

ROBERT E. DENTON
Vice President
Nuclear Energy

Baltimore Gas and Electric Company
Calvert Cliffs Nuclear Power Plant
1650 Calvert Cliffs Parkway
Lusby, Maryland 20657
410 586-2200 Ext. 4455 Local
410 260-4455 Baltimore



January 31, 1995

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
License Amendment Request; Required Volume of Trisodium Phosphate
Dodecahydrate in Containment

Pursuant to 10 CFR 50.90, the Baltimore Gas and Electric Company hereby requests an Amendment to Operating License Nos. DPR-53 and DPR-69 by the incorporation of the changes described below into the Technical Specifications for Calvert Cliffs Unit Nos. 1 and 2.

DESCRIPTION

The proposed amendment would revise the Technical Specifications for Unit Nos. 1 and 2 to increase the minimum amount of Trisodium Phosphate Dodecahydrate (TSP) verified in a Technical Specification surveillance. The requested change is based on a recalculation of the amount of TSP needed to attain an appropriate pH in the containment sump water following a Loss of Coolant Accident (LOCA). This change is specific to Calvert Cliffs Nuclear Power Plant.

BACKGROUND

Following a LOCA, the Containment Spray System activates to limit the containment atmosphere pressure and temperature increase and to thereby reduce the possibility of airborne radioactivity leakage to the outside environment. The containment spray pumps discharge borated water from the Refueling Water Tank (RWT) to the spray headers and nozzles located near the top of the containment. The water introduced into the containment in this manner will be mixed in the containment sump with the water from the Reactor Coolant System (RCS). The resultant mixture will be recirculated to the spray system only after the inventory of the RWT is nearly depleted. When the level in the tank reaches the point where the Recirculation Actuation Signal (RAS) setpoint has been reached, the pump suction changes from the RWT to the containment sump.

9502030280 950131
PDR ADOCK 05000317
P PDR

Acc
111

A higher pH containment spray is better able to control airborne activity by holding radioactive iodine in solution, as discussed in Standard Review Plan 6.5.2. Containment spray pH is also important because water sprayed in containment comes in contact with metal components. Branch Technical Position MTEB 6-1 entitled, "pH For Emergency Coolant Water For PWRs," recommends a minimum pH of 7.0 to reduce chloride stress corrosion cracking of those components.

Raising the pH is accomplished with the use of TSP. The TSP, located in the containment lower level, is stored in baskets designed to allow the chemical to flow out when it is dissolved by water. Mixing will be achieved as the solution is continuously recirculated after RAS. The final pH should be ≥ 7.0 .

The present Technical Specification TSP surveillance requirement of 100 ft³ was adopted in License Amendment Nos. 48/31, Units 1 and 2, respectively. In those amendments, the amount was increased to 100 ft³ because of an increase in boron which was required by an increase in fuel enrichment.

In the course of verifying the basis of the Surveillance Test Procedure (STP) for measuring the volume of TSP, we recalculated the amount of the chemical required to bring the water in the sump to a pH of 7.0. The new calculation showed the minimum quantity of TSP required to raise the pH to 7.0 is 289.3 ft³, based on the worst-case expected boron concentration of the containment sump water following a LOCA. The amount of TSP in Unit 1 was recently measured in the performance of an STP. An evaluation using the as-found volume was performed which showed that this amount of TSP does not create a condition adverse to safety. Installation of new baskets with increased storage capacity was completed in the 1993 and 1994 refueling outages.

REQUESTED CHANGE

Change the value of Technical Specification Surveillance 4.5.2.e.3 from 100 ft³ to 289.3 ft³, as shown on the attached markup. Change Technical Specification 4.5.2.e.4 by moving the amounts of TSP and RWT water to be used in the test to Bases 3/4.5.2 and 3/4.5.3, as shown on the attached markup. Change Bases 3/4.5.2 and 3/4.5.3 by modifying the test method.

SAFETY ANALYSIS

Trisodium Phosphate Dodecahydrate is stored in open containers in the containment to neutralize the acidic containment spray and sump water following a LOCA. The neutral solution is better able to maintain radioactive iodine in solution and reduces the possibility of stress corrosion cracking of components in the containment. The TSP, located in the containment lower level, is stored in baskets designed to allow the chemical to flow out when it is dissolved by water. Mixing will be achieved as the solution is continuously recirculated and the final pH of the sump and the spray will be ≥ 7.0 . The minimum quantity of TSP required to raise the pH to 7.0 has been calculated based on the boron concentration of the containment sump water following a LOCA.

In the course of verifying the basis of the Surveillance Test Procedure (STP) for TSP, we recalculated the amount required to bring the water in the sump to a pH of 7.0. The STP requires measurement of the depth of the TSP in the baskets and calculation of the volume actually present. By this method, the amount of TSP in Unit 1 was found to be approximately 131 ft³, and the volume in Unit 2 was approximately 129 ft³. Using the volume of 129 ft³, an evaluation was performed which showed that this amount of TSP would yield a pH of ≥ 6.5 . Since there is no significant change in iodine retention or chloride stress corrosion cracking protection between pH of 6.0 and 7.0, there was no condition adverse to safety. The new calculation showed the minimum quantity of TSP required to raise the pH to 7.0 is 289.3 ft³ based on the boron concentration of the containment sump water following a LOCA.

Hydrogen generation from corrosion of galvanized materials in containment has been conservatively calculated at a pH of 5.0. A higher pH reduces the generation rate.

Updated Final Safety Analysis Report, Chapter 14.24, "Maximum Hypothetical Accident," uses an assumption of a pre-RAS minimum containment spray pH of 5.0 for the iodine removal calculation and a post-RAS sump pH of 7.0 for iodine retention.

The proposed change to Technical Specification 4.5.2.e.4 would move the amounts of chemical and water used in the test to the Bases. This relocation will not alter the test method or acceptance criteria, but will allow adjustments to the ratio of TSP and borated water under the controls of 10 CFR 50.59 to reflect changes in plant conditions. The proposed surveillance is consistent with the Standard Technical Specifications (NUREG-1432). In the Bases, the amount of TSP used in the test is changed to reflect the ratio of TSP to water that would be found in the containment following a LOCA. The specified concentration of boron in the test reflects the highest concentration that could be found in the containment following a LOCA. The test temperature is changed to 120°F which is well below the temperature expected to be found in the containment sump following a LOCA. The decanting of the solution does not change the intent of the test method since the dissolving period will still be conducted without agitation.

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 is in accordance with the proposed amendments:

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

Trisodium Phosphate Dodecahydrate (TSP) is stored in the containment lower level to raise the pH of the sump and spray water following a Loss of Coolant Accident (LOCA). As the pH of the water increases, more radioactive iodine is kept in solution and the possibility of airborne radioactivity leakage is decreased. An additional advantage of a higher pH is the beneficial reduction in chloride stress corrosion cracking of metal components in the containment following an accident.

This chemical is an accident mitigator, not an accident initiator in that it is not used until after an accident has occurred. At the time it goes into solution, the accident has occurred, containment spray has been activated and water has collected in the containment sump. Therefore, increasing the Technical Specification minimum amount verified to be in each containment will not involve a significant increase the probability of an accident previously evaluated.

Updated Final Safety Analysis Report, Chapter 14.24, "Maximum Hypothetical Accident", uses an assumption of a pre-RAS minimum containment spray pH of 5.0 for the iodine removal calculation and a post-RAS sump pH of 7.0 for iodine retention. Raising the pH to 7.0 does not increase the consequences of an accident previously evaluated.

The proposed change to Technical Specification 4.5.2.e.4 would move the amounts of chemical and water used in the test to the Bases. This relocation will not alter the test method or acceptance criteria, but will allow adjustments to the ratio of TSP and borated water under the controls of 10 CFR 50.59 to reflect changes in plant conditions. In the Bases, the amount of TSP used in the test is changed to reflect the ratio of TSP to water that would be found in the containment following a LOCA. The specified concentration of boron in the test reflects the highest concentration that could be found in the containment following a LOCA. The test temperature is changed to 120°F which is well below the temperature expected to be found in the containment sump following a LOCA. The decanting of the solution does not change the intent of the test method since the dissolving period will still be conducted without agitation.

Therefore, this change does not involve a significant increase 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 addition of more TSP does not represent a significant change in the configuration or operation of the plant. Trisodium Phosphate Dodecahydrate is currently present in the containment lower level. There are no physical changes which result from the increase in volume. The proposed change to Technical Specification 4.5.2.e.4 would move the amounts of chemical and water used in the test to the Bases. This relocation will not alter the test method or acceptance criteria, but will allow adjustments to the ratio of TSP and borated water under the controls of 10 CFR 50.59 to reflect changes in plant conditions. In the Bases, the amount of TSP used in the test is changed to reflect the ratio of TSP to water that would be found in the containment following a LOCA. The specified concentration of boron in the test reflects the highest concentration that could be found in the containment following a LOCA. The test temperature is changed to 120°F which is well below the temperature expected to be found in the containment sump following a LOCA. The decanting of the solution does not change the intent of the test method since the dissolving period will still be conducted without agitation.

Therefore, this change would 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.*

Trisodium Phosphate Dodecahydrate is stored in the containment lower level to raise the pH of the sump and spray water following a LOCA. As the pH of the water increases, more radioactive iodine is kept in solution and the possibility of a gaseous radioactivity leakage is decreased. Additionally, a higher pH has a beneficial effect on chloride stress corrosion cracking of metal components in the containment.

Technical Specification 4.5.2.e.3 requires verification that a minimum volume of TSP is contained in the storage baskets in each containment. This change proposes to increase that volume. The increased volume will ensure the containment sump, when filled with water, will have an acceptable pH following a LOCA.

The proposed change to Technical Specification 4.5.2.e.4 would move the amounts of chemical and water used in the test to the Bases. This relocation will not alter the test method or acceptance criteria, but will allow adjustments to the ratio of TSP and borated water under the controls of 10 CFR 50.59 to reflect changes in plant conditions. In the Bases, the amount of TSP used in the test is changed to reflect the ratio of TSP to water that would be found in the containment following a LOCA. The specified concentration of boron in the test reflects the highest concentration that could be found in the containment following a LOCA. The test temperature is changed to 120°F which is well below the temperature expected to be found in the containment sump following a LOCA. The decanting of the solution does not change the intent of the test method since the dissolving period will still be conducted without agitation.

Therefore, this change would not involve a significant reduction in a margin of safety.

ENVIRONMENTAL ASSESSMENT

The proposed amendment changes requirements with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 or changes an inspection or surveillance requirement. We have determined that the proposed amendment involves no significant hazards consideration, and that operation with the proposed amendment would result in no significant change in the types or amounts of effluents that may be released offsite, and in no significant increase in individual or cumulative occupational radiation exposure. Therefore, the proposed amendment is eligible for categorical exclusion as set forth in 10 CFR Part 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental assessment is needed in connection with the approval of the proposed amendment.

SCHEDULE

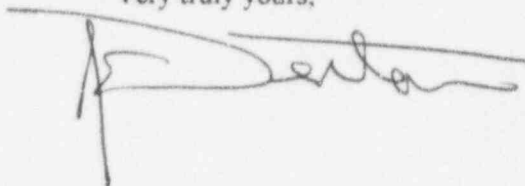
This change is requested to be approved and issued by August 1, 1995. However, issuance of this amendment is not currently identified as having an impact on outage completion or continued plant operation.

SAFETY REVIEW COMMITTEE

These proposed changes to the Technical Specifications and our determination of significant hazards have been reviewed by our Plant Operations and Safety Review Committee and Offsite Safety Review Committee. They have concluded that implementation of these changes will not result in an undue risk to the health and safety of the public.

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

Very truly yours,



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

I hereby certify that on the 31st day of January, 1995, before me, the subscriber, a Notary Public of the State of Maryland in and for Calvert County, personally appeared Robert E. Denton, 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:


Notary Public

My Commission Expires:

February 2, 1998
Date

RED/EMT/dlm

Attachments: (1) Unit 1 Marked-up Technical Specification Pages
(2) Unit 2 Marked-up Technical Specification Pages

cc: D. A. Brune, Esquire
J. E. Silberg, Esquire
L. B. Marsh, NRC
D. G. McDonald, Jr., NRC

T. T. Martin, NRC
P. R. Wilson, NRC
R. I. McLean, DNR
J. H. Walter, PSC