

**Enclosure 8 to SBK-L-15073**

**Appendix A of Westinghouse Report (PWROG-15042-P, Revision 0)  
NextEra Energy, Seabrook Unit 1  
Summary Report for the Cold Work Assessment**

**(Non-Proprietary)**

**APPENDIX A  
COLD WORK ASSESSMENT**

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## A.1 REACTOR INTERNALS COLD WORK ASSESSMENT

As a result of the review of the Applicant/Licensee Action Items (A/LAI) 1, 2 and 7 responses submitted by the industry, the U.S. Nuclear Regulatory Commission (NRC) has requested that additional information on cold work in Reactor Vessel Internals (RVI) be provided to support A/LAI 1 plant-specific demonstration of MRP-227-A [4] applicability. The issue of cold work in stainless steel relates to the criteria in MRP-175 [3] for stress corrosion cracking (SCC). The specific NRC question is focused on whether the materials of original construction for the domestic fleet RVI components contain "severe cold work" (greater than 20 percent). A guideline template (MRP 2013-025 [1]) was completed by Westinghouse and the Electric Power Research Institute (EPRI) to define a process for evaluating cold work in the RVI component materials. For the purposes of this evaluation, it is noted that the assessments are based on the screening and binning process based exclusively on material specifications. This assessment did not specifically investigate any other avenues, such as field installation.

The MRP-227-A [4] Applicability Template Guideline, as summarized in MRP 2013-025 [1], is followed to support this assessment and response to the NRC.

## A.2 SEABROOK UNIT 1 – REACTOR INTERNALS COLD WORK ASSESSMENT

Westinghouse has evaluated the Seabrook Unit 1 reactor internals components according to industry guideline MRP 2013-025 [1] and the MRP-191 [2] industry generic component listings and screening criteria (including consideration of cold work as defined in MRP-175 [3], noting the requirements of subsection 3.2.3). In addition to consideration of the material fabrication, forming and finishing process, a general screening definition of "severe cold work" as a resulting reduction in wall thickness of 20 percent was applied as an evaluation limit. It was confirmed that all of Seabrook Unit 1 components, as applicable for the design, are included directly in the MRP-191 component lists, or have been evaluated accordingly.

The evaluation included a review of all plant modifications affecting reactor internals and the plant operating history. The components were procured according to the American Society for Testing and Materials (ASTM) International or American Society of Mechanical Engineers (ASME) material specifications that were called out on the original plant construction drawings. Material and component procurement was through applicable quality-controlled protocols. Therefore, material identification based on the material call-outs and notes in the component drawings was an efficient and reasonable approach to identify the materials of construction for the RVI components in Seabrook Unit 1.

Based on the specifications called out on the Seabrook Unit 1 component drawings, the RVI components are binned into the five material categories identified in MRP 2013-025 [1].

Cold work categories based on MRP 2013-025 include:

- Cast austenitic stainless steel (CASS) (Category 1)
- Hot-formed austenitic stainless steel (Category 2)

- Annealed austenitic stainless steel (Category 3)
- Fasteners austenitic stainless steel (Category 4)
- Cold-formed austenitic stainless steel without subsequent solution annealing (Category 5)

The potential for cold work is directly controlled by the materials specifications. Essentially all of the components that are binned (based on their specified materials) as Categories 1, 2 and 3 are non-cold worked; therefore, they have less than 20 percent cold work according to the NRC criterion. Similarly, any component binned under Category 5 has the potential to contain greater than 20 percent cold work. Category 4 materials are fasteners that may have been intentionally strain-hardened.

During the fabrication of fasteners, the strain hardening was typically intentionally restricted to less than 20 percent. These restrictions, if present, were noted on engineering drawings. A restriction or limitation on the material yield stress (e.g., a maximum of 90 ksi) would indicate that the material cold work would be limited to be less than 20 percent. In the absence of a restriction on the maximum yield stress of strain-hardened material, a conservative approach has been taken to assume the potential for greater than 20 percent cold work.

Where multiple options existed for a component or assembly, the bounding condition of cold work was taken as the option that had the greater potential to include greater than 20 percent cold work. This option was then employed in the assessment of the component, and was selected for the purposes of the assessment. In some instances, sequential fabrication would appear to mitigate any potential for cold work; however, since the historical record was not detailed the potential is noted, but a conservative approach was selected for this assessment.

The evaluation, performed consistently with the industry guideline [1], concluded that the reactor internals Category 1, 2 and 3 (non-bolting) components at Seabrook Unit 1 contain no cold work greater than 20 percent as a result of material specification and controlled fabrication construction. No Seabrook Unit 1 components were binned as Category 5. Therefore, the only materials with the potential for greater than 20 percent cold work for Seabrook were strain-hardened fasteners binned as Category 4 components. For some Category 4 components, the material drawing notes and Westinghouse purchasing specifications that were employed in addition to ASME and ASTM specifications for parts purchase were found to limit the strength of the employed materials such that the use of greater than 20 percent cold work material was precluded. In cases where additional specifications were not clearly identified, a conservative posture was selected to consider the component as being cold worked for the purposes of this assessment. Category 4 components were already assumed to have the potential for cold work in the MRP-191 generic assessments.

The detailed evaluation for Seabrook Unit 1 cold work assessments concluded that the plant-specific material fabrication and design was consistent with the MRP-191 basis, and that the MRP-227-A sampling inspection aging management requirements as related to cold work are directly applicable to Seabrook Unit 1.

### A.3 REFERENCES

1. EPRI Letter, MRP 2013-025, "MRP-227-A Applicability Template Guideline," October 14, 2013.
2. *Materials Reliability Program: Screening, Categorization, and Ranking of Reactor Internals Components for Westinghouse and Combustion Engineering PWR Design (MRP-191)*. EPRI, Palo Alto, CA: 2006. 1013234.
3. *Materials Reliability Program: PWR Internals Material Aging Degradation Mechanism Screening and Threshold Values (MRP-175)*. EPRI, Palo Alto, CA: 2005. 1012081.
4. *Materials Reliability Program: Pressurized Water Reactor Internals Inspection and Evaluation Guidelines (MRP-227-A)*. EPRI, Palo Alto, CA: 2011. 1022863.

**Enclosure 9 to SBK-L-15073**

**Application for Withholding Proprietary Information  
From Public Disclosure and Affidavit**



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CAW-15-4190

May 20, 2015

APPLICATION FOR WITHHOLDING PROPRIETARY  
INFORMATION FROM PUBLIC DISCLOSURE

Subject: PWROG-15023-P, Revision 1, "Seabrook Station Unit 1 Summary Report for the Fuel Design/Fuel Management Assessments to Demonstrate MRP-227-A Applicability"  
(Proprietary)

The proprietary information for which withholding is being requested in the above-referenced report is further identified in Affidavit CAW-15-4190 signed by the owner of the proprietary information, Westinghouse Electric Company LLC. The Affidavit, which accompanies this letter, sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of 10 CFR Section 2.390 of the Commission's regulations.

Accordingly, this letter authorizes the utilization of the accompanying Affidavit by Pressurized Water Reactor Owners Group (PWROG).

Correspondence with respect to the proprietary aspects of the Application for Withholding or the Westinghouse Affidavit should reference CAW-15-4190 and should be addressed to James A. Gresham, Manager, Regulatory Compliance, Westinghouse Electric Company, 1000 Westinghouse Drive, Building 3 Suite 310, Cranberry Township, Pennsylvania 16066.

Very truly yours,

A handwritten signature in black ink, appearing to read 'J. Gresham'.

James A. Gresham, Manager

Regulatory Compliance

CAW-15-4190

May 20, 2015

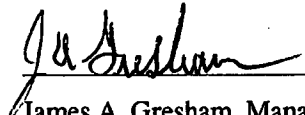
AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

ss

COUNTY OF BUTLER:

I, James A. Gresham, am authorized to execute this Affidavit on behalf of Westinghouse Electric Company LLC (Westinghouse), and that the averments of fact set forth in this Affidavit are true and correct to the best of my knowledge, information, and belief.

  
\_\_\_\_\_  
James A. Gresham, Manager  
Regulatory Compliance



- (1) I am Manager, Regulatory Compliance, 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 Westinghouse.
- (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 Proprietary Information from Public Disclosure accompanying this Affidavit.
- (3) I have personal knowledge of the criteria and procedures utilized by Westinghouse 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 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 appropriately marked in PWROG-15023-P, Revision 1, "Seabrook Station Unit 1 Summary Report for the Fuel Design/Fuel Management Assessments to Demonstrate MRP-227-A Applicability" (Proprietary), for submittal to the Commission, being transmitted by PWROG letter OG-15-198 and Application for Withholding Proprietary Information from Public Disclosure, to the Document Control Desk. The proprietary information as submitted by Westinghouse is that associated with the NRC Letter, "Request for Additional Information Related to the Review of the Seabrook Station License Renewal Application – Set 21 (TAC NO. ME4028)," ML14101A324 April 25, 2014 and may be used only for that purpose.

- (a) This information is part of that which will enable Westinghouse to:
  - (i) Support reactor vessel internals aging management.
  
- (b) Further this information has substantial commercial value as follows:
  - (i) Westinghouse plans to sell the use of similar information to its customers for the purpose of supporting reactor internals aging management
  - (ii) Westinghouse can sell support and defense of industry guidelines and acceptance criteria for plant-specific applications.
  - (iii) The information requested to be withheld reveals the distinguishing aspects of a methodology which 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 technical evaluation justifications and 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**

Transmitted herewith is the proprietary and non-proprietary version of a document furnished to the NRC associated with the NRC letter, "Request for Additional Information Related to the Review of the Seabrook Station License Renewal Application – Set 21 (TAC NO. ME4028)," ML14101A324 April 25, 2014 and may be used only for that purpose.

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, the information which is proprietary in the proprietary versions is contained within brackets, and where the proprietary information has been deleted in the non-proprietary versions, only the brackets remain (the information that was contained within the brackets in the proprietary versions having been deleted). The justification for claiming the information so designated as proprietary is indicated in both versions by means of lower case letters (a) through (f) located as a superscript immediately following the brackets enclosing each item of information being identified as proprietary or in the margin opposite such information. These lower case letters refer to the types of information Westinghouse customarily holds in confidence identified in Sections (4)(ii)(a) through (4)(ii)(f) of the Affidavit accompanying this transmittal pursuant to 10 CFR 2.390(b)(1).

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