

NORTHEAST UTILITIES

THE CONNECTICUT LIGHT AND POWER COMPANY
 THE HARTFORD ELECTRIC LIGHT COMPANY
 WESTERN MASSACHUSETTS ELECTRIC COMPANY
 THE YORK WATER POWER COMPANY
 NORTHEAST UTILITIES SERVICE COMPANY
 NORTHEAST NUCLEAR ENERGY COMPANY



P.O. BOX 270
 HARTFORD, CONNECTICUT 06101
 (203) 666-6911

March 20, 1981

Docket No. 50-245
A01203

Mr. Darrell G. Eisenhut, Director
 Division of Licensing
 Office of Nuclear Reactor Regulation
 U. S. Nuclear Regulatory Commission
 Washington, D.C. 20555

- References:
- (1) W. G. Council letter to D. M. Crutchfield, dated October 16, 1980.
 - (2) W. G. Council letter to D. G. Eisenhut, dated October 24, 1980.
 - (3) W. G. Council letter to D. G. Eisenhut, dated December 15, 1980.
 - (4) W. G. Council letter to D. G. Eisenhut, dated January 21, 1981.
 - (5) D. G. Eisenhut letter to All BWR Licensees, dated December 9, 1980.

Gentlemen:

Millstone Nuclear Power Station, Unit No. 1
BWR Scram Discharge System

In Reference (2), Northeast Nuclear Energy Company (NNECO) committed to re-evaluate the Millstone Unit No. 1 scram discharge system against the evaluation criteria developed by the BWR Owners' Group Ad-Hoc Committee on I&E Bulletin No. 80-17, and to submit the results of this reevaluation, along with a schedule for implementation of any required modifications, by December 15, 1980. However, in Reference (3), based upon the fact that NNECO believed a NRC Generic Safety Evaluation Report (SER) regarding BWR scram discharge systems was being transmitted to all BWR licensees, NNECO felt it would be more appropriate to perform the above-mentioned reevaluation after reviewing the NRC Staff's positions represented in the Generic SER. Therefore, NNECO proposed to submit the results of the reevaluation, along with a schedule for implementation of any required modifications, by January 15, 1981. Since the Generic SER was not received in time to allow a response by this date, NNECO proposed in Reference (4) to submit the above-mentioned information to the NRC Staff within thirty (30) days after receipt of the Generic SER. Therefore, this letter is in response to Reference (5), which NNECO officially received from the NRC on February 9, 1981.

The Millstone Unit No. 1 scram discharge system was evaluated against the evaluation criteria developed by the BWR Owner's Group. The NRC's acceptance

criteria specified in Reference (5) were utilized in NNECO's evaluation. The following represents the results of this evaluation as well as those long-term modifications which are necessary to comply with the BWR Owner's Group evaluation criteria. Implementation of these modifications is presently scheduled for the next refueling outage.

Functional Criterion 1:

The scram discharge volume shall have sufficient capacity to receive and contain water exhausted by a full reactor scram without adversely affecting control rod drive scram performance.

Comment:

The scram discharge volume must be enlarged to comply with the 3.34 gallons per drive requirement.

Safety Criterion 1:

No single active failure of a component, or service function shall prevent a reactor scram, under the most degraded conditions that are operationally acceptable.

Comment:

Millstone Unit No. 1 presently meets this criterion since the worst single active failure, i.e. a scram valve failure, will result in one control rod not inserting.

Safety Criterion 2:

No single active failure shall prevent uncontrolled loss of reactor coolant.

Comment:

In order to meet this criterion, motor operated block valves must be installed in series as a backup to the existing air operated valves on the vent and drain lines.

Safety Criterion 3:

The scram discharge system instrumentation shall be designed to provide redundancy, to operate reliably under all conditions, and shall not be adversely affected by hydrodynamic forces or flow characteristics.

Comment:

The instrument volume level instrumentation presently installed consists of six switches:

- 4 at hi/hi (39 gallons) level
- 1 at hi (18 gallons) level
- 1 at (3 gallons) level

The hi/hi level alarm and scram functions derive from a one-out-of-two-taken-twice logic. However, the system is configured as a singly piped system.

Hydrodynamic and flow forces have not adversely affected the instrument volume level floats. Millstone Unit No. 1 does not use the floats which were found in some BWR's to have venting problems, nor does the unit utilize the design which was suspected to cause large flow rates and/or water hammer.

Since the concern for common-cause failures of the scram level instrumentation has been added to the BWR Owner's Group evaluation criteria by the NRC, further evaluation of common-cause failures is necessary to determine what modifications, if any, are required.

Safety Criterion 4:

System operating conditions which are required for scram shall be continuously monitored.

Comment:

See Safety Criterion 3.

Safety Criterion 5:

Repair, replacement, adjustment, or surveillance of any system component shall not require the scram function to be bypassed.

Comment:

Procedures for the presently installed instrument volume level switch systems exist which meet this criterion by implementing half-scram in accordance with the technical specifications.

Operational Criterion 1:

Level instrumentation shall be designed to be maintained, tested, or calibrated during plant operation without causing a scram.

Comment:

This criterion is currently satisfied on a monthly basis in regard to the instrument volume level instrumentation.

Operational Criterion 2:

The system shall include sufficient supervisory instrumentation and alarms to permit surveillance of system operation.

Comment:

The system, as modified during the present refueling outage, alarms on high instrument volume level, and low instrument air pressure. These alarms give the operator sufficient warning of any potential problem.

Operational Criterion 3:

The system shall be designed to minimize the exposure of operating personnel to radiation.

Comment:

The system is designed so that it can be periodically hydrolased to reduce radiation levels in keeping with ALARA. The hydraulic control centers are located below the scram discharge header in a low radiation field. Access to the instrument volume is barred by locked gates and a radiation work permit is required for entry into these areas.

Operational Criterion 4:

Vent paths shall be provided to assure adequate drainage in preparation for scram reset.

Comment:

The vents are open to atmosphere and the piping is either horizontal or sloping toward the open end or back to the discharge header. There are no loop seals in the piping run.

Operational Criterion 5:

Vent and drain functions shall not be adversely affected by other system interfaces. The objective of this requirement is to preclude water backup in the scram instrument volume which could cause spurious scram.

Comment:

As stated above, the vents are open to atmosphere and not connected to any other system. The drain is connected to the Reactor Building Drain Tank (RBDT). Other systems also drain to the RBDT. The RBDT is vented to atmosphere and is below the instrument volume. If water were to back up the drain line, it would spill out of floor drains at elevations below the instrument volume before it could begin to fill the volume.

Design Criterion 1:

The scram discharge headers shall be sized in accordance with GE OER-54 and shall be hydraulically coupled to the instrumented volume(s) in a manner to permit operability of the scram level instrumentation prior to loss of system function. Each system shall be analyzed based on a plant-specific maximum inleakage to ensure that the system function is not lost prior to initiation of automatic scram. Maximum inleakage is the maximum flow rate through the scram discharge line without control rod motion summed over all control rods. The analysis should show no need for vents or drains.

Comment:

The two inch pipe which connects the discharge volume with the instrument volume on the north side of the reactor building must be replaced with a six inch pipe. On the south side of the reactor building a new instrument volume with a six inch connection to the discharge volume and associated drain piping must be installed. The yet to be installed instrument volume will comply with the applicable BWR Owners' Group evaluation criteria.

Design Criterion 2:

Level instrumentation shall be provided for automatic scram initiation while sufficient volume exists in the scram discharge volume.

Comment:

See Functional Criteria 1, Safety Criteria 3, and Design Criteria 1.

Design Criteria 3:

Instrumentation taps shall be provided on the vertical instrument volume and not on the connected piping.

Comment:

The level taps are located on the instrument volume.

Design Criterion 4:

The scram instrumentation shall be capable of detecting water accumulation in the instrumented volume(s) assuming a single active failure in the instrumentation system or the plugging of an instrument line.

Comment:

The scram instrumentation on the instrument volume is redundant. See also Safety Criterion 3.

Design Criterion 5:

Structural and component design shall consider loads and conditions including those due to fluid dynamics, thermal expansion, internal pressure, seismic considerations, and adverse environments.

Comment:

Additional supports have been added to the scram discharge system piping based upon re-analysis of the system which considered applicable loads and conditions.

Design Criterion 6:

The power-operated vent and drain valves shall close under loss of air and/or electric power. Valve position indication shall be provided in the control room.

Comment:

These valves close on loss of air and their position is indicated in the control room.

Design Criterion 7:

Any reductions in the system piping flow path shall be analyzed to assure system reliability and operability under all modes of operation.

Comment:

See Design Criterion 1.

Design Criterion 8:

System piping geometry (i.e., pitch, line size, orientation) shall be such that the system drains continuously during normal plant operation.

Comment:

Piping from the header to the instrument volume is continually sloped downward to allow for proper drainage. Piping from the instrument volume to the RBDT is either horizontal or sloped to the RBDT with no loop seals in the line.

Design Criterion 9:

Instrumentation shall be provided to aid the operator in the detection of water accumulation in the instrumented volume(s) prior to scram initiation.

Comment:

Instrumentation is provided to perform this function.

Design Criterion 10:

Vent and drain line valves shall be provided to contain the scram discharge water, with a single active failure and to minimize operational exposure.

Comment:

Vent and drain line valves are presently provided, however, these valves are not redundant. An additional valve in series with each of the existing valves will be added to meet this criterion. See also Safety Criterion 2.

Surveillance Criterion 1:

Vent and drain valves shall be periodically tested.

Comment:

Proposed technical specification changes were submitted to the NRC Staff in Reference (1) which require that the vent and drain valves be verified open at least once per month. The proposed changes also require that these valves be verified, at least once per operating cycle, to close in less than 30 seconds after receipt of a signal for control rods to scram, and to open when scram signal is reset and when scram discharge volume trip is bypassed.

Surveillance Criterion 2:

Verifying and level detection instrumentation shall be periodically tested in place.

Comment:

Functional tests of the scram level instrumentation are already required per technical specifications. However, plant procedures may need to be changed.

Surveillance Criterion 3:

The operability of the entire system as an integrated whole shall be demonstrated periodically and during each operating cycle, by demonstrating scram instrument response and valve function at pressure and temperature at approximately 50% control rod density.

Comment:

At least once during each operating cycle, the operability of the system will be demonstrated by verifying that after the unit scrams, the instrument volume level

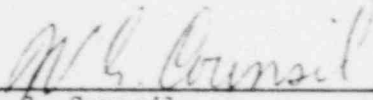
instrumentation trips occur, the vent and drain valves close, the system can be reset, and the system drains adequately. The unit will not be scrammed for the sole purpose of demonstrating the operability of the scram discharge system.

We trust that the above adequately addresses NNECO's compliance with the BWR Owners' Group evaluation criteria. NNECO will proceed on the basis that the above modifications are acceptable to the NRC unless otherwise indicated by the NRC.

Should you have any questions, please feel free to contact us.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY



W. G. Council
Senior Vice President