

December 12, 2001

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

SUBJECT: PROPOSED RULEMAKING FOR RISK-INFORMED REVISIONS TO
10 CFR 50.44, "STANDARDS FOR COMBUSTIBLE GAS CONTROL
SYSTEM IN LIGHT-WATER-COOLED POWER REACTORS"

Dear Dr. Travers:

During the 488th meeting of the Advisory Committee on Reactor Safeguards, December 5-7, 2001, we held discussions with representatives of the NRC staff concerning the proposed rulemaking for risk-informed revisions to 10 CFR 50.44, "Standards for Combustible Gas Control System in Light-Water-Cooled Power Reactors." We also had the benefit of the documents referenced.

CONCLUSION AND RECOMMENDATION

1. The proposed rulemaking for risk-informed revisions to 10 CFR 50.44 will provide more effective and efficient regulation to deal with combustible gases in containments.
2. The proposed specification for the combustible gas source term for boiling water reactor (BWR) Mark III and pressurized water reactor (PWR) ice condenser containments should be included in the draft regulatory guide (DG-1117) instead of being incorporated directly in the rule.

DISCUSSION

The severe accident research programs sponsored by the NRC during the 1980s and 1990s, the studies of severe accident risk (NUREG-1150), and the insights derived from Individual Plant Examinations (NUREG-1560) have led to an improved understanding of the behavior of combustible gas during reactor accidents. The staff provided a useful summary of the risk significance of combustible gases in Attachment 2 to SECY-00-0198, which we commented on in our report dated September 13, 2000. The severe accident studies have shown that control of combustible gases during design-basis accidents does not have significant impact on risk, but that controls are needed for beyond-design-basis accidents for some containment designs.

The proposed rule changes incorporate insights obtained from past NRC efforts. They retain requirements for high-point vents and for ensuring a mixed-containment atmosphere,

inerting BWR Mark I and Mark II containments, and providing hydrogen control systems for Mark III and ice condenser containments. The proposed rule eliminates the design-basis loss-of-coolant accident hydrogen release and requirements for systems to mitigate such a release. It retains the requirement to monitor hydrogen in the containment atmosphere for all containment designs, but monitors are no longer classified as safety-related components. Also, the proposed rule would codify the existing regulatory practice of monitoring oxygen concentrations in containments with inerted atmospheres. In addition, the proposed rule includes a number of options offering performance-based and prescriptive alternatives.

In SECY-00-0198, the staff proposed to develop combustible gas source terms appropriate for different containment types and accident scenarios. In the proposed rule, the staff has chosen instead to continue the use of a prescriptive requirement for a source term equivalent to the hydrogen generated from metal-water reactions involving 75% of the fuel cladding surrounding the active fuel region. Because of the ongoing investigation of combustible gas source terms in support of resolution of Generic Safety Issue-189 on the potential need for regulatory enhancement to deal with station blackout sequence issues for BWR Mark III and PWR ice condenser containments, it is preferable not to prescribe the source term in the rule. A combustible gas source term should be included in the associated regulatory guide (DG-1117).

We would like to review the proposed final rule after reconciliation of public comments.

Sincerely,

/RA/

George E. Apostolakis
Chairman

References:

1. Memorandum dated November 20, 2001, from David B. Matthews, Office of Nuclear Reactor Regulation, to John T. Larkins, Executive Director, Advisory Committee on Reactor Safeguards, Subject: Request for Review of Proposed Part 50 Rulemaking on Risk-Informed Revision of Combustible Gas Control (Predecisional)
2. Report dated September 13, 2000, from Dana A. Powers, Chairman, Advisory Committee on Reactor Safeguards, to Richard A. Meserve, Chairman, NRC, Subject: Proposed Risk-Informed Revisions to 10 CFR 50.44, "Standards for Combustible Gas Control System in Light-Water-Cooled Power Reactors."
3. U.S. Nuclear Regulatory Commission, NUREG-1150, Vols. 1-3, "Severe Accident Risks: An Assessment for Five U.S. Nuclear Power Plants," December 1990.
4. U.S. Nuclear Regulatory Commission, NUREG-1560, Vols. 1-6, "Individual Plant Examination Program: Perspectives on Reactor Safety and Plant Performance," December 1997.
5. Memorandum dated January 19, 2001, from Anette L. Vietti-Cook, Secretary, to William D. Travers, Executive Director for Operations, NRC, Subject: Staff Requirements - SECY-00-0198 - Status Report on Study of Risk-Informed Changes to the Technical Requirements of 10 CFR Part 50 (Option 3) and Recommendations on Risk-Informed Changes to 10 CFR 50.44 (Combustible Gas Control).

6. Memorandum dated September 14, 2000, from William D. Travers, Executive Director for Operations, NRC, to The Commissioners, Subject: SECY-00-0198, "Status Report on Study of Risk-Informed Changes to the Technical Requirements of 10 CFR Part 50 (Option 3) and Recommended Changes to 10 CFR 50.44 (Combustible Gas Control)."
7. Memorandum dated November 16, 2001, from Thomas L. King to Ashok C. Thadani, Office of Nuclear Regulatory Research, NRC, Subject: Generic Issue Management Control System Report -- Fourth Quarter FY 2001; Generic Safety Issue 189, "Susceptibility of Ice Condenser Containments to Early Failure from Hydrogen Combustion During a Severe Accident," identified May 2001.