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The Northeast Utilities System

DEC 11 2000

Docket No. 50-423
B18263

RE: 10 CFR 50.109
10 CFR 50.54(f)

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

Millstone Nuclear Power Station, Unit No. 3
Response to a Request For Additional Information
Regarding Resolution of Issues Related to Generic Letter 96-06

This letter provides Northeast Nuclear Energy Company's (NNECO) response to a request for additional information regarding resolution of issues related to Generic Letter (GL) 96-06 for Millstone Unit No. 3. GL 96-06[1] included a request for licensees to evaluate cooling water systems that serve containment air coolers to assure that they are not vulnerable to waterhammer and two-phase flow conditions.

Millstone Unit No. 3 responses to the requested actions of GL 96-06 and a previous request for additional information were provided in the following correspondences:

- By a letter dated January 28, 1997,[2] NNECO provided its assessment of Action item 1 of the GL 96-06 for Millstone Unit No. 3.
- By a letter dated May 11, 1998,[3] NNECO provided its response to Action item 2 of the GL 96-06 for Millstone Unit No. 3.

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(1) Thomas T. Martin to Licensees, Generic Letter 96-06, "Assurance of Equipment Operability and Containment Integrity During Design-Basis Accident Conditions," dated September 30, 1996.

(2) M. L. Bowling to U.S. Nuclear Regulatory Commission, "Millstone Nuclear Power Station, Unit No. 3, Response to Requested Action 1 of Generic Letter 96-06, Assurance of Equipment Operability and Containment Integrity During Design-Basis Accident Conditions," dated January 28, 1997.

(3) M. L. Bowling to U.S. Nuclear Regulatory Commission, "Millstone Nuclear Power Station, Unit No. 3, Supplemental Response to NRC Generic Letter 96-06," dated May 11, 1998.

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- By a letter dated August 31, 1998,[4] NNECO provided response to a previous request for additional Information. The previous request for additional information was provided by a letter from the Nuclear Regulatory Commission (NRC), dated May 8, 1998.[5]

On October 6, 2000,[6] NNECO received a request for additional information containing five questions. Four questions are related to Millstone Unit No. 2 and one question is related to Millstone Unit No. 3. The request was followed by two teleconferences with the NRC staff on October 18, 2000, and on October 25, 2000, to discuss clarifications of the questions provided in the request. The purpose of this letter is to transmit the response to the Millstone Unit No. 3 question. Attachment 1 contains the response. The response to Millstone Unit No. 2 questions will follow in a separate correspondence.

There are no regulatory commitments contained within this letter.

If you should have any questions on the above, please contact Mr. Ravi Joshi at (860) 440-2080.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

Raymond P. Necci
Vice President - Nuclear Technical Services

Sworn to and subscribed before me

this 11 day of December, 2000

Donna Lynne Williams
Notary Public

My Commission expires Nov 30, 2001

cc: See next page

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(4) M. L. Bowling to U.S. Nuclear Regulatory Commission, "Millstone Nuclear Power Station, Unit No. 3, NRC Generic Letter 96-06, Request For Additional Information," dated August 31, 1998.

(5) J. W. Anderson to M. L. Bowling, "Millstone Nuclear Power Station, Unit 3 - Request For Additional Information Regarding Resolution of Generic Letter (GL) 96-06, (TAC No. M96834)," dated May 8, 1998.

(6) Bob Pulsifer to Paul Russell, "Draft RAI for GL96-06," dated October 6, 2000.

Attachment (1)

cc: H. J. Miller, Region I Administrator
V. Nerses, NRC Senior Project Manager, Millstone Unit No. 3
A. C. Cerne, Senior Resident Inspector, Millstone Unit No. 3

Docket No. 50-423
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Attachment 1

Millstone Nuclear Power Station, Unit No. 3

Response to a Request for Additional Information
Regarding Resolution of Issues Related to Generic Letter 96-06

**Response to a Request for Additional Information
Regarding Resolution of Issues Related to Generic Letter 96-06
Millstone Nuclear Power Station, Unit No. 3**

Question

In the 5-11-98 submittal, the licensee describe two cases where thermal pressurization can occur. One case is where piping inside containment could pressurize and damage inboard containment isolation valves (CIVs). Provide a description of how damage of the inboard CIVs is prevented for each penetration. Another case is where isolated vent and drain lines may be thermally pressurized. The licensee provides a discussion of an assessment based on use of Appendix F of the ASME Code, but indicates that this may not be the long-term approach. The staff has determined that an analysis in accordance with the provisions of Appendix F is one acceptable method of addressing the thermal pressurization issue. Provide a description of the long-term solution for each of the vent and drain lines.

Response to Question

An engineering calculation was performed and documented to evaluate all containment penetrations for overpressure protection and provide justification for inclusion or exclusion of over pressure relief devices. This calculation also contains an evaluation of piping adjacent to the inboard Containment Isolation Valves (CIVs) which may be susceptible to thermal overpressurization.

First Case:

Containment Isolation Barrier (CIB) integrity is maintained for locations where there may be trapped water in piping adjacent to the CIV. This is based on a screening evaluation, as part of the above mentioned calculation, that has been applied to all containment penetrations to identify susceptible locations. Out of this screening evaluation, several outliers were identified. For each outlier identified, an evaluation was performed to determine if mitigating circumstances or issues related to configuration are present, and thus if there is a potential challenge to the CIB. All outliers were found to be acceptable. One location, penetration Z-62, required a procedural change, which has been implemented, to assure that the isolated leg is not water solid. All locations, including penetration Z-62, were found to have no past operability concerns. The following tabulation summarizes the evaluation results for these outliers.

System	Pen #	Description of Overpressure Potential	Disposition
PGS - Primary Grade Water (Ref. P&ID 119A)	15	Potential for fluid to be trapped between inboard CIV and closed valves feeding neutron shield tank surge tank, Pressurizer Relief Tank (PRT), and RCP #3 seal tank. Non-QA function used to support normal plant operation, therefore, administrative control to drain line is not practical. System operates at cold temperature, therefore overpressure potential exists in Design Basis Accident (DBA) environment.	Valve 3PGS-AV8030 is a 150# globe valve with a preferential orientation which would tend to lift when trapped fluid expands under valve seat. Valve is normally closed and fails closed under loss of air. Therefore, valve leakage will occur at pressures somewhere above design pressure to relieve overpressure condition and protect inboard CIV.
DGS - Containment Drains Transfer Pumps (Ref. P&ID 107A)	27	Potential for fluid to be trapped between inboard CIV and check valves on discharge of containment drains transfer pumps and PRT drains transfer pumps. Non-QA function used to support normal plant operation, therefore, administrative control to drain line is not practical. System operates at normal containment ambient conditions, therefore, overpressure potential exists in DBA environment.	Valve 3DGS*CTV24 is a 150# globe valve with a preferential orientation which would tend to lift when trapped fluid expands under valve seat. Valve is normally closed and fails closed under loss of air and Containment Isolation Actuation (CIA) signal. Therefore, valve leakage occurs at a pressure somewhere above design pressure to relieve overpressure condition and protect the containment penetration boundary.

System	Pen #	Description of Overpressure Potential	Disposition
DAS - Containment Sump Pumps (Ref. P&ID 106C)	28	Condition similar to DGS system.	Valve 3DAS*CTV24 is a 300# globe valve with a preferential orientation which would tend to lift when trapped fluid expands under valve seat. Valve is normally closed and fails closed under loss of air and CIA signal. Therefore, valve leakage occurs at a pressure somewhere above design pressure to relieve overpressure condition and protect the containment penetration boundary.
SIL/SIH - Test Connections for Reactor Coolant System (RCS) pressure boundary isolation valve (PIV) Leakage Surveillance (Ref. P&IDs 112A/B, 113A/B)	51 93-99	Potential for fluid to be trapped between inboard CIV and plug valves used to test PIV's in a manifold which is normally isolated but utilized to perform surveillance on PIV leakage. Non-QA piping utilized to support surveillance, therefore, administrative control to drain manifold is not practical. System operates at normal containment ambient conditions, therefore, overpressure potential exists in DBA environment.	Valves 3SIL*AV8878A/B/C/D are 1500# plug valves with a preferential orientation which would tend to lift when trapped fluid expands under valve seat. Valves are normally closed and fail closed under loss of air. Therefore, valve leakage occurs at a pressure somewhere above design pressure to relieve overpressure condition and protect the inboard CIV from overpressurization.
CHS - Letdown (Ref. P&ID 104A)	24	Potential for fluid to be trapped between inboard CIV and upstream letdown orifice or letdown isolation valves. System is normally in service but isolates on lo-lo pressurizer level.	System operates at temperatures which exceed DBA environment. Therefore, once isolated, trapped fluid will shrink and then expand back to pre-DBA conditions. Therefore, overpressurization is not a concern based on engineering judgment.

System	Pen #	Description of Overpressure Potential	Disposition
FPW - Fire Protection to Containment Bldg. (Ref. P&ID 146B)	56	Potential for fluid to be trapped between inboard CIV and standpipes / sprinkler heads. System normally filled and vented at normal containment ambient conditions, therefore, overpressure potential exists in DBA environment.	Elevated DBA temperature causes sprinkler heads to light off at 175 °F, resulting in a relief path to protect the inboard CIV from overpressurization. At 175 °F the pressure exceeds the CIV limit. Further review has concluded that this system is not water solid, and there is sufficient leakage past the CIV from local leak rate testing data.
SSP - Post Accident Sample Supply (Ref. P&ID 155A)	115	Potential for fluid to be trapped between inboard CIV and normally closed solenoid valves on sample lines off the RCS loops. System only used post-DBA. However, system could be filled and water solid, therefore, overpressure potential exists in DBA environment.	Valves 3SSP*SOV1A/1B/1C/1D/2A/2B are 2500# solenoid operated globe valves with a preferential orientation which would tend to lift when trapped fluid expands on the outlet side of the valve to a pressure 50 psi above the inlet pressure. Valves are normally closed and fail closed under loss of power. Therefore, valve leakage occurs at a pressure 50 psi above the set pressure of the RCS safety valves to relieve overpressure condition and protect the containment penetration boundary.
SSP - Post Accident Sample Return (Ref. P&ID 155A)	120	Potential for fluid to be trapped between inboard CIV and normally closed solenoid valves on sample return lines to the containment sump or RCP seal water return. System only used post-DBA. However, system could be filled and water solid, therefore, overpressure potential exists in DBA environment.	Valve 3SSP*CTV8 is a 2500# solenoid operated globe valve with a preferential orientation which would tend to lift when trapped fluid expands on the outlet side of the valve to a pressure 50 psi above the inlet pressure. Valve is normally closed and fails closed under loss of power and CIA signal. Therefore, valve leakage occurs at a pressure 50 psi above the set pressure of the penetration relief valve to relieve overpressure condition and protect the containment penetration boundary

System	Pen #	Description of Overpressure Potential	Disposition
CHS - Loop Fill (Ref. P&ID 104A)	62	Potential for fluid to be trapped between inboard CIV and normally closed manual valves off RCS loops. System does not perform a safety related function (currently designated as Class 2 to support N-1 operation) and is used only to fill loops prior to plant heatup. However, system could be filled and water solid, therefore, overpressure potential exists in DBA environment.	System is only utilized prior to plant heatup, therefore, administrative control possible to drain an appropriate amount of fluid to allow for expansion of trapped fluid post-DBA. For past operability determination, inservice test Type C testing indicates that check valve 3CHS*CTV62B has a leak rate of 69 sccm measured on 10/1/97 which should be adequate to allow for expansion of trapped fluid. However, administrative control of introducing an air bubble to allow for expansion is a more positive method of ensuring overpressurization does not occur in the post-DBA environment. A procedural change has been implemented to assure that the isolated leg is not water solid.

Second Case:

Certain vents and drains located within the CIB were shown to be operable but not fully qualified. This was based on a screening review which identified ten penetrations where branch lines may have water trapped between two manual valves, or between a single manual valve and an end plug.

These branch lines were evaluated. The piping is shown to be acceptable by meeting ASME B&PVC limits for faulted (Appendix F) conditions. The valves subject to thermal overpressurization are also shown to be acceptable based on their construction, and an evaluation of potential failure mechanisms.

The calculation of peak pressures due to thermal overpressurization is considered conservative because the peak containment temperature was used. This temperature lasts for a relatively short time and some of the lines, which are insulated, may not respond quickly enough to reach the peak value. Also, the calculation assumes that the segment of pipe is water solid. It is likely that there is some trapped air within the volume, which will serve to lower the calculated pressures.

Based on the above, the branch lines which were identified as potentially susceptible to thermal overpressurization are considered to be acceptable for this loading condition. Consequently, no further action is planned for these branch lines.