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August 16, 1994

Docket No. 50-423
B14930

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
Residual Heat Removal Pump Outage Time

Introduction

Pursuant to 10CFR50.90, Northeast Nuclear Energy Company (NNECO) hereby proposes to amend Operating License NPF-49 by incorporating the proposed changes described in Attachments 1 and 2 into the Technical Specifications of Millstone Unit No. 3. NNECO is proposing to revise Action Statement "a" of Limiting Condition for Operation (LCO) 3.5.2 of the Millstone Unit No. 3 Technical Specifications by increasing the time that a residual heat removal (RHR) pump may be out-of-service before a plant shutdown is required to be initiated. Currently, LCO 3.5.2 requires that a plant shutdown be initiated after one emergency core cooling subsystem has been inoperable for 72 hours. NNECO is proposing to increase this time to 120 hours in the event that an RHR pump is inoperable. The intent of the proposed change is to reduce the potential for an unnecessary plant shutdown, thus, eliminating a source of unnecessary challenges to the plant's safety systems.

Background

Nuclear industry experience has indicated that the mechanical seals on RHR pumps, similar to those on the Millstone Unit No. 3 RHR pumps, have a history of failing after approximately 5 to 7 years of operation. Thus, NNECO has been examining whether it would be prudent to replace the Millstone Unit No. 3 RHR pumps with a pump design which makes seal replacement substantially easier. While this conceptual modification could potentially reduce the time required to replace the mechanical seals, it was determined to be cost prohibitive (the modification was estimated at \$2,200,000). Therefore, other potential solutions to this condition were examined.

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The number of pump starts and pump run-time are the significant contributors to seal wear and overall lifetime. The RHR pumps are started during the performance of surveillances. These surveillances result in numerous starts per pump per quarter, and dozens of starts per fuel cycle per pump. In addition, during each refueling outage, the pumps are run for approximately 1100 hours each. There are no clear indications in the industry as to whether the seal is more likely to fail due to the number of pump starts or run-time.

With the present RHR pump design, the minimum time to replace an RHR pump mechanical seal on-line is close to the 72 hour limit of Action Statement "a" of LCO 3.5.2. NNECO has a high degree of confidence that the 72 hour limit could be met, however little margin exists for the pre-staging and engineering of the replacement mechanical seal.

Voluntary entry into an LCO to perform preventive maintenance is discussed in detail in Part 9900 of the NRC Inspection Manual. It states: "A licensee may take equipment out of service to perform PM [preventive maintenance] during power operation of the facility (on-line PM) if it expects the reliability of the equipment to improve such that the overall risk to safe operation of the facility should decrease." Additionally, the NRC Inspection Manual denotes that "if a licensee has a reasonable expectation that an on-line PM will improve safety by making equipment more reliable, then the licensee can implement that program even though it may increase the unavailability of equipment." NNECO has discussed the use of technical specification LCO action statements and the guidance contained in Part 9900 in internal correspondence.

While NNECO continues to actively pursue the activities necessary for optimizing the mechanical seal replacement activity, we have determined that repairing an inoperable RHR pump (including the replacement of a mechanical seal) while on-line is preferable from a plant safety standpoint than repairing an RHR pump while in cold shutdown. In Mode 1 (power operation), there is no immediate need for the RHR pumps. The RHR pumps are required in Modes 4 and 5 (hot and cold shutdown). Even though the capability for low head safety injection for an accident is lost on one train while the repairs are in progress during Modes 1 through 4, we believe that repairing the RHR pump on-line is preferable from an overall plant safety standpoint. Thus, NNECO is proposing to revise Action Statement "a" of LCO 3.5.2 by increasing the allowed outage time for an RHR pump from 72 hours to 120 hours.

Description of the Proposed Change

NNECO is proposing to revise Action Statement "a" of LCO 3.5.2 of the Millstone Unit No. 3 Technical Specifications by increasing the time that an RHR pump may be out-of-service before a plant shutdown is required to be initiated. Currently, LCO 3.5.2 requires that a plant shutdown be initiated after one emergency core cooling subsystem has been inoperable for 72 hours. NNECO is proposing to increase this time to 120 hours in the event that an RHR pump is inoperable.

Action Statement "a" of LCO 3.5.2 currently reads:

"With one ECCS subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours."

NNECO is proposing to rewrite Action Statement "a" of LCO 3.5.2 as follows:

With one ECCS subsystem inoperable, restore the inoperable subsystem to OPERABLE status within the times shown on the following table or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

<u>Subsystem</u>	<u>Time (Hours)</u>
Centrifugal charging pump	72
Safety Injection pump	72
RHR heat exchanger	72
RHR pump	120
Containment recirculation heat exchanger	72
Containment recirculation pump	72
Flow path capable of taking suction from the RWST on an SIS and capable of being manually realigned to transfer suction to the contain- ment sump for the recirculation phase	72

The proposed table lists the allowed outage times for the various emergency core cooling subsystems. The allowed outage time for most of the subsystems will continue to be 72 hours. The only subsystem allowed outage time that NNECO is proposing to change is the allowed outage time for an RHR pump. NNECO is proposing to increase the allowed outage time from 72 hours to 120 hours.

This proposed change is similar to a license amendment issued for the Vogtle Electric Generating Plant, Units 1 and 2, on May 31,

1994.⁽¹⁾ However, the Vogtle license amendment was only valid for a limited period of time.

Safety Assessment

NNECO's proposed change to Action Statement "a" of LCO 3.5.2 of the Millstone Unit No. 3 Technical Specifications would permit one RHR pump to be inoperable for up to 120 hours, instead of the current technical specification limit of 72 hours. The proposed change is desired to enable RHR pump repairs to be performed while the plant is at power. Given the uncertainty associated with actual task completion time, the plant would be required to be shutdown if the repairs cannot be completed within the current 72 hour outage time.

The extended time that an RHR pump may be permitted to be inoperable results in an insignificant increase in core melt frequency (CMF) due to a loss of coolant accident (LOCA). Extending the outage time may enable the RHR pump repairs to be completed while at power. This action would permit a plant shutdown to be avoided. Based on our risk assessment, the option of performing the RHR pump repairs while the plant is at power is more favorable than performing the repair while the plant is shutdown. The following discussion provides a summary of our risk analysis:

1. RHR Train Unavailability Due to Maintenance

The RHR pump seal replacement activity will significantly alter the "RHR pump out-of-service unavailability" probability from the current plant-specific value of $2.2\text{E-}03$ to $3.2\text{E-}03$ (based on a seal replacement performed at power once every five years). However, this increase is applicable irrespective of whether or not the proposed technical specification change is approved since periodic RHR seal replacement is inevitable.

2. RHR System Unavailability Due To Increase In Maintenance Unavailability

Large Break LOCAs

The increase in RHR pump maintenance unavailability results in a negligible change in the yearly-averaged RHR system unavailability for large break LOCA mitigation (current value

(1) L. L. Wheeler letter to C. K. McCoy, "Issuance of Amendments - Vogtle Electric Generating Plant, Units 1 and 2 (TAC Nos. M88481 and M88482), dated May 31, 1994.

of $1.75\text{E-}02$). With one RHR pump out of service (e.g., for seal replacement), the instantaneous RHR system unavailability for large break LOCA mitigation increases from $1.75\text{E-}02$ to $2.1\text{E-}02$. To mitigate a large break LOCA, the RHR injection flow must be delivered through the three intact Reactor Coolant System (RCS) cold legs to prevent excessive flow resistance. The RHR unavailability is dominated by a set of nine injection line check valves (three valves in series per cold leg). The check valve dependency reduces the impact of having one RHR pump out of service for seal replacement.

Small and Medium Break LOCAs

The increase in pump maintenance unavailability results in a change in the yearly-averaged RHR system unavailability for Small and Medium LOCA mitigation from $6.7\text{E-}04$ to $6.9\text{E-}04$. With one RHR pump out of service, the instantaneous RHR system unavailability increases from $6.7\text{E-}04$ to $4.3\text{E-}03$. These LOCAs require RHR injection flow to be delivered through any two (or all three) of the intact cold legs. Thus, the check valve dependency and the overall unavailability are reduced, though the relative impact of having one RHR pump out of service is greater.

3. CMF Increase Due to System Unavailability Increase

The increased RHR unavailability will only affect the core melt frequency (CMF) contribution from LOCA injection phase failures. The instantaneous CMF increase due to one RHR pump out of service at power is calculated to be $4\text{E-}08/\text{yr}$ (based on the RHR pump being unavailable for an entire year). Since the increased pump unavailability is estimated to be only an additional 48 hours per year (2×120 hours every 5 years), the yearly-averaged at power CMF increase attributed to the proposed change is of the order of $2\text{E-}10/\text{year}$ $[(4\text{E-}08/\text{year}) \times (48 \text{ hours/year}) / (8760 \text{ hours/year})]$. Even accounting for potential uncertainties, this is an insignificant increase by many orders of magnitude.

4. On-Line Repair versus Shutdown Risk Comparison

Given the need for an extended repair of the RHR pump, the risk (in terms of core melt probability) associated with performing the repair at power is $5\text{E-}10$ based on an exposure time of 120 hours and a core melt frequency of $4\text{E-}08/\text{yr}$. The risk incurred by shutting the plant down is on the order of $5\text{E-}08$. This is determined by multiplying the probability that a controlled shutdown will result in a plant transient (0.064 per EPRI-TR-101894) times the conditional probability that a

transient will result in a core melt accident ($9E-07$ per the Millstone Unit No. 3 Probabilistic Safety Study). This does not consider contributions from 1) a potential transient during the time spent at shutdown, or 2) a potential transient during the return to power operation. Based on the above risk assessment, the option to perform the seal replacement at power is favorable compared to performing the repair at shutdown, and results in a negligible impact on core melt frequency.

Significant Hazards Consideration

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

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

There are no actual plant changes that will result from NNECO's proposal to revise Action Statement "a" of LCO 3.5.2 of the Millstone Unit No. 3 Technical Specifications. The change would increase the time available to repair an RHR pump while the plant is at power. The intent is to avoid unnecessary challenges to plant systems by reducing the number of forced shutdowns. The change does not affect any initiating event. Thus, the change does not affect the probability of occurrence of any previously evaluated accident.

Additionally, the safety analysis of the plant is not affected by the change. Therefore, the radiological releases associated with the current analysis are not affected.

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

This proposed change only affects the time that the Millstone Unit No. 3 Technical Specifications permit an RHR pump to be inoperable during Modes 1 through 4. It will not change, in any way, the manner in which plant equipment functions. Since the operation of the plant is not changed, there is no potential for a new, unanalyzed accident.

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

The proposed change does not impact the physical protective boundaries, nor does it affect the performance of safety systems, or the assumptions utilized in the Millstone Unit No. 3 accident evaluations. Thus, there is no adverse impact on 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. NNECO's proposal to revise Action Statement "a" of LCO 3.5.2 of the Millstone Unit No. 3 by increasing the time that an RHR pump may be inoperable in Modes 1 through 4 from 72 hours to 120 hours is not enveloped by any of the examples. As discussed above, NNECO has concluded that the proposed change does not involve a significant hazards consideration.

Environmental Considerations

NNECO has reviewed the proposed license amendment against the criteria of 10CFR51.22 for environmental considerations. The proposed change does 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 change meets the criteria delineated in 10CFR51.22(c)(9) for a categorical exclusion from the requirements for an environmental impact statement.

Nuclear Review Board

The Millstone Unit No. 3 Nuclear Review Board has reviewed and concurred with the above determinations.

Notification of the State of Connecticut

In accordance with 10CFR50.91(b), we are providing the State of Connecticut with a copy of this amendment.

Schedule for NRC Approval and Issuance

Because this proposed change is not required for continued safe plant operation, and the RHR pumps are currently operable, NNECO is not requesting the NRC to review and approve this proposed change by a specific schedule. However, this proposed change should be acted on at your earliest convenience. This action will help to prevent any emergency need for this proposed change in the future.

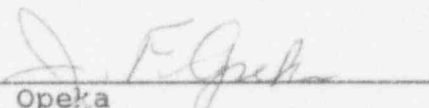
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NNECO will implement the license amendment within 30 days of the date of issuance.

Should you have any questions regarding this submittal, please contact Mr. R. G. Joshi at (203) 440-2080.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY



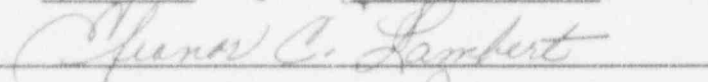
J. F. Opeka
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cc: T. T. Martin, Region I Administrator
V. L. Rooney, NRC Project Manager, Millstone Unit No. 3
P. D. Swetland, Senior Resident Inspector, Millstone Unit
Nos. 1, 2, and 3

Mr. Kevin T. A. McCarthy, Director
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Subscribed and sworn to before me

this 16 day of August, 1994



Thomas C. Lambert

Date Commission Expires: January 31, 1998

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Attachment 1
Millstone Unit No. 3
Proposed Revision to Technical Specifications
Residual Heat Removal Pump Outage Time
Marked-Up Pages

August 1994