

October 13, 2010

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Limerick Generating Station, Units 1 and 2
Facility Operating License Nos. NPF-39 and NPF-85
NRC Docket Nos. 50-352 and 50-353

Subject: Response to Request for Additional Information – Relief Request I3R-13
Associated with Pressure Testing of the Primary Containment Instrument Gas
(PCIG) Piping

- References:
- 1) Letter from P. B. Cowan (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "Relief Request I3R-13 Associated with Pressure Testing of the Primary Containment Instrument Gas (PCIG) Piping," dated January 22, 2010
 - 2) Letter from P. Bamford (U.S. Nuclear Regulatory Commission) to M. J. Pacilio (Exelon Nuclear), "Limerick Generating Station, Units 1 and 2 - Request for Additional Information Regarding Relief Request I3R-13, Pressure Testing of Primary Containment Instrument Gas Piping (TAC NOS. ME3141 and ME3142)," dated July 14, 2010
 - 3) Letter from D. P. Helker (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "Response to Request for Additional Information - Relief Request I3R-13 Associated with Pressure Testing of the Primary Containment Instrument Gas (PCIG) Piping," dated July 27, 2010
 - 4) Letter from P. Bamford (U.S. Nuclear Regulatory Commission) to M. J. Pacilio (Exelon Nuclear), "Limerick Generating Station, Units 1 and 2 - Request for Additional Information Regarding Relief Request I3R-13, Pressure Testing of Primary Containment Instrument Gas Piping (TAC NOS. ME3141 and ME3142)," dated September 21, 2010

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Pressure Testing of PCIG Piping
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In the Reference 1 letter, Exelon Generation Company, LLC (Exelon) submitted a relief request associated with the third 10-year interval Inservice Inspection (ISI) Program for Limerick Generating Station (LGS), Units 1 and 2. Specifically, this relief request concerns pressure testing of the Primary Containment Instrument Gas (PCIG) piping. References 2 and 3 concern a U.S. Nuclear Regulatory Commission request for additional information. In the Reference 4 letter, the U.S. Nuclear Regulatory Commission requested additional information. Attached is our response to this request.

Should you have any questions concerning this letter, please contact Tom Loomis at (610) 765-5510.

Respectfully,



Pamela B. Cowan
Director – Licensing & Regulatory Affairs
Exelon Generation Company, LLC

Attachment: Response to Request for Additional Information - Relief Request I3R-13

cc: USNRC Region I, Regional Administrator
USNRC Senior Resident Inspector, LGS
USNRC Project Manager, LGS
R. R. Janati, PA Bureau of Radiation Protection

Attachment

**Response to Request for Additional Information -
Relief Request I3R-13**

Question:

1. In the attachment to your letter dated January 22, 2010, Section 5.0, you stated that the proposed PCIG pressure decay test will provide the same level of quality and safety as the VT-2 pressure testing required by the ASME Code. In your letter dated July 27, 2010, you provided the test pressure and acceptance criteria for the proposed pressure decay test. Please identify the technical basis for how the acceptance criteria for the proposed test provides the same level of quality and safety as the ASME Code-required test, as you have asserted in your application. For example, you could identify what code or standard was used in developing the test criteria and/or you could demonstrate how, considering the volume of piping involved, the proposed test identifies leakage at a level consistent with what would be identified in the ASME Code required test.

When developing your response, consider that in order for the NRC to approve your request, it must make a determination that reasonable assurance of structural integrity or leak tightness of the subject components has been demonstrated.

Response:

The technical basis for the pressure decay test is that this test provides an equivalent level of quality and performance in leak detection as compared to the VT-2 test for this configuration of PCIG piping. No specific guidance or acceptance criteria is provided by the ASME code or related standard for this application. However, pressure decay testing is allowed for buried piping per IWA-5244, which states "The acceptable rate of pressure loss or flow shall be established by the Owner." Again, the ASME Code allows the owner to establish an acceptable pressure loss or flow rate which would be judged to be acceptable.

Each Unit has two loops of PCIG piping, with each loop composed of approximately 250 feet of 1-inch diameter stainless steel pipe. Each loop contains between 7 to 9 boundary valves consisting of 1 motor operated valve, 1 solenoid valve, 2 pressure relief valves, and 3 to 5 hand valves. Any of these valves have the potential for seat leakage or packing leaks during the pressure decay test. For a VT-2 system leakage test, seat leakage and packing leaks are acceptable and will not result in a failed leakage test.

The motor operated valves are primary containment isolation valves and are leak tested in accordance with the Appendix J (LLRT) Program. A review of the latest test results for these valves indicates seat leakage ranging from 20 to 137 sccm at the LLRT test pressure (45 psig). This leakage is acceptable for both Appendix J and ASME Section XI pressure testing programs, but needs to be accounted for in the determination of the acceptance criterion for the pressure decay test of the subject piping.

The proposed pressure decay test acceptance criterion is less than or equal to a 10 psig pressure loss in 5 minutes. This equates to a leak rate of 0.028 scfm (776 sccm). The pressure decay test pressurizes the process piping to a nominal 100 psig and measures the pressure in a 5-minute interval. There is approximately 250 feet of 1-inch diameter piping per loop tested, and based on this volume and the leak rate associated with a 10 psig loss in 5 minutes (776 sccm), an equivalent opening size for this leak rate is approximately 0.004 to 0.005 inches. Accordingly, considering known valve seat leakage in this piping, the actual opening size to exceed the proposed pressure decay test acceptance criterion would be smaller than the 0.004 to 0.005 inches computed. There is no specific ASME Code guidance on opening size detection required for a system leakage test; however, using engineering judgment, this acceptance criterion is deemed to be sufficiently stringent that the proposed test will provide reasonable assurance of leak tightness and structural integrity of the subject piping as compared to a VT-2 test.

As stated in the original submittal by Exelon, if the acceptance criterion is not met, troubleshooting would be performed to locate the leak and correct as required. Therefore, the proposed pressure decay test provides a reasonable assurance of leak tightness of the subject components using the proposed alternative test.