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June 5, 1996

U. S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Document Control Desk

SUBJECT: Calvert Cliffs Nuclear Power Plant
Unit Nos. 1 & 2; Docket Nos. 50-317 & 50-318
Request for Additional Information: Service Water Flow Modification to the Containment Air Coolers

REFERENCE: (a) Letter from Mr. C. H. Cruse to NRC Document Control Desk, dated May 28, 1996, Exigent License Amendment Request: Service Water Flow Modification to Containment Air Coolers

A phone call was held with the NRC on June 3, 1996, to clarify information concerning the modification we proposed in the referenced letter. Based on that phone call, we are providing the following information.

NRC Question

1. *Are the two service water (SRW) trains cross-connected during a Design Basis Event (DBE)? It appears that they are cross-connected at the suction or discharge or both.*

BGE Response

The two SRW trains are not cross-connected during a DBE. Only the No. 13(23) SRW pump can be aligned to either suction or discharge header. Numbers 11(21) and 12(22) pumps cannot be physically cross-connected. The piping was provided in the original design; however, the valves in each cross-connect line have been replaced with blanks as shown on the system drawings.

There are two parts of the system that are common to both trains, the portion of the SRW that is in the Turbine Building and the No. 13 (23) SRW pump. The Turbine Building portion of the

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piping is isolated upon receipt of a Safety Injection Actuation Signal (SIAS), eliminating the common piping from the flow path. The No. 13(23) SRW pump suction and discharge cross-connects are controlled by procedure so that the pump is only aligned to one header during normal operations. Operating Instruction-15 does allow alignment of the pump to both headers when one SRW heat exchanger is out-of-service; however, this condition requires entry into the Action Statement for Technical Specification 3.7.4.1.

NRC Question

2. *Is the third SRW pump lined up to one particular train at a time and does it automatically start and deliver flow on an SIAS?*

BGE Response

The No. 13(23) SRW pump is aligned to either the No. 11(21) or 12(22) SRW header, but not both. The No. 11(21) and 12(22) SRW pumps start automatically on a SIAS. Number 13(23) pump is a standby and can be aligned to start on a SIAS if one of the other pumps is taken out-of-service. Only two SRW pumps are credited in the design basis and accident analysis. Only one SRW pump is required to be operable on each header to meet the requirements of Technical Specification 3.7.4.1.

NRC Question

3. *Is the air supply system safety-related and redundant? What happens from loss of air to one train (all CVs* [control valve] *in one train fail open)? Does this affect the temperature of the other train (via cross-connects) and, hence, the remaining unaffected emergency diesel generator?*

BGE Response

Air supplied to the flow controllers on Valve Nos. 1(2)-CV-1581, -1584, -1589, and -1592 is from the safety-related saltwater air compressors. The saltwater air system is designed to meet the applicable safety-related design criteria, including redundancy. If one saltwater air compressor fails to operate, the other saltwater air compressor will continue to supply air to the valves. If the control valves in one train failed, the alternate train will provide adequate containment and emergency diesel generator heat removal.

NRC Question

4. *It is not clear what the difference is between the maximum flow scenario and the minimum flow scenario (not clear why and how much the initial throttled position with the flow controller is different [less flow] than with the mechanical stop). Does it have to do with assumed failure modes?*

The existing design basis considers the two extremes of potential SRW flow:

- Minimum expected SRW flow assumes SRW pumps have degraded to their low Inservice Testing action limit and the system is aligned to result in minimum flow, e.g., the 4-inch Containment Air Coolers (CAC) outlet valves are shut. In addition, the calculated flow is reduced by the uncertainty of the hydraulic model used for its determination.

- Maximum expected SRW flow assumes SRW pumps are operating at their high Inservice Testing action limit and the system is aligned to result in the highest potential flow. In addition, calculated flow is increased by the uncertainty of the hydraulic model used for its calculation.

The existing mechanical stops on the CAC SRW inlet valves are set to ensure the minimum expected SRW flow to each CAC will always be greater than 1500 gpm.

The maximum flow is used in the SRW heat exchanger calculation because it provides more limiting results. The difference between minimum and maximum expected flow is, in some cases, large due to the difference in the assumptions used for the calculation. For example, for No. 11 CAC, the expected pre-Recirculation Actuation Signal (RAS) flow is 1500 to 2081 gpm. With the proposed modification, the difference between minimum and maximum expected flow will be reduced since the controllers will maintain flow in a preset band regardless of pump condition or system line-up. However, the minimum and maximum expected SRW flows after the modification will be enveloped by the existing design basis.

NRC Question

5. *Because of Question 4, the NRC is not clear on why the cleaning interval can be extended. Is there a new maximum allowed microfouling value? What is it and how often will BGE now have to clean the heat exchangers?*

BGE Response

The design basis is being updated to reflect an SRW heat exchanger fouling resistance equal to the maximum expected equilibrium fouling level based on Baltimore Gas and Electric Company's ongoing test program using the side stream monitor. Since this new fouling level is an equilibrium value, cleaning should only be required if it is needed to meet differential

pressure limits on the heat exchanger, or if high Chesapeake Bay temperatures require a cleaner heat exchanger.

NRC Question

6. *Can the reduced flow to the CACs result in two-phase flow due to the water becoming too hot in the longer time within the cooler?*

BGE Response

No, the minimum flow rates to the CACs will be greater than that which is currently established through use of the mechanical stop for throttling the CAC SRW flow. The potential for two-phase flow was evaluated during the design of the existing system. The existing evaluation was reviewed. Flow through the cooler, and at the low pressure areas downstream, will remain subcooled throughout the planned flow control band.

NRC Question

7. *What post-modification testing is planned? Has the potential for common mode failures been adequately explored?*

BGE Response

Standard post-modification testing has been planned. We will perform a functional test of the valves to ensure that they respond correctly to a SIAS, RAS and to manual controls. In addition, stroke time testing will be done in accordance with the Inservice Testing program. Components will be calibrated, including the flow transmitter, current-to-pneumatic transducers, flow indicating controller and the solenoid valve control loop.

Standard analog circuits are used in this modification, and we do not expect common mode failures to occur based on our experience with this type of circuit in other applications.

NRC Question

8. *What environmental qualification standards are used to qualify the equipment located in a harsh environment?*

BGE Response

Title 10 CFR 50.49 is the standard used for qualifying the electrical equipment located in harsh environment associated with this modification. The flow transmitters, current-to-pneumatic transducers, solenoid valves, limit switches, new cable installations and terminations are qualified to the requirements of 10 CFR 50.49. Spare safety-related cabling was reused for a few

of the circuits between the cable spreading room and the penetration rooms. These reused spare cables are qualified to the Division of Operating Reactors Guidelines. Consistent with the provisions of 10 CFR 50.49, sound reasons for the alternate qualification criteria are provided to support the use of these cables in these harsh environment applications.

The environmental qualification provided for these electrical components is for 'Harsh Radiation only,' because these components are located outside containment and they are required to operate in response to a SIAS or RAS generated due to a DBE inside containment.

NRC Question

9. *What kind of monthly testing is performed on the valves to ensure they will perform their post-accident function?*

BGE Response

During the Engineered Safety Features Actuation Signal Automatic Actuation Logic monthly channel functional test (Technical Specification Table 4.3-2), the valves are stroked to their throttled positions. This testing will continue after the valves are modified.

NRC Question

10. *The instrumentation involved appears to meet Criterion 3 of the final policy statement regarding Technical Specifications. Therefore, we believe a Technical Specification change is necessary. Explain your reasoning for concluding that the policy statement excludes this equipment.*

BGE Response

The policy statement does not appear to exclude this equipment specifically. The valves are currently tested under Technical Specification Surveillance Requirement 4.7.4.1.b on a refueling interval basis, and Surveillance Requirement 4.3.2.1.1 on a monthly basis. After installation of this modification, the same Surveillance Requirements would apply. Because the Technical Specifications do not contain specifics about the valve numbers or flow control capabilities, a change to the Technical Specifications was not necessary.

NRC Question

11. *Are there any changes being made to the Emergency Operating Procedures (EOPs)? Are new operator actions required to mitigate a design basis accident?*

BGE Response

Only one change is anticipated to the EOPs. No new operator actions will be required pre-RAS. Post RAS, EOP-5 currently requires the operator to throttle saltwater flow as needed to maintain SRW temperature. This step will be modified to add an alternate action to allow the operator to use the flow controllers to reduce SRW flow to the CACs post-RAS when Chesapeake Bay temperatures are high. The reduced flow to each CAC will be greater than the established minimum required flow of 1900 gpm in the existing design basis.

NRC Questions

12. *Is the instrumentation purchased to Class 1E requirements? If not, please provide justification.*

BGE Response

Yes, the electrical components of this modification have been specified and are being procured as safety-related Class 1E components.

This additional information does not change the Significant Hazards Determination presented in Reference (a). Should you have further questions regarding this matter, we will be pleased to discuss them with you.

Very truly yours,

J R Lemons

for
C. H. Cruse
Vice President-Nuclear Energy

CHC/PSF/dlm

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