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May 27, 1994

Docket No. 50-336
B14859

Re: 10CFR50.90
10CFR50.91

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

Millstone Nuclear Power Station, Unit No. 2
Proposed Revision to Technical Specifications
Automatic Initiation of the Auxiliary Feedwater System

Introduction

Pursuant to 10CFR50.90, Northeast Nuclear Energy Company (NNECO) hereby proposes to amend its Operating License, DPR-65, by incorporating the changes identified in Attachments 1 and 2 into the Millstone Unit No. 2 Technical Specifications. The intent of these changes is to denote in Tables 3.3-3, 3.3-4 and 3.3-5 of the Millstone Unit No. 2 Technical Specifications that the operability of the automatic initiation logic for the auxiliary feedwater system (AFW) will rely on operator action for the remainder of Cycle 12.

In addition, NNECO is requesting that the NRC Staff process this license amendment request on an emergency basis pursuant to 10CFR50.91(a)(5), since failure to act in a timely way would prevent Millstone Unit No. 2 from resuming operation.

Alternatively, NNECO is requesting that the NRC Staff exercise enforcement discretion associated with Action Statement b of Limiting Condition for Operation (LCO) 3.3.2.1 to be effective until the license amendment is issued. The enforcement discretion would permit NNECO to operate Millstone Unit No. 2 in Modes 1, 2, or 3 while the proposed license amendment is being processed.

NNECO believes that expedited treatment is warranted in this case to avoid an unnecessary delay in plant startup following the unscheduled outage to repair a reactor coolant pump seal. This request involves no significant safety impact and the operational risk associated with the request has no undue risk on public health and safety.

Background

The AFW system is designed to provide feedwater for the removal of sensible and decay heat, and to cool the primary system to 300°F in

the event the main condensate and feedwater pumps are inoperable due to a loss of the normal power sources or the main steam system. Additionally, the AFW system may be used for normal system cooldown. The AFW system supplies feedwater from the condensate storage tank to the steam generators via three pumps (two motor-driven pumps and one turbine-driven pump). The motor-driven pumps may be initiated either automatically or manually, and the turbine-driven pump is only initiated manually.

The automatic initiation logic for the motor-driven AFW pumps is comprised of four channels which measure steam generator level. In the event that any two of the four channels detect a steam generator level $\leq 12\%$, the automatic AFW trip bistables will complete the two out of four matrix. When the matrix is complete, a three minute and 25 second time delay begins, and an alarm annunciates in the control room. Following the three minute and 25 second time delay, two auxiliary relays are deenergized. These auxiliary relays provide annunciation in the control room, and send start signals to both of the motor-driven AFW pumps and open signals to both AFW regulating valves.

Automatic initiation of the motor-driven AFW pumps was installed as a follow-up action resulting from the NRC Staff reviews regarding the Three Mile Island accident. Prior to this, operator action was credited for the start and control of the AFW system.

During an unscheduled outage to repair a reactor coolant pump seal, NNECO identified that Millstone Unit No. 2 does not conform with our previous commitments regarding automatic initiation of the AFW system. Specifically, we have discovered a single failure which could defeat the automatic initiation logic of the AFW system. This condition was promptly reported to the NRC on May 19, 1994, to comply with the requirements of 10CFR50.72.

The automatic initiation logic control circuit is common to both AFW trains. The automatic initiation logic control circuit controls two normally energized relays. Upon detection of a low steam generator level, the two normally energized relays deenergize to initiate independent timers. As stated above, after a time delay, start signals are sent to each of the motor-driven AFW pumps. A single short circuit can defeat the common control circuit, thereby preventing automatic initiation of the motor-driven AFW pumps. Note that manual initiation and control of the AFW pumps is not impacted by this condition.

This condition does not conform to the provisions of Institute of Electrical and Electronics Engineers (IEEE) Standard 279-1971 or the Millstone Unit No. 2 Electrical Separation Specification. Specifically, only one ladder logic scheme is used for both trains of automatic initiation of the AFW system. The other schemes used

in the engineered safety features actuation system utilize redundant and independent logic matrices.

NNECO has been evaluating options to resolve this issue. However, due to the complexity of this issue, NNECO has concluded that there are no apparent design changes which could provide short-term resolution of this condition. Instead, NNECO has concluded that it would be prudent to more thoroughly evaluate the options and design, engineer, install, and test a modification to resolve these issues during the next refueling outage.

NNECO believes that it is safe to operate Millstone Unit No. 2 for the remainder of Cycle 12 until a long-term resolution is implemented during the next refueling outage. However, in order to resume operation, Millstone Unit No. 2 must meet the operability requirements of each of the applicable technical specifications, including those pertaining to automatic initiation of the AFW system. NNECO has concluded that we cannot meet the operability requirements concerning automatic initiation of the AFW system. Accordingly, NNECO has determined that the definition of operability must be modified until the single failure concern can be resolved by design changes. NNECO is hereby proposing to change the Millstone Unit No. 2 Technical Specifications for the remainder of Cycle 12 by providing a definition of operability for the automatic initiation logic for the AFW system that can be met by the current design. Modifications will be implemented prior to startup for Cycle 13 to bring the automatic initiation logic into compliance with NNECO's previous commitments, or we will work with the NRC Staff to properly change the subject commitments.

Description of Proposed Changes

NNECO proposes to include a footnote in Tables 3.3-3, 3.3-4 and 3.3-5 of the Millstone Unit No. 2 Technical Specifications that would denote that operability of the automatic initiation logic for the AFW system will rely upon operator action for the remainder of Cycle 12 operation. Additionally, NNECO proposes to incorporate references to past License Amendments that have affected each of the subject technical specification pages.

NNECO proposes to add the following footnote to Tables 3.3-3, 3.3-4 and 3.3-5 of the Millstone Unit No. 2 Technical Specifications:

"For Cycle 12 only, OPERABILITY of the auxiliary feedwater (AFW) automatic initiation logic will rely on operator action to ensure successful initiation of AFW. Prior to startup for Cycle 13, modifications to the automatic initiation logic for AFW will be implemented which will eliminate the reliance on operator action."

Also, NNECO is proposing to add references to the past License Amendments that have affected each of the subject technical specification pages.

Safety Assessment

The potential for a short circuit in the wiring of the AFW automatic initiation system, that would render the automatic initiation system inoperable, has been identified. A change is being proposed to Technical Specification Tables 3.3-3, 3.3-4 and 3.3-5 to specify that operator action would be relied upon to ensure initiation of the AFW system in the event that there is a demand for AFW concurrent with this postulated single failure.

The automatic AFW initiation signals and circuits are required to be designed such that a single failure will not result in the loss of the automatic initiation capability of the AFW System. In addition, the applicable IEEE standards require that short circuits be postulated as part of the single failure analysis. With the identification of the potential for a short circuit that could render automatic AFW initiation inoperable, the design requirements for automatic initiation of AFW are no longer met. However, we have evaluated the potential for this short circuit to occur and have concluded that the probability of the postulated single failure is extremely low.

The potential short circuits fall into two categories: 1) line to line short in the cable and 2) short circuits in the control cabinets. Using generic "line to line" short circuit failure rates and the monthly test interval currently required by the Millstone Unit No. 2 Technical Specifications, the probability of a short circuit that would disable automatic initiation of AFW, given a loss of normal feedwater event, is approximately 10^{-5} . This value is derived by using the expression $[(1/2) \lambda (T)]$, where λ is the generic line-to-line short circuit failure rate of $2.7E-8/\text{hour}$ (mean value) derived from the median value of $1.0E-8/\text{hour}$ in WASH-1400; and T is the mean time between tests, which is 720 hours for monthly testing. Furthermore, there are several special features of the particular cable installation that make the failure probability extremely low, if not incredible.

The cable is enclosed in a metal casing; thus, the susceptibility to external damage is very low. Additionally, the cable in question is a control cable carrying a low current (150 milli-amps) in a cable whose ampacity far exceeds that. Thus, the potential for a fire due to self ignition is negligibly low. There is only one other cable in the metal casing. It is also an IEEE qualified low current carrying cable. Finally, the cable has been in operation for several years, with no indication of failure.

The control cabinets and cable are located in the control room. The control room is provided with active fire detection and manual suppression. The cabinets are seismically qualified. The monthly testing of the automatic initiation circuitry will detect any of the postulated short circuits.

Thus, we conclude that the probability of these types of short circuits is extremely low.

The identified short circuit could affect the AFW response for events where main feedwater is lost. This includes the loss of main feedwater event analyzed in Chapter 14 of the Final Safety Analysis Report (FSAR).

The limiting FSAR Chapter 14 transient with respect to minimum AFW flow requirements is the loss of main feedwater event. The limiting FSAR loss of main feedwater event assumes that AFW is started manually 10 minutes after the initiation of the event. Thus, a single failure that precludes the automatic initiation of the motor-driven pumps is bounded by the current FSAR analysis.

Automatic initiation of AFW is also credited in demonstrating that the AFW system meets the reliability requirements specified in Section 10.4.9 of the Standard Review Plan, as required by NUREG-0737. However, considering the extremely low probability of this type of failure and the short duration for which this vulnerability will exist, there is no significant impact on the overall reliability of the AFW system and the requirements of Section 10.4.9 of the Standard Review Plan still are met.

The identified potential for short circuits has no impact on the anticipated transient without scram (ATWS) mitigation system actuating circuitry or the manual AFW initiation control circuitry.

In terms of operator action, confirmation of proper feedwater response is already included in the standard post trip actions as specified by the Emergency Operating Procedures. Actions within the standard post-trip action direct that AFW be initiated and the steam generator be fed if feedwater is lost. Considering the fact that the current design basis loss of feedwater analysis demonstrates acceptable results with no AFW for ten minutes, the current Emergency Operating Procedures are sufficient to assure adequate AFW response in a loss of feedwater event even if a short circuit occurs that disables the automatic initiation feature.

The automatic initiation logic for the AFW system will remain energized during this period and will be placed in bypass during monthly surveillance testing.

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Additionally, references to past License Amendments that affected the subject technical specification pages were added. These changes improve clarity and are administrative. They have no impact on public health and safety.

Based on the above, the proposed changes to Tables 3.3-3, 3.3-4, and 3.3-5 of the Millstone Unit No. 2 Technical Specifications do not pose a condition adverse to safety. Also, implementation of these proposed changes cannot create any adverse safety consequences.

Justification for Emergency License Amendment

Pursuant to 10CFR50.91(a)(5), NNECO hereby requests NRC Staff "emergency" approval of the proposed amendment to Operating License DPR-65. Currently, Millstone Unit No. 2 is operating in Mode 5. Action Statement b for LCO 3.3.2.1 prevents Millstone Unit No. 2 from entering Mode 3 if the automatic initiation logic for the AFW system is inoperable. This requirement would prevent resumption of operation following the unscheduled outage to repair a reactor coolant pump seal. To avoid an unnecessary delay in plant startup, emergency authorization is required by May 31, 1994.

This emergency situation could not be avoided for the following reasons. The single failure vulnerability was identified during the current unscheduled outage to repair a reactor coolant pump seal. Since discovery, NNECO has been evaluating options to resolve this issue. However, due to the complexity of this issue, NNECO has concluded that there are no apparent design changes which could provide short-term resolution of this condition. Instead, NNECO has concluded that it would be prudent to more thoroughly evaluate the options and design, engineer, install, and test a modification to resolve these issues during the next refueling outage.

In order to resume operation, Millstone Unit No. 2 must meet the operability requirements of each of the applicable technical specifications, including those pertaining to automatic initiation of the AFW system. NNECO has concluded that we cannot meet the operability requirements concerning automatic initiation of AFW. Accordingly, NNECO has determined that the definition of operability must be modified until the single failure concern can be resolved by design changes. NNECO is hereby proposing to change the Millstone Unit No. 2 Technical Specifications for the remainder of Cycle 12 by providing a definition of operability for the automatic initiation logic for the AFW system that can be met by the current design. Modifications will be implemented prior to startup for Cycle 13 which will bring the automatic initiation logic into compliance with NNECO's previous commitments, or we will work with the NRC Staff to properly change the subject commitments.

The requested emergency license amendment is appropriate because the proposed changes do not involve an undue risk to public health and safety and do not involve a significant hazards consideration (SHC). NNECO has determined that these proposed changes are technically acceptable and do not significantly reduce any margin of safety.

Significant Hazards Consideration

NNECO has reviewed the proposed changes in accordance with 10CFR50.92 and concluded that the changes do not involve a SHC. The basis for this conclusion is that the three criteria of 10CFR50.92(c) are not compromised. The proposed changes do not involve a SHC because the changes would not:

1. Involve a significant increase in the probability or consequences of an accident previously analyzed.

Although virtually all design basis events either explicitly or implicitly rely on auxiliary feedwater for decay heat removal, the loss of normal feedwater event is the most limiting from the standpoint of AFW system performance both in terms of timing and the minimum flow requirements.

The identified single failure would prevent the auto initiation of both motor-driven pumps. The design basis loss of normal feedwater event presented in FSAR Section 14.2.7 does not rely on the automatic initiation of the AFW system. This analysis relies on the operator manually initiating AFW via the turbine-driven AFW pump 10 minutes after the initiation of the event. Because no credit was taken for the automatic initiation of AFW following the limiting loss of main feedwater event, the consequences of this event are not increased.

The proposed changes will have no significant impact on the probability of occurrence of any design basis accident. The proposed changes can affect only the response of the AFW system to a plant transient. They cannot have any impact on the probability of a loss of normal feedwater or any other accidents described in Chapter 14 of the FSAR.

Although the probability of system failure is increased due to reliance on operator action, the increase in failure probability is not significant. Confirmation of proper feedwater response is already included in the standard post trip actions as specified by the Emergency Operating Procedures. Manual initiation of the AFW system is directed by the emergency operating procedures, addressed in training, and routinely practiced on the simulator. Experience has

demonstrated that these manual actions are taken very quickly. Therefore, although the probability of system failure has increased somewhat by reliance on short-term operator action, the increase is not judged to be significant.

Adding references to past License Amendments that have affected the subject technical specification pages are administrative changes.

Based on the above, the proposed changes do not involve an increase in the probability or consequences of an accident previously analyzed.

2. Create the possibility of a new or different kind of accident from any previously analyzed.

The identified single failure impacts the automatic initiation of the AFW system. This potential failure of AFW does not impact the plant response to any transient or accident.

Although the probability of system failure is increased due to reliance on operator action, the increase in failure probability is not significant. Confirmation of proper feedwater response is already included in the standard post trip actions as specified by the emergency operating procedures. Manual initiation of the AFW system is directed by the emergency operating procedures, addressed in training, and routinely practiced on the simulator. Experience has demonstrated that these manual actions are taken very quickly. Therefore, although the probability of system failure has increased somewhat by reliance on short-term operator action, the increase is not judged to be significant.

Adding references to past License Amendments that have affected the subject technical specification pages are administrative changes.

Thus, the proposed changes do not create the possibility of a new or different kind of accident from any previously analyzed.

3. Involve a significant reduction in the margin of safety.

The identified single failure does not involve a significant reduction in the margin of safety. The limiting transient with respect to minimum AFW flow requirements is the loss of main feedwater event. The identified single failure which prevents the automatic initiation of AFW does not impact the loss of main feedwater event consequences, as this event takes credit for manual initiation of the turbine driven AFW pump

10 minutes after the initiation of the event. In addition, based upon a review of the probability of a short circuit that could disable automatic initiation of auxiliary feedwater, it is concluded that probability of this failure is extremely low and the overall reliability of auxiliary feedwater system is not affected.

Adding references to past License Amendments that have affected the subject technical specification pages are administrative changes.

Based on the above, there is no significant reduction in the margin of safety.

The Commission has provided guidance concerning the application of the standards of 10CFR50.92 by providing certain examples (51 FR 7751, March 6, 1986) of amendments that are not considered likely to involve a SHC. The proposed changes to include references to past License Amendments which affected the subject technical specification pages is enveloped by example (i), "A purely administrative change to technical specifications: for example, a change to achieve consistency throughout the technical specifications, correction of an error, or a change in nomenclature." The proposed changes to denote in Tables 3.3-3, 3.3-4 and 3.3-5 of the Millstone Unit No. 2 Technical Specifications that the operability of the automatic initiation logic of the AFW system will rely on operator action for the remainder of Cycle 12 operation are not enveloped by any of the examples. However, as demonstrated above, the changes do not involve a significant hazards consideration.

Request for Enforcement Discretion

NNECO hereby requests the NRC Staff exercise discretion not to enforce compliance with the required actions for Millstone Unit No. 2 LCO 3.3.2.1 should the processing of the proposed license amendment not be completed by May 31, 1994. NNECO hereby provides justification for enforcement discretion associated with the above LCO.

1. The Technical Specification Condition that Will Be Violated

Millstone Unit No. 2 LCO 3.3.2.1 requires the operability of the engineered safety feature actuation system instrumentation shown in Table 3.3-3. The automatic initiation logic of the AFW system is one of the systems that are required to be operable. Action Statement b for this LCO requires that the actions shown in Table 3.3-3 be taken. In this case, Table 3.3-3 requires the automatic initiation logic of the AFW

system be returned to an operable status prior to entering Mode 3.

NNECO is requesting enforcement discretion from the LCO of 3.3.2.1 to permit Millstone Unit No. 2 to avoid an unnecessary delay in plant startup. The discretion is requested to be effective until the amendment is issued and implemented. This discretion would permit NNECO to startup and operate Millstone Unit No. 2 while the proposed license amendment is being processed.

2. The Circumstances Surrounding the Situation Including the Need for Prompt Action

Currently, Millstone Unit No. 2 is operating in Mode 5. Action Statement b for LCO 3.3.2.1 prevents Millstone Unit No. 2 from entering Mode 3 if the automatic initiation logic for the AFW system is inoperable. This requirement would prevent resumption of operation following the unscheduled outage to repair a reactor coolant pump seal. To avoid an unnecessary delay in plant startup, emergency authorization is required by May 31, 1994.

This emergency situation could not be avoided for the following reasons. The single failure vulnerability was identified during the current unscheduled outage to repair a reactor coolant pump seal. Since discovery, NNECO has been evaluating options to resolve this issue. However, due to the complexity of this issue, NNECO has concluded that there are no apparent design changes which could provide short-term resolution of this condition. Instead, NNECO has concluded that it would be prudent to more thoroughly evaluate the options and design, engineer, install, and test a modification to resolve these issues during the next refueling outage, if necessary.

In order to resume operation, NNECO has to ensure that Millstone Unit No. 2 meets the operability requirements of each of the applicable technical specifications, including those pertaining to automatic initiation of the AFW system. NNECO has concluded that we cannot meet the operability requirements concerning automatic initiation of AFW. Accordingly, NNECO has determined that the definition of operability must be modified until the single failure concern can be resolved by design changes. NNECO is hereby proposing to change the Millstone Unit No. 2 Technical Specifications for the remainder of Cycle 12 by providing a definition of operability for the automatic initiation logic for the AFW system that can be met by the current design. Modifications will be implemented prior to startup for Cycle 13 which will

bring the automatic initiation logic into compliance with NNECO's previous commitments, or we will work with the NRC Staff to properly change the subject commitments.

The requested enforcement discretion is appropriate because the proposed changes do not involve an SHC.

3. Safety Basis for the Request

NNECO believes that there is a small and acceptable safety significance or potential consequence associated with this enforcement discretion. As discussed in the Safety Assessment Section of this letter, the proposed changes to Tables 3.3-3, 3.3-4, and 3.3-5 of the Millstone Unit No. 2 Technical Specifications to rely on operator action to ensure initiation of the AFW system are safe and justifiable for the remainder of Cycle 12.

4. Compensatory Measures

A Night Order will be issued to inform the operators of the increased reliance on manual initiation of the AFW system.

5. Duration of Requested Waiver

The enforcement discretion is being requested for the period of time until the license amendment is issued by the NRC. This will permit Millstone Unit No. 2 to startup and operate in Modes 1, 2, or 3.

6. Basis for No Significant Hazards Consideration

The basis for this enforcement discretion not involving an SHC is the same as previously discussed for the proposed license amendment.

7. Basis for No Irreversible Environmental Consequences

The requested enforcement discretion involves no irreversible environmental consequences. The proposed changes do not result in a reduction in a margin of safety, do not affect the calculated doses, and do not impact the capability of systems to perform their intended safety function to control the release of radiological effluents. Also, they do not affect the associated non-radiological effluents. Thus, the proposed changes do not negatively impact the public health and safety.

8. Safety Review

The Millstone Unit No. 2 Plant Operations Review Committee (PORC) and Nuclear Review Board (NRB) have reviewed and concurred with this request for enforcement discretion.

9. Additional Information

Additional information has been supplied throughout the text of this submittal.

In summary, the proposed enforcement discretion would permit Millstone Unit No. 2 to startup and operate at 100% power until the proposed license amendment is issued. This request is safe, and does not constitute an SHC.

Environmental Considerations

NNECO has reviewed the proposed license amendment against the criteria of 10CFR51.22 for environmental considerations. The proposed changes do not increase the types and amounts of effluents that may be released offsite, 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 for an environmental impact statement.

The Millstone Unit No. 2 NRB has reviewed and concurred with the above determinations.

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

Schedule Required for NRC Approval

As discussed previously, authorization of these proposed changes is necessary to permit Millstone Unit No. 2 to resume operations after an unscheduled outage to repair a reactor coolant pump seal. NNECO is requesting emergency approval prior to entering Mode 3. This request is needed by May 31, 1994, to avoid an unnecessary delay in plant startup.

Alternatively, NNECO is requesting that the NRC Staff exercise enforcement discretion associated with LCO 3.3.2.1 to be effective until the amendment is issued. By exercising enforcement discretion, the NRC Staff would permit Millstone Unit No. 2 to resume operations following the unscheduled outage to repair a reactor coolant pump seal while awaiting issuance of the proposed revision to the Millstone Unit No. 2 Technical Specifications.

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NNECO wishes to emphasize our conclusion that this proposed license amendment does not involve any undue safety risk or irreversible environmental consequences.


If the NRC Staff should have any questions or comments regarding this submittal, please contact Mr. R. H. Young at (203) 665-3717. We will promptly 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

FOR: J. F. Opeka
Executive Vice President

BY:


S. E. Scace
Vice President

cc: T. T. Martin, Region I Administrator
G. S. Vissing, NRC Project Manager, Millstone Unit No. 2
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Subscribed and sworn to before me

this 27th day of May, 1994

Gerard P. van Noorden

Date Commission Expires: 12/31/97

Docket No. 50-336
B14859

Attachment 1

Millstone Nuclear Power Station, Unit No. 2
Proposed Revision to Technical Specifications

Automatic Initiation of the Auxiliary Feedwater System
Marked-up Pages

May 1994