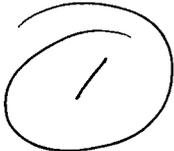


Gallagher, Carol

From: Molkenthin, James P <molkenjp@westinghouse.com>
Sent: Monday, May 19, 2014 2:42 PM
To: Gallagher, Carol
Cc: Rowley, Jonathan; Andrachek, James D; Hall, J. Brian; Gift, Frank C.; Heather Malinkowski; Jim Nurrenbern; Koehler, Christopher R.; Stringfellow, N. Jack (SouthernCo)
Subject: Transmittal of PWROG Comments on the Draft Regulatory Issue Summary (RIS) 2014-XX "Information on Licensing Applications for Fracture Toughness Requirements for Ferritic Reactor Coolant Pressure Boundary Components" (PA-MS-C-0554)
Attachments: OG-14-184.docx; PWROG Comments on Draft RIS 2014-XX Fracture Toughness Requirements.doc
Importance: High

4/17/2014
79FR 21812 

Carol,

Please find attached the PWROG comments on the Draft Regulatory Issue Summary (RIS) 2014-XX "Information on Licensing Applications for Fracture Toughness Requirements for Ferritic Reactor Coolant Pressure Boundary Components". All comments are shown in "Track Changes".

Please forward the attached comments to Cindy Bladey. I will also send these comments via mail.

For technical questions regarding the enclosed PWROG comments, please contact Brian Hall (Westinghouse) at (412) 342-1916. If you have any additional questions or comments on the enclosed information, feel free to contact me directly at (860) 731-6727.

Please let me know that you have received this email.

Regards,

Jim Molkenthin
Program Director
Materials Subcommittee • Analysis Subcommittee
☎ 860.731.6727
☎ 860.384.9092 (cell)
✉ molkenjp@pwrog.com

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E-RIDS= ADM-03
Add=

J. Mensah (TME)



Program Management Office
20 International Drive
Windsor, Connecticut 06095

May 19, 2014

OG-14-184

Cindy Bladey, Chief
Rules, Announcements and Directives Branch
Office of Administration
Mail Stop: 3WFN, 06-44M
US Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852

Subject: PWR Owners Group
Transmittal of the PWROG Comments on the Draft Regulatory Issue Summary (RIS) 2014-XX "Information on Licensing Applications for Fracture Toughness Requirements for Ferritic Reactor Coolant Pressure Boundary Components" (PA-MS-0554)

Please find enclosed the PWROG comments on the Draft Regulatory Issue Summary (RIS) 2014-XX "Information on Licensing Applications for Fracture Toughness Requirements for Ferritic Reactor Coolant Pressure Boundary Components." All comments are shown in "Track Changes."

For technical questions regarding the enclosed PWROG comments, please contact Brian Hall (Westinghouse) at (412) 342-1916. If you have any additional questions or comments on the enclosed information, feel free to contact Jim Molkenthin in the PWROG office at (860) 731-6727.

Sincerely,

J. Molkenthin Approving for J. Stringfellow

Jack Stringfellow
Chief Operating Officer & Chairman
Pressurized Water Reactor Owners Group

NJS:JPM:las

Enclosures: (1) PWROG Comments on Draft Regulatory Issue Summary (RIS) 2014-XX
“Information on Licensing Applications for Fracture Toughness
Requirements for Ferritic Reactor Coolant Pressure Boundary Components”

cc: PWROG Management Committee
PWROG Materials Committee
PWROG PMO
A. Freed, W
W. Bamford, W
J. Andrachek, W
B. Hall, W
F. Gift, W
A. Udyawar, W
G. Stevens, NRC RES
C. Fairbanks, NRR
Jonathan Rowley, NRC
T. Natour, AREVA, Inc.
M. DeVan, AREVA, Inc.
A. Nana, AREVA Inc.

PWROG Comments on Draft Regulatory Issue Summary (RIS) 2014-XX

“Information on Licensing Applications for Fracture Toughness Requirements for Ferritic Reactor Coolant Pressure Boundary Components”

ID	Section, Page, and Line #	Comment and Basis for the Comment	Proposed Revision
1	Page 1; ‘Background Information’; 1 st paragraph; 4 th line (3 rd sentence)	Reactor vessel toughness is not monitored using the P-T limits, it is monitored via the reactor vessel material surveillance program.	Please revise this sentence as follows: “Reactor vessel material toughness is monitored <u>via the reactor vessel material surveillance program using P-T limits and Charpy upper shelf energy.</u> ”
2	Page 1; ‘Background Information’; 1 st paragraph; last sentence	The last sentence is not pertinent to this RIS and is not completely accurate. This RIS does not discuss Charpy upper shelf energy and does not need to define it. Some materials can lose significant fracture toughness with irradiation, but most do not.	Please delete the following sentence: “ Charpy upper shelf energy is a measure of the average energy absorbed by materials at a temperature that is above the upper end of the temperature transition region where materials lose significant fracture toughness. ”

3	Page 2; last paragraph; 3 rd sentence	10 CFR 50, Appendix G, Section II.D.(ii) states that for beltline materials, "RT _{NDT} must account for the effects of neutron radiation." Under Section II.F. The beltline is clearly defined as materials "that directly surrounds the effective height of the active core and adjacent regions of the reactor vessel that are predicted to experience sufficient neutron radiation damage to be considered in the selection of the most limiting material with regard to radiation damage."	<p>Please revise this sentence as follows:</p> <p><u>"It is the staff's interpretation based on 10 CFR 50 Appendix H (and current understanding of irradiation embrittlement), that 1×10^{17} n/cm² (E > 1 MeV) is considered sufficient fluence to cause sufficient neutron radiation damage such that these materials should be considered in the selection of the most limiting material."</u>Appendix G to 10 CFR Part 50 states, "To demonstrate compliance with the fracture toughness requirements of section IV of this appendix, ferritic materials must be tested in accordance with the ASME Code and, for the beltline materials, the test requirements of appendix H of this part."</p>
4	Page 2; last paragraph; last sentence	Fracture toughness requirements of 10CFR50, Appendix G apply to the entire reactor vessel.	<p>Please revise the last sentence as follows:</p> <p><u>"Therefore, changes in the fracture toughness properties due to neutron irradiation should be considered for requirements of 10 CFR Part 50 Appendix G for the reactor vessel beltline are applicable to the reactor vessel materials with projected neutron fluence values greater than 1×10^{17} n/cm² (E > 1 MeV) at the end of the operating period."</u></p>
5	Page 3; first paragraph; last sentence	PWR nozzles are generally not positioned <u>immediately</u> above the active core height. A portion of the upper shell is between the nozzles and the beltline.	<p>Please revise the last sentence as follows:</p> <p><u>"In particular, this may be true for reactor vessel nozzle materials when the nozzles are positioned immediately above or below the active core height."</u></p>

6	Page 3; 2 nd paragraph; 2 nd sentence	This sentence is confusing, please reword. It seems to say the opposite of this intent.	Please revise the sentence as follows: “ <u>In the development of the P-T limits, it is not sufficient to only consider the limiting reactor vessel material (generally considered to be the vessel shell materials with the highest reference temperature), and not consider the stress levels due to structural discontinuities.</u> The inclusion of stress levels from structural discontinuities makes consideration of only the limiting material for a particular reactor vessel (generally considered to be the vessel shell material with the highest reference temperature) in the determination of the P-T limits insufficient. ”
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<p>7</p>	<p>Page 3; 3rd paragraph</p>	<p>The first sentence only provides an example which is adequately addressed in the previous paragraph. The second and third sentences should be clarified as proposed.</p> <p>10 CFR 50, Appendix G, IV. A. states “The pressure-retaining components of the reactor coolant pressure boundary that are made of ferritic materials must meet the requirements of the ASME Code, ...”</p> <p>Additionally, as stated in 10 CFR 50, Appendix G, I. the second paragraph “If no section (of ASME Code) is specified, the reference is to Section III, Division 1, ...”</p> <p>Therefore, the ferritic RCPB components outside the reactor vessel are governed by ASME Section III.</p> <p>10 CFR 50, Appendix G does not impose ASME Section XI, Appendix G requirements on ferritic RCPB components outside the reactor vessel.</p> <p>The second sentence should be revised to clarify that the RIS should be considered when the P-T limits are revised via a license amendment request (LAR), or when the P-T limits that are contained in the PTLR are revised. Please see the proposed revision to this paragraph.</p>	<p>Please replace the entire paragraph with the following:</p> <p><u>“Addressees must be able to confirm that revised P-T limit license amendment requests and PTLR revisions consider all ferritic components of the RCPB as required by 10 CFR Part 50, Appendix G. Ferritic RCPB components outside of the reactor vessel that met all the applicable ASME Code, Section III requirements at the time that the RCPB components were constructed demonstrates compliance with 10 CFR Part 50, Appendix G and do not need any further consideration for the P-T limits. Replaced ferritic RCPB components, e.g., steam generators, must also meet the ASME Code, Section III requirements in accordance with 10 CFR Part 50, Appendix G and also do not need any further consideration for the P-T limits. Vessel materials with stress discontinuities and a lower reference temperature are unlikely to provide the lowest allowable P-T limits for a vessel except early in the plant operating life or in cases with limited differences in the reference temperatures for the vessel shell materials and the materials with stress discontinuities (for example where the vessel shell materials have low levels of neutron embrittlement). Nevertheless, addressees must still be able to demonstrate that the P-T limits in license amendment requests and PTLRs developed for the plant do, in fact, bound all ferritic components of the reactor coolant pressure boundary as required by section I of 10 CFR Part 50, Appendix G. In addition, this demonstration would need to consider the effects of any replaced ferritic reactor coolant pressure boundary components on the adequacy of the P-T limits.”</u></p>
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8	Page 4; 'Summary of Issue'; 4 th sentence	<p>The RIS should only apply to future revisions of the P-T limits that are revised via a LAR, or when the P-T limits that are contained in the PTLR are revised. Please see the proposed revision to the 4th sentence in this paragraph.</p> <p>10 CFR 50, Appendix G does not impose ASME Section XI, Appendix G requirements on ferritic RCPB components outside the reactor vessel.</p>	<p>Please revise the sentence as follows:</p> <p>All addressees should ensure that <u>revised P-T limits in license amendment requests and PTLR revisions (including NRC approved PTLRs)</u> sufficiently address all ferritic materials of pressure-retaining components of the reactor coolant pressure boundary vessel, including the impact of structural discontinuities, and address the impact of neutron fluence accumulation in accordance with the requirements of 10 CFR Part 50 Appendix G.</p>
9	Page 4; 'Summary of Issue'; last sentence	<p>10 CFR 50, Appendix G does not impose ASME Section XI, Appendix G requirements on ferritic RCPB components outside the reactor vessel.</p> <p>P-T curves are not tied to a license period.</p>	<p>Please revising the sentence as follows:</p> <p>"Specifically, all ferritic components within the <u>entire RCPB reactor vessel</u> must be considered in the development of P-T limits, and the effects of neutron radiation must be considered for any materials that are predicted to experience an end-of-license neutron fluence exposure greater than 1×10^{17} n/cm² (E > 1 MeV) <u>at the end of the operating period.</u>"</p>
10	Page 4; 'Summary of Issue'; last sentence	See comment 7.	<p>Please add the following sentence:</p> <p><u>"Additionally, ferritic RCPB components outside of the reactor vessel that met all the applicable ASME Code, Section III requirements at the time that the RCPB components were constructed demonstrates compliance with 10 CFR Part 50, Appendix G and do not need any further consideration for the P-T limits."</u></p>