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BECo 84-150

Dr. Thomas E. Murley
Regional Administrator
Office of Inspection and Enforcement
Region I
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

License No. DPR-35
Docket No. 50-293

Dear Sir,

In actions related to the event described in IE Bulletin No. 84-01 "Cracks in Boiling Water Reactor Mark I Containment Vent Headers" Boston Edison Company (BECo) hereby endorses the recommendations of General Electric Service Information Letter (SIL) No. 402. The SIL No. 402 recommendations are reproduced below followed by our specific responses.

1. Evaluate Inerting System Design

   Evaluate the design of the nitrogen inerting system. Investigate the potential for introducing cold (less than 40°F) nitrogen and the orientation of the nitrogen port relative to the vent header, downcomers, or other equipment in the wetwell and drywell which may be in the path of the nitrogen plume. Assure that the temperature monitoring devices, the low temperature cutoff valve, and overall system design are adequate to prevent the injection of cold nitrogen into the containment.

Response

Plant design documents were reviewed to determine the adequacy of the nitrogen inerting system design. The evaluation shows that the design is adequate for temperature regulation and control of nitrogen entering the torus. The liquid nitrogen supply valve to the nitrogen vaporizer will close on low heating water outlet temperature from the vaporizer or low nitrogen outlet temperature. Nitrogen outlet temperature is maintained at 70°F. The evaluation further shows that there is a potential for nitrogen to impact the torus wall only. Inspections of the affected torus wall are addressed in Recommendation No. 4.

The design for the emergency makeup mode does not have any low temperature cutoff valves for the portion of the system through which the emergency makeup nitrogen would be injected to the drywell and torus. Plans will be formulated to evaluate whether system design changes are warranted. But, the small amount ($\approx$60 cfm) of nitrogen that will be injected in this mode, factored with the frequency that this mode of injection will be required, reduces the potential for damage to plant components, as described in SIL No. 402.

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2. Evaluate Inerting System Operation

Review the operating experience of the inerting system to assure that the vaporizer, the low temperature cutoff valve and the temperature indicators have functioned properly. Evaluate the plant calibration, maintenance and operating procedures for the inerting system. Assure that cold nitrogen injection would be detected and prevented.

Response

Inerting system operation is controlled by approved plant procedures. Our evaluation shows that adequate procedural controls existed to assure proper system operation prior to the time of the events described in SIL No. 402. The operations procedures required temperature control of the nitrogen at the outlet of the nitrogen vaporizer to be greater than or equal to 70°F when inerting. During the present refuel outage system modifications were made which were planned prior to the events described in SIL No. 402 and were approved for implementation by the NRC as part of the Long Term Program. Subsequently, these modifications were evaluated in response to Recommendation No. 1 above to assure that the temperature monitoring device, low temperature cutoff valve, and overall system design are adequate to prevent the injection of cold nitrogen into the containment. Pre-operational testing prior to system turnover will demonstrate the adequacy of the calibration, maintenance and operating procedures to assure that the modified system functions properly.

3. Test for Drywell/Wetwell Bypass Leakage

Perform a bypass leakage test as soon as convenient to confirm the integrity of the vent system. This test should be conducted during plant operation following normal plant procedures. If no procedures exist, the following is a general guide for preparing your procedure: pressurize the drywell to approximately 0.75 psi above the wetwell pressure, maintain this pressure difference and measure the makeup flow required to do so. Any bypass leak area can then be calculated (and is limited by Technical Specifications on many plants) from the makeup flow rate and the drywell-wetwell pressure difference. This will provide an indication that the vent system integrity is intact and that no gross failure exists.

Response

During normal operation Pilgrim Station operates with a Δ P of 1.2 psi between the drywell and torus. Any significant changes in the makeup to the drywell and venting from the torus would be noted by surveillance procedures.

Furthermore, drywell to torus leak rate tests are required by our Technical Specifications to be conducted on a quarterly basis as well as during every refueling outage. These tests also confirm the integrity of the vent system. Successful test results in the past obviate the need to conduct a special bypass leakage test. The periodic Technical Specification required tests provide reasonable assurance that any indications of gross failure of the vent system would be identified in the future.

4. Inspect Nitrogen Injection Line

Conduct an ultrasonic test (UT) as soon as convenient of all accessible welds in the nitrogen injection line from the last isolation valve to the wetwell and drywell penetrations. Also UT the containment penetrations and the containment shell within 6 inches of the penetration. UT is recommended because cracks would be most likely to initiate on the inside of the pipe or on the side of the metal in contact with cold nitrogen.

Response

All welds in the nitrogen injection lines from the innermost isolation valves to the drywell and torus penetrations were UT examined. The 20 inch piping between the innermost and outermost isolation valves was not UT examined. This piping was replaced during the current refueling outage due to a system modification. The remaining welds in the nitrogen injection lines between the innermost and outermost isolation valves were UT examined with one exception. The welds in the 1 inch normal makeup lines were not UT examined because these welds are socket welds which do not facilitate UT examination. In lieu of UT examination these welds were visually examined. The torus shell was UT examined from the nitrogen inlet nozzle to a distance of 6 inches below the nozzle. The drywell liner was not UT inspected based on the results of the visual inspection of the inlet deflector, as described in Recommendation No. 5. The inlet deflector, because of its design orientation, is subject to the most severe conditions resulting from nitrogen injection. The results show that no indications were found which could be attributed to a faulty nitrogen inerting system.

5. Inspect Containment

During the next planned outage, perform a visual inspection of the vent header, downcomers and other equipment in the containment which might be expected to be affected by the injection of cold nitrogen. The vent header should be inspected on the outside and the inside. Also inspect the containment shell or steel liner for at least 6 inches around the nitrogen penetration.

Response

A visual inspection of the outside of the vent header and the main vent lines adjacent to the nitrogen injection lines was conducted to satisfy the requirements of IE Bulletin No. 84-01. All surfaces and welds were found to be acceptable. It is BECo's position that an internal visual inspection of the vent header is not warranted unless cracking in the inlet piping was found. The inlet deflector for the nitrogen injection line to the drywell was visually inspected and found to be in acceptable condition. Inspection of the torus shell and drywell lines have been previously addressed in Recommendation No. 4.

BECo feels that our responses to each of the above items confirm that equipment damage has not occurred and that inerting system operation is proper. Should you have any further questions on this issue, please contact us.

Very truly yours,

W D Harrington

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