



UNITED STATES  
**NUCLEAR REGULATORY COMMISSION**  
ADVISORY COMMITTEE ON NUCLEAR WASTE  
WASHINGTON, DC 20555 - 0001

ACNWR-0256

January 4, 2007

The Honorable Dale Klein  
Chairman  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

Dear Chairman Klein:

**SUBJECT: PROPOSED REVISION 1 TO REGULATORY GUIDE 1.112, "CALCULATION OF RELEASES OF RADIOACTIVE MATERIALS IN GASEOUS AND LIQUID EFFLUENTS FROM LIGHT-WATER-COOLED NUCLEAR POWER REACTORS"**

During its 174<sup>th</sup> meeting, on November 13–16, 2006, the Advisory Committee on Nuclear Waste (ACNW) heard a presentation from the U.S. Nuclear Regulatory Commission (NRC) staff on a proposed Revision 1 to Regulatory Guide 1.112, "Calculation of Releases of Radioactive Materials in Gaseous and Liquid Effluents from Light-Water-Cooled Nuclear Power Reactors." This Regulatory Guide describes an acceptable method for calculating the annual radioactive liquid and gaseous source terms used in evaluating the adequacy of radioactive effluent control systems for nuclear reactors. The Regulatory Guide references NUREG-0016 (BWR-GALE) and NUREG-0017 (PWR-GALE)<sup>1</sup> as acceptable approaches for calculating average annual expected releases of radioactive material in gaseous and liquid effluents from a reactor. The Office of Nuclear Regulatory Research requested that the Committee review Revision 1 to Regulatory Guide 1.112 for consideration in support of new reactor licensing activities.

#### OBSERVATIONS

1. The staff reported its priorities and tentative schedule to make changes as follows:
  - a. Make currently proposed administrative changes (March 2007)
  - b. Technical update of the GALE Computer Codes (Late 2007)
  - c. Update Regulatory Guide 1.112 and issue for public comments (2008)
  - d. Publish Revised Regulatory Guide (six months after the draft comment period is complete)

The Committee notes that updates to the technical basis documents that support this Regulatory Guide are planned to occur later in the process rather than at the beginning.

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<sup>1</sup>The BWR and PWR GALE Codes are computerized mathematical models for calculating the releases of radioactive material in gaseous and liquid effluents (i.e., the gaseous and liquid source terms) to determine conformance with the requirements of Appendix I to 10 CFR Part 50.

2. It was reported that many of the assumptions and parameters in the GALE codes are represented by fixed values based on design approaches and operating experience for reactors prior to 1980. The Committee is concerned with the relevance of these values to new applications.
3. The staff reported that its short term focus will be to (a) make changes to the Regulatory Guide for consistency with ANSI standard 18.1-1999 because applicants are likely to refer to this standard in their applications and (b) update the Regulatory Guide to be consistent with the current terminology and other requirements of 10 CFR Part 20. The Committee believes that making the changes to the Regulatory Guide before the GALE code and its basis are updated is not efficient or technically defensible.

## RECOMMENDATION

Staff priorities should be to evaluate and update the technical aspects of the GALE codes and their associated documentation first. The Regulatory Guide should then be revised to reflect these updates. The emphasis should be assuring that the GALE codes and Regulatory Guide are based on up-to-date approaches for estimating radioactive gaseous and liquid effluent source terms.

Sincerely,

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Michael T. Ryan  
Chairman

## References:

1. Memorandum dated September 25, 2006, from Jimi T. Yerokun, Chief, Risk Applications and Special Project Branch, RES to Michael R. Snodderly, Chief for Technical Support Branch, ACRS, Subject: Additional Information - Regulatory Guide 1.112, "Calculation of Releases of Radioactive Materials in Gaseous and Liquid Effluents from Light-water-cooled Nuclear Power Reactors" (DG-1160).
2. NUREG-0016, "Calculation of Releases of Radioactive Materials in Gaseous and Liquid Effluents from Boiling Water Reactors (BWR-GALE Code)," Revision 1, issued 1979.
3. NUREG-0017, "Calculation of Releases of Radioactive Materials in Gaseous and Liquid Effluents from Pressurized Water Reactors (PWR-GALE Code)," Revision 1, issued 1985.
4. ANS/ANSI 18.1-1999, "Radioactive Source Term for Normal Operation of Light Water Reactors."