Northeast
Utilities System

Millstone Offices • Rope Ferry Rd., Waterford, CT

P.O. Box 128
Waterford, CT 06385-0128
(203) 447-1791

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Docket No. 50-245
B16158

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

Millstone Nuclear Power Station, Unit No. 1
Response to NRC Generic Letter 96-06
Assurance of Equipment Operability and Containment Integrity During
Design-Basis Accident Conditions

The purpose of this letter is for Northeast Nuclear Energy Company (NNECO) to provide the required 120 day response to Generic Letter (GL) 96-06,[1] "Assurance of Equipment Operability and Containment Integrity During Design-Basis Accident Conditions," on behalf of Millstone Unit No. 1.

Background

On September 30, 1996, the NRC Staff issued GL 96-06 as a result of NRC inspection activities and several event reports. The issues identified to be of concern are:

- Cooling water systems serving the containment air coolers may be exposed to the hydrodynamic effects of water hammer during either a loss-of-coolant accident (LOCA) or a main steam line break (MSLB).

- Cooling water systems serving the containment air coolers may experience two-phase flow conditions during postulated LOCA and MSLB scenarios.

- Thermally induced overpressurization of isolated water filled piping sections in containment could jeopardize the ability of accident-mitigating systems to perform their safety functions and could also lead to a breach of containment integrity via bypass leakage.

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(1) NRC Generic Letter 96-06: Assurance of Equipment Operability and Containment Integrity During Design-Basis Accident Conditions, dated September 8, 1996

Specifically, the NRC Staff requested licensees to determine:

- If containment air cooler cooling water systems are susceptible to either water hammer or two-phase flow conditions during postulated accident conditions.

- If piping systems that penetrate the containment are susceptible to thermal expansion of fluid so that overpressurization of piping could occur.

Response

1. The containment air coolers are not credited in the mitigation of any design-basis accident and are, therefore, classified as non-safety related. The reactor building closed cooling water (RBCCW) supply is isolated automatically when the pressure in the drywell reaches 5 psig. There is no relief protection provided on the RBCCW header inside the drywell. Thus, the water trapped in the header and air coolers will eventually reach the drywell atmosphere post-LOCA temperature. The header could become over stressed and fail. However, the redundant isolation valves prevent draining of the RBCCW system and establishing a vent path from the drywell into the reactor building. Water hammer is not a concern since the redundant isolation valves are not required to be opened following the LOCA.

2. All containment penetrations were reviewed for their susceptibility to thermal overpressurization following isolation post Design-Basis Accident. Those penetrations which are not susceptible to thermal overpressurization are associated with systems that are open (pressure can be relieved to another system) or do not contain a fluid that is subjected to thermal expansion during and after a design-basis accident. The following five water-filled penetrations were identified as being potentially susceptible to thermal overpressurization:

   (a) Shutdown Cooling System Supply (penetration X12)

   (b) Post-Accident Sampling to Shutdown Cooling Supply (penetration X12)

   (c) Drywell Floor Drain (penetration X18)

   (d) Drywell Equipment Drain (penetration X19)

   (e) Reactor Building Closed Cooling Water System Inlet (penetration X23)

   (f) Reactor Building Closed Cooling Water System Outlet (penetration X24)

   For penetrations (a) and (b) above, one containment isolation valve is inside the containment and the others are located outside. Both containment isolation valves

are located outside the containment for penetrations (c) through (f). Penetrations (e) and (f) form a continuous piping loop inside containment.

Qualitative evaluations indicate that the isolation system components themselves may be the limiting component in each of the penetration configurations. The piping appears to yield and maintain the pressure boundary. The isolation valves may leak (possibly under the seat through the packing or out the bonnet-to-body joint), or they may prove to be able to withstand the thermal induced pressure stress. Detailed component/valve analyses must be completed to determine if the existing penetration configurations are adequate or if any corrective actions must be implemented.

The following additional penetrations are potentially susceptible to thermal overpressurization if the penetration piping is not adequately drained.

(g) Main Steam Line Drain (penetration X-8)

(h) Feedwater Sparger Test [penetration X-29(f), 40A(e), 44(c), and X-44(d)]

(i) Reactor Head Flange Leak Detector [penetration X-28 (c)]

A review of the operating procedures and piping configuration to ensure adequate draining of each of the above penetrations is necessary.

Millstone Unit No. 1 is currently in an extended shutdown and requires an NRC Commission vote to restart. Therefore, the requested time to complete the stress analyses and implement corrective actions, if required, will have no impact on plant safety.

Commitments

The following is NNECO's commitment. Other statements within this letter are provided as information only:

B16158-1 NNECO will complete prior to restart the detailed component/valve analyses and drain down reviews, and will provide to the NRC staff a written summary of the conclusions reached relative to whether the existing penetration configurations are adequate, and what corrective actions are required, if any, and a schedule for their implementation.

If the NRC Staff should have any questions or comments regarding this submittal, please contact Mr. R. W. Walpole at (860) 440-2191.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

John P. McElwain
Millstone Unit No. 1 Recovery Officer

Subscribed and sworn to before me

this 27th day of January, 1997

Date Commission Expires: 12/31/2001

cc: H. J. Miller, Region I Administrator
S. Dembek, NRC Project Manager, Millstone Unit No. 1
T. A. Easlick, Senior Resident Inspector, Millstone Unit No. 1
W. D. Travers, Dr., Director, Special Projects