

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Region I

Report No. 50-334/78-23

Docket No. 50-334

License No. DPR-66 Priority -- Category C

Licensee: Duquesne Light Company

435 Sixth Avenue

Pittsburgh, Pennsylvania 15219

Facility Name: Beaver Valley Power Station, Unit No. 1

Inspection at: Corporate Office, Pittsburgh, Pennsylvania

Inspection conducted: September 6, 1978

Inspectors: William J. Raymond 10/2/78
W. J. Raymond, Reactor Inspector date signed

date signed

date signed

Approved by: R. R. Keating 10/3/78
R. R. Keating, Chief, Reactor Projects date signed
Section No. 1, ROINS Branch

Inspection Summary:

Inspection on September 6, 1978 (Report No. 50-334/78-23)
Areas Inspected: Routine, announced inspection by a regional based in-
spector of licensee reviews and corrective actions in regard to environ-
mental qualification for electrical components, identified in IEC 78-08.
The inspection involved five inspector hours by one NRC regional based
inspector.
Results: No items of noncompliance were identified.

DETAILS

1. Persons Contacted

Duquesne Light Company

- *Mr. R. Burski, Senior Engineer
- *Mr. M. Siegel, Senior Project Engineer

Stone and Webster Corporation

- *Mr. R. Bealey, Engineer
- Mr. L. Fosse, Engineer
- Mr. H. Mooncai, Lead Electrical Engineer

*denotes those present at the exit interview.

2. Inspection Purpose

An interview was held with licensee personnel at the start of the inspection on September 6, 1978, to explain that the purpose of the inspection was to review the actions taken by the licensee in regard to Inspection and Enforcement Circular 78-08, "Environmental Qualification of Safety Related Electrical Equipment at Nuclear Power Plants", dated May 31, 1978.

3. Inspection Scope

The areas reviewed during this inspection consisted of those items listed in IEC 78-08, involving problems that have been identified in demonstrating environmental qualification of safety related plant components. The following items were addressed:

- a. whether a specific licensee individual has been assigned responsibility for reviewing identified problems and documentation referenced in IEC 78-08;
- b. whether a comparison has been made between the plant specific circumstances at the Beaver Valley Power Station and problems identified by IEC 78-08;

- c. what actions have been taken by the licensee in regard to the subject review, the status of any corrective actions planned or taken, and the schedule for finishing the review of any areas not yet complete;
- d. a sampling review of documentation which supports the environmental qualification of electrical components, including electrical connectors, containment electrical penetrations, terminal blocks, cables and cable splices, transmitters and valves.

Except as noted in Paragraph 5 below, no inadequacies were identified during this review.

4. References

Documentation used during this review is listed below. Material listed under items (d) through (p) were used only to the extent necessary to verify documentation existed to support electrical component qualification and to audit the licensee's plans and methodology for addressing concerns identified by IEC 78-08.

- a. IEC 78-08, Environmental Qualification of Safety-Related Electrical Equipment at Nuclear Power Plants, May 31, 1978, including fourteen separate references addressed in the circular;
- b. DLC responses to IE Bulletins 77-05, 77-05A, 77-06, 78-02 and 78-04, dated December 9, 1977, December 5, 1977, February 10, 1978 and March 22, 1978, respectively;
- c. NRC:Region I Inspection Report 50-334/78-10, detail 6;
- d. BVPS Specification No. BVS-384 for penetrations including test reports showing penetration certificates of compliance provided by Viking Industries;
- e. Specification BVS-403 for motor operated valves, including qualification type test reports for Limatorque valve actuators tested to IEEE Standard 282-1972, dated June - November, 1974; Addendum to Environmental Qualification Test Data for Class IE Electric Motor Actuators, dated September 16, 1977; and, Lockheed Electric Motor Company, Inc. Report of Tests on Limatorque Valve Operator Size SNB000-2/HOBC, dated May 3, 1972;

- f. Specification BVS-547 for motor operated dampers, including final report of seismic analysis of 18" and 42" butterfly valve assemblies, dated September 26, 1973;
- g. Specification 574 for inside recirculation spray pumps, including Report of Vibration Test on Electric Motors 5K6319x J1B, dated November 1972; Seismic Qualification of IRS Pump Motors, dated April 15, 1975; Bingham Willamette Certificate of Compliance to Specification 574, dated August 29, 1975; and, Franklin Institute Final Report F-C2909, Qualification Test of Prototype Vertical Indication Motor - Containment Recirculation Spray Pump;
- h. Specification 584 for coaxial cable, including Raychem certificate of Compliance for Purchase Order BV-711, dated March 27, 1974;
- i. DLC-BVPS 1 Zone 1 (Containment) Physical Location of Safety Related Equipment;
- j. DLC-BVPS 1 Zone 1 Containment Wiring - Safety Related Equipment;
- k. Work List of Equipment Types for Zones 1 through 4 showing governing BVPS specification, certificate of compliance, governing qualification test requirement (environmental, radiation, seismic) and status for demonstrating conformance to the governing requirement;
- l. Key to Zones and One Line Diagrams for Safety Related Equipment; Zone 1 - Containment, Zone 2 - Main Steam Line Areas, Zone 3 - Control Areas, Zone 4 - Safeguard Area;
- m. BVPS 1 System Identification and Cable Schedule for Zone 1;
- n. BVPS 1 Motor list, Bill of Material and Safety Related Cables for Zone 1;
- o. Material and Equipment Monitoring System (computer printout) providing a listing of equipment between containment elevations 692' and 698' that may be subject to flooding;
- p. Internal S&W Memorandum dated September 15, 1978 showing terminal board instrumentation below LOCA flood level 698' 2" for BVPS 1.

5. Findings

a. Review of Component Environmental Qualification

An extensive and comprehensive review to reverify satisfactory environmental qualification of BVI electrical components has been initiated by the licensee's offsite engineering group, in response to IEC 78-08. A senior project engineer in the Engineering Department is responsible for completion of the project, which is being conducted in conjunction with the licensee's A/E. All of the fourteen references listed in IEC 78-08 have been reviewed for relevance to the BV specific circumstances. No new information from IEC 78-08 has been identified that would warrant corrective actions by the licensee.

The approach taken by the licensee in this review was to first identify the areas within the plant that would be subject to adverse environmental conditions under postulated accident sequences. The following four plant zones were designated for the purpose of the review: Zone 1 - Containment; Zone 2 - Main Steam Line Areas; Zone 3 - Control Areas; and Zone 4 - Safeguard Areas. The next step in the review involves identifying safety related components/circuits in each zone and then determining the physical location of each component in the zone. Lastly, documentation is assembled to demonstrate qualification of each component for the environmental condition it would be subjected to in the respective plant zones. Using this method, the inspector reviewed portions of the low head safety injection system with licensee representatives, and verified the appropriate qualification documentation existed. The licensee's review of Zone 1 is essentially complete; no inadequacies have been identified. The reviews for Zones 2 through 4 is scheduled to be completed by the end of December, 1978.

The inspector had no further questions on the licensee's methodology for accomplishing the review, but stated that this area would be re-examined during subsequent inspection pending completion of the review for all plant Zones. (50-334/78-23-01).

b. Incorporation of Design Changes

During discussions with the licensee regarding the review methodology, it was noted that design changes and modifications of plant systems should be incorporated in the review. The licensee stated that design changes would be incorporated in the review to assure that all safety related circuits are appropriately evaluated. This item will be reexamined during a subsequent inspection. (50-334/78-23-02).

c. Qualification of Valve Limit Switches

The licensee's response to IEB 78-04 on March 22, 1978, identified 21 air operated and 15 motor operated valves installed on safety related equipment in containment which use NAMCO Model D2400X Snap Lock Switches. The stem mounted limit switches (SMLS) function to provide "latch in" capability to the valve actuation control circuitry on the air operated valves (AOVs) only. The switches serve to provide annunciation only on the motor operated valves (MOVs). The licensee provided a valve listing for inspector review. The inspector noted that the affected AOVs were all containment isolation valves in the component cooling, charging, safety inspection, containment vacuum and leakage monitoring systems. None of the valves are in a line providing direct injection of ECCS water. Of the affected MOVs, valves SI 865A, 865B, 865C and 890C are in a primary injection path for ECCS water, but the valves are administratively kept open and deenergized during power operation.

The licensee has elected to replace all the subject switches with seismically and environmentally qualified switches, NAMCO Model EA-180. The switches have not yet been replaced due to delays in obtaining the replacements from the switch vendor. The licensee stated that procurement efforts would be expedited to obtain the replacement switches in time to upgrade the existing valves during the current maintenance outage (the plant has been in cold shutdown since July 30, 1978). The inspector stated that this item would be unresolved pending completion of the licensee's actions in this area and subsequent review by NRC:Region I. (50-334/78-23-03)

The inspector noted during discussions with licensee personnel that the onsite safety committee (OSC) review of this item was incomplete in that justification for plant operation with the unqualified switches had not been addressed, nor had alternate solutions to correct the problem been evaluated, should replacement of the existing switches not be possible during the present outage. The licensee stated this item would be reviewed during the next regularly scheduled OSC meeting. The inspector stated that this item was unresolved pending subsequent review of the licensee's actions in this area. (50-334/78-23-04).

d. Additional Qualification Documentation

Qualification documentation for the following equipment was not available for review during this inspection: signal transmitters used in containment; cables employed in safety related circuits inside containment, and, equipment in containment that would be subjected to LOCA flood conditions. The licensee stated that most of the qualification documentation is being obtained from the NSSS vendor, who will supply a listing of topical reports which address the subject equipment. The inspector reviewed with licensee representatives a listing of plant equipment below containment elevation 698'. The equipment involved, associated with the component cooling, sump level, RCS and feedwater systems, were deemed not to be required during the post-LOCA period. The licensee stated that further review of this area would be completed to reverify that no equipment subject to flooding conditions would adversely affect the plant capability to respond to an accident.

The inspector stated that this item would be further examined during a subsequent inspection. (50-334/78-23-05).

6. Unresolved Items

Unresolved items are those items for which more information is required to determine if the items are acceptable or items of noncompliance. Unresolved items are identified in Paragraph 5 of this report.

7. Exit Interview

A management meeting was held with licensee personnel (denoted in Paragraph 1) at the conclusion of the inspection on September 6, 1978. The purpose, scope and findings of this inspection were discussed as they appear in this report.