

# NRC PUBLIC MEETING SUMMARY REPORT

**Date:** August 5, 2011

**Meeting Contact:** Gary L. Stevens  
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**Subject:** CATEGORY 2 PUBLIC MEETING - DISCUSSION OF REACTOR PRESSURE VESSEL INTEGRITY ISSUES FOR OPERATING NUCLEAR POWER PLANTS

**Meeting Date/Time:** Tuesday, July 26, 2011 / 09:00 am

**Location:** U.S. Nuclear Regulatory Commission  
One White Flint North, 16<sup>th</sup> Floor, Room B04  
11555 Rockville Pike  
Rockville, MD 20852-2738

**Purpose:** The purpose of this meeting was to have technical discussions related to the evaluation of irradiation effects on reactor pressure vessel (RPV) ferritic materials for operating plants, with particular focus on 10 CFR 50.61a and the NRC's Embrittlement Database.

**Summary:** The announcement for this meeting was posted on July 12, 2011 on the NRC web site. It is available via ADAMS at Accession No. ML111930046.

The revised final meeting agenda is provided in Attachment 1.

Meeting attendance is provided in Attachment 2.

Material presented at this meeting and referred to in the discussion below is also posted in ADAMS at Accession No. ML112060066.

Note that the public meeting notice had conflicting meeting start times. The announcement and NRC website identified a start time of 0900, whereas the preliminary draft agenda identified a start time as 0830. The meeting was started at 0900 per the public meeting announcement.

Morning Portion of Meeting:

Gary Stevens (NRC) opened the meeting at 0900 with introductions, followed by summary statements the NRC Office of Nuclear Regulatory Research is performing additional research on reactor pressure vessel (RPV) integrity issues, and is soliciting relevant input from interested parties on this subject. The purpose of this meeting was to have technical discussions related to the evaluation of irradiation effects on RPV ferritic materials for operating plants. The NRC's research efforts on RPV integrity relate to several documents. This meeting included technical discussions related to these research activities, with particular focus on 10 CFR 50.61a and the NRC's Embrittlement Database.

An introductory presentation was given by Mo Dingler (Wolf Creek Nuclear Operating Company (WCNOC), representative for the Pressurized Water Reactor Owners Group (PWROG) and Materials Reliability Program (MRP)) is provided in the presentation entitled, "Introductory Industry Comments regarding Implementation of 10CFR50.61a, Alternative PTS Rule." This presentation lasted from approximately 09:02 until 09:05, and there were no follow-on questions.

A second presentation was given by Tim Griesbach (Structural Integrity Associates) is provided in the presentation entitled, "Use of Surveillance Data for Alternative PTS Rule." This presentation lasted from approximately 09:06 until 09:32. There were several questions asked during the presentation to clarify the content, and discussion ensued afterward, which included the following points:

- Slide #3 (Question #1):
  - The new embrittlement trend correlation is intended to be an improvement over past predictions due to the large amount of data considered in its development.
  - The industry's interpretation on the topic covered by this question is correct.
  - Shift adjustments are made only if non-conservative shifts are predicted; there are no adjustments for conservative shift predictions (although a licensee could apply for exemption under 10 CFR 50.12).
- Slide #5 (question #3):
  - The NRC noted that the topic of surveillance adjustments is not as simple as it used to be, so there was no attempt to formulate guidance on adjustments due to the number of possibilities available.
  - Licensees should submit any suggestions they have regarding the treatment of surveillance adjustments,

especially related to generic adjustments, to the NRC for consideration.

- Also, one reason the NRC is holding these periodic public meetings on RPV integrity is to solicit input and ideas from the industry on surveillance adjustments.
- Slide #7 (Question #5):
  - Sister plant data should be used. The intent of 10 CFR 50.61a was to treat surveillance data the same as in 10 CFR 50.61.
  - The sharing of sister data should differentiate reactor types (BWR vs. PWR).
  - The NRC report, “Statistical Procedures for Assessing Surveillance Data for 10 CFR Part 50.61a” (ADAMS ML081290654), which is referenced in the Federal Register Notice for 10 CFR 50.61a, provides further information on this topic.

A third presentation was given by Nathan Palm (Westinghouse Electric Company, LLC) is provided in the presentation entitled, “Treatment of Surveillance Data in the Alternate PTS Rule.” This presentation lasted from approximately 09:34 until 10:30. There were several questions asked during the presentation to clarify the content, and discussion ensued afterward, which included the following points:

- Slide #8 (Heats of Material in Currently...):
  - The data presented here only includes the Eason data as of 2002. The NRC identified that the industry has compiled data since 2002. A suggestion was made that the industry assess these data.
- One other item was identified during this presentation that is not included on the slide material having to do with the embrittlement trend curve parameter for CE vs. non-CE vessels. A few plants in the fleet were initially fabricated from non-CE vendors, but were later assembled by CE. The NRC committed to provide additional insights on this topic at a future meeting.

Robin Dyle (EPRI) summarized nondestructive examination (NDE) issues relative to 10 CFR 50.61a implementation. Dennis Weakland (Ironwood Consulting) summarized several questions the industry has with respect to NDE related to 10 CFR 50.61a. The NRC clarified this topic as follows:

- The intent of 10 CFR 50.61a is to be able to utilize pre-existing examinations that meet the requirements of the Performance

Demonstration Initiative (PDI) and ASME Section XI Mandatory Appendix VIII. Appendix VIII is referenced in 10 CFR 50.61a.

- The flaw distribution assumption is a major player in 10 CFR 50.61a. This assumption needs to be confirmed with a reasonable level of assurance.
- Each licensee needs to decide if they need to go beyond normal ASME requirements to adequately protect the health and safety of the public from PTS.

The NRC recognized the need for clarification of this topic, and committed to hold another public meeting devoted to NDE issues related to RPV integrity in early September. During that meeting, the NRC will provide clarification on the use of updated surveillance data, failure of surveillance data checks, use of sister plant data, and other aspects of 10 CFR 50.61a.

Matt Mitchell (NRC) summarized that the applicability of alternate PTS implementation issues to other risk-informed-based rules and exemptions, stating that the NRC expects to see consistency in the application of RPV embrittlement issues between other NRC rules and guidance (e.g., Risk-informed ASME Code Section XI Appendix G or PWR RPV Inservice Inspection Interval Extension). The NRC also noted that some of these provisions (e.g., Risk-informed ASME Code Section XI Appendix G) with also need to be recognized by BWR operators.

Gary Stevens (NRC) summarized a need to validate flange stresses in support of revising 10 CFR 50 Appendix G, as documented in Westinghouse Report WCAP-15315, Revision 1, "Reactor Vessel Closure Head/Vessel Flange Requirements Evaluation for Operating PWR and BWR Plants" (ADAMS ML021580219). The industry committed to continue dialogue with the NRC on this subject after a PWROG meeting during the week of August 1, 2011 to identify whether they could provide additional data for NRC use on this topic.

There were no other presentations offered, nor were there any comments from any members of the public.

The morning portion of the meeting was adjourned at 11:50 am for lunch to re-convene at 1:30 pm.

Afternoon Portion of Meeting:

The afternoon session of the meeting re-convened at 1:30 pm. Those present for this portion of the meeting are listed in Attachment 2.

An introductory presentation was given by Gary Stevens (NRC) is provided in the presentation entitled, "Status of Embrittlement Database Efforts." Discussion ensued about the database efforts, with the following actions noted:

- NRC will provide a list of all data fields contained in the database to Tim Hardin (EPRI) for review and comment.
- NRC will provide a list of all U.S. surveillance reports that have not been located to Tim Hardin (EPRI). The industry will help to locate and provide copies of these reports.
- NRC will provide a list of all U.S. surveillance reports that are missing legal permission to include in the database to Tim Hardin (EPRI). The industry will help to and provide these permissions.
- The industry will determine if a list of industry RPV integrity contacts is available and, if so, they will provide that list to the NRC.
- The NRC will consider initiating a Memorandum of Understanding (MOU) Addendum with EPRI to define information exchange for the database.
- The industry will define the key individuals that should attend all future meetings on this topic so that meetings schedule conflicts could be coordinated and minimized.
- The industry does not have significant funding to support database activities through 2012. Therefore, their participation will be limited in this timeframe to quarterly meetings and low-level action items. Further, more detailed participation will be discussed as 2013 approaches.
- The next meeting is targeted for October.
- The NRC will provide the industry a draft of their QA Plan prior to the next meeting.

There were no other presentations offered, nor were there any comments from any members of the public.

The meeting was adjourned at 3:50 pm.

**Attachments:** The following attachments are included with this report:

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## Attachment 1

### AGENDA

#### DISCUSSION OF REACTOR PRESSURE VESSEL INTEGRITY ISSUES FOR OPERATING NUCLEAR POWER PLANTS

*Tuesday, July 26, 2011*

*9:00 a.m. – 4:00 p.m.*

#### Location:

U.S. Nuclear Regulatory Commission  
One White Flint North, 16th Floor, Room B04  
11555 Rockville Pike  
Rockville, MD 20852-2738

#### Purpose of Meeting:

The purpose of this meeting is to have technical discussions related to the evaluation of irradiation effects on RPV ferritic materials for operating plants, with particular focus on 10 CFR 50.61a and the NRC's Embrittlement Database.

#### Agenda:

Time	Topic	Organization	Coordinator or Presenter
8:30	Welcome and Introduction	NRC	Stevens
8:45	NRC Research Update on Regulatory Guide Development for Alternative PTS Implementation Guidance	NRC	Stevens
9:00	Introductory Industry Comments regarding Implementation of 10CFR50.61a, Alternative PTS Rule	WCNOC; PWROG, MRP	Dingler
9:30	Use of Surveillance Data for Alternative PTS Rule	SIA	Griesbach
<b>10:15</b>	<b>BREAK</b>		
10:30	Treatment of Surveillance Data in the Alternate PTS Rule	Westinghouse	Palm
11:00	Overview of NDE Issues Relative to Alternative Rule PTS Implementation	EPRI	Dyle
11:20	Available Data for RPV Flange Stresses for Use in Revision to 10 CFR 50 Appendix G	NRC	Stevens
11:30	Applicability of Alt PTS Implementation Issues to Other Risk-Informed-based Rules and Exemptions	NRC	Mitchell
11:45	Public Comments	All	Stevens
11:50	Review and Action Items	All	Stevens
<b>12:00</b>	<b>BREAK FOR LUNCH</b>		
1:00	RPV Integrity Database Discussion	NRC	Stevens
3:30	Break		
3:45	Public Comments	All	Stevens
3:50	Review of Action Items - Database	All	Stevens
<b>4:00</b>	<b>ADJOURN</b>		

## Attachment 2

### Attendance List

The following individuals participated in the morning portion of the meeting via telephone:

<b>Name</b>	<b>Organization</b>	<b>E-mail</b>
Tom L. Wallace	Entergy	twallac@entergy.com
Keith Smith	Entergy	Ksmit21@entergy.com
Steve Brown	Entergy	sbrown7@entergy.com
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Al Butcavage	NRC Region II	Alexander.Butcavage@nrc.gov

The following individuals participated in the afternoon portion of the meeting via telephone:

<b>Name</b>	<b>Organization</b>	<b>E-mail</b>
Hilda Klasky	Oak Ridge National Laboratory	klaskyhb@ornl.gov
Richard Bass	Oak Ridge National Laboratory	bassbr@ornl.gov
Tom Wallace	Entergy	twallac@entergy.com
Sarah Davidsaver	Areva	Sarah.Davidsaver@areva.com
Al Butcavage	NRC Region II	Alexander.Butcavage@nrc.gov

The following individuals, whose contact information is provided on the following 3 pages, participated in the afternoon portion of the meeting in person:

<b>Name (Organization)</b>	<b>Name (Organization)</b>	<b>Name (Organization)</b>
Gary Stevens (NRC)	Brian Hall (Westinghouse)	Bob Carter (EPRI)
Robin Dyle (EPRI)	Mo Dingler (WCNOC)	Dennis Weakland (Ironwood Consulting)
Rachel Vaucher (NRC)	Carolyn Fairbanks (NRC)	Jeff Poehler (NRC)
Tim Griesbach (Structural Integrity Associates)	Aladar Csontos (NRC)	Pat Purtscher (NRC)

The following 3 pages provide a list of participants that attended the morning portion of the meeting in person.

## ATTENDANCE LIST (1/3)

### for Public Meeting

#### DISCUSSION OF REACTOR PRESSURE VESSEL INTEGRITY ISSUES FOR OPERATING NUCLEAR POWER PLANTS

Tuesday, July 26, 2011  
8:30 a.m. - 4:00 p.m.

**Location:** U.S. Nuclear Regulatory Commission  
One White Flint North, 16th Floor, Room B04  
11555 Rockville Pike  
Rockville, MD 20852-2738

<u>Name</u>	<u>Organization</u>	<u>E-mail</u>
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**ATTENDANCE LIST (2/3)**  
for  
**Public Meeting**

**DISCUSSION OF REACTOR PRESSURE VESSEL INTEGRITY ISSUES FOR OPERATING  
NUCLEAR POWER PLANTS**

Tuesday, July 26, 2011  
8:30 a.m. – 4:00 p.m.

**Location:** U.S. Nuclear Regulatory Commission  
One White Flint North, 18th Floor, Room B04  
11555 Rockville Pike  
Rockville, MD 20852-2738

<u>Name</u>	<u>Organization</u>	<u>E-mail</u>
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**ATTENDANCE LIST (3/3)**

**for  
Public Meeting**

**DISCUSSION OF REACTOR PRESSURE VESSEL INTEGRITY ISSUES FOR OPERATING  
NUCLEAR POWER PLANTS**

Tuesday, July 26, 2011  
8:30 a.m. - 4:00 p.m.

**Location:** U.S. Nuclear Regulatory Commission  
One White Flint North, 16th Floor, Room B04  
11555 Rockville Pike  
Rockville, MD 20852-2738

<u>Name</u>	<u>Organization</u>	<u>E-mail</u>
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