WITHHOLD FROM PUBLIC DISCLOSURE UNDER 10 CFR 2.390
UPON REMOVAL OF ENCLOSURE D, THIS LETTER CAN BE PUBLICLY DISCLOSED

FENOC

FirstEnergy Nuclear Operating Company

Beaver Valley Power Station
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November 16, 2016
L-16-327

10 CFR 50.55a

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

SUBJECT:
Beaver Valley Power Station, Unit No. 2
Docket No. 50-412, License No. NPF-73
Request 2-TYP-3-RV-04, Revision 1, for Alternative Examination of Reactor Vessel Head Penetration J-Groove Weld Repairs

By correspondence dated September 30, 2015 (Accession No. ML15273A066), FirstEnergy Nuclear Operating Company (FENOC) requested Nuclear Regulatory Commission (NRC) approval of a proposed alternative (2-TYP-3-RV-04, Revision 0) to certain requirements associated with repair activities for reactor vessel head penetration nozzles and associated J-groove welds at Beaver Valley Power Station, Unit No. 2 (BVPS-2). The NRC authorized the request in its letter dated June 17, 2016 (Accession No. ML16147A362), with corrections described in a letter dated October 21, 2016 (Accession No. ML16228A408).

Request 2-TYP-3-RV-04, Revision 1 proposes a change to the inservice inspection requirements identified for the J-groove weld repairs in the previously approved request and is provided in Enclosure A. Specifically, the schedule for the surface examinations of the embedded flaw repairs of J-groove welds will be changed from every outage to every other outage when surface examination results of the repair are verified to be acceptable for two consecutive cycles after the repair. The alternative surface examination schedule will allow a significant personnel dose reduction by decreasing the amount of time that personnel are under the reactor vessel head performing examinations.

Sections of request 2-TYP-3-RV-04, Revision 1, that are different from that submitted with the September 30, 2015 letter have been identified by sidebars in the right page margin. Approval is requested by March 15, 2017 to support the BVPS-2 spring 2017 refueling outage (2R19).

The technical basis for optimization of embedded flaw repair surface examinations is enclosed. A related application for withholding proprietary information from public

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disclosure, accompanying affidavit, proprietary information notice, and copyright notice are provided in Enclosure B. Nonproprietary and proprietary versions of the technical basis information are provided in enclosures C and D, respectively.

It is respectfully requested that the information which is proprietary to Westinghouse Electric Company LLC be withheld from public disclosure in accordance with 10 CFR Section 2.390 of the Commission's regulations. Once Enclosure D has been separated from this letter, the letter can be publicly disclosed.

There are no regulatory commitments contained in this submittal. If there are any questions or if additional information is required, please contact Mr. Thomas A. Lentz, Manager – Fleet Licensing, at (330) 315-6810.

Sincerely,

Marty L. Richey

Enclosures:

A. Beaver Valley Power Station, Unit No. 2,
   10 CFR 50.55a Request 2-TYP-3-RV-04, Revision 1
B. Application for Withholding Proprietary Information from Public Disclosure
C. Technical Basis for Optimization or Elimination of Liquid Penetrant Exams for the Embedded Flaw Repair, Beaver Valley, Unit 2, Letter LTR-PSDR-16-008-NP, Revision 0, dated October 2016 (Nonproprietary Version)
D. Technical Basis for Optimization or Elimination of Liquid Penetrant Exams for the Embedded Flaw Repair, Beaver Valley, Unit 2, Letter LTR-PSDR-16-008-P, Revision 0, dated October 2016 (Proprietary Version)

cc: NRC Region I Administrator
NRC Resident Inspector
NRC Project Manager
Director BRP/DEP
Site BRP/DEP Representative

Enclosure A
L-16-327

Beaver Valley Power Station, Unit No. 2,
10 CFR 50.55a Request 2-TYP-3-RV-04, Revision 1

(8 Pages Follow)

Proposed Alternative
In Accordance with 10 CFR 50.55a(z)(1)

--Alternative Provides Acceptable Level of Quality and Safety--

1. ASME CODE COMPONENTS AFFECTED

Component Numbers:	2RCS-REV-21 (Reactor Vessel) Reactor Vessel Head Penetrations 1 through 65
Code Class:	Class 1
Examination Category:	B-P
Item Number:	B15.10
Description:	Alternative Repair Methods for Reactor Vessel Head Penetrations and J-groove Welds

2. APPLICABLE CODE EDITION AND ADDENDA

American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (ASME Code), Section XI, 2001 Edition through 2003 Addenda is the code of record for the inservice inspection and repair/replacement programs.

The reactor vessel Construction Code is ASME Section III, 1971 Edition through Summer 1972 Addenda.

3. APPLICABLE CODE REQUIREMENTS

IWA-4000 of ASME Section XI contains requirements for the removal of defects from and welded repairs performed on ASME components. The specific Code requirements for which use of the proposed alternative is being requested are as follows:

ASME Section XI, IWA-4421 states, that:

> Defects shall be removed or mitigated in accordance with the following requirements:
>
> (a) Defect removal by mechanical processing shall be in accordance with IWA-4462.
>
> (b) Defect removal by thermal methods shall be in accordance with IWA-4461.
>
> (c) Defect removal or mitigation by welding or brazing shall be in accordance with IWA-4411.
>
> (d) Defect removal or mitigation by modification shall be in accordance with IWA-4340.

Use of the "Mitigation of Defects by Modification" provisions of IWA-4340 is prohibited per 10 CFR 50.55a(b)(2)(xxv).

For the removal or mitigation of defects by welding, ASME Section XI, IWA-4411 states, in part, the following.

> Welding, brazing, and installation shall be performed in accordance with the Owner's Requirements and...in accordance with the Construction Code of the item...

The applicable requirements of the Construction Code required by IWA-4411 for the removal or mitigation of defects by welding from which relief is requested are as follows.

For defects in base material, ASME Section III, NB-4131 requires that the defects are removed, repaired, and examined in accordance with the requirements of NB-2500. These requirements include the removal of defects via grinding or machining per NB-2538 and, if necessary to satisfy the design thickness requirement of NB-3000, repair welding in accordance with NB-2539.

Similarly, with respect to defects in weld material, ASME Section III, NB-4451 requires that unacceptable defects in weld metal be eliminated and, when necessary, repaired in accordance with NB-4452 and NB-4453.

4. REASON FOR REQUEST

FirstEnergy Nuclear Operating Company (FENOC) conducts inspections of the Beaver Valley Power Station Unit No. 2 (BVPS-2) reactor vessel head in accordance with ASME Code Case N-729-1, with conditions as specified in 10 CFR 50.55a(g)(6)(ii)(D). To address any need to repair unacceptable indications in reactor head penetrations or J-groove welds, relief is requested from the requirements of ASME Code Section XI, IWA-4421, IWA-4411, and the applicable sections of the Construction Code.

Specifically, relief is requested from the requirements of ASME Code Section III, NB-4131, NB-2538, and NB-2539 for the removal of base material defects prior to repair by welding. Relief is also requested from the requirements of ASME Code Section III, NB-4451, NB-4452, and NB-4453 for the removal of weld material defects prior to repair by welding.

5. PROPOSED ALTERNATIVE AND BASIS FOR USE

The Nuclear Regulatory Commission (NRC) Safety Evaluation for WCAP-15987 (Reference 1) specified the use of "Flaw Evaluation Guidelines," which was sent to the Nuclear Energy Institute (NEI) by letter dated April 11, 2003 (Reference 2). In lieu of these guidelines, FENOC proposes to follow the criteria for flaw evaluation established in 10 CFR 50.55a(g)(6)(ii)(D), which specifies the use of Code Case N-729-1, with conditions.

As an alternative to the defect removal requirements of ASME Section XI and Section III, FENOC proposes the use of the embedded flaw repair process described in WCAP-15987, Revision 2-A (Reference 3), for the repair of unacceptable indications in reactor vessel head penetrations and J-groove welds, as approved by the NRC (Reference 1). Design and implementation of the repairs will be consistent with WCAP-15987 and WCAP-16158-P, Revision 0 (Reference 4). Preservice inspections and inservice inspections of repairs will be consistent with ASME Code Case N-729-1. Pursuant to 10 CFR 50.55a(a)(z)(1), the alternative is proposed on the basis that it will provide an acceptable level of quality and safety while minimizing cumulative occupational radiation exposure [dose].

5.1 Reactor Vessel Head Penetration Inside Diameter (ID) Repair Methodology

Consistent with WCAP-15987 methodology, the following repair requirements are proposed for a reactor vessel head penetration ID repair.

An unacceptable axial flaw will be first excavated (or partially excavated) to a depth no greater than 0.125 inches. Although this depth differs from that specified in WCAP-15987, Revision 2-A, Section 2.2.1, the cavity depth is not a critical parameter in the implementation of a repair on the ID surface. The goal of the inlay is to isolate the susceptible material from the environment. The purpose of the excavation is to accommodate the application of weld layers to meet that requirement. The depth specified in WCAP-15987 is a nominal dimension and the depth needed to accommodate three weld layers while still maintaining the tube ID. Since only two weld layers will be applied, less excavation is required and 0.125 inches of excavation is all that is required. The smaller thickness of the cavity excavated for two layers would mean a slightly thinner weld, which would produce less residual stress.

The excavation will be performed using an electrical discharge machining process to minimize penetration tube distortion. After the excavation is complete, either an ultrasonic test (UT) or eddy current test (ECT) will be performed to ensure the entire flaw length is captured. Then, a minimum of two layers of Alloy 52 or 52M weld material will be applied to fill the excavation. The expected chemistry of the weld surface is that typical of Alloy 52 weldment with no significant dilution. Finally, the finished weld will be machined to restore the inside diameter and then a UT and surface examination to ensure acceptability.

Whenever an embedded flaw repair is planned for an inside diameter circumferential flaw, the NRC will be notified.

5.2 Reactor Vessel Head Penetration Outside Diameter (OD) and J-groove Weld Repair Methodology

Consistent with WCAP-15987 methodology, the following repair requirements are proposed for reactor vessel head penetration OD and J-groove weld repairs.

1. An unacceptable axial or circumferential flaw in a tube below a J-groove attachment weld will be sealed off with Alloy 52 or 52M weldment. Excavation or partial excavation of such flaws will not be required, since clearance is not a concern on the outside of a tube. The embedded flaw repair technique may be applied to OD axial or circumferential cracks below the J-groove weld because they are located away from the pressure boundary, and the proposed repair of sealing the crack with Alloy 690 weld material would isolate the crack from the environment as stated in Section 3.6.1 of the NRC staff safety evaluation for WCAP-15987.

2. Unacceptable radial flaws in the J-groove attachment weld will be sealed off with a 360 degree overlay of Alloy 52 or 52M covering the entire weld. No excavation will be required. The overlay will extend onto and encompass the outside diameter of the penetration tube.

The seal weld will extend beyond the Alloy 600 weld material by at least one half inch, as stated in the NRC safety evaluation for WCAP-15987.

3. Unacceptable axial tube flaws extending into the J-groove attachment weld will be sealed with Alloy 52 or 52M as in Item 1 above. In addition, the entire J-groove attachment weld will be overlaid with Alloy 52 or 52M to embed the axial crack in the seal weld on the penetration. The overlay will extend onto and encompass the outside diameter of the penetration tube. The seal weld will extend beyond the Alloy 600 weld material by at least one half inch, as stated in the NRC safety evaluation for WCAP-15987.

4. For weld overlays performed on the J-groove attachment weld, the interface boundary between the J-groove weld and stainless steel cladding will be located with a hand-held ferrite meter instrument that identifies this interface boundary. This technique has been successfully used at BVPS-2 for the positive identification of the weld clad interface to ensure that all of the Alloy 82 material of the J-groove weld is overlaid during the repair. Markings are made to locate the interface as well as a boundary of at least one half inch outboard of the stainless steel clad 182 interface.

5. Prior to application of three Alloy 52M repair weld layers on the clad surface, a minimum of three passes (one layer) of Alloy ER309L shall be installed at the periphery of the weld overlay (at the repair-to-clad interface).

   The Alloy ER309L weld passes ensure that the outer pass of the Alloy 52M embedded flaw weld overlay repair only contacts the Alloy ER309L weld deposit, and does not contact the original clad material. The Alloy ER309L weld passes are not permitted to come into contact with the Alloy 600 weld. Alloy 52M weld passes do not extend beyond the outermost edge of the Alloy ER309L weld passes. This ensures that the entirety of the outer-most edge of the Alloy 52M weld will rest on the surface of the barrier layer of the Alloy ER309L filler and does not contact the stainless steel cladding. However, if unacceptable indications are identified at the periphery of the embedded flaw weld overlay repair during final examination, and repair welding is required, Alloy 52M material may extend beyond the Alloy ER309L weld beads to accommodate the repair.

6. The embedded flaw repair weld will be three layers thick for applications to the J-groove attachment welds and at least two layers thick for application to base metal locations.

7. For all of the above flaw configurations, the finished repair will be examined in accordance with ASME Code Case N-729-1, with conditions as specified in 10 CFR 50.55a(g)(6)(ii)(D).

8. For all embedded flaw repairs, inservice inspections of the overlay and original penetration during subsequent outages will be performed in accordance with the requirements of Code Case N-729-1, with conditions as specified in 10 CFR 50.55a(g)(6)(ii)(D).

9. Whenever an embedded flaw repair is planned for an axial or circumferential flaw in a tube above the J-groove attachment weld, the NRC will be notified.

10. Instead of the examination requirements identified for J-groove welds in the table on page 9 of the NRC staff safety evaluation of WCAP-15987-P, Revision 2 (included in the WCAP), FENOC proposes to perform non-destructive examination (NDE) of the completed repair and inservice inspection (ISI) of the repair as provided in the table below:

Repair Location	Flaw Orientation	Repair Weld	Repair NDE	ISI NDE of the Repair, Note 1
J-groove weld	Axial	Seal	UT and Surface, Note 2	UT and Surface, Notes 2 and 3
J-groove weld	Circumferential	Seal	UT and Surface, Note 2	UT and Surface, Notes 2 and 3

Notes:

1) Preservice and inservice inspection to be consistent with 10 CFR 50.55a(g)(6)(ii)(D), which requires the implementation of Code Case N-729-1 with conditions; or NRC-approved alternatives to these specified conditions.
2) UT personnel and procedures qualified in accordance with 10 CFR 50.55a(g)(6)(ii)(D), which requires the implementation of Code Case N-729-1 with conditions. Examine the accessible portion of the J-groove repaired region. The UT plus surface examination coverage must equal 100 percent.
3) Surface examination of the embedded flaw repair shall be performed to ensure the repair satisfies ASME Code Section III, NB-5350, acceptance standards. The frequency of examination shall be as follows:
    a. Perform surface examination during the first and second refueling outage after installation or repair of the embedded flaw repair.
    b. When the examination results in 3.a. above verify acceptable results then re-inspection of the embedded flaw repair will be continued at a frequency of every other refueling outage. If these examinations identify unacceptable results that require flaw removal, flaw reduction to acceptable dimensions, or welded repair the requirements of 3.a above shall be applied during the next refueling outage.

5.3 Technical Basis for Proposed Alternative

The purpose of the repair overlay welds is to embed and isolate identified flaws in the Alloy 600 reactor vessel head penetration tube and/or its Alloy 600 (Inconel 182) J-groove attachment weld. The repair overlay welds are not credited for providing structural strength to the original pressure boundary materials.

As discussed in WCAP-15987, the embedded flaw repair technique is considered a permanent repair for a number of reasons. As long as a primary water stress corrosion cracking (PWSCC) flaw remains isolated from the primary water (PW) environment, it cannot propagate. Alloy 690 and Alloy 52 are highly resistant to stress corrosion cracking, as demonstrated by multiple laboratory tests, as well as over 15 years of service experience in replacement steam generators. Since Alloy 52 weldment is considered highly resistant to PWSCC, a new PWSCC flaw cannot initiate and grow through the Alloy 52 repair weld layers to reconnect the PW environment with the embedded flaw.

The residual stresses produced by the embedded flaw technique have been measured and found to be relatively low, indicating that no new flaws will initiate and grow in the area adjacent to the repair weld. As described in WCAP-13998, Revision 1 (Reference 5), Section 7, the hole drilling method of residual stress measurement was used to determine the buildup of residual stresses from welding on the reactor vessel closure head and penetration tube. This technique involves mounting a three strain gage rosette at the location where the measurement is required. A small hole is drilled at the center of the rosette and the relieved strain is measured by the three gages of the rosette. The relieved strain and elastic constants of the material and the constants for the rosette are used to calculate the residual stress. There are no other known mechanisms for significant flaw propagation in this region since cyclic fatigue loading is negligible. Therefore, fatigue driven crack growth is not a mechanism for further crack growth after the embedded flaw repair process is implemented.

The thermal expansion properties of Alloy 52 weld metal are not specified in the ASME Code, as is the case for other weld metals. In this case, the properties of the equivalent base metal (Alloy 690) should be used. For that material, the thermal expansion coefficient at 600 degrees Fahrenheit (F) is 8.2 E-6 inch/inch/degree F, as found in Section II part D of the Code. The Alloy 600 base metal has a coefficient of thermal expansion of 7.8 E-6 inch/inch/degree F, a difference of about 5 percent.

The effect of this small difference in thermal expansion is that the weld metal will contract more than the base metal when it cools, thus producing a compressive stress on the Alloy 600 tube or attachment weld. This beneficial effect has already been accounted for in the residual stress measurements reported in the technical basis for the embedded flaw repair, as noted in WCAP-15987.

The small residual stresses produced by the embedded flaw weld will act constantly, and, therefore, will have no impact on the fatigue effects in this region. Since the stress would be additive to the maximum and minimum stress, the stress range will not change, and the already negligible usage factor for the region will not change.

Use of the Alloy ER309L weld barrier for weld overlay repairs will reduce the contaminant level present during installation of the critical Alloy 52M outer pass. Specifically, only the first Alloy ER309L pass will be in full contact with the cladding. This first pass, due to its exposure to maximum substrate-related dilution, has the highest susceptibility to cracking. The second Alloy ER309L pass will be exposed to substantially lower substrate-related contaminant levels, by virtue of its overlap with the initial Alloy ER309L pass. The third Alloy ER309L weld pass will also benefit from reduced substrate-related contaminant exposure in the same manner. This Alloy ER309L weld sequence will reduce contaminant exposure and crack susceptibility at the outer edge of this weld region.

WCAP-16158-P provides the plant-specific analysis performed for BVPS-2 using the same methodology as WCAP-15987. This analysis provides the means to evaluate a broad range of postulated repair scenarios to the reactor vessel head penetrations and J-groove welds relative to ASME Code requirements for allowable size and service life. Non-destructive preservice and inservice inspections discussed below ensure that any initial embedded flaw growth due to a postulated fatigue mechanism remains bounded by the WCAP-16158-P analysis, thus ensuring the continued structural integrity of each embedded flaw repair until reactor vessel head replacement.

Prior to return to service, preservice inspections will be performed in accordance with ASME Code Case N-729-1, with conditions as required by 10 CFR 50.55a(g)(6)(ii)(D).

Inservice inspections of reactor vessel head penetrations and J-groove welds repaired utilizing the embedded flaw repair process, along with submission of any necessary reports, will be in accordance with 10 CFR 50.55a(g)(6)(ii)(D), which requires implementation of Code Case N-729-1, with certain conditions.

When monitored with the proposed periodic ISI examinations, the embedded flaw repair is considered to be a robust permanent repair technique. The embedded flaw repair is designed to have a minimum of two layers of Alloy 52/152 weld metal, which is highly-resistant to PWSCC. In over 22 years of service history, there have been no PWSCC crack initiations in this material. Over 50 embedded flaw repairs have been installed in 12 separate nuclear power plants, with the longest period of service exposure being 10 years. Of the many dye penetrant surface examinations that have been performed on embedded flaw repairs to date, none have provided evidence of service-induced cracking or structural degradation. The indications found in embedded flaw repairs have been attributable to fabrication defects and not PWSCC. Reference 6 (LTR-PSDR-16-008-P) provides the technical basis for extending the surface examination frequency to every other outage after two successful surface examinations of the embedded flaw repair have been performed in the first and second cycles after installation or repair of the embedded flaw repair.

In order to provide reasonable assurance that the embedded flaw repairs at BVPS-2 will continue to perform their design function, a combination of volumetric and surface examinations will continue to be performed in accordance with 10 CFR 50.55a and ASME Code Case N-729-1. The volumetric (UT) examination that is performed each outage will continue to monitor the embedded flaw repair for flaw growth or potential leak paths. The surface (dye penetrant) examination will continue to supplement the UT examination when the surface examination is performed every other outage as proposed. The proposed alternative examinations continue to provide reasonable assurance of the structural integrity of the embedded flaw repair while minimizing radiation exposure to plant personnel.

Based on surface examinations performed during the last refueling outage (2R18), surface examination of each embedded flaw repair resulted in personnel radiation exposure of approximately 0.26 REM. The proposed frequency extension for surface examinations is expected to result in a dose savings of approximately 1 REM per refueling outage.

The above proposed alternative, as supported by the referenced generic and plant-specific technical bases, is considered to be an alternative to Code requirements that provides an acceptable level of quality and safety.

6. DURATION OF THE PROPOSED ALTERNATIVE

The duration of the proposed alternative is the third 10-year ISI interval at BVPS-2, that ends on August 28, 2018, or until replacement of the reactor pressure vessel head, whichever occurs first.

7. PRECEDENT

The NRC approved a request to change the J-groove weld embedded flaw repair surface examination frequency at the Byron and Braidwood stations as discussed in a January 21, 2016 NRC staff letter (Reference 7). This revision to 2-TYP-3-RV-04 proposes the same change for BVPS-2. Byron, Braidwood, and BVPS-2 utilize the embedded flaw repair methodology identified in Westinghouse WCAP-15987-P, Revision 2.

8. REFERENCES

1. Letter from H. N. Berkow (U.S. NRC) to H. A. Sepp (Westinghouse Electric Company), "Acceptance for Referencing - Topical Report WCAP-15987-P, Revision 2, 'Technical Basis for the Embedded Flaw Process for Repair of Reactor Vessel Head Penetrations,' (TAC No. MB8997)," dated July 3, 2003, Accession Number ML031840237.
2. Letter from R. Barrett (U.S. NRC) to A. Marion (Nuclear Energy Institute), "Flaw Evaluation Guidelines," dated April 11, 2003, Accession Number ML030980322.
3. Westinghouse WCAP-15987-P, Revision 2-P-A, "Technical Basis for the Embedded Flaw Process for Repair of Reactor Vessel Head Penetrations," December 2003.
4. Westinghouse WCAP-16158-P, Revision 0, "Technical Basis for Repair Options for Reactor Vessel Head Penetration Nozzles and Attachment Welds: Beaver Valley Unit 2," November 2003, Accession Number ML082900208.
5. WCAP-13998, Revision 1, "RV Closure Head Penetration Tube ID Weld Overlay Repair," November 1995.
6. Westinghouse Letter LTR-PSDR-16-008-P, Revision 0, "Technical Basis For Optimization Or Elimination Of Liquid Penetrant Exams For The Embedded Flaw Repair, Beaver Valley Unit 2," September 2016.
7. Letter from Justin C. Poole (NRC) to Bryan C. Hanson (Exelon), Byron Station, Unit Nos. 1 and 2, and Braidwood Station, Units 1 and 2 – Relief From the Requirements of the ASME Code, Dated January 21, 2016, Accession Number ML16007A185.

Enclosure B
L-16-327

Application for Withholding Proprietary Information from Public Disclosure

(7 Pages Follow)

Westinghouse

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CAW-16-4477

September 29, 2016

APPLICATION FOR WITHHOLDING PROPRIETARY
INFORMATION FROM PUBLIC DISCLOSURE

Subject: LTR-PSDR-16-008-P, Revision 0, "Technical Basis for Optimization or Elimination of Liquid Penetrant Exams for the Embedded Flaw Repair Beaver Valley Unit 2"

The Application for Withholding Proprietary Information from Public Disclosure is submitted by Westinghouse Electric Company LLC ("Westinghouse"), pursuant to the provisions of paragraph (b)(1) of Section 2.390 of the Commission's regulations. It contains commercial strategic information proprietary to Westinghouse and customarily held in confidence.

The proprietary information for which withholding is being requested in the above-referenced report is further identified in Affidavit CAW-16-4477 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 FENOC.

Correspondence with respect to the proprietary aspects of the Application for Withholding or the Westinghouse Affidavit should reference CAW-16-4477, 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.

J A Gresham

James A. Gresham, Manager
Regulatory Compliance

CAW-16-4477

September 29, 2016

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

ss

COUNTY OF BUTLER:

I, Terry G. Rudek, 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.

Terry G. Rudek, Vice President
Systems and Components Engineering

(1) I am Vice President, Systems and Components Engineering, 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, 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 LTR-PSDR-16-008 P-Attachment, "Technical Basis for Optimization or Elimination of Liquid Penetrant Exams for the Embedded Flaw Repair Beaver Valley Unit 2" (Proprietary), for submittal to the Commission, being transmitted by FENOC letter 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 elimination of liquid penetrant exams for the embedded flaw repair at Beaver Valley Unit 2 and may be used only for that purpose.

(a) This information is part of that which will enable Westinghouse to eliminate the liquid penetrant exams for the embedded flaw repair at Beaver Valley Unit 2

(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 elimination of liquid penetrant exams for the embedded flaw repair.

(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 are proprietary and non-proprietary versions of a document, furnished to the NRC in connection with requests for generic and/or plant-specific review and approval.

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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