

November 24, 2004

MEMORANDUM TO: David C. Lew, Chief  
Probabilistic Risk Analysis Branch  
Division of Risk Analysis & Applications  
Office of Nuclear Regulatory Research

FROM: Amarjit Singh, P.E. /RA/  
Probabilistic Risk Analysis Branch  
Division of Risk Analysis & Applications  
Office of Nuclear Regulatory Research

SUBJECT: SUMMARY OF NOVEMBER 9, 2004, PUBLIC MEETING WITH INTERESTED STAKEHOLDERS ON DRAFT APPENDIX C, "NRC STAFF POSITION ON AMERICAN NATIONAL STANDARD EXTERNAL-EVENTS PRA METHODOLOGY," TO REGULATORY GUIDE 1.200, "AN APPROACH FOR DETERMINING THE ADEQUACY OF PROBABILISTIC RISK ASSESSMENT RESULTS FOR RISK-INFORMED ACTIVITIES"

The staff held a public meeting with interested stakeholders on November 9, 2004, to discuss and solicit comments on the staff's proposed position on the, "American National Standard External -Events Probabilistic Risk Assessment (PRA) Methodology," documented in the draft Appendix C to Regulatory Guide 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk-Informed Activities." DG-1138 was issued for public comment on August 31, 2004; the public comment period ended on October 29, 2004. The meeting included representatives from the American Nuclear Society (ANS), the Electric Power Research Institute (EPRI), the Nuclear Energy Institute (NEI), and Westinghouse. In general, the meeting attendees agreed with the staff's proposed position on external-events standard. ANS plans, with a few exceptions, to modify the standard to reflect the staff position. Commenters also recommended that the staff consider issuing Appendix C for trial use prior to issuing the document as final. This standard supports ongoing staff efforts associated with the implementation of the phased approach to Probabilistic Risk Assessment quality. In addition, the staff plans to issue Revision 0 of RG 1.200 with Appendix C next year (tentative schedule of June-August 2005) for public review and comment.

The list of attendees, the meeting agenda, and the meeting handouts are provided in Attachments 1, 2, and 3, respectively. The following agenda items were discussed at the meeting.

- Introduction: purpose of the meeting
- Background/History

- Purpose and scope of Regulatory Guide (RG) 1.200, Appendix C and Standard Review Plan (SRP) 19.1
- Schedule
- Regulatory Guide Structure
- Appendix C to Regulatory Guide 1.200
- Staff Review: General Comments
- Staff Review: Specific Comments
- Nuclear Energy Institute Comments
- American Nuclear Society Response on the NRC's proposed position on the standard
- Conclusion

A summary of the discussion on each of the above topics is presented below.

### **Introduction: purpose of the meeting**

The purpose of this meeting was to solicit public input on the staff's proposed position on ANS standard ANSI/ANS-58.21-2003, "American National Standard External-Events Probabilistic Risk Assessment Methodology," as documented in Draft Regulatory Guide DG-1138. DG-1138 provides the draft Appendix C to Regulatory Guide (RG) 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities." DG-1138 was issued for public comment on August 31, 2004, and the public comment period ended on October 29, 2004.

### **Background/History**

The staff provided background/history of Appendix C to RG 1.200. In April of 2002, the American Society of Mechanical Engineers (ASME) published "Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications" (ASME RA-S-2002) and published Addendum A on December 5, 2003. The staff position on the Addendum A to the ASME standard is documented in Appendix A to RG 1.200. In June of 2002, NEI published NEI-00-02 Industry Peer Review Process. The staff provided its position on the NEI Peer Review Process in Appendix B to RG 1.200. In December 2003, ANS published American National Standard on External-Events Probabilistic Risk Assessment Methodology. In February of 2004, the staff issued the Regulatory Guide (RG) 1.200 (formerly DG-1122) for trial use.

### **Purpose and Scope of Regulatory Guide (RG) 1.200, Appendix C and Standard Review Plan (SRP) 19.1**

This regulatory guide is a supporting document to other NRC regulatory guides that addresses risk-informed activities. This regulatory guide describes one acceptable approach for determining that the quality of the PRA, in total or the parts that are used to support an application, is sufficient to provide confidence in the results such that the PRA can be used in regulatory decision making for light-water reactors. It is also intended to reflect and endorse guidance provided by standards-setting and nuclear industry organizations.

The SRP is intended to support the staff in its assessment of the technical adequacy of the PRA model used to generate results to support a risk-informed submittals and it does not

address how PRA results are used in a decision-making process. The RG and its associated SRP solely address the issue of determining the acceptability of PRA results for an application.

### **Schedule\***

- Issue RG 1.200, Revision 1 with Appendices A, B, and C for public review and comment by the end of August 2005
- Hold another workshop by the mid of October 2005, to discuss public comments on Revision 1 RG 1.200 and staff's proposed resolution
- Issue RG 1.200, Revision 1 by end of December 2005

\*Schedule is dependent on ASME issuing Addendum B to the ASME standard on Level 1/LERF, NEI Revision 1 to NEI-00-02, and ANS issuing revision to external-events standard

### **Regulatory Guide Structure**

Appendices:

- A. NRC Regulatory position on ASME standard
- B. NRC Regulatory position on NEI-00-02
- C. NRC Regulatory position on ANS standard on external events
- D. Low power shutdown (to be written)
- E. Internal fires (to be written)
- F. NRC Regulatory position on any other PRA standards (to be written)

### **Appendix C to Regulatory Guide 1.200**

The NRC staff has reviewed the American National Standard External-Events PRA Methodology (ANSI/ANS-58.21-2003) against the regulatory positions in RG 1.200 regarding technical characteristics and attributes and principles and objectives of a standard. In addition, the staff's objections to the ASME standard, wherever applicable, will apply to the ANS standard, for example, the use of term "dominant".

The staff's position on each requirement is categorized as "no objection," "no objection with clarification," or "no objection subject to the following qualification," and defined as follows:

- **No objection:** the staff has no objection to the requirement.
- **No objection with clarification:** The staff has no objection to the requirement. However, certain requirements, as written, are either unclear or ambiguous, and therefore the staff has provided its understanding of these requirements.
- **No objection subject to the following qualification:** the staff has a technical concern with the requirement and has provided a qualification to resolve the concern.

**Staff Review: General Comments**

The ANS original intent was to have the external events standard “seamless” with the ASME standard and that it appropriately relies, wherever applicable, on the ASME standard. This has not been achieved in the following aspects:

- Not “seamless” in use of terminology such as “shall, should, may.”
- Use of definitions are not consistent with ASME standard.
- The use of same words under more than one capability category in supporting requirements (SRs) cannot imply a grade interpretation (as currently stated in Section 1.4 of the standard).
- The supporting requirement applies equally to each capability and is either met or not met, it is independent of category.
- Many of the supporting requirements are not written as minimal requirements (overuse of permissives).
- The supporting requirements are to use action verbs, such as Review, Identify, Provide, and Estimate, to state the requirements, and not permissive words such as Should, May or Consider which do not provide a minimum requirement.
- For some supporting requirements (SRs), certain material from the notes should be mandatory and therefore should be in the SR itself.

**Staff Review: Specific Comments**

In Section 3.4.2 of the standard, three fundamental quantitative screening criteria are introduced that focus on core damage frequency (CDF). The last paragraph recognizes that large early release frequency (LERF) should also be considered in the screening but does not suggest additional requirements. One approach is to lower the numerical criteria (e.g., in REQ.EXT-C1) to result in screening at a CDF of 1E-07 rather than 1E-06.

Appendix D in the ANS Standard is a nonmandatory appendix that provides guidance on uses of a seismic margins assessment with enhancements. The seismic margin approach, while it can be used for certain applications, is not a PRA. Since this standard provides requirements for an external events PRA, the staff takes objection to this appendix. The staff believes the appropriate place to provide its position on this Appendix would be in the NUREG being prepared by the Office of Nuclear Regulatory Research addressing the use of non-PRA methods in risk-informed decision-making.

### **Nuclear Energy Institute Comments**

The Nuclear Energy Institute Representatives provided the following comments:

- The pilot program to address Appendices A and B of Regulatory Guide 1.200, which addresses the ASME internal events PRA standard, is still underway. Experience to date has indicated issues of interpretation remain with respect to both the standard itself and NRC positions contained in the Appendices A and B. Given that the ANS external event standard builds off the ASME internal events standard, it is premature to finalize the regulatory position on the ANS standard until the ongoing pilot program is complete, and the regulatory positions on the ASME standard are fully clarified and understood. Following the conclusion of the existing pilot plant activities, and NRC communication of the results, Appendix C will additionally need its own pilot phase, and should initially be issued for trial use.
- The lack of a large volume or number of industry comments on Appendix C (beyond those provided in detail separately) should not be interpreted as tacit endorsement of either the ANS standard or the regulatory positions.
- NEI is concerned that the regulatory position appears to disavow use of the Seismic Margin Analysis (SMA) for most applications. It is not apparent that development of a full seismic PRA is a prudent activity for many plants, given the competing needs to improve internal events, fire, and other PRAs of greater importance to regulatory decision making. SMA provides a useful approach for many regulatory applications and should be included in the RG 1.200.

### **American Nuclear Society Response on the NRC's proposed position on the standard**

The ANS Standard Working Group provided the deposition of the proposed staff's comments. Most comments are considered procedural and accepted by the Working Group. The resolution of some comments is also dependent on the final revision of the ASME Standard. The schedule for incorporating the staff's comments and reissuing the standard will be decided by the ANS Committee at their next meeting.

### **Conclusion**

The meeting concluded with the general agreement that the meeting was productive and had provided for a good exchange of information and were able to resolve many issues. There are some potential policy issues which need to be resolved. It was agreed that a distinction should

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be made between regulatory requirements vs. expectations and policy guidance. The commenters also recommended that the staff consider issuing Appendix C for trial use prior to issuing the document as final.

- Attachments:
1. List of Attendees
  2. Meeting agenda
  3. Meeting handouts

cc: Hard Copy  
 PRAB r/f  
 ACRS (M. Snodderly)  
 OGC (G. Mizuno)

E-Mail

NRR:

S. Black  
 M. Johnson  
 D. Harrison  
 G. Parry  
 M. Rubin  
 M. Tschiltz

RES:

C. Ader  
 M. Cunningham  
 N. Chokshi  
 A. Rubin  
 M. Drouin  
 D. Lew  
 A. Singh

NEI:

A. Pietrangelo, NEI  
 A. Heymer, NEI

BNL:

J. Lehner, BNL  
 J. Xu, BNL

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OFFICE	DRAA/PRAB		DRAA/PRAB	
NAME	ASingh		MDrouin	
DATE	11/ 24 /2004		11/ 24 /2004	

**PUBLIC MEETING ON STAFF REVIEW OF  
 “AMERICAN NATIONAL STANDARD EXTERNAL-EVENTS  
 PROBABILISTIC RISK ASSESSMENT METHODOLOGY”  
 NRC, ROCKVILLE, MARYLAND  
 November 9, 2004**

**MEETING ATTENDEES**

Name	Organization	Telephone	E-Mail
Robert Budnitz	LLNL	202-586-8886	BUDNITZ1@LLNL.gov
Nilesh Chokshi	NRC/RES	301-415-6013	NCC2@nrc.gov
David Finnicum	Westinghouse	860-731-6440	david.j.finnicum@us.westinghouse.com
Greg Hardy	ABS Consulting	714-734-4242	ghardy@absconsulting.com
Robert Kassawara	EPRI	650-855-2775	
Gareth Parry	NRC/NRR	301-415-1464	gwp@nrc.gov
Alan Rubin	NRC/RES/DRAA/PRAB	301-415-6776	AMR@nrc.gov
Amarjit Singh	NRC/RES	301-415-0250	axs3@nrc.gov

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**AGENDA**

10:00am-10:15am	Introduction	NRC
10:15am-10:30am	Overview of RG 1.200 And Appendix C	NRC
10:30am- 11:00am	Overall, general staff comments And Observations	
11:00am-12:00 Noon	Detailed discussion on specific Staff objections to ANS standard	
<b>12:00 Noon- 1:00 p.m.</b>	<b>LUNCH</b>	
1:00 p.m.-2:00 p.m.	Detailed discussion (cont'd)	
2:00 p.m.-2:30 p.m.	Open Discussion	
2:30 p.m.-3:00	Wrap-up	
<b>3:00 p.m.</b>	<b>Adjourn</b>	

The meeting was adjourned at noon

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**Meeting Handouts**

**“American National Standard  
External-Events Probabilistic  
Risk Assessment Methodology”**