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Technical Basis for Regulatory Guidance on the Alternate PTS Rule

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Comment On: NRC-2014-0137-0001
Draft Guidance Regarding the Alternate Pressurized Thermal Shock Rule

Document: NRC-2014-0137-DRAFT-0003
Comment on FR Doc # 2015-05754

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Submitter Information

3

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General Comment

Please see Letter MRP-2015-018.

Attachments

MRP 2015-018

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Add= To: Stevens (9154)

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MRP Materials Reliability Program _____ **MRP 2015-018**

(via e-mail)

May 11, 2015

Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: EPRI Comments Pertaining to Draft Regulatory Guide DG-1299 and Draft NUREG-2163,
Docket ID NRC-2014-0137

Reference: Federal Register Doc. 2015-05754.

In the referenced document, the U.S. Nuclear Regulatory Commission (U.S. NRC) requested public comment on the following documents:

- Draft regulatory guide DG-1299, "Regulatory Guidance on the Alternate Pressurized Thermal Shock Rule"
- Draft NUREG-2163, "Technical Basis for Regulatory Guidance on the Alternate Pressurized Thermal Shock Rule"

Comments by the Electric Power Research Institute are attached.

Thank you for the opportunity to comment on these documents. If you should have any questions concerning this letter, please contact Tim Hardin (thardin@epri.com).

Sincerely,



Anne Demma
MRP Program Manager
Electric Power Research Institute (EPRI)

Cc: Tim Hardin, EPRI
Nathan A. Palm, EPRI
Mark Richter, NEI

Enclosure:

- EPRI Comments on DG-1299, "Regulatory Guidance on the Alternate Pressurized Thermal Shock Rule" and draft NUREG-2163, "Technical Basis for Regulatory Guidance on the Alternate Pressurized Thermal Shock Rule"

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ENCLOSURE

EPRI COMMENTS ON

**DG-1299, "REGULATORY GUIDANCE ON THE ALTERNATE PRESSURIZED
THERMAL SHOCK RULE"**

AND

**DRAFT NUREG-2163, "TECHNICAL BASIS FOR REGULATORY GUIDANCE ON
THE ALTERNATE PRESSURIZED THERMAL SHOCK RULE"**

Comments on DG-1299, "Regulatory Guidance on the Alternate Pressurized Thermal Shock Rule" and draft NUREG-2163, "Technical Basis for Regulatory Guidance on the Alternate Pressurized Thermal Shock Rule"

ID	Document, Section, Page, and Line #	Comment	Proposed Resolution
Comments on DG-1299			
1	DG-1299, Page 3, Item 1, "Construction Requirements"	This item indicates that licensees must apply for an exemption to Item (b) of 10 CFR 50.61a (hereafter, "the rule") if it is used for vessels fabricated subsequent to a certain date. A regulatory guide, which is not a substitute for a rule and for which compliance is not required, should not be used to encourage or require exemptions to the rule.	Item (b) of the rule should be modified so that a licensee wishing to use the rule for a vessel fabricated subsequent to a certain date submits a request and justification for implementing the rule to the Director of NRR for review and approval. This change will allow approval in accordance with the rule rather than an exemption to the rule.
2	DG-1299, Page 3 through page 20	Most of the text in the draft guide (DG) is a repeat of the requirements in the rule. Text that repeats the rule is not clearly differentiated from the text that offers guidance for those conditions where the rule allows alternate procedures to demonstrate compliance with the rule.	Adopt a consistent, uniform convention throughout the DG for differentiating (identifying) what is from the Rule and what is guidance. The text in Paragraph 4, "Alternate Limits on Embrittlement" from the middle of page 18 to the top of page 19 illustrates an effective, succinct and easy to understand format that should be used throughout the RG. In this instance, the text identifies: the specific paragraphs in the rule where explicit compliance cannot be demonstrated, the specific paragraphs in the rule that allows alternate measures to be used to demonstrate compliance with the rule, and guidelines that are acceptable to the staff for demonstrating compliance to the rule. It is recommended that this same format be used to address the "Plant Specific Surveillance" and "ISI Data and NDE Requirements" sections.

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3	DG-1299, Page 17, Figure 2.	The flow chart in Figure 2 is difficult to understand and can be simplified.	The flow chart in Figure 2 is unnecessary complex and can be made easier to understand by revising it to follow the flow described in Paragraph (e) (4) of the rule.
4	DG-1299, Step I: text on page 15 and Figure 2 on Page 17	The block labeled "Evaluate for Acceptability" in Figure 2 indicates that either of two criteria can be used. However, the "Preclude Brittle Fracture" option is not mentioned in the rule and this option is not mentioned in the text in Step I.	The text in Step I should be consistent with the flow chart in Figure 2 and identify the "Preclude Brittle Fracture" option and should state explicitly that compliance with the "Preclude Brittle Fracture" option provides assurance that TWCF < 1E-6.
5	DG-1299, Step G: text on page 15 and Figure 2 on Page 17	The block labeled "Account for NDE Uncertainty" in Figure 2 indicates that any or all of three procedures may be used to account for uncertainty. However, the text in Step G implies that all three items should be included to account for uncertainty.	The text in Step G should be modified to be consistent with the "Account for NDE Uncertainty" block in Figure 2 and with NUREG-2163. It is recommended that the text in Step G be modified to include the following sentence from Section 6.4.2 of NUREG-2163: Any or all of these uncertainties may be considered, depending on the level of detail needed for flaw assessment.
6	DG-1299, Page 18, First full paragraph, 4 th line	The statement is made that this alternate procedure fulfills the requirements of (d)(3) through (d)(6) of the rule. It would appear from the structure of the rule that this alternative procedure would not fulfill (d)(3).	The text in the RG should indicate that the alternate procedure fulfills requirements (d)(4) through (d)(6).
7	DG-1299, Page 16, Paragraphs 2i and 2ii	These paragraphs refer to two computer codes developed with NRC funding to provide a posterior flaw distribution based on a prior flaw distribution and flaws detected by NDE examinations. These computer codes are not generally available.	These computer codes should be made publically available for industry use in the same manner the FAVOR software is publically available.

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8	DG-1299, Page 6, Section 2, Step 1, (a)	In the application of RG 1.99, Revision 2, and 10 CFR 50.61, assessment and consideration of surveillance data has been limited to data from equivalent reactor types. In other words, BWR surveillance data has not been used for PWRs and vice versa. It is understood that the ETC contained in 10 CFR 50.61a has flux and temperature terms that allow for the consideration of reactor type. However, in some cases, low fluence BWR data is not appropriate for comparison with higher fluence PWR data. Consistent with the guidance in DG-1299, C.2, Step 2, (d), iii, 3, a, BWR data should be excluded from consideration in the surveillance data checks if it is at a fluence that is less than 10% of the fluence at which the PTS evaluation is being performed.	The requirements for consideration of low fluence data from BWRs should be clarified and exclusion of such data should be permitted if it is for fluence levels less than 10% of the fluence at which the PTS evaluation is being performed.
9	DG-1299, Page 7, Section 2, Step 1, (c)	The note for the coolant temperature explains that T_c is the time weighted average from the start of full power operation through the end of licensed operation. For the purposes of the surveillance data statistical analysis, this should be the average up until date that the capsule was withdrawn.	Change "through the end of licensed operation" to "to the date of surveillance capsule withdrawal".
10	DG-1299, Page 7 Section 2, Step 1, (c)	The text at the end of this section says that conservative estimates (mean plus one standard deviation) can be used. Suggest that it be identified that the conservative wt% values for P and Mn in Table 4 of 10 CFR 50.61a are acceptable for use.	Add a sentence to the end of the paragraph stating that Table 4 of 10 CFR 50.61a provides conservative wt% values for P and Mn that are acceptable for use in the statistical assessments in the absence of plant specific values.

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11	DG-1299, Page 8, Section 2, Step 2, (a), iv.	The text states that if the mean test is not satisfied you should "proceed to Step 2(d)". This is misleading because even if the mean test is failed, the slope and outlier test still need to be considered.	Delete "; in this case proceed to Step 2(d)."
12	DG-1299, Page 8, Section 2, Table 2, footnote a.	It is not clear what the purpose of footnote "a" is in the RG.	Delete footnote "a" from Table 2, or clarify its purpose.
13	DG-1299, Page 9, Section 2, Step 2, (b), iv.	The text states that if the slope test is not satisfied you should "proceed to Step 2(d)". This is misleading because even if the mean test is failed, the outlier test still needs to be considered.	Delete "; in this case proceed to Step 2(d)."
14	DG-1299, Page 17, Section 3, Figure 2 NUREG-2163, Page 45, Section 6.1, Figure 5	In step D, the meaning or intent of the statement, "Remaining Flaws Must be Acceptable per ASME, Section XI, Table IWB-3510-1" is not clear. Furthermore, this is not discussed in the text for Step D on page 15.	Add clarification that the "Remaining flaws" are those flaws in the inner 3/8 vessel thickness that were not evaluated in Step F.
15	DG-1299, Page 3, line 1	States "The 'Alternate PTS Rule' contained in 10 CFR 50.61a is revised PTS screening criteria..."	Change to "The 'Alternate PTS Rule' contained in 10 CFR 50.61a provides revised PTS screening criteria..."
16	DG-1299, Page 3, regulatory position #1, line 9.	The period at the end of the sentence is missing.	Add period after "criteria".

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17	DG-1299, Page 18, Section 3, Figure 3 NUREG-2163, Page 55, Section 6.3, Figure 6	This figure is confusing and it is not clear what value it adds beyond what is shown in Figure 2 (DG-1299) and Figure 5 (NUREG-2163). Step A, "Combine Recordable Flaws" is redundant with the box that says "Section XI Flaw Proximity Criteria" and it implies that flaws are required to be further combined for use with the 10 CFR 50.61a flaw limits, which is not the case. The labeling for Step F should be isolated to the "Section XI IWB-3600 Flaw Evaluation" decision point. The use of Tables 2 and 3 of 10 CFR 50.61a should be shown to the right of the figure and receive input from the "Acceptable, Use As-Is" and "Acceptable: Operate for Time Interval, Augmented Examinations" boxes.	Delete the figure or revise as discussed in the comment.
18	DG-1299, Page 18, Section 4, Step 3	Not all flaw populations may be appropriate for a given vessel	Insert "(as applicable)" following "and forging flaw populations"
19	DG-1299, Page 6, Equation for $g(Cu_e, Ni, \phi t_e)$.	Incorrect symbol is used to denote multiplication. The symbol between "0.5" and "tanh" is the variable x ; it should be " \times ", which is the symbol used to indicate multiplication elsewhere in the equations.	Replace x with " \times ".
20	DG-1299, Page 7, item (c)	The list of information to be assembled is missing flux.	Add flux to the list of information to be assembled.
21	DG-1299, Pages 9 and 10	The steps for the Outlier test are numbered incorrectly. On page 10, "Table 4" is erroneously numbered as step "iii".	Correctly number the steps associated with the Outlier test.

ID	Document, Section, Page, and Line #	Comment	Proposed Resolution
Comments on Draft NUREG-2163			
22	NUREG-2163, Page xiii, Exec. Summary, Line 36	Insert the word "such" between "(ETC)" and "that"	Insert the word "such" between "(ETC)" and "that"
23	NUREG-2163, Page xvii	Definition for T _c should state that it is a time weighted average of the coolant temperature	Change definition to "Time weighted average of the Irradiated (coolant) temperature in degrees Fahrenheit (°F) or Celsius (°C)"
24	NUREG-2163, Page 3, Section 1.2, Lines 43-45	DG-1299 refers to this text and says that the beltline is defined as the "shell materials" with fluences projected to be greater than 1E17 n/cm ² . However, this text defines the beltline as "all regions of the RPV adjacent to the core" exposed to fluences greater than 1E17. The definition in the NUREG is confusing because "adjacent" is open to interpretation. The current text implies that the beltline is those materials that are both next to the core and have fluence projected to exceed 1E17.	Make the definition of beltline in the NUREG consistent with that in DG-1299 by referring to the "shell materials" with projected neutron fluences equal to or greater than 1E17 n/cm ²
25	NUREG-2163, Page 9, Section 2.4, Line 22	The limits of Table IWB-3510-1 only apply to flaws within the inner 3/8 thickness	Insert "within the inner 3/8 of the vessel thickness" between "flaws" and "exceeding"

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26	NUREG-2163, Page 14, Section 3, Table 3, Item 8	<p>The intent of this recommendation of the MRP was that all flaws detected in the ASME Section XI weld examination volume (weld width + 1/2T on either side of the weld) would be considered as weld flaws with the exception of those flaws on the very edges of the examination volume (those flaws 1/2T-0.5" from the weld). Those flaws would be considered plate flaws. The point of the recommendation was that HAZ flaws should be considered weld flaws. The NRC response indicates that this comment was agreed with. That is not entirely accurate. It is acknowledged in the footnote on page 53 that HAZ flaws may be considered as weld flaws. However, the MRP recommendation was not entirely implemented.</p>	<p>NRC response for item 8 on page 14 should be revised to reflect partial agreement with the MRP recommendation.</p>
27	NUREG-2163, Page 24, Section 5.2, 1, b)	<p>In the application of RG 1.99, Rev. 2, and 10 CFR 50.61, assessment and consideration of surveillance data has been limited to data from equivalent reactor types – e.g., BWR surveillance data has not been used for PWRs and vice versa. It is understood that the ETC contained in 10 CFR 50.61a has flux and temperature terms that may allow for consideration of shift data for materials irradiated in a different reactor type. However, in some cases, low fluence BWR data is not appropriate for comparison with higher fluence PWR data. Consistent with the guidance in DG-1299, 2, Step 2, (d), iii, 3, a, BWR data should be excluded from consideration in the surveillance data checks if it is at a fluence that is less than 10% of the fluence at which the PTS evaluation is being performed.</p>	<p>The requirements for consideration of low fluence data from BWRs should be clarified, and exclusion of such data should be permitted if fluence of the BWR data is less than 10% of the fluence at which the PTS evaluation is being performed.</p>