ACRSR-2037

May 16, 2003

The Honorable Nils J. Diaz
Chairman
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: DRAFT FINAL REGULATORY GUIDE 1.178 AND STANDARD REVIEW PLAN SECTION 3.9.8 FOR RISK-INFORMED INSERVICE INSPECTION OF PIPING

Dear Chairman Diaz:

During the 502nd meeting of the Advisory Committee on Reactor Safeguards, May 8-9, 2003, we met with representatives of the NRC staff to discuss the draft final Regulatory Guide (RG) 1.178, "An Approach for Plant Specific Risk-Informed Decisionmaking for Inservice Inspection of Piping," and the associated Standard Review Plan (SRP) Section 3.9.8, "Standard Review Plan for the Review of Risk-Informed Inservice Inspection Applications." We also had the benefit of the documents referenced.

RECOMMENDATIONS

1. The draft final RG 1.178 and associated SRP Section 3.9.8 should be issued.

2. The staff should consider undertaking a study in which EPRI , Westinghouse Owners Group (WOG), and French methodologies are applied to the same piping system and the resulting inspection plans are compared to gain a better understanding of the impact of the different approaches.

DISCUSSION

RG 1.178 and the associated SRP Section 3.9.8 were issued for trial use in September 1998. In our report of June 12, 1998, we concluded that a risk-informed inservice inspection (RI-ISI) program would result in reductions in the risk from piping failures, occupational radiation exposures, and associated inspection costs and that RG 1.178 provided general guidance for developing RI-ISI programs. The detailed methodologies needed for the development of such programs are provided in topical reports prepared by EPRI and WOG.

Based on the staff's experience during the trial use period, the staff is now preparing to issue a final revised version of RG 1.178 and SRP Section 3.9.8. Most of the changes in RG 1.178 are editorial.

The most important substantive changes are additional documentation requirements in RG 1.178 and reviewer directions in SRP Section 3.9.8 to ensure that the probabilistic risk assessment used to support the submittal is of adequate quality. The revised guide states that the licensee's submittal should discuss the measures taken to ensure quality and to address any limitations of the analysis that are expected to impact conclusions about the acceptability of proposed changes. If a peer review were performed, the submittal should discuss the resolution of the findings of the review. We support the staff's decision to require such documentation.

Although the staff has the general impression that the EPRI methodology gives somewhat more conservative results than the WOG methodology, no systematic comparison of the results of the two methodologies has been made by staff or industry. The two methodologies take different approaches to risk categorization of piping segments and different approaches to the assessment of pipe failure frequency. The EPRI methodology uses absolute values of conditional core damage probability. The WOG methodology uses Fussell-Vesely and Risk Achievement Worth importance measures. From our discussions, we understand that most of the international nuclear community is adopting the EPRI and WOG methodologies, with one exception. A third methodology has been developed in France. The staff should consider a study comparing the results from the application of the three methodologies to the same piping system. Such a comparison could give useful insights into the process of risk categorization. Also, high confidence in the effectiveness of RI-ISI programs will become increasingly important when considering risk-informed approaches to 10 CFR 50.46.

Sincerely,

/RA/

Mario V. Bonaca
Chairman

References:

1. Letter dated April 25, 2003, from Scott F. Newberry, Office of Nuclear Regulatory Research, to John T. Larkins, Executive Director, ACRS, Subject: ACRS Review of Draft Revised Regulatory Guide 1.178, "An Approach for Plant Specific Risk-Informed Decisionmaking for Inservice Inspection of Piping," and the Associated Standard Review Plan Chapter 3.9.8" (Predecisional).
2. Report dated June 12, 1998, from R. L. Seale, Chairman, ACRS, to Shirley Ann Jackson, Chairman, NRC, Subject: Proposed Final Standard Review Plan Section 3.9.8 and Regulatory Guide 1.178 for Risk-Informed Inservice Inspection of Piping.
3. Electric Power Research Institute, "Risk-Informed Inservice Inspection Evaluation Procedure," EPRI TR-106706, June 1996.

4. Westinghouse Energy Systems, WCAP-14572, Revision 1, "Westinghouse Owners Group Application of Risk Informed Methods to Piping Inservice Inspection Topical Report," October 1997.
5. Westinghouse Energy Systems, WCAP-14572, Revision 1, Supplement 1, "Westinghouse Structural Reliability and Risk Assessment (SRRA) Model for Piping Risk-Informed Inservice Inspection," October 1997.
6. European Commission - DG Environment, Study Contract: B4-3040/99/23123/MAR/C2, Final Report of Task 1 of RIBA Project, “Review of Existing Risk-Informed Methodologies,” December 2001.