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Baltimore Gas and Electric Company
Calvert Cliffs Nuclear Power Plant
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BGE

May 28, 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
Exigent License Amendment Request: Service Water Flow Modification to Containment Air Coolers

REFERENCE: (a) Letter from Mr. P. E. Katz (BGE) to NRC Document Control Desk, dated February 16, 1996, "Licensee Event Report 50-317/96-001, SRW Heat Exchanger Microfouling Higher Than Assumed In Design Basis"

Pursuant to 10 CFR 50.90, the Baltimore Gas and Electric Company (BGE) hereby requests an exigent amendment to Operating License Nos. DPR-53 and DPR-69 to allow installation of a proposed modification of the Unit 1 and 2 Service Water (SRW) Systems. The proposed modification has been determined to constitute an unreviewed safety question as described in 10 CFR 50.59. We propose replacing the mechanical stops in the inlet control valves of the containment air coolers (CACs) with a variable flow controller for the inlet control valve. This change may create a noticeable increase in the probability that the inlet control valve may fail. This results in a situation where a CAC or an emergency diesel generator (EDG) may not be available to perform its safety function. While this increase in the probability of failure is offset by the increased EDG availability, these offsetting factors cannot be readily compared. We have, therefore, conservatively elected to consider this an unreviewed safety question and request, per 10 CFR 50.92(2)(c), that the NRC review and approve this modification through an amendment to our operating licenses.

In Reference (a), BGE reported that engineering analysis had determined that the SRW heat exchangers may not have been capable of meeting their intended safety function during past periods of high water temperatures in our ultimate heat sink, the Chesapeake Bay. The proposed modification is the result of our evaluation of methods to reduce the peak post-accident heat load on the SRW heat exchangers. It will replace the mechanical stops currently on the control valves which admit SRW into the CACs with variable flow controllers. By throttling the SRW to the CACs, the heat load on the SRW heat exchangers is reduced during the early phases of a design basis accident. This permits an adequate amount of heat

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removal capacity to be available to cool the EDGs. The modification will ensure that the SRW heat exchangers (and therefore equipment important to safety supported by SRW) are capable of meeting their intended safety function up to the maximum expected Chesapeake Bay water temperature.

Without the proposed modification, either the existing water temperature limits would have to be reduced or the SRW heat exchangers would have to be cleaned at intervals no longer than every 14 days. If the water temperature limits are reduced both Calvert Cliffs units would have to reduce power or shut down whenever the Chesapeake Bay water exceeds those limits. As high Chesapeake Bay water temperature usually occurs during periods of high electrical demand, reducing power at two large generating units is not an option we consider to be in the best interest of the public. However, whenever the SRW heat exchangers are being cleaned, some safety-related plant equipment is unavailable. Since increasing the cleaning frequency results in increased safety-related system unavailability, we have determined that the proposed modification is a superior resolution to the high bay water temperature issue because it will not affect the availability of safety-related systems and will allow the units to operate at full power during the summer. Additional information concerning the modification and its effect on the plant is contained in Attachment (1).

UNREVIEWED SAFETY QUESTION

We have concluded that, when installed, the proposed modification may slightly increase the probability of a malfunction of the CAC System or EDGs due to an increase in the failure probability of the modified flow control loop. Therefore, the proposed modification constitutes an unreviewed safety question. Additional information on this determination is contained in Attachment (1).

STATEMENT OF EXIGENT CIRCUMSTANCES

We request that this amendment be considered as exigent under the criteria of 10 CFR 50.91(a)(6). We could not have foreseen the need for this request prior to this time. This modification is the result of a substantial proactive effort in dealing with the concerns that we have with our SRW System. The history of our activities concerning the SRW System is given in Attachment (1). This particular modification was determined to be necessary after we obtained data from a side stream monitor that we had installed to measure the rate of microfouling in our SRW heat exchangers. The data from the side stream monitor was not analyzed and available to us until January 17, 1996. By mid-February, we had determined that the installation of flow controllers on the CAC inlet valves was necessary to offset the effects of the larger than expected microfouling. We have committed the necessary money and resources to install this modification before the summer. Design and procurement activities were done in parallel. About mid-April, the engineering was to the stage that work could begin on the safety evaluation required by 10 CFR 50.59. Refinements to the engineering continued even as the safety evaluation was being developed. On May 24, 1996, the Plant General Manager determined that an unreviewed safety question existed for this modification. This request has been submitted as soon as practical after the determination was made.

It is important for us to perform this modification on the schedule set out a number of months ago. To prevent operational and safety impacts, this modification must be installed before the hot summer

weather causes the Chesapeake Bay water temperature to exceed the SRW temperature limit. Historically, the Chesapeake Bay water temperature has approached or exceeded our current limit by the last week in June. As noted above, whenever the SRW heat exchangers are removed from service for cleaning, some safety-related equipment is rendered inoperable. It is important to minimize the amount of time we are in these more vulnerable conditions (with some safety-related equipment out-of-service). Additionally, we believe that reducing the power output from both units significantly during a time of high demand (high summer temperatures) is not in the best interest of the public.

Therefore, given the need to act quickly, and the determination that this change does not represent a significant hazard, we request that this amendment be considered under exigent circumstances as described in 10 CFR 50.91(a)(6).

SCHEDULE

In order to install the proposed modification as soon as possible, we request that this change be approved by June 15, 1996.

ASSESSMENT AND REVIEW

We have evaluated the significant hazards considerations associated with this change as required by 10 CFR 50.92, and determined that there are none (see Attachment 2 for a complete discussion). We have also determined that operation with the proposed modification would not result in any significant change in the types or significant increases in the amounts of any effluents that may be released offsite, and in no significant increases in individual or cumulative occupational radiation exposure. Therefore, the proposed amendment is eligible for categorical exclusion as set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment is needed in connection with the approval of the proposed amendment. The Plant Operations Safety Review Committee and the Offsite Safety Review Committee have reviewed this proposed change and concur that this change involves no significant hazards considerations, and operation with the proposed change will not result in an undue risk to the health and safety of the public.

Should you have questions regarding this matter, we will be pleased to discuss them with you.

Very truly yours,

[signature]

STATE OF MARYLAND :
: TO WIT :
COUNTY OF CALVERT :

I hereby certify that on the 28th day of May, 1996, before me, the subscriber, a Notary Public of the State of Maryland in and for Calvert County, personally appeared Charles H. Cruse, being duly sworn, and states that he is Vice President of the Baltimore Gas and Electric Company, a corporation of the State of Maryland; that he provides the foregoing response for the purposes therein set forth; that the statements made are true and correct to the best of his knowledge, information, and belief; and that he was authorized to provide the response on behalf of said Corporation.

WITNESS my Hand and Notarial Seal: Denise D Snuhis
Notary Public

My Commission Expires: 2/2/98
Date

CHC/PSF/dlm

Attachments: (1) Technical Information
(2) Determination of Significant Hazards

cc: D. A. Brune, Esquire
J. E. Silberg, Esquire
Director, Project Directorate I-1, NRC
A. W. Dromerick, NRC
T. T. Martin, NRC
Resident Inspector, NRC
R. I. McLean, DNR
J. H. Walter, PSC

ATTACHMENT (1)

TECHNICAL INFORMATION

Baltimore Gas and Electric Company
Calvert Cliffs Nuclear Power Plant
May 28, 1996

BACKGROUND

In our response to Generic Letter 89-13, we committed to perform testing to verify the thermal performance of our service water (SRW) heat exchangers. In late 1993, we completed thermal performance testing to verify the heat removal capability of our SRW heat exchangers in the clean condition. The results, while not conclusive, indicated the SRW heat exchangers may not have been capable of meeting their intended safety function at the most limiting design accident conditions specified in the Updated Final Safety Analysis Report. The calculated fouling of a clean SRW heat exchanger (baseline fouling), plus the associated uncertainty from the thermal performance testing, was larger than the available design margin, indicating the possibility of actual thermal performance being less than required to meet current plant design requirements. We reported the results and corrective actions surrounding this issue in Licensee Event Report 93-007 (Reference 3).

The original design calculations assumed minimum SRW flow to be the most limiting case. The SRW heat exchangers are sized based on these calculations. Current calculations recognize that assuming maximum SRW design flow rate to the containment air coolers (CACs) during a combined loss-of-offsite power/loss-of-coolant accident (LOCA) results in heat being transferred from containment to the SRW System at a faster rate than assumed. This causes higher post-accident SRW temperatures than previously calculated, which reduces the amount of heat removal capacity for the EDGs and challenges the ability of the EDGs to perform their design function. Because the resulting SRW heat exchanger design margins are relatively small, significant changes to the design input parameters, such as fouling factors, can pose a challenge to SRW System operability.

The actual tube-side fouling factor for the SRW heat exchangers has been difficult to validate due to difficulties in mathematically separating the effects of microfouling and macrofouling, which are accounted for separately in the SRW heat exchanger design basis. The microfouling factor is a term used to describe how heat exchanger tube-side microfouling contributes to the fouling factor of the heat exchanger. Since December 1993, we have continued to investigate the low thermal margin issue for our SRW heat exchangers. In Reference (2), we discussed our efforts to verify tube-side microfouling for the SRW heat exchangers. We indicated that we were evaluating use of a Side Stream Monitor (SSM) to verify the tube-side microfouling. The SSM provides a means of trending SRW performance.

The SSM is a self-contained, skid-mounted shell and tube heat exchanger, that was custom designed for use at Calvert Cliffs, to accurately model SRW heat exchanger tube-side microfouling with respect to time and seasonal variations. The SSM has been recording tube-side microfouling data since June 20, 1995. An average daily fouling factor was computed and plotted.

The SRW heat exchanger fouling factor currently used in our design basis was developed through extensive analysis and thermal performance testing. The current maximum allowable design fouling factor for the SRW heat exchangers is 0.0012 Hr-Ft^2-°F/BTU. This fouling factor is made up of two independently derived components, baseline fouling and microfouling. The first component, baseline fouling, is the fouling factor of a clean heat exchanger. Testing has shown the baseline fouling component has remained constant over the last two years at 0.0007 Hr-Ft^2-°F/BTU. This baseline component is comprised of the tested fouling factor ~ 0.00045 Hr-Ft^2-°F/BTU, and the testing uncertainty of ~ 0.00025 Hr-Ft^2-°F/BTU. The second component, microfouling, measures the resistance to heat transfer created by the formation of a slime and silt layer on the inside of the heat exchanger tubes. Based on a qualitative study done in 1989, the microfouling of the SRW heat exchangers was

postulated to build up to less than or equal to 0.0005 Hr-Ft^2-°F/BTU during the three months between cleanings.

To date, we have collected data from four separate SSM operating cycles. A SSM operating cycle is defined as operation from initial cleaning to maximum equilibrium microfouling. The results of microfouling factor calculations using this data indicate that the maximum equilibrium microfouling and the microfouling growth rate are greater than currently assumed in our design basis calculations.

The SSM data indicates that following a mechanical cleaning, the worst case time to reach the previously used maximum allowable microfouling value of 0.0005 Hr-Ft^2-°F/BTU is as little as 15 days. This is a significantly shorter time than the three-month interval on which our tube cleaning was based in the past. The data also indicated the maximum equilibrium SRW heat exchanger microfouling level predicted by the worst-case SSM data seen to date is 0.0010 Hr-Ft^2-°F/BTU, resulting in a higher total equilibrium fouling factor (0.0017 Hr-Ft^2-°F/BTU) than was previously used in the design basis calculations (0.0012 Hr-Ft^2-°F/BTU). In Reference (1), we reported that the results of the SSM tests indicate the possibility that the SRW heat exchangers may not have been capable of meeting their intended safety function during periods of high Chesapeake Bay water temperatures when the heat exchangers had not been cleaned within the past 14 days. The proposed modification is the result of our investigation of equipment and system modifications that reduce the peak post-accident heat load on the SRW heat exchangers. We have concluded that it is the best available means to assure safety while operating at elevated Chesapeake Bay water temperatures.

SYSTEM OVERVIEW

Service Water System:

The SRW System is a closed loop system which uses plant demineralized water with a corrosion inhibitor added. The system removes heat from secondary side plant components, blowdown recovery heat exchangers, CACs, spent fuel pool cooling heat exchangers, and EDG heat exchangers. During a response to a design basis accident, SRW provides cooling to the CACs and the EDG heat exchangers only.

The SRW System is divided into two subsystems in the Auxiliary Building to meet single failure criteria. Supply and return line redundancy is provided for the CACs and the EDGs; however, No. 11 SRW subsystem does not provide cooling to an EDG. During normal operation, both subsystems are required and are independent to the degree necessary to assure the safe operation and shutdown of the plant assuming a single failure. During accident conditions, both subsystems have identical heat loads (except No. 11 SRW subsystem) and flow requirements. Each subsystem supplies a maximum of two CACs and one EDG (except No. 11 SRW subsystem). During the most limiting design basis accident, the SRW System design temperature increases to 115°F and decreases below 105°F within 35 minutes. The SRW System temperature remains below 105°F for the remainder of the event.

TECHNICAL INFORMATION

Emergency Diesel Generators:

The EDGs are designed to provide a dependable onsite power source capable of starting and supplying the essential loads necessary to safely shut down the plant and maintain it in a safe shutdown condition. Three of the four EDGs (Nos. 1B, 2A, & 2B) heat exchangers are cooled by SRW. Number 1A EDG is air cooled. Operability of the SRW cooled EDGs requires the temperature of the SRW System to remain below its design limit (105°F) although the manufacturer has agreed that the diesel remains operable during a short temperature transient above 105°F (115°F for 35 minutes).

Containment Air Cooling System:

Four, two-speed CACs are provided in each unit to remove ambient heat from the containment during normal plant operation. In the event of a LOCA or main steam line break accident, the CACs limit the containment pressure rise to below the design value. During these accidents, the system also functions to reduce the leakage of airborne and gaseous radioactivity by providing a means of cooling the containment atmosphere. The four CACs operate independently from the Safety Injection and Containment Spray Systems.

Service water is circulated through the CACs air cooling coils. The SRW supply line for each cooler currently has an air-operated control valve (CV) which is normally open (deenergized). Each of these valves is designed to fail open. These inlet valves are the subject of this modification. The SRW return line from each cooler has air-operated CVs which can be operated from the control room.

Three CACs are normally in operation. During normal operation, the full flow (8") SRW outlet valves, which are used following a design basis accident, are closed, while the smaller (4") valves are open. Occasionally, during extended periods of high outside temperature, all four coolers are used to limit the containment temperature to 120°F.

On receipt of a Safety Injection Actuation Signal (SIAS), the non-operating cooling unit(s) automatically start in low fan speed and, simultaneously, the others are automatically switched from their normal high fan speed operation to low speed operation. The full flow SRW outlet valve at each cooler is also opened on receipt of a SIAS. The SRW inlet valves move to a throttled position on receipt of a SIAS, and return to the full open position later, on receipt of a Recirculation Actuation Signal (RAS). The throttled position is set by a mechanical stop that prevents the valve from fully closing. By throttling SRW flow to a predetermined flow setting following a SIAS, the CACs will remove enough heat to maintain the design pressure/temperature requirements of the containment structure without raising the SRW temperature greater than the temperature limit of the EDGs (Nos. 1B, 2A & 2B).

DESCRIPTION OF EXISTING CONFIGURATION

Currently, each CAC inlet CV is an 8" air-operated butterfly valve. The CV is normally open with the operator vented to atmosphere via a three-way solenoid valve. On receipt of a SIAS, the solenoid valve redirects the Saltwater Air Compressor air to the CV operator, which throttles the valve against a mechanical stop. The mechanical stop prevents the valve from fully stroking and positions it in a predetermined throttle position. On receipt of a RAS, the solenoid valve repositions to vent the air from

the actuator and the CV fully opens. The existing SRW flow throttle setting is based on meeting the requirement of removing the heat load developed by the containment temperature and pressure analysis during a large break LOCA, while maintaining SRW temperature low enough to support continuous EDG operation.

DESCRIPTION OF PROPOSED MODIFICATION

The proposed modification would add a flow control loop that would modulate the CV to obtain a predetermined flow rate. The existing mechanical stop will be backed off which will allow the CV to shut. The valve would be open during normal operation. On receipt of a SIAS, the valve would throttle to the predetermined flow setpoint and control the SRW flow to the CACs. On receipt of an RAS, the valve will return to its full open position. If it becomes necessary to control SRW System temperature, the Flow Indicating Controller in the new flow control loop would enable the Control Room Operator to manually control the flow by adjusting the flow setpoint or valve position. The new design uses a feedback loop based on the actual SRW flow to the CACs. The new control loop is an overall improvement in the method and accuracy of controlling SRW flow. This is the same design of flow control equipment used in our Auxiliary Feedwater System to provide post-accident flow control. This equipment utilizes proven analog electronic technology and the history of this system's operation indicates that it is a very reliable system.

Four Flow Indicating Controllers per unit will be installed in the Control Room. Each Flow Indicating Controller will maintain the existing physical and electrical train separation and redundancy requirements. The new control loop will be procured, designed and installed in accordance with applicable codes and standards. The equipment located in a harsh environment is environmentally qualified.

New cable and raceways will be installed such that the design requirements for the electrical separation and seismic installation are met. The additional electrical load has been reviewed to ensure the load limits for vital 1E bus are not exceeded. The circuits and components related to this control loop function are safety-related, and are similar to those used for the other safety-related flow control functions. Additionally, testing is performed on these valves once every month to ensure that they perform their post-accident function. Based on the history of operation with the same design of system as on the Auxiliary Feedwater System, and the rigorous standards used to design and install this modification, we believe that these flow controllers will prove to be very reliable.

Since the new control scheme is based on an actual process flow measurement and feedback control, it has the following advantages over the existing configuration:

- reduced flow setpoint uncertainty band;
- improved control of SRW flow to the CACs;
- with the mechanical stop backed off, the CV can be used as an isolation valve;
- flow control that is independent of pump performance; and
- remote, manual flow control.

UNREVIEWED SAFETY QUESTION

We have concluded that, when installed, the proposed modification constitutes an unreviewed safety question because it may increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the Safety Analysis Report. There are more components and additional control features in the proposed flow control loop and, therefore, the number of components subject to malfunction for which compensatory actions may not adequately control the consequence of failure is increased. Because this flow control loop affects the flow of cooling water to both the CACs and the EDGs, this proposed modification can affect the failure probability of both systems.

Once the modification is installed, frequent cleaning of the SRW heat exchangers will not be necessary. This increases the availability of the CACs. In addition, there is an improvement in the level of flow control, which improves CAC performance. This reduces the probability of malfunction of the associated CACs; however, this offsetting effect cannot be determined with sufficient accuracy to ensure that the overall probability of malfunction is not increased.

Because of the EDG's reliance on this modification to ensure that the EDGs are provided with a sufficient heat sink, the installation of this proposed modification also affects the failure probability of the EDGs. The compensating factor for this increased failure is the reduction in the number of SRW heat exchanger cleanings that must be done. There is an offsetting advantage for this modification in that there will be a reduction in unavailability of the EDGs. However, this offsetting factor cannot be readily quantified and compared. Accordingly, we consider this possible increase an unreviewed safety question.

SAFETY ANALYSIS

To determine if there is an effect on plant safety resulting from this proposed modification, an evaluation was done of the various malfunctions that could occur if the flow controller were installed for the inlet CV to the CACs. The three valve malfunctions that were postulated were that the valve failed to open, failed to shut or failed to throttle properly. The equipment important to safety, previously evaluated, affected by these malfunctions are the CACs and Nos. 1B, 2A, and 2B EDGs. The effect of each of these malfunctions on both CAC and EDG operability is described below. The conclusion of this evaluation is that the installation of this proposed modification does not raise any safety considerations that were not already accounted for in the existing single failure analysis for the CACs or any EDG.

If the CV fails closed during a SIAS, cooling to a CAC will be lost. The Containment Spray System and the remaining CACs will satisfy the containment post-accident response criteria. The CV failing in the closed position will not affect the operability of the EDG. It will receive adequate cooling water from the SRW System. The affected SRW System heat load will be reduced by almost half. For the No. 11 SRW subsystem (which does not cool an EDG), a valve closure may result in the system flow dropping slightly below the minimum SRW pump flow requirement. Without operator action, the SRW pump should continue to operate below its low flow limit until receipt of an RAS.

If the CV fails in the full open position following a SIAS, more than adequate heat removal will be provided to the CACs. They will be able to maintain the containment temperature and pressure under the approved limits. A small break LOCA will not cause a containment peak temperature high enough to

raise the SRW temperature above the EDG temperature limit. However, for a large break LOCA, the heat removed from containment could increase the SRW System temperature above the design limit for the EDG under certain conditions, such as elevated Chesapeake Bay water temperatures. However, a redundant EDG is available to provide ample power to operate a full complement of essential auxiliary equipment for post-accident conditions.

If the CV fails to throttle properly following a SIAS, minimum containment heat removal requirements will not be affected. This case is bounded by the valve failing either open or closed, as discussed above. In the event SRW temperature design limit is approached, manual flow control to the CACs will be available. Three of the four CACs would remain in operation (only two are needed to remove the design heat load) along with one EDG.

CONCLUSION

The proposed modification has been determined to constitute an unreviewed safety question as defined in 10 CFR 50.59. We are replacing the mechanical stop in the inlet CV of the CACs with a flow control loop for the inlet CV. This change may create a small increase in the probability that the CAC System or the EDGs may not be available to perform their safety function. The safety significance of this modification, as explained above, is minimal as redundant equipment is available to respond to any accident conditions and any failure mechanism of the flow control loop. Therefore, per 10 CFR 50.92(2)(c), we request the NRC review and approve this modification through an amendment to our operating licenses.

REFERENCES:

(1) Letter from Mr. P. E. Katz (BGE) to NRC Document Control Desk, dated February 16, 1996, "Licensee Event Report 50-317/96-001, SRW Heat Exchanger Microfouling Higher Than Assumed In Design Basis"

(2) Letter from Mr. C. H. Cruse (BGE) to NRC Document Control Desk, dated June 17, 1994, "Reply to Request for Additional Information - Service Water System Operational Performance Inspection"

(3) Letter from Mr. C. H. Cruse (BGE) to NRC Document Control Desk, dated December 29, 1993, "Licensee Event Report 50-317/93-007 Performance Tests Indicate Possibility of SRW Heat Exchanger Inoperability"

ATTACHMENT (2)

DETERMINATION OF SIGNIFICANT HAZARDS

Baltimore Gas and Electric Company
Calvert Cliffs Nuclear Power Plant
May 28, 1996

ATTACHMENT (2)

DETERMINATION OF SIGNIFICANT HAZARDS

The proposed change has been evaluated against the standards in 10 CFR 50.92 and has been determined to not involve a significant hazards consideration, in that operation of the facility in accordance with the proposed amendments:

1. *Would not involve a significant increase in the probability or consequences of an accident previously evaluated.*

The proposed modification is the result of our need to reduce the peak post-accident heat load on the service water (SRW) heat exchangers. It will replace the mechanical stops currently on the control valves which admit SRW into the containment air coolers (CACs) with a flow controller loop. By throttling the SRW to the CACs, the heat load on the SRW heat exchangers is reduced during the early phases of an accident. The increased accuracy of throttling would allow the SRW System to perform its safety function during periods of high ultimate heat sink temperatures. During the summer months, the Chesapeake Bay water (the ultimate heat sink for the units) heats up substantially during some parts of the day. At times, these high temperatures could exceed the current expected limits for heat exchanger operation. With the more accurately throttled valves, the effect of high ultimate heat sink temperatures is reduced. The modification will ensure that the SRW heat exchangers are capable of meeting their intended safety function up to the maximum expected bay water temperature.

The safety function of the SRW System is to provide cooling to the CACs and the Emergency Diesel Generators (EDGs) following a design basis accident. With this proposed modification in place, the SRW System will continue to meet this safety function. All of the failure mechanisms for this modification have previously been evaluated and were found acceptable. However, because the proposed modification may have a higher probability of malfunction for which compensatory actions may not adequately control the consequence of failure, the probability of a malfunction of systems important to safety may be slightly increased, and this modification has been determined to be an unreviewed safety question.

The single failure of the flow controllers would not be an initiator to an accident. The system provides cooling to safety-related equipment following an accident. It supports accident mitigation functions. Therefore, this proposed modification does not significantly increase the probability of an accident previously evaluated.

The proposed modification will enhance the ability of the SRW System to respond to accident conditions under a wider range of environmental conditions (i.e., higher ultimate heat sink temperatures). Malfunctions of the flow controller have been evaluated and determined to result in consequences that are no more severe than those previously approved. A failure of the flow controller could allow the valve to fail in a position that does not allow the SRW System to perform its safety function. Since the SRW System is redundant on each unit, a single failure of one of the flow controllers would not prevent the other redundant portion of the system from performing its safety function. The consequences of a single failure of the SRW System have been previously analyzed and these consequences do not change due to this modification.

Therefore, this proposed modification does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. *Would not create the possibility of a new or different type of accident from any accident previously evaluated.*

The SRW System provides cooling water to the CACs and EDGs. The purpose of the components which are affected by this modification is to mitigate accidents. The single failure of the flow controllers would not be an initiator to an accident. This modification does not change the equipment's function, or significantly alter the method of operating the equipment to be modified. The system will continue to operate in essentially the same manner as before the modification was done.

Therefore, the proposed change does not create the possibility of a new or different type of accident from any accident previously evaluated.

3. *Would not involve a significant reduction in a margin of safety.*

The margin of safety is reduced for this proposed modification, but not significantly. If the CAC inlet valve fails open, the CAC on that train would continue to perform its safety function. However, the EDG on that train would receive cooling water above the design temperature and may fail to perform its safety function. The redundant EDG would provide adequate electricity to continue to perform its safety function. If the CAC inlet valve fails in the closed position, the EDG would continue to function; however, the affected CAC would not receive adequate cooling water. The other three CACs would provide adequate cooling for the containment. Also, the Containment Spray System provides additional containment cooling as a backup to the CACs. If the CAC inlet valve fails to throttle properly, the consequences are bounded by the other two cases discussed above.

Adding a more complex component which could fail and result in a failure of the SRW System does reduce the margin of safety, but not significantly because: 1) the proposed flow controller is very reliable and not likely to fail; 2) the other redundant CAC and EDG are available to mitigate the consequence of an accident should there be a single failure of the flow controller.

Therefore, this modification does not significantly reduce the margin of safety.