

NORTHEAST UTILITIES



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October 25, 1990

Docket No. 50-423

B13510

Re: 10CFR50.90

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

Gentlemen:

Millstone Nuclear Power Station, Unit No. 3
Proposed Revision to Technical Specifications
Residual Heat Removal (RHR) System Autoclosure Interlock (ACI)

Introduction

Northeast Nuclear Energy Company (NNECO) hereby proposes to remove the auto-closure interlock (ACI) function from the Millstone Unit No. 3 residual heat removal (RHR) system suction valves. There are three motor-operated valves in series in each of the two RHR pump suction lines from the reactor coolant system (RCS) hot legs. Two valves in series (Train A suction valves--3RHS*MV8701 A & B, Train B suction valves--3RHS*MV8702 A & B) located close to the containment walls, one inside containment and one outside containment, are provided with interlocks. The third valve (Train A--RHS*MV8701C and Train B--RHS*8702C) in each train is located inside containment and is closed and deenergized at the motor control center (MCC) during power operation. No interlocks are provided to this third valve. The proposed modification will remove the ACI feature of the RHR suction valves 3RHS*MV8701 A & B and 3RHS*MV8702 A & B. The function of this interlock is to automatically isolate the RHR system from the RCS when the RCS pressure exceeds 750 psig. Instead, an alarm will be added on these valves to warn the operators if the RCS pressure is high (exceeds 440 psig) when the suction valves are open.

Removal of the RHR ACI function addresses Commission concerns regarding the potential for failure of the ACI circuitry to cause inadvertent isolation of the RHR system with subsequent loss of RHR capability during cold shutdown and refueling operation. In addition, this proposed change is consistent with the recommendations of Generic Letter 88-17, "Loss of Decay Heat Removal."

The proposed removal of ACI features will result in 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 change identified in Attachment 1 into the Technical Specifications of Millstone Unit No. 3.

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Background

For Millstone Unit No. 3, the RHR system transfers heat from the RCS to the reactor plant component cooling water system to reduce the temperature of the reactor coolant to the cold shutdown temperature at a controlled rate during the second part of normal plant cooldown and maintains this temperature until the plant is started up again.

Part of the RHR system also serves as part of the emergency core cooling system (ECCS) during the injection phase of a loss of coolant accident (LOCA).

The RHR system may be used to transfer refueling water between the refueling cavity and the refueling water storage tank at the beginning and end of the refueling operations.

The RHR system consists of two residual heat removal exchangers, two residual heat removal pumps, and the associated piping, valves, and instrumentation necessary for operational control. The suction lines to the RHR system are connected to the hot legs of two reactor coolant loops, while the return lines are connected to the cold legs of each of the reactor coolant loops. The RHR system is designed to be isolated from the RCS whenever the RCS pressure exceeds the RHR design pressure. The RHR system suction lines are isolated from the RCS by three normally-closed motor-operated valves in series. The two normally closed isolation valves inside containment in each RHR system suction line receive power from the same Class 1E source as the RHR pump in that line while the valve outside containment is powered by the opposite train. This arrangement ensures that single failure requirements for RHR system accessibility and isolation are met. Each discharge line is isolated from the RCS by three check valves located inside the containment and by a normally open motor-operated valve located outside the containment. (The check valves and the motor-operated valve on each discharge line are not part of the RHR system; these valves are shown as part of the ECCS; Millstone Unit No. 3 FSAR, Figure 6.3-1.)

As stated above, there are three motor-operated valves in series in each of the two RHR pump suction lines from the RCS hot legs. Two valves in series located close to the containment walls, one inside containment and one outside containment, are provided with interlocks. The interlock features provided for the isolation valves are identical for both trains and are shown on FSAR Figure 7.6-1.

Each of the two valves is interlocked so that it cannot be opened unless the RCS pressure is below approximately 375 psig. This interlock prevents the valve from being opened when the RCS pressure plus the RHR pump pressure would be above the RHR system design pressure. A second pressure interlock is provided to close the valve automatically if the RCS pressure subsequently increases to above 750 psig. The interlocks for each train are independent and diverse, derived from signals generated by transmitters manufactured by two different vendors.

The third valve in each train is located inside containment and is closed and deenergized at the MCC during power operation. No interlocks are provided.

Safety Assessment

By letter dated August 8, 1989,⁽¹⁾ the NRC indicated that they have completed review of a topical report, WCAP-11736, "Residual Heat Removal System Auto-closure Interlock Removal Report for the Westinghouse Owners Group." In that letter, the Staff concluded that the information in WCAP-11736 can be used to supplement plant-specific requests to remove the ACI from the Westinghouse plants covered by the report. WCAP-11736 provides an evaluation of the removal of the ACI from suction/isolation valves in the RHR system at four reference plants: Salem Unit 1, Callaway Unit 1, North Anna Unit 1 and Shearon Harris Unit 1. NNECO on behalf of Millstone Unit No. 3 participated in this program. The Westinghouse Owners Group (WOG) plants participating in the program were categorized into one of four groups based on RHR system configuration and design characteristics that were similar to one of the four reference plants. It was intended that other members of the WOG could reference the applicable lead plant in the study and provide a plant-specific analysis should they desire to delete the ACI feature from the RHR system suction valves. The basis information presented in WCAP-11736 is applicable for use in the Millstone Unit No. 3 plant-specific effort. It is noted that for Millstone Unit No. 3, the reference plant in WCAP-11736 is Callaway Unit 1. The literature review and licensing basis remain the same for all Westinghouse plants. The probabilistic models and data base can be utilized as a basis for the plant-specific effort. The recommended changes to Technical Specifications are also applicable.

In addition, the Staff, in their safety evaluations⁽²⁾ identified five items that must be addressed on a plant-specific basis. Attachment 2 provides responses to those five items. A review and analysis have been performed for Millstone Unit No. 3 (see Attachment 3) to justify removal of the ACI associated with the Millstone Unit No. 3 RHR system suction valves. Removal of the RHR ACI function addresses industry and NRC concerns regarding the potential for failure of the ACI circuitry to cause inadvertent isolation of the RHR system and subsequent loss of RHR capability during cold shutdown and refueling operations.

The purpose of the analysis provided in Attachment 3 is to investigate the risk impact of removing the ACI from the RHR system suction valves 3RHS*MV8701 A & B and 3RHS*MV8702 A & B at Millstone Unit No. 3 and adding a control room alarm to alert the operator that a suction/isolation valve is not fully closed when the RCS pressure is above the alarm setpoint. The plant-specific report for Millstone Unit No. 3 justifies removal of the ACI based on a safety evaluation of the effect of ACI removal on low temperature overpressure protection, RHR system reliability and interfacing system LOCA potential.

(1) A. Thadani letter to R. A. Newton, Chairman WOG, Acceptance for Reference WCAP-11736, Rev. 0, "Residual Heat Removal System, Auto Closure Interlock (ACI) Removal Report" in Plant Specific Submittals, dated August 8, 1989.

(2) Ibid.

This report recommends the deletion of the autoclosure interlock of the RHR system suction/isolation valves during shutdown. The installation of a control room alarm is recommended to warn the operator that a suction/isolation valve(s) is not fully closed when RCS pressure is above the alarm setpoint. The results of the intersystem LOCA analysis show that the frequency of the Event V decreases (approximately 2.3%) with the removal of the ACI feature. Removal of the ACI features will reduce the RHR short-term unavailability by 12% from $1.64\text{E-}2$ to $1.45\text{E-}2$. Further, removal of the ACI features significantly reduces the long-term RHR unavailability (approximately 70%) from $3.94\text{E-}2$ to $1.19\text{E-}2$. It is also concluded that the removal of the RHR ACI has no significant impact on the overpressure transient due to a) adequate capacity of RHR relief valves, b) adequate capacity of pressurizer power operated relief valves and c) the plant procedure that directs the inadvertent safety injection actuated charging flow to the refueling water storage tank, rather than to the RCS.

In addition, the fluid system review of this proposed modification has determined that RHR ACI removal would not adversely impact the capability of the RHR system to perform its safety function. The electrical and control system review indicates that removal of the RHR ACI feature does not degrade the capability of the remaining plant protection logic to perform its safety function.

Description of the Proposed Change

The proposed Technical Specification change will delete the surveillance requirements (Section 4.5.2.d.1) associated with the RHR ACI concurrent with the removal of the ACI circuitry planned for the third refueling outage.

Surveillance Requirements 4.5.2.d.1 of the Millstone Unit No. 3 Technical Specifications requires that the automatic isolation and interlock function of the RHR inlet isolation valves be demonstrated operable on an 18-month interval. However, with the ACI function removed, there is no longer a need to retain this surveillance requirement within the Technical Specifications.

Significant Hazards Consideration

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

1. Involve a significant increase in the probability or consequences of an accident previously evaluated. The removal of the RHR ACI was analyzed generically in WCAP-11736 in terms of the frequency of an interfacing LOCA, the availability of the RHR system and the effect on overpressure transients. This generic analysis has been supplemented by the plant-specific submittal (Attachment 2) for Millstone Unit No. 3. With the removal of the ACI and addition of a control room alarm, the analysis predicts a decrease in interfacing LOCA frequency of approximately 2.3%. Further, removal of the ACI feature significantly reduces the long-term

RHR unavailability (approximately 70%) from $3.94\text{E-}2$ to $1.19\text{E-}2$. Finally, removing the RHR ACI has no significant impact on the overpressure transient. With removal of the ACI feature on the RHR suction/isolation valves, as stated above, the control room alarm and administrative procedures would be capable of ensuring that the low pressure RHR system is isolated from the high pressure RCS, when the RCS operating pressure exceeds the alarm setpoint. The current system relies on RHR suction relief valves (440 psig set pressure) and the cold overpressure protection system (COPPS), to limit the pressure rise during a transient. The RHR relief valves and COPPS will remain available per Technical Specification 3.4.9.3 to mitigate a pressure transient. Therefore, the proposed change would not increase the consequences of an accident previously analyzed.

2. Create the possibility of a new or different kind of accident from any previously evaluated. The effect of an overpressure transient at cold shutdown conditions will not be altered by removal of the RHR ACI function. With or without the ACI function, the RHR system could be subject to overpressure for which the RHR relief valves must be relied upon to limit pressure to within RHR design parameters. While it is true that the ACI initiates an automatic closure of the RHR suction/isolation valves on high RCS pressure, overpressure protection of the RHR system is provided by the RHR system relief valves and not by the slow acting suction/isolation valves that isolate the RHR system from the RCS. Since relief valves prevent overpressurization of the RHR system during shutdown conditions and procedures are in place to ensure that the RHR system is isolated from the RCS during normal plant conditions, removal of the ACI does not create the possibility of a new or different kind of accident from any accident previously evaluated.
3. Involve a significant reduction in safety margin. The RHR ACI function is not a consideration in a margin of safety in the basis for any Technical Specification. However, since the probabilistic analysis of WCAP-11736 and the Millstone Unit No. 3 plant-specific analysis indicates that the availability of the RHR system is increased with removal of the ACI, implementation of the modification (addition of a control room alarm) and the procedural changes will produce an increase in overall safety.

Moreover, the Commission has provided guidance concerning the application of standards in 10CFR50.92 by providing certain examples (51FR7751, March 6, 1986) of amendments that are considered not likely to involve a significant hazards consideration. Although the proposed change is not enveloped by a specific example, the proposed change would not involve a significant increase in the probability or consequences of an accident previously analyzed. With the removal of the ACI and addition of a control room alarm, the Millstone Unit No. 3 plant-specific analysis predicts a decrease in interfacing LOCA frequency of approximately 2.3%. Further, removal of the ACI features significantly reduces the long-term RHR unavailability from $3.94\text{E-}2$ to $1.19\text{E-}2$. Finally, removing the RHR ACI has no significant impact on the overpressure transient.

Based upon the information contained in this submittal and the environmental assessment for Millstone Unit No. 3, there are no radiological or nonradiological impacts associated with the proposed change and the proposed license amendment will not have a significant effect on the quality of the human environment.

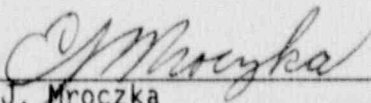
The Millstone Unit No. 3 Nuclear Review Board has reviewed and approved the attached proposed revisions and has concurred with the above determinations.

To allow for implementation of the design change related to this technical specification change during the third refueling outage, scheduled to start in February 1991, your timely review and approval of the proposed license amendment is requested.

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

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY



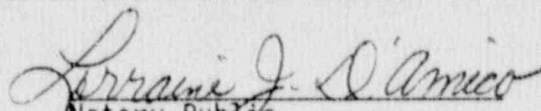
E. J. Mroczka
Senior Vice President

cc: T. T. Martin, Region I Administrator
D. H. Jaffe, NRC Project Manager, Millstone Unit No. 3
W. J. Raymond, Senior Resident Inspector, Millstone Unit Nos. 1, 2, and 3

Mr. Kevin McCarthy
Director, Radiation Control Unit
Department of Environmental Protection
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STATE OF CONNECTICUT)
) ss. Berlin
COUNTY OF HARTFORD)

Then personally appeared before me, E. J. Mroczka, who being duly sworn, did state that he is Senior Vice President of Northeast Nuclear Energy Company, a Licensee herein, that he is authorized to execute and file the foregoing information in the name and on behalf of the Licensee herein, and that the statements contained in said information are true and correct to the best of his knowledge and belief.



Notary Public

My Commission Expires March 31, 1993