



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 78

TO FACILITY OPERATING LICENSE NO. DPR-69

BALTIMORE GAS AND ELECTRIC COMPANY

CALVERT CLIFFS NUCLEAR POWER PLANT UNIT NO. 2

DOCKET NO. 50-318

Introduction

By application for license amendment dated April 9, 1984, Baltimore Gas and Electric Company (BG&E) requested changes to the Technical Specifications (TS) for Calvert Cliffs Unit 2. The proposed changes would provide revised Limiting Conditions for Operation (LCO) and Surveillance Requirements for the Auxiliary Feedwater System (TS 3/4.7.1.2). The April 9, 1984 application was supplemented by BG&E's letter dated May 4, 1984.

Discussion and Evaluation

The Calvert Cliffs Unit 2 AFW system has three 100% capacity AFW pumps*, two of which are driven by steam turbines. The third AFW pump is driven with an electric motor that can be supplied by the backup on-site AC power source upon loss of off-site power. In addition, the motor driven AFW train can be cross connected to the Unit 1 AFW train thus providing a backup motor driven AFW pump.

BG&E has proposed several changes to the LCOs for the Auxiliary Feedwater System (TS 3.7.1.2). The first proposed change would delete a special test exception which permitted certain portions of the Auxiliary Feedwater (AFW) System to be inoperable, for testing purposes, for up to 30 days following startup from the previous refueling outage. Since the time limit for this special test exception has lapsed, it is no longer applicable and thus can be deleted without any effect on plant safety.

A second proposed change to the LCO involves specification of the maximum allowable out of service time for AFW pumps. A two-part remedial action statement (TS 3.7.1.2.a.1) is proposed for an inoperable motor-driven pump. The existing specification requires that an inoperable motor-driven pump be restored to operable status within 72 hours or be in HOT SHUTDOWN within the next 12 hours. The proposed specification would extend this period to a maximum of 7 days by

*A 100% capacity pump provides sufficient water to cool down the primary system from post-trip conditions to less than 300°F.

taking credit for the continued ability to align two steam-driven AFWS pumps to automatic initiating status. A single steam driven AFW pump would also be permitted to be inoperable for a period of up to 7 days.

In the event that any two of the three AFWS pumps were to become inoperable at the same time, a new remedial action statement (TS 3.7.1.2.b) is being added that would require the operators to verify within one hour that the remaining pump is aligned for automatic initiation and that the cross-connect between the Unit 1 and Unit 2 motor-driven trains is operable and capable of delivering AFW flow to the affected unit upon manual initiation. In addition, the operators would be required to restore a second pump to automatic initiating status within 72 hours. If these actions could not be successfully completed, the operators would be required to place the unit in hot shutdown within the following 12 hours.

The proposed LCO requires that 300% AFW capacity be maintained. This capacity could be reduced to 200% for up to 7 days should a steam driven AFW pump be inoperable. Should a motor driven AFW pump be inoperable, the AFW cross-connect could be utilized to provide a back-up AFW pump. The most limiting configuration permitted under the proposed LCO would still require the availability of 100% AFW capacity. This situation would correspond to the inoperability of both steam driven AFW pumps which would be permitted for up to 72 hours. Even under these conditions, the Unit 1 motor driven AFW pump would, most likely, still be available as a back-up via the cross connect. Thus, the proposed LCO provides sufficient assurance that a reliable AFW capacity will be maintained and thus these proposed changes to TS 3.7.1.2a and TS 3.7.1.2b are acceptable.

A change has also been proposed to TS 3.7.1.2d which currently specifies the combinations of AFW pumps which are required to be aligned for automatic initiation in order to change operational modes (for example, increase power above 5%). The present requirement states "...any combination of two (motor or steam driven) pumps..." The licensee has proposed a change in this wording to "...one motor and one steam-driven pump (or two steam-driven pumps)..." The proposed wording eliminates the possibility that a Unit 1 motor driven AFW pump could be used, via the AFW cross connection, to satisfy the requirements of Unit 2 TS 3.7.1.2d. Moreover, the proposed wording preserves the requirement that two Unit 2 AFW pumps be aligned for automatic initiation in order for Unit 2 to change operational modes. Accordingly, we find the proposed change to TS 3.7.1.2d to be acceptable.

Two changes to the Surveillance Requirements of TS 4.7.1.2 are proposed. First is the proposed deletion of the requirement to verify a 160 gpm setpoint on the controller for the automatic flow control valves (TS 4.7.1.2.c.4). The second proposed change is a clarification of TS 4.7.1.2.c for testing the automatic functions of the AFWS. The new specification would require that all automatic valves in the flow path actuate to their correct positions and each auxiliary feedwater pump automatically starts upon receipt of each AFAS test signal. Consistent with the above discussion concerning the quantity of flow automatically delivered by the AFWS, the requirement to verify a modulated flow of 160 gpm \pm 10 gpm would be deleted. To ensure that the system can deliver a minimum specified

flowrate a new requirement would be added (TS 4.7.1.2.c.2) that provides for a demonstration that 200 gpm nominal flow can be delivered to each flow leg. The purpose of this test is to ensure that no flow path degradation has occurred (e.g., obstructions in the line) during the surveillance interval. The test would be performed by manually aligning each of the flow legs and individually verifying their capability to pass 200 gpm flow.

Finally, the Bases for TS 3/4.7.1.2 would be revised to include a new nominal flow setpoint and instrument loop error band.

The transients affected by AFWS performance, and the assumptions used in the analysis of these transients, would be listed in the Basis for TS 3/4.7.1.2. Analyses have demonstrated that for the first ten minutes following the most severe under-cooling transient, no AFW flow is required for up to ten minutes, after which AFW flow can be established. Likewise, for the most severe overcooling transient, AFW flow of up to 1300 gpm (pump "run-out" flow) for up to ten minutes yields acceptable results. From these analyses, it is concluded that the AFW flow setpoint does not affect the course of transients that result in under-cooling or over-cooling of the primary system. Although the operational nominal flow setpoint of 200 gpm is discussed, it is made clear that flow fluctuations beyond the discussed band are allowable.

The new interim nominal flow setpoint does not represent a limiting safety system setting required to maintain the assumptions of the FSAR. This setting is defined only to support enhanced equipment reliability and prudent operations to ensure that the effects of the following abnormal operating events are mitigated:

1. AFAS actuation concurrent with a low steam generator backpressure condition will not result in motor-driven AFW pump runout.
2. AFAS actuation concurrent with a plant trip that does not involve an excessive cooldown transient will not result in excessive cooldown (with subsequent safety injection actuation) within the first ten minutes of assumed no operator action.

The nominal flow setpoint and associated error band will be finalized during the present Unit 2 refueling outage. Modifications are planned for the automatic flow control features of the motor-driven pump train to improve system performance during low steam generator backpressure conditions. Following completion of these modifications, testing will be performed to identify the final setpoint. The value of this setpoint will be submitted for incorporation in the TS at a later date.

Based upon the above, we conclude that the proposed Surveillance Requirements assure that the AFW system will be appropriately tested to maintain system reliability. In addition the AFW flow requirements are consistent with the transient analyses. Accordingly, we find the proposed Surveillance Requirements for TS 4.7.1.2 to be acceptable.

Environmental Consideration

A "Notice of Environmental Assessment and Finding of No Significant Impact" was published in the Federal Register on July 26, 1984 (49 FR 30145) in connection with this action.

Conclusion

We have concluded, based on the considerations discussed above, that:
(1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Date: August 20, 1984.

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