

**From:** [Weerakkody, Sunil](#)  
**To:** [Chavarria, Jennifer](#)  
**Cc:** [Green, Brian](#)  
**Subject:** Request for ACTION: Risk Significance of a Potential Seismic Induced Rupture of BWST related Class II Piping and Recirc Path at TMI  
**Date:** Monday, August 24, 2015 11:31:24 AM  
**Importance:** High

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Jennifer,

Please include the appended Email in non-public ADAMS and give the ML# to Brian Green. If a Form 665 is necessary, Brian will provide it. Thank you!

Sunil

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**From:** Weerakkody, Sunil  
**Sent:** Monday, August 24, 2015 11:30 AM  
**To:** Green, Brian  
**Subject:** Risk Significance of a Potential Seismic Induced Rupture of BWST related Class II Piping and Recirc Path at TMI

### Summary

I performed a qualitative assessment of the risk significance of the subject issue. Specifically, I examined the risk significance of any operator manual actions that the licensee may have to rely on, to isolate a potential rupture of the subject piping. To that end, I examined (a) frequency of an earthquake that may cause a rupture to the subject pipe, (b) likelihood of a concurrent loss of coolant accident (LOCA) which requires water from the BWST to be injected into the reactor core, and (c) likelihood of not having sufficient water from BWST to the reactor vessel due to flow diversion via the recirculation path. Based on these assessments, I have concluded that the risk significance of the operator manual actions that the licensee may have to rely on to isolate a potential rupture of the subject piping is negligible.

### Background

By letter dated July 23, 2015 Exelon Generation Company, LLC submitted an application to seek approval to change the technical specifications for the Three Mile Island (TMI) Nuclear Station, Unit 1 to allow for temporary operation of the Borated Water Storage Tank (BWST) via seismic Class II piping cleanup and recirculation paths during the Fall 2015 refueling outage as well as during the subsequent cycle (ADAMS Accession No. ML15204A843). This License Amendment Request was supplemented by letter dated July 28, 2015 (ADAMS Accession No. ML15209A960).

This request is for temporary operations to clean up the water in the BWST and to perform surveillances while a determination is made about the adequacy of the design (Technical Interface Agreement, TIA 2015-01 "Request for Technical Assistance Regarding Three Mile Island Licensing Bases and Acceptability to Use a Non-Seismic Qualified Cleanup Path for the Borated Water Storage Tank" ADAMS Accession No. ML15175A300)).

Based on the information provided in the subject LAR, an assessment was made to determine the risk-significance of the operator manual actions that the licensee may have to rely on to mitigate the scenario where a rupture of subject Class II piping occurs.

### Risk Assessment

Even though earthquakes are credible events, based on operating experiences, likelihood of earthquakes which are capable of causing pipe ruptures is relatively small. Based on various hazard curves published by EPRI, the frequencies of such earthquakes are of the order of  $1\text{E-}4/\text{year}$ . Even if a pipe rupture occurs, unless there is a concurrent pipe rupture in Class I piping which causes a LOCA, core damage cannot occur. Conservatively, one may assume that the frequency of an earthquake that ruptures the subject Class II piping and also causes a LOCA to be  $1\text{E-}04/\text{year}$  or less.

The subject Class II piping has a diameter of 3". In comparison, the diameter of the pipe that supplies water from the BWST to the reactor vessel to keep the reactor core covered is 18". Therefore, in the event of a LOCA concurrent with a subject pipe break, only a few percent of the BWST water will be diverted via the ruptured Class II pipe, i.e., even if the operator fails to isolate the rupture, the BWST will be able to provide water to inject into the core. The consequence of failure to isolate the rupture will be limited to the need to establish the recirculation cooling a (at most) few minutes earlier than expected.

Based on the above, the risk-significance of the subject operator manual action that the licensee may have to rely on is determined to be negligible.

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