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January 23, 1995

Docket No. 50-423
B15077

RE: 10CFR50.90

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Millstone Nuclear Power Station, Unit No. 3
Proposed Revision to Technical Specifications
Trisodium Phosphate Storage Baskets

Introduction

Pursuant to 10CFR50.90, Northeast Nuclear Energy Company (NNECO) hereby proposes to amend its Operating License, NPF-49, by incorporating the changes into the Technical Specifications of Millstone Unit No. 3. Specifically, NNECO proposes to revise the Millstone Unit No. 3 Technical Specifications by:

1. Adding a new Section 3/4.5.5 which provides a limiting condition for operation, an action statement, a surveillance requirement, and a corresponding bases section, for the trisodium phosphate (TSP) baskets which will be installed in the next refueling outage.

2. Deleting Section 3/4.6.2.3 and Bases 3/4.6.2.3 related to the spray additive system. This technical specification is no longer needed since the chemical addition tank (CAT) is being abandoned.

3. Index Pages viii, ix, and xiv are being revised to reflect the above changes.

Discussion

A. Existing Design

The present Millstone Unit No. 3 design requires that the final minimum pH of the water in the containment structure sump following a design basis accident (DBA) such as a loss of coolant accident, including the content of the refueling

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water storage tank (RWST) is between ≥ 7.0 and ≥ 7.25 (refer to the Millstone Unit No. 3 Final Safety Analysis Report Section 6.2.2.2). The reasons for this requirement of a pH ≥ 7.0 is (i) to preclude potential stress corrosion cracking and (ii) to increase the decontamination factors by keeping most of the dissolved iodine in the sump water in a non-volatile form.

The present design achieves the pH control by gravity feed of sodium hydroxide (NaOH) solution into the quench spray suction line upon a DBA. The NaOH solution is stored in the CAT. This system has experienced some operational problems in the past, including: migration of RWST water into the CAT, contamination of RWST water by NaOH (from the CAT), and packing leaks in the associated valves and pumps due to the harshness of the NaOH solution.

B. Proposed Design

The proposed change abandons in place the CAT and its active automatic discharge valve system. The proposed method of change is to store granular TSP dodecahydrate in twelve (12) porous wire mesh baskets (3RSS-BSKT 1 through 12) on the containment lowest floor El. - 24'-6" as a passive form of pH control of the containment sump water, in lieu of the active CAT system, presently in use. During a DBA, the TSP will dissolve in the containment sump as the water from quench spray system (QSS) (and the pipe break) collects in the containment sump. The TSP and water form a base, pH > 7, which will neutralize the acidic borated water from the RWST or the reactor coolant system. There is also a potential for a small amount of hydrochloric acid to be formed with the byproducts of irradiated chlorosulforated polyethylene cable covering and nitric acid from the containment atmosphere. Hypalon is the trade name for one manufacturer's chlorosulfonated polyethylene. The quantity of TSP in the baskets is sufficient to yield a final pH of > 7.0. A result of this change is that the pH of QSS flow will be acidic (i.e., pH = 4.4). This limit for acidity is based on an assumed maximum boric acid concentration of 2900 ppm (the technical specification maximum limit) in the RWST. A design pH of ≥ 7.1 is being selected to meet the standard review plan, Section 6.5.2, Revision 2, acceptance criterion of pH ≥ 7.0. A value greater than the acceptance criterion was

chosen to provide a margin to account for the uncertainties in estimating the amount of hydrochloric acid produced from the byproducts of the Hypalon.

Evaluation

This proposed change involves a change in the Millstone Unit No. 3 Technical Specifications. Therefore, pursuant to 10CFR50.90, NNECO hereby proposes to amend its operating license, NPF-49, by incorporating the attached changes into the Technical Specifications of Millstone Unit No. 3. Although an explicit discussion addressing the criteria of 10CFR50.59 is not required to process the proposed license amendment, we have included the safety evaluation on the proposed design change (i.e., the substitution of CAT [subsystem of QSS] with the TSP baskets) to assist the NRC Staff in its review of this matter. Along with this amendment request, supporting documentation is provided as follows:

- Attachment 1 provides the safety evaluation for the design change.

- Attachment 2 provides the radiological calculation assumptions and results.

- Attachment 3 and Attachment 4 forward the marked up technical specification pages and retyped technical specification pages, respectively.

- Attachment 5 provides a description of the proposed technical specification changes and a safety assessment for the changes. NNECO has reviewed the proposed technical specification changes in accordance with 10CFR50.92 and has determined that the changes do not involve a significant hazards consideration (SHC). The basis for this determination is discussed in Attachment 5.

Moreover, the Commission has provided guidance concerning the application of standards in 10CFR50.92 by providing certain examples (March 6, 1986, 51 FR 7751) of amendments that are considered not likely to involve an SHC. The proposed changes to Section 3.6.2.3 and the new proposed Section 3/4.5.5 of the Millstone Unit No. 3 Technical Specifications are not enveloped by a specific example. However, it has been demonstrated that the proposed changes do not involve a significant increase in the consequences of an accident previously evaluated.

Environmental Considerations

NNECO has reviewed the proposed license amendment request against the criteria of 10CFR51.22 for environmental considerations. The proposed changes do not involve an SHC, do not significantly increase the types and amounts of effluents that may be released off site, nor significantly increase individual or cumulative occupational radiation exposures. Based on the foregoing, NNECO concludes that the proposed changes meet the criteria delineated in 10CFR51.22(c)(9) for a categorical exclusion from the requirements of an environmental impact statement.

Nuclear Review Board Review

Millstone Unit No. 3 Nuclear Review Board has reviewed this proposed amendment and concurs with the above determination.

State Notification

In accordance with 10CFR50.91(b), we are providing the State of Connecticut with a copy of this proposed amendment to ensure their awareness of this request.

Schedule Required for NRC Approval

Currently, the next refueling outage is scheduled to begin in April 1995, with startup scheduled for June 1995. NNECO requests that this proposed license amendment be reviewed and approved prior to the start of the next cycle operation, with implementation within 60 days of receipt.

If the NRC Staff should have any questions or comments regarding this submittal, please contact Mr. R. G. Joshi at (203) 440-2080.

We will provide any additional information the NRC Staff may need to respond to this request, and we appreciate your efforts in support of this request.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

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Executive Vice President

cc: T. T. Martin, Region I Administrator
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Subscribed and sworn to before me

this 23rd day of January, 1995

Notary Public

Date Commission Expires: 8/31/98

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Attachment 1

Millstone Nuclear Power Station, Unit No. 3
Safety Evaluation for the Proposed
Design Change - Installation of
Trisodium Phosphate Baskets in Containment

January 1995

Attachment 1

Millstone Nuclear Power Station, Unit No. 3
Safety Evaluation for the Proposed
Design Change - Installation of
Trisodium Phosphate Baskets in Containment

Although an explicit discussion addressing the criteria of 10CFR50.59 is not required to process the proposed license amendment, we have included the safety evaluation on the proposed design changes to assist the NRC Staff in its review of this matter.

Description of the Proposed Design Change

The proposed change involves the abandonment of the chemical addition tank (CAT) and the installation of 12 trisodium phosphate (TSP) dodecahydrate baskets on the containment floor (EL -24'6"). The removal of piping, power supply, and instrumentation associated with the CAT is also performed by this proposed design change. The TSP baskets will provide a passive method to assure that the containment sump water pH will be $\geq$ 7.1 following a loss of coolant accident (LOCA) while still assuring adequate retainment of fission products (Iodine) in the containment sump. The design pH value of 7.1 was selected to provide margin, compensating for uncertainties, to assure that a final sump pH $\geq$ 7.0 is achieved (as required by Standard Review Plan 6.5.2, Rev. 2).

The current system mixes the boric acid solution (from the refueling water storage tank [RWST]) with sodium hydroxide solution (from the CAT) to produce a neutralized solution for the containment quench spray system (QSS). This system has experienced some operational problems in the past including: migration of RWST water into the CAT, contamination of RWST water by sodium hydroxide (from the CAT) and packing leaks in associated valves, and pumps due to the harshness of the sodium hydroxide solution.

The installation of the TSP baskets and the abandonment of the CAT provides a passive means of attaining an ultimate sump pH of about 7.1 following a LOCA. A result of this change is that the pH of QSS flow will be acidic (ph = 4.4). This limit for acidity is based on an assumed maximum boric acid concentration of 2900 ppm in the RWST. Just following the initiation of recirculation spray

system (RSS) the RSS flow will reach a maximum pH of about 11.0. About 18 minutes after the initiation of the LOCA the pH of the RSS flow will be below the design limit of 10.5. After about 3 hours, when the QSS flow stops, the final pH of the containment sump water will be $\geq$ 7.1.

NNECO has reviewed the proposed design change to assess the effect on the accidents evaluated as the design basis, the potential for creation of a new unanalyzed event, and the impact on the margin of safety.

A. Impact on Previously Evaluated Accidents

The impact on the final safety analysis basis accidents evaluated. Specifically, the steam system piping failure/main steam line break (MSLB) inside containment and the LOCA are the only design basis events which credit the QSS and RSS for containment heat removal/pressure mitigation. The LOCA is the only event which credits fission product (iodine) removal by the QSS and RSS.

1. Effect on the Probability of Occurrence of Previously Evaluated Accidents

The plant change affects the chemical composition of the QSS flow and the method of sump pH control which are important for containment pressure control (MSLB and LOCA) and fission product removal (LOCA). However, this change does not affect the probability of occurrence of these accidents. Since the TSP baskets are passive devices located inside the containment, they can not initiate a transient or affect the probability of occurrence of any previously evaluated accident.

2. Effect on the Probability of Occurrence of a Previously Evaluated Malfunction of Equipment Important to Safety

The installation of the TSP baskets and the abandonment of the CAT will not change the probability of a malfunction of safety-related equipment. The reasons supporting this conclusion are discussed below:

As noted previously, this design change provides a passive method for assuring a post-LOCA sump pH of $\geq$ 7.1. The current system with the CAT has experienced some operational problems in the past including: migration of RWST water into the CAT, contamination of RWST water by

sodium hydroxide (from the CAT), and packing leaks in associated valves and pumps due to the harshness of the sodium hydroxide solution. Therefore, this design change improves the method of neutralizing the sump pH.

Potential malfunctions of the TSP powder and the 12 baskets which hold the TSP powder have been evaluated. It is expected that the TSP will perform its safety function for the following reasons:

- The TSP powder has been determined to be chemically stable and its neutralization capabilities will not change.
- A sufficient volume of TSP powder is assured through periodic surveillance.
- The TSP has been determined to be sufficiently soluble even if it is caked or hardened. For this same reason, clogging of the wire mesh in the baskets is not a concern.
- Deformation and movement of the baskets due to a seismic event will not prevent the TSP from dissolving and performing its function.
- The potential movement of the baskets due to a seismic event will not adversely affect other plant equipment such as the containment sump protective screen assembly.

Following a LOCA, the QSS flow is acidic (pH = 4.4). Just after the initiation of recirculation spray, the RSS flow is highly basic (pH ~ 10.5). After about 18 minutes, the pH will drop below 10.5. The final pH of the recirculation spray flow will be $\geq$ 7.1 after about 3 hours. This transient pH behavior does not adversely affect metals, coatings, and elastomers in the containment, and the performance of associated safety functions is not affected. There is no impact on the environmental qualification of electrical equipment inside containment.

The change in the chemical composition of the QSS solution will not effect the operability of this system or its ability for containment heat removal and pressure mitigation. Spray droplet size and temperature are not

affected by the design changes and, therefore, the effectiveness of the QSS is not impacted.

3. Effect on the Consequences of the Previously Evaluated Accidents

As noted previously, the design changes will not adversely affect the capability of the QSS for containment heat removal/pressure mitigation. Also, the change will not adversely affect any other equipment credited in the safety analysis.

The design change will not adversely affect the radiological doses for the design basis LOCA at the Exclusion Area Boundary, Low Population Zone, Millstone Unit No. 3 Control Room, Millstone Unit No. 2 Control Room, and the Millstone Technical Support Center.

4. Effect on the Consequences of a Previously Evaluated Malfunction of Equipment Important to Safety

As noted previously, the design change involving the addition of TSP baskets will provide a passive method for assuring a post-LOCA sump pH $\geq$ 7.1. The current system with the CAT has experienced some operational problems in the past and, therefore, this design change improves the method of neutralizing the sump pH and improves system reliability.

Potential malfunctions relating to the TSP powder and the 12 baskets which hold the TSP powder, the QSS and other systems, and equipment credited in the safety analysis were evaluated and determined not to be adversely affected by the change. Additionally, the transient pH behavior of the spray flow will not adversely affect metals, coatings, elastomers, or qualification of equipment in the containment and the performance of associated safety functions is not affected.

Finally, the change in the chemical composition of the QSS solution will not effect the operability of this system or its ability for containment heat removal and pressure mitigation.

Therefore, there is no adverse effect on the consequence due to previously evaluated equipment malfunction.

B. Potential for a New Unanalyzed Accident

1. Possibility of an Accident of a Different Type Than Previously Evaluated

The change does not create the possibility of a new, unanalyzed accident. The change involves the installation of TSP baskets which are a passive component and, therefore, it will not create a new accident.

2. Possibility of a Malfunction of a Different Type than Previously Evaluated

The change does not create a malfunction that is different from those previously evaluated. As noted in Section A, the installation of the TSP baskets and the abandonment of the CAT will not change the probability of a malfunction of safety-related equipment.

Potential malfunctions relating to the TSP powder and the 12 baskets which hold the TSP powder, the QSS and other systems, and equipment credited in the safety analysis were evaluated and determined not to be adversely affected by the change. Additionally, the transient pH behavior of the spray flow will not adversely affect metals, coatings, elastomers , or the qualification of equipment in the containment and the performance of associated safety functions is not affected.

Finally, the change in the chemical composition of the QSS solution will not affect the operability of this system or its ability for containment heat removal and pressure mitigation.

C. Impact on the Margin of Safety

As discussed in Sections A and B, the design changes do not adversely affect the ability of the QSS to perform the function of containment heat removal, pressure mitigation and fission product (iodine) retention. The design changes do not adversely affect any equipment credited in the safety analysis. Also, the design changes to not increase the calculated peak clad temperature or the offsite doses due to the design basis LOCA. Therefore, there is no impact on the margin of safety as specified in the Technical Specifications.

Summary and Conclusions

Based on the foregoing assessment, the proposed design change will not adversely impact the plant system response, containment pressure response, and radiological consequences during the limiting design basis accident. Additionally, it was determined that there will not be an adverse impact on equipment and materials in the containment due to the change in the chemical composition of the QSS flow and the method of sump pH control. Therefore, the proposed design change is safe.