

July 13, 2015

The Honorable Debbie Stabenow  
United States Senator  
221 W. Lake Lansing Road, Suite 100  
East Lansing, MI 48823

Dear Senator Stabenow:

I am responding to your letter of June 18, 2015, forwarding correspondence from your constituent, Mark Muhich, who raises several concerns regarding embrittlement testing of the pressurized reactor vessel at the Palisades Nuclear Plant near South Haven, Michigan. Specifically, Mr. Muhich believes that the owner of the plant, Entergy Nuclear Operations, Inc. (Entergy), is inappropriately seeking “regulatory relief” from existing requirements for embrittlement testing, the original “coupons” or testing strips installed in the pressurized reactor vessel in 1974 should be analyzed, and that Entergy should not be allowed to submit data from “sister” plants as part of its testing regime.

We understand Mr. Muhich’s concerns to be related to Entergy’s license amendment request dated July 29, 2014, in which the licensee requested NRC approval of its use of the alternate fracture toughness requirements for protection against pressurized thermal shock (PTS) events provided in 10 CFR 50.61a, in lieu of the requirements in 10 CFR 50.61. To address PTS, the Commission’s regulations permit certain reactor licensees to follow either of these two regulations, provided they satisfy the criteria and requirements set forth in the specified regulation.

Several groups requested a hearing on Entergy’s license amendment request to use 10 CFR 50.61a in lieu of 10 CFR 50.61, and the issues they raised are currently pending in litigation before the Commission. Mr. Muhich’s concerns are very similar to the matters currently in litigation, and have not yet been ruled on by the Commission. Therefore, what follows is the NRC staff’s position on the matters addressed in Mr. Muhich’s correspondence. The staff’s position is further developed in the briefs filed with the Atomic Safety and Licensing Board and the Commission, which can be obtained from the NRC’s Electronic Hearing Docket, Docket No. Palisades 50-255-LA, <https://adams.nrc.gov/ehd/>.

10 CFR 50.61 was published in 1985, and was followed in 2010 by the publication of 10 CFR 50.61a. 10 CFR 50.61a was developed based on an additional 25 years of surveillance test results and operating experience. During those 25 years, the state of knowledge regarding embrittlement, fracture mechanics, and the populations of flaws found in reactor pressure vessels has increased substantially. When coupled with increased computer modeling capabilities, these advances permitted the 10 CFR 50.61a calculations to capture much more accurately the details of a PTS event than was possible when 10 CFR 50.61 was adopted. As a result, it was determined that the risks of through-wall cracking due to a PTS event are much lower than previously estimated when 10 CFR 50.61 was adopted. Therefore, it was possible to

increase the reference temperature screening criteria in 10 CFR 50.61a (relative to those in 10 CFR 50.61) while at the same time decreasing the risk of vessel failure associated with these screening criteria.

The licensee's application requesting NRC approval of its use of 10 CFR 50.61a does not constitute "regulatory relief," as the Commission's regulations allow for the licensee to apply to use 10 CFR 50.61a, and the regulations provide specific criteria for approving such a request. Compliance with 10 CFR 50.61 or 10 CFR 50.61a provides adequate protection of public health and safety and the environment against the possibility of pressurized thermal shock.

Mr. Muhich requests testing of coupons placed in the reactor vessel, but testing of those coupons is governed by a schedule submitted pursuant to Appendix H to 10 CFR Part 50, and no further testing is required at this time. Appendix H of 10 CFR Part 50 establishes the requirements for the reactor vessel material surveillance program and requires licensees to monitor steel coupons placed in surveillance capsules within the reactor vessel. The coupons are made from the same materials as the plates, forgings, and welds of the reactor vessel beltline. The capsules are periodically removed from the reactor vessel and the coupons are tested to measure the reference temperature of the steel used in the reactor vessel beltline after varying degrees of irradiation exposure. Testing of the capsules provides the NRC and the licensee with information about future reactor vessel embrittlement. Entergy added supplemental capsules to augment their Appendix H program so that the actual limiting weld material could be evaluated at Palisades. Entergy has fulfilled the requirements of 10 CFR Part 50, Appendix H by removing the scheduled capsules, and is required to continue to remove capsules in accordance with their approved Appendix H withdrawal schedule.

Regarding the use of data from "sister" plants, NRC regulations require licensees to verify that the predicted reference temperatures (derived using equations from 10 CFR 50.61a) are appropriate. To achieve this, the licensees must perform statistical analyses to compare the predicted reference temperatures with the measured reference temperatures obtained from the surveillance data (coupons). Surveillance data, as defined in NRC regulations includes, "any data that demonstrates the embrittlement trends for the beltline materials, including, but not limited to, surveillance programs at other plants...." Thus, 10 CFR 50.61a requires the licensee to evaluate surveillance data withdrawn in accordance with the Appendix H withdrawal schedule at Palisades and at other plants (also referred to as "sister" plants) if certain criteria are met. As such, Entergy's use of sister plant data is required by 10 CFR 50.61a (as it also is for 10 CFR 50.61).

The NRC is currently evaluating the license amendment request from Entergy to determine if Entergy has met the requirements of 10 CFR 50.61a, and to determine if there is reasonable assurance of adequate protection of public health and safety and the environment. Only if the licensee has presented the NRC staff with enough information to make that determination will the NRC grant the licensee's request to use 10 CFR 50.61a at Palisades. Additionally, as noted above, the issues raised by Mr. Muhich are currently pending before the Commission in an adjudicatory context.

D. Stabenow

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I hope this information is useful to you. If you need anything additional, please contact me or Eugene Dacus, Director of the Office of Congressional Affairs, at (301) 415-1776.

Sincerely,

**/RA/** MJohnson for

Mark A. Satorius  
Executive Director for Operations

D. Stabenow

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Sincerely,

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