June 9, 2011

MEMORANDUM TO: Michael C. Cheok, Director
Division of Risk Assessment
Office of Nuclear Reactor Regulation

FROM: Steven A. Laur, Senior Technical Advisor **/RA/**
Division of Risk Assessment
Office of Nuclear Reactor Regulation

SUBJECT: JUNE 8, 2011 PUBLIC MEETING SUMMARY - PROPOSED CHANGES TO CLARIFY THE DEFENSE-IN-DEPTH PHILOSOPHY OF REGULATORY GUIDE 1.174, "AN APPROACH FOR USING PROBABILISTIC RISK ASSESSMENT IN RISK-INFORMED DECISIONS ON PLANT-SPECIFIC CHANGES TO THE LICENSING BASIS"

A Category 2 public meeting was held on June 8, 2011, at the Nuclear Regulatory Commission (NRC) headquarters to discuss proposed changes to the defense-in-depth portion of Regulatory Guide (RG) 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis." The enclosure lists the attendees. The meeting was announced on May 19, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML111380056).

The purpose of the meeting was to discuss proposed changes to clarify the defense-in-depth philosophy as set forth in regulatory position 2.1 of RG 1.174. Steven Laur (NRC) stated that the meeting was to ensure clarity and promote understanding of the proposed changes, but pointed out that the NRC is not soliciting formal comments at this time. He noted that there will be a public comment period at the appropriate point in the regulatory guide development process. He also provided a brief background of the purpose for the revision, which is in response to Staff Requirements Memorandum (SRM) SECY-11-0014, "Use of Containment Accident Pressure in Analyzing Emergency Core Cooling System and Containment Heat Removal System Pump Performance in Postulated Accidents." That SRM stated, in part:

> "Because the statements in Regulatory Guide 1.174 are subject to different interpretations, the staff should revise this guide using precise language to assure that the defense-in-depth philosophy is interpreted and implemented consistently."

Mr. Laur said that the staff's approach for addressing this requirement was to provide additional explanatory material and examples after each of the seven defense-in-depth attributes in the bulleted list in regulatory position 2.1.1 of RG 1.174. He went on to say that the staff did not attempt to redefine defense-in-depth or to develop new attributes. Meeting participants as a whole appeared to agree with this approach, although a few individuals expressed the viewpoint that it might have been better to start at a more fundamental level.

CONTACT: Steven A. Laur, NRR/DRA
(301) 415-2889

A wide-ranging discussion was held on various aspects of the proposed changes. The following captures some of the points made, in no particular order. No evaluation of the comments or judgment regarding them should be inferred from these minutes.

- The examples need more work. Several of the examples are not RG 1.174 examples; i.e., not representative of risk-informed changes to the licensing basis. Examples that are more representative of actual RG 1.174 changes would be beneficial, such as technical specification change requests that have actually occurred.
- The examples do not reach a decision on a given attribute of defense-in-depth, but could be used to support either an “accept” or “reject” position.
- It might be useful to develop integrated examples rather than attribute-specific examples. An integrated example might consider how each of the seven attributes were met or not met. The examples could also be integrated across the five key principles of risk-informed regulation, including defense-in-depth. A couple of individuals expressed support for the attribute-specific examples. Some participants noted that both specific and integrated examples could be employed if desired.
- Both industry and NRC noted that there is a potential for examples to be over-used. Examples should clarify the intent of the defense-in-depth attributes, but not lead to a go/no-go or checklist approach to evaluating the attributes.
- There should be an explanation of how the seven attributes relate to each other. There was a proposal that the attributes be grouped in some fashion; for example, the “programmatic activities” and the “defenses against human error” might be considered together. Some participants noted that the seven attributes were not all of the same importance or level of detail, and suggested that a hierarchical treatment would be useful.
- Some of the terms in the proposed language need to be carefully considered. The term “safety function” should be defined. The word “element” to describe the seven attributes did not appear to be the correct term to one participant. The use of the word “independent” was questioned in several cases.
- It was noted that the short attribute description (“bullet” in the text) should be consistent with the following descriptive paragraphs. For example, if the bullet says “independence should be preserved,” it is not useful for the text that follows to modify the common English-language usage of the word “independence.”
- In general, the seven attributes should be stated in relative terms rather than absolute terms; e.g., use of phrases such as “reasonable” or “commensurate with” is preferable to stating absolute requirements.
- The guidance documents for implementing 10 CFR 50.69, “Risk-informed categorization and treatment of structures, systems and components for nuclear power reactors,” (NEI 00-04 and RG 1.201) have useful examples for addressing the common-cause failure attribute.
- Regarding the first attribute, preserving a reasonable balance among core damage, containment failure, and mitigation: Clarify the sentence regarding “consequence

mitigation" to make it clear whether it is referring to normal releases, 10 CFR Part 100 releases, or something else.

- Regarding the second attribute, over-reliance on programmatic activities: The first example about fire protection compensatory measures should be reviewed to ensure consistency with existing regulatory guidance on compensatory measures. The second example may not be consistent with the reliance on operators as permitted in emergency operating procedures.
- Regarding the third attribute, system redundancy, independence, and diversity: The term "key safety function" should be defined. The term "functional isolation" was confusing.
- Regarding the fourth attribute, common cause failures: This attribute might logically be a sub-bullet under the third attribute. The two examples do not fit under this attribute; rather, uncertainties such as presented in the examples are addressed by the fifth key principle of risk-informed regulation, "performance measurement."
- Regarding the fifth attribute, independence of barriers: It is not clear why the terms "redundant and diverse" were added, which are not in the current revision of RG 1.174. The attribute should be changed back and conforming changes made to the descriptive paragraphs.
- Regarding the seventh attribute, intent of the plant's design criteria: This attribute is nebulous. Participants questioned whether this attribute is even necessary. There appeared to be general agreement that this material does not fit under "defense-in-depth" but rather under the first key element of risk-informed regulation, "compliance with regulations."
- Participants questioned the source of the revised definition of defense-in-depth that is presented in the first paragraph of regulatory position 2.1.1. Mary Drouin pointed out that this was taken directly from the document "Staff Requirements - SECY-98-144 - White Paper on Risk-Informed and Performance-Based Regulation," U.S. Nuclear Regulatory Commission, Washington, DC (March 1, 1999) (ADAMS ML003753601).

There were no comments by members of the public at the appointed place in the agenda.

The meeting participants agreed that another meeting on this subject would be beneficial. The tentative time for such a meeting should be around the end of August or early September, 2011. Steven Laur and Mary Drouin will set up the next public meeting in that time frame.

At this point, there being no further questions, comments or discussion, the meeting was adjourned.

Enclosure:
List of Attendees

mitigation" to make it clear whether it is referring to normal releases, 10 CFR Part 100 releases, or something else.

- Regarding the second attribute, over-reliance on programmatic activities: The first example about fire protection compensatory measures should be reviewed to ensure consistency with existing regulatory guidance on compensatory measures. The second example may not be consistent with the reliance on operators as permitted in emergency operating procedures.
- Regarding the third attribute, system redundancy, independence, and diversity: The term "key safety function" should be defined. The term "functional isolation" was confusing.
- Regarding the fourth attribute, common cause failures: This attribute might logically be a sub-bullet under the third attribute. The two examples do not fit under this attribute; rather, uncertainties such as presented in the examples are addressed by the fifth key principle of risk-informed regulation, "performance measurement."
- Regarding the fifth attribute, independence of barriers: It is not clear why the terms "redundant and diverse" were added, which are not in the current revision of RG 1.174. The attribute should be changed back and conforming changes made to the descriptive paragraphs.
- Regarding the seventh attribute, intent of the plant's design criteria: This attribute is nebulous. Participants questioned whether this attribute is even necessary. There appeared to be general agreement that this material does not fit under "defense-in-depth" but rather under the first key element of risk-informed regulation, "compliance with regulations."
- Participants questioned the source of the revised definition of defense-in-depth that is presented in the first paragraph of regulatory position 2.1.1. Mary Drouin pointed out that this was taken directly from the document "Staff Requirements - SECY-98-144 - White Paper on Risk-Informed and Performance-Based Regulation," U.S. Nuclear Regulatory Commission, Washington, DC (March 1, 1999) (ADAMS ML003753601).

There were no comments by members of the public at the appointed place in the agenda.

The meeting participants agreed that another meeting on this subject would be beneficial. The tentative time for such a meeting should be around the end of August or early September, 2011. Steven Laur and Mary Drouin will set up the next public meeting in that time frame.

At this point, there being no further questions, comments or discussion, the meeting was adjourned.

Enclosure:
List of Attendees

DISTRIBUTION:

MCaruso (NRO)
RCarpenter (RES)
MDrouin (RES)
AGilbertson (RES)
DHarrision (NRR)
TKeynon (NRO)
RLobel (NRR)
MStutzke (RES)
RidsOpaMail Resource
RidsNrrDraApla
RidsOgcMailCenter Resource
RidsAcrsAcnw _MailCTR Resource
RidsRgnlMailCenter Resource
RidsNrrDraApob

ADAMS Accession No.: ML111600279 NRR-006

OFFICE:	NRR/DRA
NAME:	SLaur
DATE:	06/09/2011

OFFICIAL RECORD COPY

LIST OF ATTENDEES

NRC Public Meeting on Proposed Changes To Clarify The Defense-in-Depth Philosophy of Regulatory Guide RG 1.174

June 8, 2011, 10:00 AM – 12:00 PM
NRC HQ, Two White Flint North Room O-7A1, Rockville, MD

Name	Organization	Phone	E-mail
Participated in Person			
Victoria Anderson	NEI	202-247-1669	vka@nei.org
Jana Bergman	Curtiss-Wright	301-956-4184	jbergman@curtisswright.com
Biff Bradley	NEI	202-739-8083	reb@nei.org
Mark Caruso	NRC/NRO	301-415-1310	Mark.caruso@nrc.gov
Guy Cesare	Enercon	301-972-6900	gcesare@enercon.com
Stephen Dinsmore	NRC/NRR/DRA	301-415-8482	Stephen.dinsmore@nrc.gov
Mary Drouin	NRC/RES	301-251-7574	Mary.Drouin@nrc.gov
Don Dube	NRC/NRO	301-415-1483	Donald.dube@nrc.gov
Anders Gilbertson	NRC/RES	301-251-7592	Anders.Gilbertson@nrc.gov
Donnie Harrison	NRC/NRR/DRA	301-415-2470	Donnie.harrison@nrc.gov
Thomas Kenyon	NRC/NRO/ARP	301-415-1120	Thomas.kenyon@nrc.gov
Greg Krueger	Exelon	610-765-5973	Gregory.krueger @exelonop.com
Steven Laur	NRC/NRR/DRA	301-415-2889	Steven.laur@nrc.gov
Michael Snodderly	NRC/NRR/DRA	301-415-1801	michael.snodderly@nrc.gov
Participated via Telephone			
David Blanchard	Ar-Eng	408-374-0678	dblanchardare@earthlink.net
Robert Carpenter	NRC/RES	301-251-7483	Robert.Carpenter@NRC.gov
Nancy Chapman	Bechtel	301-228-6025	ngchapma@bechtel.com
Jeff LaChance	Sandia	505 844-9173	jllacha@sandia.gov
Stanley Levinson	AREVA NP Inc.	434-832-2768	stanley.levinson@areva.com
Stephen Nass	Westinghouse	(412) 374-3098	NassSA@Westinghouse.co m
Gareth Parry	Erin	520 777 4285	gwparry@erineng.com
William D. Reckley	NRC	301 415-7490	william.reckley@nrc.gov
Ahsan Sallman	NRC/NRR/DSS	301-415-2380	Ahsan.sallman@nrc.gov
Ray Schneider	Westinghouse	860-731-6461	schneire@westinghouse.com
Doug True	Erin	(925) 943-7077	detrue@erineng.com

ENCLOSURE