



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

January 24, 2011

Mr. R. W. Borchardt  
Executive Director for Operations  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

**SUBJECT: DRAFT FINAL REVISION 2 TO REGULATORY GUIDE 1.174 AND  
REVISION 1 TO REGULATORY GUIDE 1.177**

Dear Mr. Borchardt:

During the 579<sup>th</sup> meeting of the Advisory Committee on Reactor Safeguards, January 13-15, 2011, we reviewed the draft final Revision 2 to Regulatory Guide (RG) 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," and Revision 1 to RG 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications." During this review, we had the benefit of discussions with representatives of the NRC staff. We also had the benefit of the documents referenced.

**RECOMMENDATIONS**

1. Revision 1 to RG 1.177 should be issued as final. Revision 2 to RG 1.174 should be revised as described in Recommendation 2 before being issued as final.
2. The staff should reinstate guidance on the consideration of late containment failure in RG 1.174; i.e., as part of the assessment of impacts on defense-in-depth, licensees should include an assessment of the potential for an increase in the likelihood of late containment failure. This assessment can be qualitative.
3. The staff should continue to investigate approaches for addressing the interfaces between measures taken for safety and measures taken for security, and to identify revisions and adaptations that might be required for new reactors.

**DISCUSSION**

The publication of RG 1.174 remains a major milestone in the NRC initiative to risk-inform the regulations. RG 1.174 introduced the concept of an integrated decisionmaking process that had as inputs: risk information, considerations of defense-in-depth, and sufficient safety margins. The Guide defines acceptable ranges of values

for the possible increases in core damage frequency (CDF) and large early release frequency (LERF) that could result from proposed changes in the licensing basis. It recognizes that the scope, level of detail, and technical acceptability of the PRA should be commensurate with the application.

The risk-informed process introduced in RG 1.174 has evolved into a suite of regulatory guides and NUREG reports that define an integrated approach to risk-informed regulation:

- RG 1.174, Revision 2, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis"
- RG 1.177, Revision 1, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications"
- RG 1.200, Revision 2, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities"
- NUREG-0800, Section 19.2, "Review of Risk Information Used to Support Permanent Plant-Specific Changes to the Licensing Basis: General Guidance"
- NUREG-1855, "Guidance on the Treatment of Uncertainties Associated with PRAs in Risk-Informed Decision Making"
- RG 1.201, Revision 1, "Guidance for Categorizing Structures, Systems, and Components in Nuclear Power Plants According to Their Safety Significance"
- RG 1.205, Revision 1, "Risk-informed, Performance-Based Fire Protection For Existing Light-Water Nuclear Power Plants"
- RG 1.206, "Combined License Applications for Nuclear Power Plants (LWR Edition)"
- NUREG/CR-6141, "Handbook of Methods for Risk-Based Analyses of Technical Specifications"

Given the number of interrelated guidance documents, the staff has decided to use RG 1.200 as the NRC document that references and endorses specific risk-informed consensus standards. We agree with this approach, but note that the current drafts of RG 1.174 and 1.177 still include citations to a specific revision of the ASME/ANS PRA Standard. These citations should refer to the standard, without noting a revision or date.

We have advocated development and implementation of the risk-informed regulation approach through a series of reports since 1997. Most of the recommendations from our reports have now been addressed within the suite of guidance documents. However, guidance in the draft guide DG-1226, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," that addressed our recommendation on late containment failure has been removed.

Our recommendation addressed risks not clearly reflected in changes to CDF and LERF. For example, changes affecting long-term containment performance could impact radionuclide releases from containment occurring late in the accident. Such releases could result in substantial changes to offsite consequences, including latent cancer fatalities or land contamination.

Containment function is an important factor in maintaining the defense-in-depth philosophy. Therefore, the impact of the proposed change on those aspects of containment function not reflected in the evaluation of LERF should be assessed at least qualitatively. Although this guidance could be considered as implicit in the current requirement for an assessment of defense in depth, as argued in the public comments and the current staff position, we believe an explicit statement will help ensure that it is appropriately considered.

The staff identified three items deferred from inclusion in the current revision of RG 1.174: consideration of a new risk metric to further address late containment failure, integration of the safety/security interface, and modification to guidance for new reactors. We agree that work should continue on these issues and urge the staff to continue their efforts to develop practical approaches to address them.

The revisions to RG 1.174 and RG 1.177 bring them up-to-date and make them consistent with the larger suite of guidance documents, including the ASME/ANS PRA standard, developed and refined in recent years. After the inclusion of guidance addressing late containment failure as a defense-in-depth measure, the revised documents should be issued as final. We look forward to following the staff's continued development of risk-informed guidance.

Sincerely,

*/RA/*

Said Abdel-Khalik  
Chairman

## REFERENCES

1. Draft Regulatory Guide, DG-1226, (Proposed Revision 2 of Regulatory Guide 1.174, dated November 2002), "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis", August 2009 (ML091200100)
2. Draft Regulatory Guide, DG-1227, (Proposed Revision 1 of Regulatory Guide 1.177, dated August 1998), "An Approach for Plant-Specific, Risk-Informed Designmaking: Technical Specifications", August 2009 (ML091200294)
3. Letter to Shirley A. Jackson, "Proposed Standard Review Plan Sections and Regulatory Guides for Risk-Informed, Performance-Based Regulation", March 17, 1997 (ML051640695)
4. Letter to Shirley A. Jackson, "Proposed Final Regulatory Guide 1.174 and Standard Review Plan Chapter 19 for Risk-Informed, Performance-Based Regulation", December 11, 1997 (ML091130698)
5. Letter to Shirley A. Jackson, "Proposed Final Standard Review Plan Sections and Regulatory Guides for Risk-Informed, Performance-Based Regulation for Inservice Testing, Graded Quality Assurance, and Technical Specifications", March 12, 1998 (ML091200213)

6. Letter to Shirley A. Jackson, "Impact of Probabilistic Risk Assessment Results and Insights on the Regulatory System", September 30, 1998 (ML091210387)
7. Letter to Richard A. Meserve, "Draft Final Revision 1 to Regulatory Guide 1.174 and to Chapter 19 of the Standard Review Plan", July 23, 2002 (ML022060159)
8. Letter to Nils J. Diaz, "SECY-04-0037, 'Issues Related to Proposed Rulemaking to Risk-Inform Requirements Related to Large Break Loss-Of-Coolant Accident (LOCA) Break Size and Plans for Rulemaking on LOCA with Coincident Loss-Of-Offsite Power'", April 27, 2004 (ML041200655)

6. Letter to Shirley A. Jackson, "Impact of Probabilistic Risk Assessment Results and Insights on the Regulatory System", September 30, 1998 (ML091210387)
7. Letter to Richard A. Meserve, "Draft Final Revision 1 to Regulatory Guide 1.174 and to Chapter 19 of the Standard Review Plan", July 23, 2002 (ML022060159)
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Letter to R. W. Borchardt, Executive Director for Operations, from Said Abdel-Khalik, ACRS Chairman dated January 24, 2011

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