the referenced documentation concluded that it provides supporting information for the environmental qualification of this item for the specified service environment.

Item 4: Limit Switch - NAMCo

These switches are used for valve position indication. The bounding environmental service conditions are identified as those resulting from the loss of coolant accident with associated temperature (300°F), pressure (62.2 psia), relative humidity (100%), chemical addition (concentration not explicitly stated) and radiation (5×10^7 Rads). The required operating time for this item is identified as thirty seconds.

The audit of the reference environmental qualification documentation verified that this type item was exposed to compatible environmental conditions as those stated above with satisfactory results. It was noted that the sample was tested in an energized state and that the 10°C rule was used to address aging. No required chemical concentration is identified, therefore, this parameter could not be verified. In this regard, the applicant should state the required chemical concentration. With the exception of the above item our audit of the referenced environmental qualification documentation concluded that it provides supporting information for the environmental qualification of this item for the specified service environment.

Item 5: Level Transmitters - Gems

This item is used to monitor fluid level in the containment following a loss of coolant accident. The limiting environmental parameters are identified as temperature (300°F), pressure (62.2 psia), relative humidity (100%), chemical addition (concentration not explicitly stated) and radiation (5×10^7 Rads.). The required operating time for this item is indicated as four hours.

The referenced documentation included a test report, correspondence and a test plan. Information presented in the test report and the correspondence indicated that this equipment had not been subjected to the environmental conditions required by the specifications (as stated above). In addition, the tested component was not subjected to the effects of borated water spray and pressure simultaneously. Further, the required concentration of chemical addition is not identified.

Additional testing for a similar transmitter is planned for the near future in accordance with the requirements of IEEE-323-1974. The test plan is listed in the submittal; however, this testing will be performed on a component which has been modified. Documentation should be provided addressing the similarity of the as-installed units with the unit to be tested. This item remains a concern.

Item 6: Electrical Penetrations (Low Voltage) - General Electric

This item is used in the Farley 2 design as containment boundary electrical penetrations. The bounding environmental conditions as identified are caused by a loss of coolant accident with associated temperature (300^{0}F), pressure (62.2 psia), relative humidity (100%), chemical addition (concentration not explicitly stated) and radiation (5×10^{7} Rads.). The required operating time (electrical integrity) is identified as four hours.

The referenced documentation indicated that cabling of this type had been subjected to environmental conditions which met or exceeded those specified. Electrical integrity was not verified during or following the LOCA exposure. Only pressure integrity was verified. Additional supporting documentation is required to verify both electrical and mechanical integrity of these components. Also, the required chemical concentration should be identified.