Docket No. 50-423
B13510

Attachment 1

Millstone Unit No. 3

Proposed Revision to Technical Specifications
Residual Heat Removal System Autoclosure Interlock

October 1990

4.5.2 Each ECCS subsystem shall be demonstrated OPERABLE:

a. At least once per 12 hours by verifying that the following valves are in the indicated positions with power to the valve operators removed:

Valve Number	Valve Function	Valve Position
3SIH*MV8806	RWST Supply to SI Pumps	OPEN
3SIH*MV8802A	SI Pump A to Hot Leg Injection	CLOSED
3SIH*MV8802B	SI Pump B to Hot Leg Injection	CLOSED
3SIH*MV8835	SI Cold Leg Master Isolation	OPEN
3SIH*MV8813	SI Pump Master Miniflow Isolation	OPEN
3SIL*MV8840	RHR to Hot Leg Injection	CLOSED
3SIL*MV8809A	RHR Pump A to Cold Leg Injection	OPEN
3SIL*MV8809B	RHR Pump B to Cold Leg Injection	OPEN

b. At least once per 31 days by:

1) Verifying that the ECCS piping, except for the RSS pump, heat exchanger and associated piping, is full of water by venting the ECCS pump casings and accessible discharge piping high points, and

2) Verifying that each valve (manual, power-operated, or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

c. By a visual inspection which verifies that no loose debris (rags, trash, clothing, etc.) is present in the containment which could be transported to the containment sump and cause restriction of the pump suctions during LOCA conditions. This visual inspection shall be performed:

1) For all accessible areas of the containment prior to establishing CONTAINMENT INTEGRITY, and

2) Of the areas affected within containment at the completion of each containment entry when CONTAINMENT INTEGRITY is established.

d. At least once per 18 months by:

1) Verifying automatic interlock action of the RHR System from the Reactor Coolant System by ensuring that with a simulated or actual Reactor Coolant System pressure signal greater than or equal to 390 psia the interlocks prevent the valves from being opened.

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Attachment 2

Millstone Unit No. 3

Response to Plant Specific Items Regarding
the Removal of the Residual Heat Removal System Autoclosure
Interlock Function

October 1990

Response to Plant-Specific Items Regarding the Removal of
the Residual Heat Removal System Autoclosure Interlock Function

Millstone Unit No. 3

By letters dated April 22, 1988[1] and January 3, 1989,[2] the Westinghouse Owners Group (WOG) requested that the Staff review WCAP-11736, "Residual Heat Removal System Auto Closure Interlock Removal Report." This report provides an evaluation of the removal of the auto closure interlock (ACI) from suction/isolation valves in the residual heat removal (RHR) system at four reference plants. The choice of the four particular reference plants was intended to provide the maximum number of other WOG members with the best possible fit should they choose to delete the ACI in the future and reference WCAP-11736. It is expected that, should a plant desire to delete the ACI, a plant-specific analysis would still be required, but that substantially less resources would need to be expended to produce and review this analysis by the Staff if reference was made to WCAP-11736. It is noted that for Millstone Unit No. 3, the reference plant in WCAP-11736 is Callaway Unit 1. By letter dated August 8, 1989,[3] the NRC indicated that they have completed review of WCAP-11736 and concluded that WCAP-11736 may be referenced in the licensee's plant-specific submittals to show compliance with those items that are not plant-specific. In addition, the Staff, in their safety evaluation,[4] identified five items that must be addressed on a plant-specific basis. The following is the response to the five items requested in the NRC safety evaluation of WCAP-11736 for the plant-specific submittal.

Item 1

An alarm will be added to each RHR suction valve which will actuate if the valve is open and the pressure is greater than the open permissive setpoint and less than the RHR system design pressure minus the RHR pump head pressure (justified by 11736).

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(1) R. A. Newton (WOG) letter to M. W. Hodges (NRC), "Residual Heat Removal System Autoclosure Interlock Removal Report for the Westinghouse Owners Group," February 1988, WCAP-11736, Revision 0, dated April 22, 1988.

(2) R. A. Newton (WOG) letter to M. W. Hodges, (NRC), dated January 3, 1989.

(3) A. Thadani (NRC) letter to R. A. Newton (WOG), Acceptance for Referencing WCAP-11736 Rev. 0, "Residual Heat Removal System Autoclosure Interlock (ACI) Removal Report" in Plant-Specific Submittals, dated August 8, 1989.

(4) Ibid.

Response

Northeast Nuclear Energy Company (NNECO) proposes to remove the autoclosure interlock (ACI) function from the residual heat removal (RHR) 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 located close to the containment walls, one inside containment and one outside containment, are provided with interlocks.

The interlock features provided for the suction valves are identical for both trains (Train A suction valves - 3RHS*MV8701 A & B, Train B suction valves 3RHS*MV8702 A & B). 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. This autoclosure interlock will be removed from the RHR suction valves. The open permissive interlock will remain intact. An alarm will be added to each valve which will actuate if the valve is open and if RCS pressure is above a value set between 375 psig and 450 psig. The actual setpoint of 440 psig has been selected based on the following:

1.	RHR Pump Discharge Pressure	150 psig
2.	RHR Suction Valve Open Permissive	375 psig
3.	RHR Relief Valve set to open	440 psig
4.	RHR ACI Setpoint (to be deleted)	750 psig
5.	RHR System Design Pressure	600 psig

The third valve in each train is located inside the containment and is closed and de-energized at the motor control center (MCC) during power operation. No interlocks are provided.

Item 2

Valve position indication to the alarm must be provided from the stem-mounted limit switches (SMLSs) and power to the SMLS must not be affected by power lockout of the valve (justified by WCAP-11736).

Response

As stated in the previous response, the third suction valve in each RHR system (3RHS*MV8702C and 3RHS*MV8701C) is closed and de-energized (power lockout) at the MCC during power operation. No interlocks are provided. Valve position indication and computer points for valve position are available during power lockout of these valves. No changes are proposed to these valves. For the other two valves, the ACI interlock will be removed. A control room alarm will be provided to alert the operator to an improperly positioned RHR suction valve. An alarm will occur if an RHR suction valve is not fully closed and if the RCS pressure exceeds the alarm setpoint. Valve positions will be sensed

from limit switches in the limitorque operators. For each of these valves, computer points for the valve position, valve open/RCS pressure hi alarm and the open block interlock will remain. This data provides adequate information to the operator to assure that suction valves are closed when needed and that RHR system pressure rating is not exceeded. A similar design has been accepted by the NRC on the Callaway plant.

Item 3

The procedural improvements described in WCAP-11736 should be implemented. Procedures themselves are plant specific.

Response

NNECO will be conducting a review of the Millstone Unit No. 3 operating procedures to determine the continued applicability of the procedures and will make any changes necessary to ensure continued safe operation without the ACI. In addition, the RHR alarm response procedure will be modified to reflect the appropriate (new) alarm recognition and responses for the added alarm. In addition, a procedure for the RHR suction valve alarms will be added to ensure these alarms remain functional.

Item 4

Where feasible, power should be removed from the RHR suction valves prior to their being leak-checked (plant-specific.)

Response

It is NNECO's intention not to remove power from the RHR suction valves prior to their being leak-checked for the following reasons:

1. The reference plant for Millstone Unit No. 3 (Callaway) normally has power removed from the valve operators during Modes 1/2/3. Removal of power during a leak test is therefore consistent with their Mode 1/2/3 operating requirements, and may present no additional administrative burden to them.

2. At Millstone Unit No. 3, however, these four valves do not have power removed during normal operation. Power is available at all times to these valves. Requiring power removal during leak testing would therefore place the system in an abnormal mode. The potential would then exist to fail to restore power, thus leaving the system in an inoperable or degraded condition.

3. The stated rationale in WCAP-11736 for power removal during leak tests is to verify valve closure and to ensure the valves remain in the tested configuration. During Millstone Unit No. 3 leak testing, verification of valve closure is by position indicating lights driven from limit switches. During the various leak tests, the valves are under

administrative control of the leak test procedure, thus preventing inadvertent valve operation.

4. Power removal would require an additional operator during the leak test, and would increase the complexity of the test itself.

5. If a problem with decay heat removal arose and the train under test was required on line quickly, power restoration would delay this evolution. This could therefore challenge adequate core cooling.

6. Depending on the leak test being performed, some of these valves must be stroked open after the leak test is complete to realign the system. Again, this would require power to be restored, thus complicating the evolution.

7. The RHR suction valves (3RHS*MV8701A&B and 3RHS*MV8702A&B) have key lock handswitches that are administratively controlled.

Item 5

The RHR suction valve operator should be sized so that the valves cannot be opened against full system pressure (plant-specific).

Response

In response to this NRC concern, NNECO attempted to confirm that the RHR inlet isolation valve motor-operated actuators are incapable of opening the valves when the RCS is at full pressure. Although it appears that the thrust requirement to open the valves with the RCS at full pressure cannot be met by the motor-operated actuators, this cannot be confirmed, due to uncertainties regarding the actual maximum capability of the actuators. In addition, although the Westinghouse specification for the valves/actuators required that the valves be capable of opening and closing against a differential pressure of 700 psi, there was no requirement regarding a maximum differential pressure against which the valves would open. Therefore, NNECO cannot confirm that the motor-operated actuators are incapable of opening the valves against an RCS full pressure.

However, it can be stated that these valves cannot be opened with the RCS at pressure, due to the existence of the open permissive interlock. This interlock prevents opening of the RHR inlet isolation valves when the RCS pressure is greater than or equal to 375 psig. In accordance with the Technical Specification Section 4.5.2.d.1, this open permissive interlock is tested on an eighteen-month frequency. The RHR Autoclosure Interlock removal modification does not change the open permissive circuitry. Therefore, the open permissive interlock will prevent the valves from being opened with the RCS at pressure and, accordingly, the sizing of the valve motor operators is not significant. Finally, per pages 9-2 and 9-3 of the WCAP 11736, no credit was taken in the supporting frequency of an interfacing systems LOCA analysis for the inability of the motor operators to open the RHR inlet isolation valves in Modes 1, 2, or 3.

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Attachment 3
Millstone Unit No. 3

Plant-Specific Analysis for the Removal of the Residual Heat Removal Autoclosure Interlock Function

October 1990