

10 CFR 50.55a

TMI-10-101  
October 8, 2010

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

Three Mile Island Nuclear Station, Unit 1  
Renewed Facility Operating License No. DPR-50  
NRC Docket No. 50-289

Subject: Supplemental Information Request - Fourth Inservice Inspection (ISI) Interval  
Relief Request I4R-02

- References: 1) Letter from P. B. Cowan (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "Submittal of Relief Requests Associated with the Fourth Inservice Inspection (ISI) Interval," dated August 10, 2010
- 2) Letter from P. Bamford (U.S. Nuclear Regulatory Commission) to M. J. Pacilio (Exelon Generation Company, LLC), "Three Mile Island Nuclear Station, Unit 1 - Supplemental Information Needed for Acceptance of Requested Licensing Action RE: Request for Relief I4R-02, Fourth Inservice Inspection Interval, Alternate Risk Informed Selection and Examination Criteria for Pressure Retaining Welds (TAC NO. ME4519)," dated September 23, 2010

In the Reference 1 letter, Exelon Generation Company, LLC submitted relief requests associated with the fourth Inservice Inspection (ISI) interval for Three Mile Island Nuclear Station (TMI), Unit 1. The fourth interval of the TMI, Unit 1 ISI program complies with the 2004 Edition, no Addenda, of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code. In the Reference 2 letter, the U.S. Nuclear Regulatory Commission requested supplemental information concerning Relief Request I4R-02.

Attached is our response to this supplemental request.

There are no regulatory commitments in this letter.

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

Respectfully,

A handwritten signature in cursive script, reading "Pamela B. Cowan", is written over a horizontal line.

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

Attachment: Supplemental Information Concerning Relief Request I4R-02

cc: Regional Administrator, Region I, USNRC  
D. M. Kern, USNRC Senior Resident Inspector, TMI  
P. J. Bamford, USNRC Project Manager, TMI

**ATTACHMENT**

**Supplemental Information Concerning Relief Request I4R-02**

Supplemental Information Request:

1. *Relief Request I4R-02 neither discusses the technical adequacy of its fire, seismic, and external events probabilistic risk assessment (PRA) nor provides a justification that these hazard groups are insignificant to the application's risk-informed decision making, and therefore is not demonstrated to be consistent with Regulatory Guide (RG) 1.200, Revision 2 and RG 1.174, Revision 1, both of which are referenced in the application. Without this information, the NRC staff does not have sufficient information to begin its review.*

*Relief Request I4R-02 must be modified to provide a discussion confirming that either RG 1.200, Revision 2, guidelines on the technical adequacy have been evaluated and satisfied, or provide a justification that these hazard groups are insignificant to the application's risk-informed decision making consistent with RG 1.174, Revision 1, guidelines.*

Response:

In response to the request, a justification is provided that the fire, seismic and external events hazard groups are insignificant to the risk-informed inservice inspection (RI-ISI) evaluation and results. From Draft Regulatory Guide DG-1226<sup>1</sup> (Proposed Revision 2 of Regulatory Guide 1.174) [A5]:

*“A qualitative treatment of the missing modes and hazard groups may be sufficient when the licensee can demonstrate that those risk contributions would not affect the decision; that is, they do not alter the results of the comparison with the acceptance guidelines in Section 2.4 of this guide.”*

Section 2.2 of EPRI 1021467, *Nondestructive Evaluation: Probabilistic Risk Assessment Technical Adequacy Guidance for Risk-Informed In-Service Inspection Programs* [A4], provides justification for RI-ISI supporting analyses being based only on internal events PRAs. Fire, seismic and external hazard groups are determined to not affect the decision for the TMI, Unit 1 RI-ISI assessment. Each of these hazard groups are discussed:

Internal Fire Events

The following from EPRI 1021467 [A4] applies to TMI, Unit 1:

---

<sup>1</sup> Although draft, DG-1226 is applicable since it refers to Regulatory Guide 1.200, Revision 2 (the current revision that addresses PRA for external hazards).

*"The potential contribution of piping failure to internal fire risk is insignificant as the failure probability of piping is insignificant compared to the failure probability of other systems, structures and components (SSCs), such as pumps, valves and power supplies. Fire events are also not likely to present significantly different challenges to the piping in the scope of this application. Meeting defense in depth and safety margin principles provides additional assurance that this conclusion will remain valid. ISI is an integral part of defense in depth, and the RI ISI process will maintain the basic intent of ISI (i.e., identifying and repairing flaws) and thus provide reasonable assurance of an ongoing substantive assessment of piping condition. In addition, there are no changes to design basis events and thus Safety Margins are maintained."*

### Seismic Events

The following from EPRI 1021467 [A4] applies to TMI, Unit 1:

*"Well engineered systems and structures (e.g., piping systems) are seismically rugged. IPEEE and other industry and NRC studies (e.g., EPRI TR-1000895, NUREG/CR-5646) have shown piping systems to have seismic fragility capacities greater than the screening values typically used in seismic assessment and are not considered likely to fail during a seismic event. ISI is not considered in establishing fragilities of such SSCs. Meeting defense in depth and safety margin principles provides assurance that this conclusion will remain valid. ISI is an integral part of defense in depth, and the RI ISI process will maintain the basic intent of ISI (i.e., identifying and repairing flaws) and thus provide reasonable assurance of an ongoing substantive assessment of piping condition. In addition, there are no changes to design basis events and thus Safety Margins are maintained."*

The NRC has recently published documents that involve seismic capabilities of the reactor coolant system (DG-1216 and NUREG-1903), and the risk impact of updated seismic hazard estimates (GI-199). DG-1216 [A2] and NUREG-1903 [A6] provided no indication that seismic events would have an impact on the RI-ISI process. GI-199 [A3] was reviewed specifically for the seismic risk impact at TMI, Unit 1. The TMI, Unit 1 seismic risk is estimated to be lower, based on the 2008 USGS Seismic Hazard Curves, when compared to the risk calculated using the previous 1994 LLNL Seismic Hazard Curves [Appendix D of Reference A3]. Finally, the TMI, Unit 1 IPEEE [A8] was reviewed; no seismic vulnerabilities were identified and seismic pipe failures were not important contributors.

### Other External Events

The following from EPRI 1021467 [A4] applies to TMI, Unit 1:

*“...the purpose of developing a RI-ISI program is to define an alternative in-service inspection strategy for piping systems. Other hazards (e.g. high wind, external floods) are not considered in the development of an in-service inspection program for piping. The reasons include: the structural ruggedness of the piping systems, location, as relevant systems are typically inside well engineered structure, and the consequence assessment for internal events already includes the consideration of spatial impacts. In addition, the substantial industry experience with plants implementing RI-ISI programs has not identified changes based upon insight from the evaluation of these other external hazards. The very small potential impact on the potential for piping failure of a RI ISI process, and the approaches to maintaining defense in depth and safety margins summarized above, provide confidence in this conclusion.”*

The EPRI 1018427 [A7] guidance on meeting Regulatory Guide 1.200, Revision 1 and Regulatory Guide 1.174 is sufficient for developing the RI-ISI program at TMI, Unit 1. The additional requirements imposed by Regulatory Guide 1.200, Revision 2 do not change the conclusions of the RI-ISI analysis at TMI because the quantification of the fire, seismic and other external events hazard groups has an insignificant impact on the RI-ISI analysis. Therefore, quantification of the fire, seismic and other external events hazard groups will not change the conclusions derived from the RI-ISI process.

### **REFERENCES**

- A1. NRC Letter to M. J. Pacilio, *Three Mile Island Nuclear Station, Unit 1 - Supplemental Information Needed for Acceptance of Requested Licensing Action RE: Request for Relief I4R-02, Fourth Inservice Inspection Interval, Alternate Risk Informed Selection and Examination Criteria for Pressure Retaining Welds* (TAC No. ME4519), September 23, 2010.
- A2. Draft Regulatory Guide DG-1216, *Plant-Specific Applicability of Transition Break Size Specified in 10 CFR 50.46a*, June 2010.
- A3. Generic Issue 199 (GI-199), *Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States on Existing Plants, Safety/Risk Assessment*, August 2010.
- A4. *Nondestructive Evaluation: Probabilistic Risk Assessment Technical Adequacy Guidance for Risk-Informed In-Service Inspection Programs*. EPRI, Palo Alto, CA: 2010. 1021467.

- A5. Draft Regulatory Guide DG-1226 (*Proposed Revision 2 of Regulatory Guide 1.174, dated November 2002*), *An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis*, August 2009.
- A6. NUREG-1903, *Seismic Considerations For the Transition Break Size*, February 2008.
- A7. *Nondestructive Evaluation: Probabilistic Risk Assessment Technical Adequacy Guidance for Risk-Informed In-Service Inspection Programs*. EPRI, Palo Alto, CA: 2008. 1018427.
- A8. *TMI Unit 1 Individual Plant Examination for External Events Submittal Report*, December 1994.