ACRSR-2020

February 20, 2003

Dr. William D. Travers
Executive Director for Operations
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: PROPOSED RESOLUTION OF GENERIC SAFETY ISSUE-191, "ASSESSMENT OF DEBRIS ACCUMULATION ON PWR SUMP PERFORMANCE"

Dear Dr. Travers:

During the 499th meeting of the Advisory Committee on Reactor Safeguards, February 6-8, 2003, we reviewed the proposed NRC Generic Letter 2003-XX, "Potential Impact of Debris Blockage on Emergency Recirculation During Design-Basis Accidents at Pressurized-Water Reactors," and Draft Regulatory Guide DG-1107, "Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant Accident," associated with the resolution of Generic Safety Issue (GSI)-191. Our Subcommittee on Thermal-Hydraulic Phenomena also reviewed this matter during its meeting on February 4, 2003. During this review, we had the benefit of discussions with representatives of the NRC staff. We also had the benefit of the documents referenced.

CONCLUSIONS AND RECOMMENDATIONS

1. We agree with the staff's proposal to issue the proposed Generic Letter for public comment.

2. We agree with the staff's proposal to issue Draft Regulatory Guide DG-1107 provided that the accompanying request for public comments incorporates our recommendation 3 and the associated discussion.

3. The staff should evaluate the possibility that strainers may prove to be so susceptible to debris blockage that alternative solutions may be required to ensure long-term cooling. The staff should invite public comments on this matter.

4. The "acceptable methods" discussed in DG-1107 should be peer reviewed after technical reports from the Office of Nuclear Regulatory Research (RES) contractors become available.

DISCUSSION

In our letter of September 14, 2001, we agreed with the staff that potential issues associated with the performance of containment sumps in pressurized water reactors had been identified. We stated that, if plant-specific analyses were required, guidance for performing these analyses should be developed by the staff. We also indicated our desire to review the proposed final disposition of this issue. The staff developed the proposed Generic Letter and associated draft Regulatory Guide DG-1107 for resolving GSI-191.

The proposed Generic Letter will serve the purpose of initiating the process of gathering plant-specific information and requiring licensees to develop plans for resolving potential issues. This is an appropriate first step toward resolving GSI-191. The schedule for responding to the Generic Letter is realistic and should be maintained in order to reach an expeditious resolution. The ability of licensees to respond may depend significantly on the availability and acceptability of guidance being prepared by the Nuclear Energy Institute (NEI), which is expected to be published in September 2003.

DG-1107 describes the technical issues that require resolution in order for plants to ensure that sump recirculation will function adequately following a loss-of-coolant-accident (LOCA). These issues include potential sources of debris, debris generation and transport, and screen blockage. These phenomena are influenced by many details of the location and size of the LOCA, the forms of insulation on neighboring piping and vessels, and the numerous flow paths by which the debris can reach the sump. A workable approach to predicting these phenomena requires scientific understanding combined with suitable engineering models that adequately describe selected key parameters and their relationships. DG-1107 correctly anticipates the possible need to make conservative assumptions because of high degrees of uncertainty associated with these processes.

DG-1107 describes “acceptable methods” for predicting debris sources and generation, transport, accumulation, and loss of net positive suction head. These methods are being studied at the Los Alamos National Laboratory and the University of New Mexico. Our Thermal-Hydraulic Phenomena Subcommittee heard presentations summarizing parts of this work during its meeting on February 4, 2003. We have not yet received the final report that describes the suggested design methods and their implementation. Therefore, we are uncertain as to whether these methods are sufficiently mature to be included in the final regulatory guide. The “acceptable methods” require peer review when the supporting documents are available. The staff will also need to develop a technical basis for assessing the acceptability of the methods proposed in the forthcoming NEI guidance document.

We anticipate that the “acceptable methods” will require further review, and possible revision, before publication of the final Regulatory Guide. However, these future activities should not impede the release of the draft Regulatory Guide DG-1107 for public comment.

The staff also needs to consider the possibility that strainers may prove to be so susceptible to debris blockage that alternative solutions may be required to ensure long term cooling. This might involve, for example, changes in the types of insulation used within containment or implementing diverse means of providing long-term cooling.

We look forward to reviewing the final draft of the Generic Letter and DG-1107 after resolution of public comments.

Sincerely,

/RA/

Mario V. Bonaca
Chairman

References:

1. U. S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Generic Letter 2003-XX, “Potential Impact of Debris Blockage on Emergency Recirculation During Design-Basis Accidents at Pressurized-Water Reactors," transmitted January 15, 2003.
2. U. S. Nuclear Regulatory Commission, Office of Nuclear Regulatory Research, Draft Regulatory Guide DG-1107, "Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant Accident,” transmitted December 2002.
3. Letter dated September 14, 2001, from George E. Apostolakis, ACRS, to William D. Travers, EDO, Subject: Generic Safety Issue-191, “Assessment of Debris Accumulation on PWR Sump Performance.”