



BOSTON EDISON

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BECO 90-158

U.S. Nuclear Regulatory Commission
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Response to Generic Letter 89-10 Supplement 3

Boston Edison is submitting the following response to Generic Letter 89-10 Supplement 3, "Consideration of the Results of NRC-Sponsored Tests of Motor Operated Valves". The Generic Letter requested an assessment of the applicability of the data from NRC-sponsored tests on Motor Operated Valves (MOVs) to determine the "as-is" capability of the MOVs used to provide containment isolation in the steam supply lines of HPCI and RCIC and in the supply line for RWCU. Additionally, BWR Licensees were requested to perform a plant specific safety assessment to verify that the generic safety assessments performed by the NRC staff and the BWR Owners' Group are applicable. Notification within 30 days of receipt of Supplement 3 is required, verifying that a plant specific safety assessment has been performed and whether any MOVs with deficiencies of greater safety significance than in the HPCI, RCIC, and RWCU systems exist in the plant. An additional notification within 120 days of receipt is also requested which provides the criteria reflecting operating experience and the latest test data applied in determining whether deficiencies exist in the HPCI, RCIC, and RWCU MOVs and in MOVs considered to be more safety significant.

The test data was provided in Information Notice (IN) 90-40, "Results of NRC-Sponsored Testing of Motor Operated Valves" issued June 5, 1990. As discussed in the Information Notice, the tests revealed that, regardless of fluid conditions, the tested valves required more thrust for opening and closing under various differential pressure and flow conditions than would have been predicted from standard industry calculations using typical friction factors. Based on our review of the test results, each Pilgrim Plant valve in question will perform its safety function to close within the design criteria of the valve and operator. Attachment 1 details the results of our review.

We do not consider a plant-specific safety assessment to be necessary since the valves in the HPCI, RCIC, and RWCU systems are capable of performing their safety-related function. The generic safety assessments performed by the NRC and BWR Owners Group are applicable only if deficiencies (i.e. valve actuator undersized, torque switch trip set too low, etc.) exist which would prevent isolation under blowdown conditions.

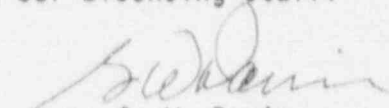
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BOSTON EDISON COMPANY

U. S. Nuclear Regulatory Commission

Page 2

Based on the above discussion we conclude the subject valves in the HPCI, RCIC, and RWCU systems are capable of providing containment isolation in the event of a line break outside containment. This submittal completes our 30 and 120 day response to Generic Letter 89-10, Supplement 3. Should you or your staff have any questions regarding this response, please contact our Licensing staff.


G. W. Davis

BRS/njm/5177

Enclosed: Attachment 1

cc: Mr. R. Eaton, Project anager
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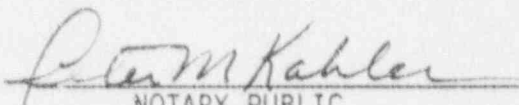
Senior NRC Resident Inspector
Pilgrim Nuclear Power Station
Licensing

Commonwealth of Massachusetts)
County of Plymouth)

Then personally appeared before me, George W. Davis, who being duly sworn, did state that he is Senior Vice President - Nuclear of Boston Edison Company and that he is duly authorized to execute and file the submittal contained herein in the name and on behalf of Boston Edison Company and that the statements in said submittal are true to the best of his knowledge and belief.

My commission expires:

October 5, 1995
DATE


NOTARY PUBLIC

ATTACHMENT 1

As requested by GL 89-10 Supplement 3, BECo has reviewed and evaluated HPCI valves 2301-4 and -5, RCIC valves 1301-16 and -17, and RWCU valves 1201-2 and -5 to determine if deficiencies exist relative to test results given in Information Notice (IN) 90-40.

The result of the evaluation is that each valve in question will perform its safety function to close within the design criteria of the valve and operator. The motor operated valves in question (2301-4 and -5, 1301-16 and -17 and 1201-2 and -5) are unique because they are normally open at 100% reactor power and provide a direct path for reactor coolant outside the primary containment. In the event of a pipe break they must be able to close to mitigate flow of primary water and steam to the reactor building. Other motor operated valves are normally closed at power or have check valves to prevent back flow of primary water/steam and would not be required to close under pipe break conditions at full reactor pressure.

1. HPCI Valve 2301-4 Velan (Gate) 8"
SMB-2-60(AC) Torque Switch Trip = 29916#
Not tested by NRC, Idaho Nuclear Engineering Laboratory (INEL) tests

Since this valve was not tested by INEL, we compared similarities of PNPS valves to valves used in the NRC tests. IN 90-40 concluded that a valve friction factor of .3 did not bound the required thrust. Ten tests were done on Velan 6" and 10" valves. Nine were done with hot water or steam and the valve friction factors were .43 to .56. One test was in cold water and the valve friction factor was .63. This test was not included in the evaluation since it was not near operating conditions. The thrust at torque switch trip obtained from static diagnostic testing of 2301-4 was evaluated at degraded voltage conditions. We concluded that the thrust is sufficient to overcome a friction factor of .6. Therefore, the valve friction factor for 2301-4 is acceptable and the valve will perform its safety function.

2. HPCI valve 2301-5, Velan (Gate) 8"
SMB-1-60(DC) Torque Switch Trip = 34300#
Not tested by NRC, INEL tests

An evaluation similar to 2301-4 was applied to the 2301-5 valve. The thrust is sufficient to overcome a friction factor of .7 using the thrust at torque switch trip obtained from static diagnostic testing and evaluating it at degraded voltage conditions. Therefore, the valve friction factor is acceptable for 2301-5 and the valve will perform its safety function.

3. RCIC 1301-16 Westinghouse (Globe) 3"
SMB-000-10(AC) Torque Switch Trip = 5480#
Not tested by NRC, INEL tests

This isolation valve is a globe valve rather than a gate valve and is outside the scope of IN 90-40. However, we evaluated the thrust at torque switch trip and the thrust is sufficient to overcome a friction factor of .7. Therefore, the valve friction factor is greater than the friction factors required during the IN 90-40 tests, and the valve will perform its safety function even with degraded voltage conditions.

ATTACHMENT 1

4. RCIC 1301-17 Velan (Globe) 3"
SMB-000-5(DC) Torque Switch Trip = 6269#
Not tested by NRC, INEL tests

This isolation valve is a globe valve rather than a gate valve, and is outside the scope of IN 90-40. However, we evaluated the thrust at torque switch trip and the thrust is sufficient to overcome a friction factor of .8. Therefore, the valve friction factor is greater than the friction factors required during the IN 90-40 tests, and the valve will perform its safety function even with degraded voltage conditions.

5. RWCJ 1201-2 Walworth (Gate) 6"
SMB-00-15(AC) Torque Switch Trip = Not known, never tested
INEL test required 12,000# thrust at about 1135 psi delta pressure.

1201-2 is wired so the torque switch is by-passed for 98% of the closed stroke (Drawing E5020E7 and MR88-12-9). The by-pass is initiated by high temperature in the non-regenerative heat exchanger room, initiation of SBLC, low reactor water level, high area temperature, or high delta pressure (flow) in the RWCJ system. The torque switch is not by-passed during manual operation. The high differential pressure across the valve due to blowdown momentum is not acting on the valve disc at 98% closed. When a gate valve is closed 98%, the port is covered due to the valve disc guides and the bottom of the disc is in the valve body groove. This eliminates the blowdown force component acting on the valve disc resulting in sufficient thrust being available for final 2% closure with the torque switch in the circuit.

The INEL tests show the maximum required thrust would be about 12,000# in the event there is a pipe break outside containment downstream of 1201-2. This is within the motor operator design capability of 14,000#. A "weak link analysis" for the valve/motor operator assembly is being conducted by Crane-Aloyco and will be completed by approximately 2/15/91. This is required by GL 89-10 to ensure valve components are not overstressed during operation. Crane-Aloyco has stated the valve can withstand a thrust of greater than 14,000# but the exact number has not been calculated. The 1201-2 and 1201-5 valves are similar designs and the 1201-5 valve is good for 58,000# closing. Therefore, we believe the 1201-2 valve can withstand the motor operator design thrust of 14,000#. Also the motor will not stall while the torque switch is by-passed since this value (12,000#) is within the design capability of the motor operator at reduced voltage. Therefore 1201-2 will perform its safety function closing after a pipe break against an expected thrust of 12,000#.

GL 89-10 also recommends all safety-related valves have a history to monitor deterioration. This starts with diagnostic testing and baseline signatures of each safety-related or position changeable MOV. 1201-2 shall be tested during RFO #8. The actual thrust at torque switch trip is not known but the limit switches have been adjusted.

ATTACHMENT 1

6. RWCU 1201-5 Anchor/Darling (Gate) 6"
SMB-O-25(DC) Torque Switch Trip = 15,400#
INEL test required 20,000# thrust at 990 psi delta pressure

1201-5 is wired in the same manner as 1201-2 so the torque switch is by-passed for 98% of the closed stroke.

The INEL tests show the maximum required thrust would be about 20,000# in the event of a pipe break outside containment downstream of 1201-5. This is within the motor operator design capability of 24,000#. The results of the "weak link analysis" show the weak link in closing direction to be the yoke leg which is capable of 57.9 kips. Therefore, the valve and operator are acceptable for maximum required thrust conditions. Also the motor will not stall while the torque switch is by-passed since this value (20,000#) is within the design capability of the motor operator at reduced voltage. Therefore 1201-5 will perform its safety-related function by closing after a pipe break against an expected thrust of 20,000#.