

November 14, 1984

*DLR 076*

Docket Nos. 50-317  
and 50-318

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Mr. A. E. Lundvall, Jr.  
Vice President - Supply  
Baltimore Gas & Electric Company  
P.O. Box 1475  
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Dear Mr. Lundvall:

We have completed our review concerning the 48-Hour Auxiliary Feedwater Pump (AFP) endurance tests for Calvert Cliffs Units 1 and 2 which were conducted in accordance with TMI Action Item II.E.1.1 (Additional Short Term Recommendation 2). The results from performance of these tests were transmitted by your letters dated January 26, and June 23, 1981, and January 21 and September 23, 1983.

Enclosure 1 contains our Safety Evaluation concerning the tests for AFP 12, 21, and 22. Enclosure 2 contains our Safety Evaluation concerning the tests for AFP 13 and 23. Our acceptance of the test results from AFP 11 was contained in our letter dated May 8, 1981. Based upon our review of these tests, we conclude that the tests were successfully conducted in accordance with the recommendations of Additional Short Term Recommendation 2 and that the results are acceptable.

Sincerely,

James R. Miller, Chief  
Operating Reactors Branch #3  
Division of Licensing

Enclosures:  
As stated

cc w/enclosures:  
See next page

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

ENCLOSURE 1

SAFETY EVALUATION  
CALVERT CLIFFS NUCLEAR POWER PLANT  
ADDITIONAL SHORT TERM RECOMMENDATION 2  
FOR AUXILIARY FEEDWATER SYSTEMS  
AFW PUMPS 12, 21 AND 22

Reference: Letter from R. F. Ash, BG&E to R. A. Clark, NRC/NRR, dated June 23, 1981

Additional Short Term Recommendation 2 - The licensee should perform a 48-hour endurance test on all AFW systems pumps, if such a test or continuous period of operation has not been accomplished to date. Following the 48-hour pump run, the pumps should be shut down and cooled down and then restarted and run for one hour. Test acceptance criteria should include demonstrating that the pumps remain within design limits with respect to bearing/bearing oil temperatures and vibration and that pump room ambient conditions (temperature, humidity) do not exceed environmental qualification limits for safety-related equipment in the room.

The licensee should provide a summary of the conditions and results of the tests. The summary should include the following: 1) a brief description of the test method (including flow schematic diagram) and how the test was instrumented (i.e., where and how bearing temperatures were measured). 2) A discussion of how the test conditions (pump flow, head, speed and steam temperature) compare to design operating conditions. 3) Plots of bearing/bearing oil temperature vs. time for each bearing of each AFW pump/driver demonstrating that temperature design limits were not exceeded. 4) A plot of pump room ambient temperature and humidity vs. time demonstrating that the pump room ambient conditions do not exceed environmental qualifications limits for safety-related equipment in the room. 5) A statement confirming that the pump vibration did not exceed allowable limits during tests.

Evaluation

In the reference letter the licensee provided a schematic diagram indicating how the endurance tests for auxiliary feedwater pumps 12, 21 and 22 were conducted and instrumented. Plots of bearing temperature versus time for pumps and the turbines were provided. The pump bearing temperatures and turbine bearing oil temperatures were within the manufacturer's temperature design limits. Plots of pump room ambient temperature and humidity versus time were provided. For these tests the pump room ambient conditions did not exceed the environmental qualification limits for safety-related equipment in the room. The pump vibration measurements taken during these tests did not exceed the allowable vibration limits. Based upon conformance of the test results with the acceptance criteria stated in the recommendation, the staff concludes that the licensee's response to this recommendation is acceptable.



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

ENCLOSURE 2

SAFETY EVALUATION  
CALVERT CLIFFS NUCLEAR POWER PLANT, UNITS 1 AND 2  
ADDITIONAL SHORT TERM RECOMMENDATION 2  
AUXILIARY FEEDWATER (AFW) SYSTEM  
AFW PUMPS 13 AND 23

TMI Task Action Plan (NUREG-0737), Item II.E.1.1, recommends that an endurance test be performed on the auxiliary feedwater system pumps by running them for 48-hours, and that the results of the test be provided for staff evaluation. Following the 48-hour pump run, the pumps should be shut down and cooled down and then restarted and run for one hour. Test acceptance criteria should include demonstrating that the pumps remain within design limits with respect to bearing/bearing oil temperatures and vibration and that pump room ambient conditions (temperature, humidity) do not exceed environmental qualification limits for safety-related equipment in the room.

A summary of the conditions and results of the tests shall be provided to the staff. The summary should include the following: 1) A brief description of the test method (including flow schematic diagram) and how the test was instrumented (i.e., where and how bearing temperatures were measured); 2) A discussion of how the test conditions (pump flow, head, speed and steam temperature) compare to design operating conditions. 3) Plots of bearing/bearing oil temperature vs. time for each bearing of each AFW pump/driver demonstrating that temperature design limits were not exceeded. 4) A plot of pump room ambient temperature and humidity vs. time demonstrating that the pump room ambient conditions do not exceed environmental qualification limits for safety-related equipment in the room; 5) A statement confirming that the pump vibration did not exceed allowable limits during tests.

Evaluation

By letters dated January 21 and September 23, 1983, the licensee provided the following information and results for the 48-hour endurance test of the motor driven AFW pumps (Nos. 13 and 23):

1. Schematic diagrams indicating how the endurance tests for AFW pumps were conducted and instrumented were provided.
2. A comparison between the test conditions and the design operating conditions for pump flowrate and discharge pressure was provided which showed that the percent differences are well within design requirements.
3. Plots of bearing oil temperature versus time for the AFW pumps were provided and demonstrated that temperatures were within the manufacturer's temperature design limits.

4. Plots of pump room ambient temperature and humidity versus time were provided showing that the pump room ambient conditions did not exceed the environmental qualification limits for safety-related equipment in the room.
5. The pump vibration measurements taken during these tests did not exceed allowable vibration limits.

Based on conformance of the above test results with the acceptance criteria stated in the recommendation of NUREG-0737, Item II.E.1.1, we conclude that the licensee's response to this recommendation is acceptable.