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UNITED STATES
NUCLEAR REGULATORY COMMISSION
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MEMORANDUM TO: John T. Larkins, Executive Director
Advisory Committee on Reactor Safeguards

FROM: Carl J. Paperiello, Director
Office of Nuclear Regulatory Research

SUBJECT: ACRS REVIEW OF PROPOSED REVISIONS OF REGULATORY GUIDE 1.178, "AN APPROACH FOR PLANT-SPECIFIC RISK-INFORMED DECISION-MAKING FOR INSERVICE INSPECTION OF PIPING," AND THE ASSOCIATED "STANDARD REVIEW PLAN FOR THE REVIEW OF RISK-INFORMED INSERVICE INSPECTION APPLICATIONS" (NUREG-0800, SECTION 3.9.8)

On May 8, 2003, the staff of the U.S. Nuclear Regulatory Commission (NRC) briefed the Advisory Committee on-Reactor Safeguards (ACRS), on the revisions to Regulatory Guide 1.178, "An Approach for Plant-Specific Risk-Informed Decision-Making for Inservice Inspection of Piping," and the associated "Standard Review Plan for the Review of Risk-Informed Inservice Inspection [RI-ISI] Applications" (NUREG-0800, Section 3.9.8). The ACRS subsequently issued a letter, dated May 16, 2003, conveying its observations and recommendations concerning RI-ISI. In particular, the Committee recommended that the staff should consider undertaking a study to compare the results of applying three distinct RI-ISI methodologies to the same piping system, in order to derive useful insights into the process of risk categorization and the impact of the different approaches. Specifically, the ACRS recommended focusing on the methodologies espoused by the Electric Power Research Institute (EPRI) and the Westinghouse Owners Group (WOG), as well as a new methodology developed in France. The purpose of this memorandum is to convey the staff's conclusions regarding this comparative study.

In evaluating the feasibility and usefulness of this comparative study, the staff first considered the fact that the NRC previously conducted extensive reviews of both the EPRI and WOG methodologies in 1996–1998 before they were approved. In so doing, the staff found that both approaches are acceptable (albeit somewhat different), and the staff has since approved approximately 70 plant-specific RI-ISI programs based on one of the two methodologies.

Both methods utilize the same primary input parameters including identification of degradation mechanisms and the susceptible locations, as well as the conditional risk estimates for ruptures at different locations. Any comparison study would begin with the same degradation mechanisms, locations, and risk estimates. Moreover, the application of either method using these input parameters would target inspections toward locations where degradation mechanisms exist, and where the conditional risk of pipe ruptures is highest.

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Consequently, the staff has concluded that although a comparative study of the two methods would be expected to yield different numbers and weld locations, those differences would, most likely, not be risk-significant and, therefore, would not justify changes to either methodology. Furthermore, a comparative study would require participation of a licensee to allow staff access to plant-specific data. For these reasons, the staff does not believe that from a comparative study would yield sufficient benefits to justify the expenditure of resources and, therefore, the staff does not intend to pursue such a study at this time.

The staff will, however, remain abreast of regarding the various RI-ISI methodologies. Toward that end, two staff members from the Office of Nuclear Regulatory Research participated in the Committee on the Safety of Nuclear Installations Workshop on "International Developments and Cooperation on Risk-Informed Inservice Inspection and Nondestructive Testing Qualification," in Stockholm, Sweden, in April 2004. That workshop spawned considerable discussions concerning the comparison of qualitative and quantitative methods, and the French representative indicated that France does not intend to implement RI-ISI methodologies. Nonetheless, most other European countries are using either the EPRI or WOG methodology, or developing or using some variation thereof.

We appreciate the Committee's comments and insights concerning this subject.