

RESOLUTION OF COMMENTS BY THE OFFICE OF NUCLEAR REACTOR REGULATION
REGARDING THE DRAFT SAFETY EVALUATION FOR
TOPICAL REPORT WCAP-17236-NP, REVISION 0, "RISK-INFORMED EXTENSION OF THE
REACTOR VESSEL NOZZLE INSERVICE INSPECTION INTERVAL"
PRESSURIZED WATER REACTOR OWNERS GROUP
PROJECT NO. 694

This Attachment provides the U.S. Nuclear Regulatory Commission (NRC) staff's review and disposition of the comments made by the Pressurized Water Reactor Owners Group (PWROG) on the draft safety evaluation for Topical Report WCAP-17236-NP, Revision 0, "Risk-Informed Extension of the Reactor Vessel Nozzle Inservice Inspection Interval" (Agencywide Documents and Management System (ADAMS) Accession No. ML120240450). The PWROG provided its comments by a letter dated March 22, 2012 (ADAMS Accession No. ML12083A195).

Suggested Changes on NRC Draft Safety Evaluation for WCAP-17236-NP, Revision 0

Comment #	Page	Section	Location*	Line(s)	Editorial (E) or Technical (T)	Description of Suggested Change	NRC Staff Comment Resolution
1	1	1.0	P3, S1	32	E	Before the text "Reference 3" add the text "(ASME-XI, Appendix R, Method A)"	Accepted. The SE now states, (ASME Code, Section XI, Appendix R, Method A (Reference 3))."
2	1	1.0	P4, S3	38-39	E	Before the text "Reference 5" add "(ASME-XI, Appendix R, Method B), "	Accepted. The SE now states, (ASME Code, Section XI, Appendix R, Method B (Reference 5))."
3	2	3.0	S1	33	E	Delete the word "and" before the word "which"	Accepted.
4	3	3.1	P2	4-9	T	The SER states that licensees must identify in their requests for relief the dates in which they plan to perform their inspections and they must be within plus or minus one outage of the dates provided in Table 3-13 of the TR. Table 3-13 of the TR is based on the PWROG plan for implementing the RV ISI interval extension as documented in PWROG letter OG-10-238. This plan is referenced in the recently revised SER for WCAP-16168-NP-A, Revision 3. Since these RV nozzle exams will be performed at the same time as the RV exams, it would be more efficient for industry and the NRC to manage implementation based on one schedule rather than two. It is suggested that the SER be revised to reference WCAP-16168-NP-A as the schedule for RV nozzle ISI interval extension implementation. The PWROG proposes to revise the sentence on Page 3-22 of the TR starting with "Since the RV nozzle weld inspections are..." to	Accepted. The SE now states that, "The dates provided must be within plus or minus one refueling cycle of the dates identified in the implementation plan referenced in the most recent Revision of TR WCAP-16168-NP-A."

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						read "Since the RV nozzle weld inspections are performed at the same time as the RV inspections, the proposed inspection dates in the implementation plan are consistent with those in the plan for implementation of the RV ISI interval extension in the latest revision of WCAP-16168-NP-A, (Reference 6)." Furthermore, Reference 6 will be revised to reference WCAP-16168-NP-A, Revision 3, rather than WCAP-16168-NP-A, Revision 2.	
5	4	3.2.1	P1	4	E	Delete "fracture mechanics" and the parenthesis of "PFM" since they are not part of the TR sentence that the SE quoted from.	Accepted.
6	4	3.2.1	P1, last S	10	E	It is recommended that the text "of an aspect ratio of 6 to 1" be replaced with the text "with this initial through-wall depth distribution"	Accepted.
7	4	3.2.1	P2, last S	20	E	Add "every 20 years" after "continued monitoring"	Accepted.
8	7	3.2.2	P2, S5	16	T	It is believed that the intent of the text "ASME" in "EPRI/ASME" is to refer to ASME Section XI Code Case N-716. If so, it is suggested that the text be revised to "PWROG, EPRI, or ASME Code Case N-716". "EPRI/ASME" should also be changed throughout the SER to "EPRI/N-716". It is understood that Code Case N-716 is an ASME Code Case, but using only the word "ASME" leads the reader to believe that you are referring to the traditional ASME Section XI approach or	Accepted.

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						one of the ASME Section XI Nonmandatory Appendix R methods.	
9	7	3.2.2.1	P1, S1	33	E	Change “discussed above” to “discussed previously”	Accepted.
10	8	3.2.2.2	P1, S1	3	E	Change “RV nozzle welds” to “RV nozzle-to-pipe (RV nozzle) welds” since it is repeated several times	Not accepted. “RV nozzle welds” was first used in Section 2.0 (Page 2) to represent “RV nozzle-to-pipe welds” and, since its first occurrence, appeared numerous times throughout the SE text.
11	8	3.2.2.2	Last P	22	T	It is stated that the TR proposes a total of seven different methods. Based on the comment # 13 (below), there should be a total of 8 different methods, 4 for PWROG and 4 for EPRI.	Accepted. Resolution of #12 and #13 added a PWROG method, but resolution of #16 indicated that two of the EPRI methods were, in fact, the same so there is still a total of 7 methods.
12	8	3.2.2.2	All	42-51	T	This paragraph says that “The TR proposes three alternative methods to estimate the change in risk between the ASME program and a PWROG RI-ISI program that includes an extended ISI interval for selected RV nozzle welds.” It is stated later in the paragraph that “All three methods modify the PWROG RI-ISI change-in-risk methodology by assigning the segment failure frequency to each weld in the segment, and accounting for changing the number of inspections within each segment.” However, the SER does not mention that the TR also proposes a methodology that is consistent with the	Accepted, the original PWROG methodology may be applied to the nozzles when the original acceptance guidelines can be satisfied.

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						<p>PWROG change-in-risk methodology in that the number of inspections within each segment is not considered. This original approach is discussed in Section 2.4.1 and in Section 3.2.5.1, Page 3-31, "Evaluation of Effect of RV Nozzle ISI Interval Extension." An example of this approach is shown in Table 3-15 for Beaver Valley Unit 1. The first sentence of Section 3.2.5.1, Page 3-31, "Alternative Change-in-Risk Evaluation Methods," states "If the PWROG original change-in-risk acceptance criteria cannot be met using the PWROG change-in-risk evaluation method in WCAP-14572 or an excessive number of exams would have to be added to meet the criteria, the following three alternative change-in-risk evaluation methods can be utilized to evaluate the effect on the RI-ISI program". The original PWROG change-in-risk method needs to be added as an acceptable method throughout the SER.</p>	
13	9	3.2.2.2	P1	1-11	T	<p>This paragraph states "...in response to DRA-RAI-2 and DRA-RAI-4, Westinghouse states that nozzles should be treated as segments and therefore nozzles with two welds should only use a single weld frequency (i.e., segment basis). This is inconsistent with the modified PWROG methodology..." As noted in Comment 13, the SER does not mention the original PWROG methodology in which the number</p>	<p>Accepted, the original PWROG methodology may be applied to the nozzles when the original acceptance guidelines can be satisfied.</p>

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						of welds is not considered. Further, the response to DRA-RAI-2 says “However, when evaluating the impact on the RI-ISI program for plants that have implemented the PWROG RI-ISI methodology and that are using the PWROG original change-in-risk evaluation, the evaluation is conducted on a per-segment basis. Thus, as discussed in the response to DRA-RAI-4, the change in risk added to the change in risk from the RI-ISI element selection should be calculated based on one weld per nozzle.” It is suggested that the text in the SER be removed and to provide clarification, the PWROG proposes to add the text “...and the calculations are conducted on a per segment basis.” to the end of the first sentence of the second paragraph of Section 2.4.1 of WCAP-17236-NP. It is agreed that if one of the 3 alternative methods are used, in which the number of welds is considered, the nozzles should be treated as two welds when two welds exist.	
14	9	3.2.2.2	P4	19	E	The word “associated” is missing the “d”	Accepted.
15	9 10	3.2.2.2	P3	47-50 31-33	T	It is stated that “The first method is a qualitative method. As stated in the TR, “[t]his method implicitly assumes that all inspections are performed on the same interval.” The discussion in the TR does not provide any alternative to this assumption which is no longer valid if the ISI interval is extended and therefore the NRC staff does	Accepted, if the original RI-ISI program was determined to be risk neutral, the only increase would come from extending the nozzle weld inspection intervals.

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						<p>not approve the use of the qualitative method.” However, the TR does state on Page 3-39 that “If this method were to show that there is no reduction, or there is an increase in the number of inspections, the only increase in risk would be as a result of the extension in inspection interval for the reactor vessel nozzle welds. Therefore, as long as the change in risk as calculated per Section 3.2.4 meets the Regulatory Guide 1.174 acceptance criteria, the extension in inspection interval would be acceptable.” The PWROG proposes to replace “Regulatory Guide 1.174” with “EPRI RI-ISI”. With this change, the PWROG believes that the qualitative method should be an acceptable method for evaluating the acceptability of the effect on the RI-ISI program. The SER should therefore be revised to allow the use of the qualitative method.</p>	
16	10	3.2.2.2	P5	14-20	T	<p>It is stated that “In the discussion following these equations (3-2 and 3-2), the TR states that changes in failure frequency from Tables 3-3 through 3-6 should somehow be used in the equations. This discussion is inconsistent with the definitions of the parameters in the equations and would yield incorrect results when combined with changes in the IE factors. Therefore, licensees that use the frequencies from Tables 3-3 through 3-6 cannot use these equations and parameter</p>	<p>Accepted. The general, mutually agreed observation that the change-in-frequencies from Table 3-3 through 3-6 should not be used with an IE or POD is accurate. The second and the third (of the original four) EPRI methods appeared to propose using an IE or a POD at all welds, including the nozzles. However, the PWROG clarified that the equations</p>

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						<p>definitions and must report this deviation and identify and justify their proposed method and input values.” It is assumed that the text that is being referred to is in the section “Method B” on page 3-43 of the TR. It was never the intention of the TR to propose that the change-in-failure frequencies be used to calculate inspection effectiveness factors and we do not believe that the text in the TR implies this. We agree that this would be incorrect. What is proposed is that even if the Markov Model had been used to originally calculate the change-in-risk for the RI-ISI program, the change-in-failure frequencies in Tables 3-3 through 3-6 could be used to calculate the incremental increase in risk from the RV nozzle ISI interval extension. This incremental increase in risk for the nozzles would be added to the total plant and RC system risk as determined for the RI-ISI program. This approach is similar to the approach defined for Method 2. The PWROG suggests that the quoted text from the SER be removed because we do not believe that it implies the use of the bounding change-in-failure frequencies in the determination of inspection effectiveness factors. However, it would be acceptable to the PWROG for the NRC wants to place a limitation in Section 4 stating that the bounding-change-in-failure frequencies may not be used to calculate</p>	<p>illustrated the EPRI method at all welds other than the nozzles - the nozzles would use the change in nozzle weld frequencies in the TR. Thus the previous second and third methods both treat the nozzles the same way and are one method with respect to the TR. The third method (previously the fourth method) does require the use of frequencies other than those in the TR and the requirement that each licensee fully report were it obtained all its parameters when using this last method is retained.</p>

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						inspection effectiveness factors, since we have no intention to do so.	
17	12	3.4	P3	26	T	As stated in Comment 4, the PWROG proposes to revise the TR to refer to WCAP-16168-NP-A as the basis for the implementation schedule.	Accepted. Consistent with NRC resolution of Comment 4.
18	12	4.0	B1	47	E	Because satisfaction of all Section 4.0 items is required for NRC acceptance in Section 5.0, please add "every 20 years" after "continued monitoring" to avoid any confusion in the future.	Accepted.
19	13	4.0	B1	2-5	T	The PWROG is of the opinion that the basis for the failure frequencies, whether 40 or 60 years, should be consistent with the piping RI-ISI program at all times. The suggestion to always be conservative is in contradiction with other TR requirements. It is recommended that the last sentence of this paragraph be removed.	Accepted.
20	13	4.0	B3	15-17	T	As noted in comment 15, the PWROG believes that this condition\limitation for the qualitative method should be removed.	Accepted.
21	13	4.0	B4	19-20	T/E	It is suggested that this condition \ limitation be revised to read as follows: "Licensees must identify specifically which of the change-in-risk equations and methods in the TR were used. Any deviations from the selected equations and/or methods must be identified and justified."	Accepted.
22	13	4.0	B6	36	E	It is requested that the text "...may not refer to the examples to justify any evaluation or calculation." be changed to	Accepted.

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						“may not reference the examples as a basis for a plant specific request for alternative.” The use of the word “refer” gives the impressions that the examples are not suitable for serving their intended purpose, which is to illustrate the method.	
23	14	5.0	P3	26-28	T	As stated in Comment 4, the PWROG proposes to revise the TR to refer to WCAP-16168-NP-A as the basis for the implementation schedule.	Accepted. Consistent with NRC resolution of Comment 4.
24	15	6.0	R4	1-2	E	WCAP-16168-NP-A, Revision 2 has been revised and is now Revision 3.	Accepted.
25	15	6.0	R6	8-9	E	No ASME approval date is specified for Code Case N-716.	Accepted.
26	15	6.0	R10	24-27	T	As stated in Comment 4, the PWROG proposes to revise the TR to refer to WCAP-16168-NP-A as the basis for the implementation schedule. Therefore, this reference is no longer needed and can be removed.	Accepted.

*Note: B is for bullet, P is for paragraph, R is for reference, and S is for sentence.