April 6, 2010

Mr. Alexander Marion
Nuclear Energy Institute
1776 I Street, NW, Suite 400
Washington DC, 20006-3708

SUBJECT: REVISED GUIDANCE REGARDING COATINGS ZONE OF INFLUENCE FOR REVIEW OF FINAL LICENSEE RESPONSES TO GENERIC LETTER 2004-02, "POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON EMERGENCY RECIRCULATION DURING DESIGN BASIS ACCIDENTS AT PRESSURIZED-WATER REACTORS"

Dear Mr. Marion:

By letter dated March 28, 2008, "Revised Guidance for Review of Final Licensee Responses to Generic Letter 2004-02" (Accession Number ML080230234), the U.S. Nuclear Regulatory Commission (NRC) staff provided guidance for the staff's review of licensee responses to Generic Letter 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation during Design Basis Accidents at Pressurized-Water Reactors." The review guidance addressed the areas of chemical effects, coatings, and head loss testing, with the intent to both guide the NRC staff's review of licensee submittals and to inform stakeholders of the staff's views on these subjects. An error was recently identified in a vendor's analysis that formed the basis for the staff's guidance on zone of influence (ZOI) for protective coatings. The intent of this letter is to inform you of the revised staff guidance regarding the zone of influence for protective coatings.

In support of development of the review guidance, the NRC staff reviewed industry testing documented in technical report WCAP-16568-P, "Jet Impingement Testing to Determine the Zone of Influence for DBA-Qualified/Acceptable Coatings" (Proprietary Accession Number ML061990594). This report recommended smaller ZOIs for qualified inorganic zinc and epoxy coatings than was stated in the NRC staff safety evaluation (SE) for NEI-04-07, "Pressurized Water Reactor Sump Performance Evaluation Methodology" (Accession Number ML043280007). In Enclosure 2 to the NRC staff's March 28, 2008 letter, the NRC provided positions and guidance on the coatings ZOIs presented in WCAP-16568-P. In general, the staff accepted the conclusions in the report.

In light of the testing issue that was reported by Westinghouse on February 12, 2010 (Accession Number ML100480138), which affected WCAP-16568-P, the NRC staff questioned whether the ZOIs recommended by the technical report might be undersized for qualified coatings. Westinghouse provided revised ZOI analyses for both epoxy and untopcoated inorganic zinc coatings in a letter dated March 24, 2010 (Accession Number ML100880023). The NRC staff has reviewed these analyses and concluded that the small diameter locations upstream of the test nozzle constitute significant test design errors. Given these test design errors, Westinghouse has not provided sufficient technical basis for the NRC staff to accept the concept of a characteristic jet diameter or that the Wyle instrumented tests represented free-jet expansion experiments as described in the Westinghouse analyses.

The NRC staff has concluded that the test design errors introduce significant uncertainty in attempting to make comparisons between the axial distances from the Wyle test nozzle and L/Ds of a freely expanding jet.

However, despite the test design errors, the NRC staff has concluded that a measured Wyle test jet pressure at the same location of a previously tested material can be used as a material-specific destruction pressure because it reflects the actual jet pressure that was present at the test target. The measured destruction pressure can then be used as an input to the American National Standard Institute/American Nuclear Society (ANSI/ANS) 58.2-1988 model for calculating a ZOI. This approach of using empirically derived (i.e. measured) damage pressures as an input to the ANSI/ANS 58.2-1988 model for calculating a ZOI volume is consistent with the staff SE of NEI 04-07.

Based on these conclusions, the NRC staff has accepted the confirmatory testing and analysis by Westinghouse that shows a ZOI of 4D (4 pipe diameters) for epoxy coatings specified in the March 2008 review guidance remains valid. This conclusion is based on Westinghouse use of a measured pressure at the location of the test article, with the result converted to a zone of influence through use of the ANSI/ANS 58.2-1988 model. The original analysis for epoxy coatings included margin which was used in the refined analysis to compensate for the test design errors.

However, the staff has not accepted the confirmatory testing and analysis by Westinghouse intended to support a ZOI of 5D for untopcoated inorganic zinc coatings specified in the March 2008 review guidance. Specifically, the measured Wyle test jet pressures at the distances of interest for inorganic zinc do not support a reduced ZOI when input into the ANSI/ANS 58.2-1988 model. In addition, the NRC staff does not accept the analytical method used by Westinghouse to justify the inorganic zinc ZOI because Westinghouse has not provided sufficient technical information to justify use of a characteristic nozzle diameter and comparisons of the Wyle test jet to a freely expanding jet. In particular, Westinghouse has not addressed the large discrepancy in predicted and measured pressures at the distances of interest for inorganic zinc. The staff believes that this discrepancy might be attributable to the Wyle test loop design errors. Therefore, the NRC staff no longer finds a 5D ZOI acceptable for untopcoated inorganic zinc. Instead, licensees may rely on the staff's prior acceptance of a 10D ZOI for untopcoated inorganic zinc as documented in its SE for NEI 04-07.

As described above, the only change to the existing guidance is that the staff finds a ZOI of 10D (not 5D) to be acceptable for qualified untopcoated inorganic zinc coatings inside containment. As with any guidance, conformance by licensees is not mandatory. Alternate approaches may be used if adequately supported and the NRC's regulations are met.

The NRC staff will review licensee responses to Generic Letter 2004-02 already received, as well as future responses, in light of the new information discussed above. The staff will consider whether each plant's head loss testing supports a conclusion of reasonable assurance of compliance with applicable regulations. Where such assurance has not yet been obtained, the staff plans to seek additional information from affected licensees. The NRC staff has discussed the content of this letter with the cognizent NEI staff. NEI has agreed to forward this revised guidance to licensees.

If you would like to discuss the contents of this letter further, please contact me at (301) 415-3283.

Sincerely,

/RA/

William H. Ruland, Director
Division of Safety Systems
Office of Nuclear Reactor Regulation

If you would like to discuss the contents of this letter further, please contact me at (301) 415-3283.

Sincerely,

/RA/

William H. Ruland, Director
Division of Safety Systems
Office of Nuclear Reactor Regulation

DISTRIBUTION:

DCI R/F RidsNrrDciCsgb RidsNrrDssSsib PPatnaik

ADAMS Accession No.: ML100960495

OFFICE	NRR/DCI/CSGB	NRR/DSS/SSIB	NRR/DCI/CSGB	NRR/DCI	NRR/DSS
NAME	MYoder	MScott	RTaylor	MEvans	BRuland
DATE	03/30/2010	03/30/2010	03/30/2010	03/31/2010	04/06/2010

OFFICIAL RECORD COPY