RESOLUTION OF COMMENTS BY THE OFFICE OF NUCLEAR REACTOR REGULATION

ON DRAFT SAFETY EVALUATION FOR

TOPICAL REPORT WCAP-17100-P/NP, REVISION 1,

"PRA MODEL FOR THE WESTINGHOUSE SHUT DOWN SEAL" (PA-RMSC-0499)

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 (SE) for Topical Report (TR) WCAP-17100-P/NP, Revision 1, "PRA [Probabilistic Risk Assessment] Model for the Westinghouse Shut Down Seal." The PWROG provided its comments in a letter dated January 21, 2011, entitled "Comments to the NRC Draft Safety Evaluation for Pressurized Water Reactor Owners Group (PWROG) on Topical Report (TR) WCAP-17100-P/NP, Revision 1, "PRA Model for the Westinghouse Shut Down Seal", PA-RMSC-0499" (Agencywide Documents and Management System Accession No. ML110770012).

Disposition of PWROG Comments on the Draft SE for TR WCAP-17100-P/NP			
Draft SE Location	**Suggested Change**	**NRC Resolution**	**NRC Disposition**
Page 2, Line 19	Add "-A" to WCAP-15603	Accepted	Editorial
Page 3, Line 26	Change 1.5 gpm to 1.7 gpm	Accepted	As a result of an inquiry at the final design review, the leakage was re-assessed using maximum tolerances instead of nominal values.
Page 4, Line 37	Add "-A" to WCAP-15603	Accepted	Editorial
Page 5, Line 19	Change the number of tests to 22 and the failure rate to 0.0217 per demand	Accepted	There were actually 22 tests run which yields a reliability of 0.0217 per demand using Jeffreys non-informative prior methods.
Page 5, Line 24	Add the failure rate to the sentence	Accepted	Clarifies that the "higher failure rate" refers to 0.0217 per demand.

Draft SE Location	Suggested Change	NRC Resolution	NRC Disposition
Page 5, Line 41	Add sentence "The NRC staff expects that a single SDS failure rate of 0.0217 would be used to represent all SDS installed in the plant."	Accepted	Clarifies that the failure is not per RCP, consistent with previous usage of RCP seal failures such as the WOG2000 model. In other words, the SDS failure rate for a 3-loop plant with SDS in all RCPs would be 0.0217 and not 0.0651 (0.0217 x 3).
Page 7, Line 5	Change failure rate to 0.0217 per demand	Accepted	Change is consistent with previous change.
Page 7, Line 5	Delete "percent"	Accepted	Editorial
Page 8, Lines 27-31	Change conditions for NRC approval for Model 93 and Model 93A-1 RCPs.	Not Accepted	The NRC staff agrees that the SDS can be used for other RCP models other than 93A; however, additional testing is needed to demonstrate a failure probability value equal to or lower than the Model 93A SDS as described in WCAP-17100-P/NP, Revision 1. SDS components that were modified in any manner when compared to the Model 93A components shall be tested as in WCAP-17100-P/NP, Revision 1. SDS components that were not modified shall require no additional individual testing. The entire SDS package, containing the modified SDS components, shall also be tested as in WCAP-17100-P/NP, Revision 1, to verify the proper interactions between all SDS components in an environment simulating the associated RCP model. All additional testing data shall be available to the NRC for review to verify the integrity of the additional tests. Additionally, RCP Model 100 seal packages do not provide adequate RCP trip operator response margin before SDS actuation; therefore, Westinghouse should provide additional guidance to improve operator response margin through decreased RCP leak-off rates.

Draft SE Location	Suggested Change	NRC Resolution	NRC Disposition
Page 8, Line 46	Change failure rate to 0.0217 per demand	Accepted	Change is consistent with previous change.
Page 8, Line 47	Change "Bayesain" to "Bayesian"	Accepted	Editorial
Page 8, Line 48	Add sentence "This failure rate is to be used to represent all RCPs with the SDS and not each individual RCP."	Not Accepted. However, added the sentence "The staff agrees that this individual failure rate is to be applied to represent simultaneous failure of all RCPs with the SDS."	Clarifies that the failure probability doesn't represent one RCP but, conservatively represents the probability of all RCP seal packages failing simultaneously. This will account for the lack of a rigorous common cause failure analysis and is consistent with previous treatment of RCP seal failures as in the WOG2000 model.
Page 9, Lines 2-3	Add the words "in a manner consistent with the 50.59 assessment performed for SDS installation"	Not Accepted	Licensees shall address inadvertent SDS actuation.
Page 9, Lines 8-9	Add words "The 50.59 assessment should be used to determine required approvals and processes for installation."	Not Accepted	Licensees are expected to determine the appropriate assessment for installation.

Draft SE Location	Suggested Change	NRC Resolution	NRC Disposition
Page 9, Lines 14-19	Clarify Westinghouse restrictions by breaking the old bullet into separate considerations for re-establishing thermal barrier cooling and seal injection.	Accepted. Also added, "Licensees must verify that the SDS has successfully actuated at all pumps."	If the SDS has actuated, cold water from re-establishing seal injection cannot reach the seal package due to the sealing action of the SDS. This may be a preferred makeup or boration strategy for some plants for some initiating events. As discussed in the response to RAI#8 for WCAP-17100-P/NP provided via OG-10-149, the consequences of re-establishing would be limited to damage to the pump shaft and radial bearing which is an economic impact and not a safety concern. Also note that the seal package would be disassembled and impacted prior to return to plant operation to ensure that there is no damage that would result in a safety concern.
Page 9, Lines 17-19	Clarify the Westinghouse restriction on re-establishing seal injection.	Accepted	Change is consistent with previous change.
Page 9, Line 22	Remove the words "to prevent thermal shock to the RCP seal package".	Accepted	RCS cooldown and depressurization has no impact on the potential for thermal shock to the seal package regardless of whether the SDS has actuated.
Page 9, Lines 23-25	Add "The RCS cooldown and depressurization can be delayed until plant stabilization and equipment status checks have been completed if it is diagnosed that the SDS has actuated and provides a tight seal."	Accepted	This provides for a more orderly RCS cooldown and depressurization which minimizes the potential for operator errors.

Draft SE Location	Suggested Change	NRC Resolution	NRC Disposition
Page 9, Lines 37-40	Add a new limitation as follows: "If the SDS is installed in the RCPs over several outages, the NRC staff expects the licensees PRA models will reflect both seal behaviors as appropriate by separately modeling the probabilities and leakages for those RCPs with the SDS and the probabilities and leakages for those RCPs without the SDS."	Not Accepted. However, added a new limitation as follows: "If the SDS is installed in the RCPs over several outages, the NRC staff expects that licensee's PRA models will continue to reflect the prior seal behavior. After completion of installation of the SDS to all RCPs, licensees can use the appropriate SDS model."	The NRC staff considered that credit for the SDS should be given upon the completion of the installation at all RCPs. Until then, licensees should continue to use the appropriate model for the previous seal for all RCPs.
Page 10, Lines 2-3	Add the words "as well as the basis for plant licensing basis station blackout and fire protection coping strategies."	Not Accepted	The NRC staff disagrees with adding the suggested words to the SE.