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WCAP-16175-P (Proprietary)
Project No. 694

March 6, 2006

WOG-06-81

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

Subject: Westinghouse Owners Group Comments and Resolution of Comments on the NRC's Draft Safety Evaluation on WCAP-16175-P, Rev. 0, "Model for Failure of RCP Seals Given Loss of Seal Cooling in CE NSSS Plants" (PA-RMSC-0103)

References:

1. WOG-04-039, "Response to Request for Additional Information – CE NPSD-1199-P (WCAP-16175-P/NP, Rev. 0), 'Model for Failure of RCP Seals Given Loss of Seal Cooling,' January 22, 2004."
2. US NRC Letter, "Draft Safety Evaluation for Westinghouse Owners Group (WOG) Topical Report WCAP-16175-P, Revision 0, (CE NPSD-1199, Revision 1) 'Model for Failure of RCP Seals Given Loss of Seal Cooling in CE Nuclear Steam Supply Systems Plants,' TAC No. MB5803, January 19, 2006"

WCAP-16175-P, Rev. 0, "Model for Failure of RCP Seals Given Loss of Seal Cooling" was submitted by the Westinghouse Owners Group (WOG) for NRC review and approval on January 22, 2004 (Reference 1). The staff issued a draft safety evaluation for this topical report on January 19, 2006 (Reference 2).

Attached are the WOG comments and proposed resolution of the comments on the draft safety evaluation. The WOG also proposes to incorporate additional tables in the WCAP to address failure probabilities for Waterford-3 RCP seals. Following approval of these changes by the staff, the proposed changes will be incorporated into the Accepted version of the topical report.

The WOG requests that the Staff review the comments, proposed resolutions, and proposed changes to the topical report, and factor appropriate information into the final safety evaluation.

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Westinghouse respectfully requests that the information designated as proprietary in this transmittal be withheld from public disclosure pursuant to 10 CFR 2.390 of the Commission's regulations. The reasons for requesting withholding of the proprietary information are delineated in CAW-06-2109 and supported by an Affidavit signed by Westinghouse. Correspondence with respect to the Application for Withholding should reference CAW-06-2109 and should be addressed to:

Mr. B. F. Maurer, Acting Manager
Regulatory Compliance and Plant Licensing
Westinghouse Electric Company LLC
P. O. Box 355
Pittsburgh, PA 15230 - 0355

If you have any questions or issues you'd like to further discuss related to the WOG's comments on the draft Safety Evaluation or the WCAP, please contact Paul Hijeck of the WOG Project Office at 860-731-6240.

Sincerely yours,



Frederick P. "Ted" Schiffley, II, Chairman
Westinghouse Owners Group

FPS:PJH:las

Enclosure: CAW-06-2019, Request for Withholding
Attachments:

cc: Risk Management Subcommittee
Steering Committee
R. A. Gramm, NRC
G. S. Shukla, NRC
G. Ament
C. B. Brinkman
B. F. Maurer
PMO

Attachment 2 (Non-Proprietary)

**Westinghouse Owners Group Comments and Resolution of Comments on the
NRC's Draft Safety Evaluation on WCAP-16175-P, Rev. 0,
"Model for Failure of RCP Seals Given Loss of Seal Cooling"**

Introduction

WCAP-16175-P, Rev 0 establishes a model for estimating the probability of failure of a RCP seal given a loss of all cooling to the RCP seal. This model is intended for use in the individual CE plant's probabilistic risk/safety assessments to quantify the risk of an RCP seal loss-of-coolant accident, given the occurrence of a loss of seal cooling event. When used within the conditions, limitations and modifications described in the draft safety evaluation issued on January 19, 2006, the staff confirmed that the RCP seal leakage model documented in WCAP-16175-P, Rev 0 was acceptable for use in plant-specific probabilistic risk/safety assessments and may be used in support of risk-informed applications for CE NSSS plants.

The following provides specific comments on the draft Safety Evaluation and the proposed resolution of these comments. Proposed WCAP revisions are also provided. Suggested text deletions are shown by strikethrough; text additions are shown with underline.

Comment 1 (SE Page 4, Lines 8, 9, 25, 26; Page 6, Line 20 and Page 13, Lines 20, 21)

The draft safety evaluation could be misinterpreted to mean that Waterford does not use an improved RCP seal design and that the hybrid seal design may exhibit failure data in excess of that shown in the topical report for non-hybrid designs. To resolve this concern, Westinghouse has prepared Waterford-specific RCP seal failure fault tree probabilities tables that will be added to Section 9 of the topical. These tables, attached, show that the seal failure data for Waterford remains consistent with that of the CE fleet and are provided for staff review. It is intended that these Waterford-specific tables will be incorporated into the accepted version of the report. Thus the WOG requests that specific parenthetical comments regarding the hybrid Waterford seal design be deleted from the final SE.

Comment 2 (SE Page 9, Lines 20-24 and Page 14, Line 9)

WCAP-16175-P, Rev 0 identifies as proprietary certain controlled bleed-off (CBO) isolation times. The draft SE states that the staff interprets early CBO isolation as being within 10 minutes of the LOSC event

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Editorial Comments identified in the draft SE

The NRC staff has identified four editorial inconsistencies in the topical report. The WOG confirms these issues will be corrected in the Accepted version of WCAP-16175-NP, Rev 0, including:

1. A transfer gate naming error and a transfer gate paging error in the RCP seal failure model fault tree for 3-stage RCP seals in Chapter 6,
2. An exponent error in one of the summary table entries for the BJ N-9000 and Sulzer 4-stage seal designs with CBO isolated in Chapter 9,
3. An inconsistency for the timing of late CBO isolation between the text in Chapter 6 and the summary results tables of Chapter 9, and
4. A "No" entry for elastomer failure for an event that involved a stage failure due to thermal expansion and seal face cracking.

WSES-3 RCP Seal Model Quantification Data for Staff Review

Material to be incorporated into the Accepted version of WCAP-16175-P-A in support of the WSES-3 RCP seal model.

1. Updated TOC to include new Tables 9.3-4A through 9.3-4F.
2. Revised Pg 9-29 to address WSES-3 RCP seal model quantification data shown in Tables 9.3-4(A - F).
3. Supplemental Tables 9.3-4A through 9.3-4F.
4. Renumbered and updated Table 9.3-4 as 9.3-5 to include WSES-3 results.
5. Updated Table 9.4-1 to include WSES-3 sensitivity results.

LIST OF TABLES (cont'd)

<u>Table</u>	<u>Title</u>	<u>Page</u>
<u>9.3-3F</u>	<u>RCP Seal Fault Tree Basic Event Probabilities for the Sulzer Balanced Stator Seal Design (CBO Isolated within 10 Minutes and RCS Cold Leg Subcooling < 50°F)</u>	<u>9-38</u>
<u>9.3-4A</u>	<u>RCP Seal Failure Fault Tree Basic Event Probabilities for the N-9000 RCP Seal Package with a BJ/SU Vapor Stage (CBO Isolated within 20 Minutes and RCS Cold Leg Subcooling > 50°F)</u>	<u>9-39</u>
<u>9.3-4B</u>	<u>RCP Seal Failure Fault Tree Basic Event Probabilities for the N-9000 RCP Seal Package with a BJ/SU Vapor Stage (CBO Isolated within 20 Minutes and RCS Cold Leg Subcooling < 50°F)</u>	<u>9-39</u>
<u>9.3-4C</u>	<u>RCP Seal Failure Fault Tree Basic Event Probabilities for the N-9000 RCP Seal Package with a BJ/SU Vapor Stage (CBO Not Isolated and RCS Cold Leg Subcooling > 50°F)</u>	<u>9-40</u>
<u>9.3-4D</u>	<u>RCP Seal Failure Fault Tree Basic Event Probabilities for the N-9000 RCP Seal Package with a BJ/SU Vapor Stage (CBO Not Isolated and RCS Cold Leg Subcooling < 50°F)</u>	<u>9-40</u>
<u>9.3-4E</u>	<u>RCP Seal Failure Fault Tree Basic Event Probabilities for the N-9000 RCP Seal Package with a BJ/SU Vapor Stage (CBO Isolated within 10 Minutes and RCS Cold Leg Subcooling > 50°F)</u>	<u>9-41</u>
<u>9.3-4F</u>	<u>RCP Seal Failure Fault Tree Basic Event Probabilities for the N-9000 RCP Seal Package with a BJ/SU Vapor Stage (CBO Isolated within 10 Minutes and RCS Cold Leg Subcooling < 50°F)</u>	<u>9-41</u>
<u>9.3-5</u>	<u>Summary of Conditional RCP Seal Failure Probabilities for Various CE PWR Seal Designs</u>	<u>9-42</u>
<u>9.4-1</u>	<u>Comparison of Conditional Failure Probabilities</u>	<u>9-43</u>
<u>10.1-1</u>	<u>Frequency of SBO Induced Seal LOCA</u>	<u>10-2</u>
<u>10.2-1</u>	<u>Frequency of LOCCW Induced Seal LOCA: Case 1</u>	<u>10-3</u>
<u>10.2-2</u>	<u>Frequency of LOCCW Induced Seal LOCA: Case 2</u>	<u>10-3</u>
<u>10.2-3</u>	<u>Frequency of LOCCW Induced Seal LOCA: Case 3</u>	<u>10-3</u>

(from WCAP-16175-NP, Rev 0, Page 9-29)

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**Table 9.3-5
 Summary of Conditional RCP Seal Failure Probabilities for Various CE PWR Seal Designs**

BJ/SU 4-stage Seals

RCS Conditions	0.1 to 1 Hr	0.1 to 2 Hr	0.1 to 4 Hr	0.1 to 8 Hr	0.1 to 24 Hr

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N-9000 & Sulzer Balanced Stator 4-Stage Seals

RCS Conditions	0.1 to 1 Hr	0.1 to 2 Hr	0.1 to 4 Hr	0.1 to 8 Hr	0.1 to 24 Hr

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Sulzer Balanced Stator 3-Stage Seal

RCS Conditions	0.1 to 1 Hr	0.1 to 2 Hr	0.1 to 4 Hr	0.1 to 8 Hr	0.1 to 24 Hr

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N-9000 RCP Seal Package with a BJ/SU Vapor Stage

RCS Conditions	0.1 to 1 Hr	0.1 to 2 Hr	0.1 to 4 Hr	0.1 to 8 Hr	0.1 to 24 Hr

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**Table 9.4-1
Comparison of Conditional Failure Probabilities**

Seal Type	Evaluation Conditions	Nominal Conditional Failure Probability	Case 1: Pop-Open Lower Limit	Case 2: Vapor Seal Pop-Open Guaranteed	Case 3: Low temp. exposure modeling

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Our ref: CAW-06-2019
March 6, 2006

**APPLICATION FOR WITHHOLDING PROPRIETARY
INFORMATION FROM PUBLIC DISCLOSURE**

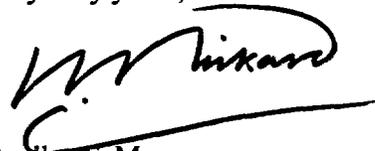
- Subject:** Westinghouse Owners Group Comments and Resolution of Comments on the NRC's Draft Safety Evaluation on WCAP-16175-P, Rev. 0, "Model for Failure of RCP Seals Given Loss of Seal Cooling in CE NSSS Plants" (PA-RMSC-0103), WOG-06-81, 3/6/06. (Proprietary)
- Reference:** US NRC Letter, "Draft Safety Evaluation for Westinghouse Owners Group (WOG) Topical Report WCAP-16175-P, Revision 0, (CE NPSD-1199, Revision 1) 'Model for Failure of RCP Seals Given Loss of Seal Cooling in CE Nuclear Steam Supply Systems Plants,' TAC No. MB5803, January 19, 2006"

Westinghouse hereby transmits the enclosed affidavit and request for withholding concerning feedback of comments on the Reference draft safety evaluation for WCAP-16175-P. Affidavit CAW-06-2019, signed by Westinghouse Electric Company LLC, the owner of the information, sets forth the basis on which the proprietary information is requested to be withheld from public disclosure by the NRC and addresses the considerations listed in paragraph (b)(4) of 10 CFR 2.390 of the Commission's regulations.

In conformance with the requirements of 10 CFR 2.390, Westinghouse confirms that the information contained within letter WOG-06-81 is proprietary. The justification for claiming this information as proprietary is identified in Sections (4)(ii)(a) through (4)(ii)(f) of the enclosed affidavit.

Correspondence with respect to the proprietary aspects of the application for withholding or the Westinghouse affidavit should reference this letter, CAW-06-2019, and should be addressed to the undersigned.

Very truly yours,


for Bradley F. Maurer,
Acting Manager
Regulatory Compliance and Plant Licensing

Enclosure

cc: G. S. Shukla / NRC

- (1) I, Ian C. Rickard, depose and say that I am the Licensing Project Manager in Nuclear Services, Westinghouse Electric Company LLC ("Westinghouse"), and as such I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rule making proceedings, and am authorized to apply for its withholding on behalf of the Westinghouse Electric Company LLC.
- (2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.390 of the Commission's regulations and in conjunction with the Westinghouse application for withholding accompanying this Affidavit.
- (3) I have personal knowledge of the criteria and procedures utilized by the Westinghouse Electric Company LLC in designating information as a trade secret, privileged or as confidential commercial or financial information.
- (4) Pursuant to the provisions of paragraph (b)(4) of Section 2.390 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.
 - (i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Westinghouse.
 - (ii) The information is of a type customarily held in confidence by Westinghouse and not customarily disclosed to the public. Westinghouse has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitute Westinghouse policy and provide the rational basis required.

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:

- (a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.
- (b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage, e.g., by optimization or improved marketability.
- (c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.

- (d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.
 - (e) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.
 - (f) It contains patentable ideas, for which patent protection may be desirable.
- (iii) There are sound policy reasons behind the Westinghouse system for classification of proprietary information, which include the following:
- (a) The use of such information by Westinghouse gives Westinghouse a competitive advantage over its competitors. It is, therefore, withheld from disclosure to protect the Westinghouse competitive position.
 - (b) It is information that is marketable in many ways. The extent to which such information is available to competitors diminishes the Westinghouse ability to sell products and services involving the use of the information.
 - (c) Use by our competitor would put Westinghouse at a competitive disadvantage by reducing his expenditure of resources at our expense.
 - (d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving Westinghouse of a competitive advantage.
 - (e) Unrestricted disclosure would jeopardize the position of prominence of Westinghouse in the world market, and thereby give a market advantage to the competition of those countries.
 - (f) The Westinghouse capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.
- (iv) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR Section 2.390; it is to be received in confidence by the Commission.
- (v) The information sought to be protected is not available in public sources or available information has not been previously employed in the same original manner or method to the best of our knowledge and belief.
- (vi) The proprietary information sought to be withheld in this submittal is that which is contained in the letter WOG-06-81, "Westinghouse Owners Group Comments and Resolution of Comments on the NRC's Draft Safety Evaluation on WCAP-16175-P, Rev. 0, 'Model for Failure of RCP Seals Given Loss of Seal Cooling in CE NSSS Plants,' " dated March 6, 2006.

The information is part of a model that will enable Westinghouse to estimate the probability of failure of a reactor coolant pump seal given loss of cooling to the seal, and in particular to supporting utilities with CE NSSS plants in the application of such, including:

- (a) The identification of important phenomena relevant to the application of the reactor coolant pump seal failure model, including quantification of dominant failure mechanisms, operational considerations and model implementation,
- (b) A generic methodology for the applicability of the reactor coolant pump seal failure model to utilities with CE NSSS plants, and
- (c) An evaluation of problems with reactor coolant pump seals in CE NSSS plants that have common cause implications and the probability of such events leading to seal failure.

Further this information has substantial commercial value as follows:

- (a) Westinghouse plans to sell the use of similar information to its customers for purposes of meeting NRC requirements for licensing documentation.
- (b) Westinghouse can sell the application and defense of the reactor coolant pump seal failure model.
- (c) The information requested to be withheld reveals the distinguishing aspects of a methodology that was developed by Westinghouse.

Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Westinghouse because it would enhance the ability of competitors to provide similar advanced nuclear power plant designs and to provide licensing defense services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without purchasing the right to use the information.

The development of the technology described in part by the information is the result of applying the results of many years of experience in an intensive Westinghouse effort and the expenditure of a considerable sum of money.

In order for competitors of Westinghouse to duplicate this information, similar technical programs would have to be performed and a significant manpower effort, having the requisite talent and experience, would have to be expended.

Further the deponent sayeth not.

PROPRIETARY INFORMATION NOTICE

In order to conform to the requirements of 10 CFR 2.390 of the Commission's regulations concerning the protection of proprietary information so submitted to the NRC, Westinghouse confirms that the information in WOG-06-81, "Westinghouse Owners Group Comments and Resolution of Comments on the NRC's Draft Safety Evaluation on WCAP-16175-P, Rev. 0, 'Model for Failure of RCP Seals Given Loss of Seal Cooling in CE NSSS Plants,' " dated March 6, 2006, is proprietary. The justification for claiming the report as proprietary is indicated in Sections (4)(ii)(a) through (4)(ii)(f) of the affidavit accompanying this transmittal.

COPYRIGHT NOTICE

WOG-06-81, "Westinghouse Owners Group Comments and Resolution of Comments on the NRC's Draft Safety Evaluation on WCAP-16175-P, Rev. 0, 'Model for Failure of RCP Seals Given Loss of Seal Cooling in CE NSSS Plants,' " dated March 6, 2006 and transmitted herewith is copyright by Westinghouse Electric Company LLC. The NRC is permitted to make the number of copies of the information contained in this transmittal that are necessary for its internal use in connection with generic and plant-specific reviews and approvals as well as the issuance, denial, amendment, transfer, renewal, modification, suspension, revocation, or violation of a license, permit, order, or regulation subject to the requirements of 10 CFR 2.390 regarding restrictions on public disclosure to the extent such information has been identified as proprietary by Westinghouse, copyright protection notwithstanding. Copies made by the NRC must include the copyright notice in all instances and the proprietary notice if the original was identified as proprietary.