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DMB 016

Docket Nos. 50-277
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Mr. Edward G. Bauer, Jr.
Vice President and General Counsel
Philadelphia Electric Company
2301 Market Street
Philadelphia, Pennsylvania 19101

Dear Mr. Bauer:

SUBJECT: NUREG-0737, ITEM II.K.3.28, VERIFY QUALIFICATION OF ACCUMULATORS
ON AUTOMATIC DEPRESSURIZATION SYSTEM VALVES

Re: Peach Bottom Atomic Power Station, Units 2 and 3

The staff in concert with its technical assistance contractor, Brookhaven National Laboratory (BNL), has completed its review of the appropriate documentation with regard to TMI Action Item II.K.3.28, Verify Qualification of Accumulators on Automatic Depressurization System (ADS) Valves.

The enclosed Safety Evaluation Report was prepared by BNL and the NRC staff concurs with the conclusion reached in this evaluation; namely, that the Philadelphia Electric Company (the licensee) has verified qualification of the accumulators on the ADS valves as specified in NUREG-0737.

Therefore, this completes our review of NUREG-0737, Item II.K.3.28 for the Peach Bottom facility.

Sincerely,

"ORIGINAL SIGNED BY:"

George W. Rivenbark, Acting Chief
Operating Reactors Branch #4
Division of Licensing

Enclosure:
Safety Evaluation Report

cc w/enclosure:
See next page

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Philadelphia Electric Company

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SAFETY EVALUATION REPORT

PEACH BOTTOM UNITS 2 AND 3
DOCKET NOS. 50-277 AND 50-278

MULTI-PLANT ACTION F-55 VERIFY QUALIFICATION OF ACCUMULATOR ON ADS VALVES

1.0 Background

Safety analysis reports claim that air or nitrogen accumulators for the automatic depressurization system (ADS) valves are provided with sufficient capacity to cycle the valves open five times at design pressures. GE has also stated that the emergency core cooling (ECC) systems are designed to withstand a hostile environment and still perform their function for 100 days following an accident. Licensees and applicants must demonstrate that the ADS valves, accumulators, and associated equipment and instrumentation meet the requirements specified in the plant's FSAR and are capable of performing their functions during and following exposure to hostile environments, taking no credit for non-safety-related equipment or instrumentation. Additionally, air (or nitrogen) leakage through valves must be accounted for in order to assure that enough inventory of compressed air is available to cycle the ADS valves. If this cannot be demonstrated, it must be shown that the accumulator design is still acceptable.

The commitment to satisfy the requirement of TMI action item II.K.3.28 for Peach Bottom Units 2 and 3 is discussed in the licensee's initial submittal dated January 18, 1980 and their response to the request for additional information dated June 2, 1983, with enclosed surveillance test procedures.

2.0 Discussion

The following description is taken from the licensee's letter of June 2, 1983.

Each of the ADS valves is provided with a separate, safety grade pneumatic supply consisting of an accumulator, an isolation check valve, piping, a solenoid valve, tubing, and the SRV actuator diaphragm.

The ADS accumulators are normally supplied from the Instrument Nitrogen System. This system consists of two trains of instrument gas compressors, filters, dryers, receiver tanks, and associated piping, valves, and controls. Suction is taken from the drywell atmosphere and 80 to 105 psig compressed gas is supplied to the "A" and "B" drywell instrument Nitrogen headers. Each ADS accumulator is supplied from both instrument nitrogen headers. In the event of low pressure in the Instrument Nitrogen System receiver tanks, an alarm is annunciated in the control room and the station Instrument Air System is automatically connected as a backup.

A safety grade backup pneumatic supply is also installed and will provide the ADS accumulators with a safety-grade gas supply to assure ADS SRV operability for a period of at least 100 days following an accident. This pneumatic supply also provides a backup to the ADS accumulators in their fulfillment of the short-term requirements.

Two headers are installed inside containment with three (3) ADS SRV accumulators connected to one (1) header and the remaining two (2) ADS SRV accumulators connected to the other header. The source of the safety grade pneumatic pressure is a series of three (3) nitrogen cylinders located within the reactor building. A connection is provided outside the reactor building for the installation of additional nitrogen cylinders, as required.

3.0 Demonstration of Qualification

The licensee's letter of June 2, 1983 states that the accumulators alone have the capability to cycle the ADS valves at least five times at atmospheric pressure and at least twice at 70% of maximum internal drywell pressure. The allowable leakage is 22 cc per second, and margin is provided in the analysis (approximately 50%) for possible increase in leakage due to seismic effects and/or harsh environment. No credit is taken for non-safety equipment.

Periodic leak tests of the ADS accumulator systems are accomplished once every refueling cycle according to documented test procedure (ST 30.131). A safety grade backup system, consisting of two headers, each supplied by three nitrogen cylinders is located within the reactor building. A connection is provided outside of the reactor building to allow for the addition of other nitrogen cylinders as necessary to give the system 100 day capability. Pressure and flow indication for the backup system are provided in the control room.

Backup system testing is performed as part of the primary containment leak rate testing program (ST 20.129) and daily monitoring of nitrogen bottle pressure is performed by operation personnel.

Presently, Peach Bottom Technical Specifications do not address ADS leak test frequency or allowable leakage rates. The licensee is a member of the BWR's owners group which will determine the Technical Specification requirements after NRC staff review is completed.

The ADS accumulators have been modified to meet seismic design requirements and the backup nitrogen supply system is safety grade and installed in accordance with seismic design criteria. All electrical equipment, instrumentation, and controls associated with the ADS accumulators and backup supply have been environmentally qualified for the locations in which they are installed. The entire ADS supply system was designed and installed to perform during and following an accident without taking credit for non-safety related equipment or instrumentation.

4.0 Evaluation

4.1 The licensee defines and verifies the number of times the ADS valves are capable of cycling using only the accumulator and the length of time these accumulators are capable of performing their function following an accident. The staff finds this acceptable.

4.2 The licensee has defined the allowable leakage criteria, and included additional margin in the criteria to account for a harsh environment and/or seismic event. The staff finds this acceptable.

4.3 To assure emergency supply of air for the required number and duration of valve actuations, the licensee has committed to performing periodic leak testing. A concise description of the backup system alarms and instrumentation associated with the ADS, alarm surveillance program and the test performed on the backup system, was included in the licensee's submittals. The staff has reviewed these and finds them acceptable.

4.4 The Peach Bottom units have been in operation since 1974 and the Technical Specifications were not required to define ADS requirements. The present use of surveillance test and calibration procedures, however, documents the plants monitoring practices for the ADS and its backup system.

4.5 The licensee has provided statements acceptable to the staff confirming the following:

1. That the ADS valves, accumulators, and piping out to and including the accumulator system isolation check valve, and the backup system are seismically and environmentally qualified.
2. That the accumulators, associated equipment and instrumentation are capable of performing their function during and following an accident situation, while taking no credit for non-safety related equipment and instrumentation.

5.0 Conclusion

The staff concludes that the licensee has verified qualification of accumulators for the ADS valves.

NRC principal contributor: R. Wright

Dated: May 1, 1984