

December 10, 2014

Mr. Anthony R. Pietrangelo
Senior Vice President and
Chief Nuclear Officer
Nuclear Energy Institute
1201 F Street NW, Suite 1100
Washington, DC 20004

Dear Mr. Pietrangelo:

This letter provides the response from the U.S. Nuclear Regulatory Commission (NRC) to a request to endorse a proposal dated September 10, 2014, submitted by the Nuclear Energy Institute (NEI) on behalf of the nuclear industry. The proposal was entitled "Compliance with Phase 2 of NRC Order to Modify the Licenses of Boiling Water Reactors (BWRs) with Mark I and II Containments with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (EA-13-109)" (Agencywide Documents Access and Management Systems (ADAMS) Accession No. ML14266A270).

In its letter, NEI indicated that NRC endorsement of the industry's proposal would greatly assist in the timely development of guidance needed for compliance with Phase 2 of Order EA-13-109, "Order Modifying Licenses With Regard To Reliable Hardened Containment Vents Capable of Performing under Severe Accident Conditions" (ADAMS Accession No. ML13130A067). The industry also discussed these concepts at public meetings held on September 11 and 25, 2014. Specifically, the industry described a containment venting approach that included severe accident water addition (SAWA) and severe accident water management (SAWM) strategies that could preserve the use of a wetwell vent path, in addition to providing other benefits. In the letter, the NEI requested NRC endorsement of the following three items:

1. The concept of an option for severe accident water addition in the NEI guidance for compliance with Phase 2 of the BWR Vent Order, recognizing that NRC will be asked to review and endorse the next revision of the guidance.
2. The scope breakdown between Phase 2 of the BWR Vent Order and the closely-related Containment Protection and Release Reduction of BWR with Mark I and Mark II Containments (CPRR) Rulemaking.
3. The target schedule for Phase 2 of the BWR Vent Order.

Phase 2 of Order EA-13-109 requires installation of a reliable, severe accident capable drywell vent system or the development of a reliable containment venting strategy that makes it unlikely that a licensee would need to vent from the containment drywell during severe accident conditions. Currently, NEI 13-02, "Industry Guidance for Compliance with Order EA-13-109 – BWR Mark I & II Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions," (ADAMS Accession No. ML13316A853) includes guidance associated with Phase 1 of the Order EA-13-109 regarding upgrading the venting capabilities from the containment wetwell to provide reliable, severe accident capable hardened vents to assist in

preventing core damage, and, if necessary, to provide venting capability during severe accident conditions. NEI has subsequently indicated its intent to modify the document to include information and guidance on potential options for complying with the Phase 2 requirements of the order.

Severe Accident Water Addition for Phase 2 Compliance

With respect to Item 1, Order EA-13-109 was imposed as a means to improve capabilities for decay heat removal and containment pressure control. Some proposed approaches to implement the order include the addition of water to the drywell during severe accident conditions. This provides benefits that include reducing temperatures and cooling molten core debris. In SECY-12-0157, the NRC discussed various risk assessments by the NRC and industry that have concluded that adding water to the drywell significantly reduces the likelihood of release of radioactive materials for those severe accident scenarios that involve fuel melting through the reactor vessel. The water added to the drywell cools the molten fuel, which can arrest its progression and reduce the likelihood of a loss of the containment function through liner melt-through, containment over-pressurization failure, and containment over-temperature failure.

In addition to the benefits associated with containment protection, recent technical evaluations performed by both the industry and the NRC staff indicate that including the capability of timely SAWA results in a substantially lower drywell temperature for consideration in designing the drywell vent. SAWA will, therefore, facilitate implementation of Phase 2 of Order EA-13-109 by establishing the design conditions for a drywell vent and supporting SAWM for licensees choosing to pursue that option.

For the reasons mentioned above, the NRC staff supports including SAWA in the strategies dedicated to compliance with Phase 2 of Order EA-13-109.

Scope of Phase 2 Compliance and CPRR Rulemaking

With respect to Item 2, the staff has reviewed the information in the NEI letter and its attachment (ADAMS Accession No. ML14273A098) regarding the two options proposed by industry for Phase 2 compliance and the division point between Phase 2 of Order EA-13-109 and the closely-related CPRR rulemaking. Option 1 includes installation of a severe accident capable drywell vent (SADV) and Option 2 will include installation of a SADV with SAWA or a SAWM strategy that precludes the need for a SADV. As noted under Item 1 above, the NRC staff supports the emphasis on water addition to maintain containment performance under severe accident conditions. The order is focused on measures to address overpressure conditions through improving containment vent capability. As discussed in several meetings, licensees may propose to include SAWA to establish design requirements for the drywell vent or as part of SAWM. In such cases, SAWA becomes part of compliance with the order. The CPRR rulemaking is addressing accident management measures to address various containment failure modes and uncontrolled release paths, including overtemperature and liner melt-through scenarios. Evaluations in support of the rulemaking will consider accident management measures such as SAWA and these may be included in the CPRR requirements. Thus, there is potential overlap between CPRR and order requirements in certain areas. These topics will be addressed in a paper the NRC staff expects to provide to the Commission early next year. In

addition, the relationship between the CRR rulemaking and Order EA-13-109 will continue to be discussed during public meetings being scheduled for both activities.

Subsequent to NEI's letter, at the public meeting held on September 25, 2014, the NEI working group (ADAMS Accession No. ML14273A098) provided additional details and stated that although Option 1 (SADV without SAWA) is a hypothetical option for Phase 2 of Order EA-13-109, NEI 13-02 will not include any guidance on this option and would direct licensees considering this option to do so on a plant-specific basis.

In light of the benefits of SAWA described above, the NRC staff agrees that the inclusion of SAWA as an element of implementing Phase 2 of Order EA-13-109 would result in a more synergistic means of improving overall severe accident management for BWRs with Mark I or II containments. As defined by the current plans for the CRR rulemaking, proposed requirements beyond Order EA-13-109, if any, could include SAWA and/or SAWM.

With the information provided at the September 25, 2014, public meeting, the NRC staff does not see a conflict between licensee's plans for Phase 2 of Order EA-13-109 and the development of the CRR rulemaking. Close coordination of the two actions should continue through the public meetings being held regarding both activities.

Phase 2 Compliance Schedule

With respect to Item 3 regarding the target schedule provided in the attachment to the NEI letter for developing guidance for Phase 2 of Order EA-13-109 and submittal of overall integrated plans by licensees by December 2015, the staff agrees with the proposed schedule, except the date for issuance of the interim staff guidance should be changed from March 2015 to April 2015, the date provided in Order EA-13-109. This was discussed at the public meeting held on September 25, 2014.

If you have any questions, please contact Dr. Rajender Auluck of my staff at (301) 415-1025, or via email to Rajender.Auluck@nrc.gov.

Sincerely,

/RA/

William M. Dean, Director
Office of Nuclear Reactor Regulation

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Sincerely,
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 William M. Dean, Director
 Office of Nuclear Reactor Regulation

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