Attachments 2 and 3 of the Enclosure contains PROPRIETARY information to be withheld under 10 CFR 2.390

10 CFR 50.90

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102-07508-MLL/TNW
May 24, 2017

U. S. Nuclear Regulatory Commission
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References:
1. Arizona Public Service Company (APS) letter number 102-07149, *License Amendment Request to Revise Technical Specifications to Incorporate Updated Criticality Safety Analysis,* dated November 25, 2015, [Agencywide Documents Access and Management System (ADAMS) Accession Numbers ML15336A251 and ML15336A087]
2. APS letter number 102-07342, *Response to Request for Additional Information Regarding License Amendment Request to Revise Technical Specifications to Incorporate Updated Criticality Safety Analysis,* dated October 6, 2016 (ADAMS Accession Number ML16286A240)
3. APS letter number 102-07449, *Supplemental Response to Request for Additional Information Regarding License Amendment Request to Revise Technical Specifications to Incorporate Updated Criticality Safety Analysis*, dated March 3, 2017 (ADAMS Accession Number ML17062B036)

Dear Sirs:

Subject: **Palo Verde Nuclear Generating Station**
Units 1, 2, and 3
Docket Nos. STN 50-528, 50-529, and 50-530
Supplemental Response to Request for Additional Information Regarding License Amendment Request to Revise Technical Specifications to Incorporate Updated Criticality Safety Analysis

In Reference 1, Arizona Public Service Company (APS) submitted a license amendment request (LAR) to revise the Technical Specifications (TSs) for Palo Verde Nuclear Generating Station (PVNGS) Units 1, 2, and 3. The proposed amendment would modify TS requirements to incorporate the results of an updated criticality safety analysis for both new and spent fuel storage. In Reference 2, APS provided a response to an NRC staff request for additional information (RAI). APS provided supplemental information in Reference 3 based upon a conference call held on February 9, 2017. Reference 3 superseded the Nuclear Performance and Code Review Branch (SNPB) RAI-1 response of Reference 2.

On April 11 and 26, 2017, conference calls were held with the NRC staff regarding the LAR and the APS supplemental information provided in Reference 3. Specifically, the NRC staff requested clarification regarding the storage of used fuel assemblies in the spent fuel pool that are missing fuel pins (rods). The enclosure to this letter contains the clarifying information, within the context of the SNPB RAI-1, subpart d, response. This response supersedes the previous response provided as SNPB RAI-1, subpart d, in Reference 3. The changes are indicated with margin bars. The APS responses to SNPB RAI-1, subparts a through c and e through g of Reference 3 remain unchanged.

Attachments 2 and 3 transmitted herewith contains PROPRIETARY information.
When separated from Attachments 2 and 3, this transmittal document is decontrolled.

This letter also provides additional information related to the implementation of in-cell blocking devices described in the APS response to RAI-12 of Reference 2.

A portion of this supplemental SNPB RAI-1, subpart d, response involves proprietary information from Westinghouse Electric Company LLC. Attachment 1 of the enclosure is the Westinghouse affidavit signed by Westinghouse Electric Company LLC that sets forth the basis on which the proprietary information in Attachments 2 and 3 of the enclosure may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in 10 CFR 2.390(b)(4).

Correspondence with respect to the proprietary aspects of Attachments 2 and 3 of the enclosure or the supporting Westinghouse affidavit should reference Westinghouse letter number CAW-17-4572 and be addressed to James A. Gresham, Manager, Regulatory Compliance, Westinghouse Electric Company, 1000 Westinghouse Drive, Building 3 Suite 310, Cranberry Township, Pennsylvania 16066. Attachments 2 and 3 of the enclosure contain the Westinghouse proprietary information.

This APS supplemental response does not affect the conclusion of the no significant hazards consideration determination [10 CFR 50.91(a)] provided in the original LAR. This submittal does not contain new regulatory commitments. The existing commitment made in Reference 2 and reiterated in Reference 3, in response to SNPB RAI-1, subpart g, remains unchanged. By copy of this letter, this response is being forwarded to the Arizona Radiation Regulatory Agency in accordance with 10 CFR 50.91(b)(1). Should you have any questions concerning the content of this letter, please contact Michael D. DiLorenzo, Licensing Section Leader, at (623) 393-3495.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on: May 24, 2017
(Date)

Sincerely,

Andrews, George W(Z99748)

Digitally signed by Andrews, George W(Z99748)
DN: cn=Andrews, George W(Z99748)
Reason: I am approving this document as delegated for Maria Lacal
Date: 2017.05.24 11:51:21 -07'00'

MLL/TNW/MDD
Enclosure: Supplemental Response to Request for Additional Information Regarding License Amendment Request to Revise Technical Specifications to Incorporate Updated Criticality Safety Analysis – Nuclear Performance and Code Review Branch (SNPB)

cc:

K. M. Kennedy	NRC Region IV Regional Administrator
S. P. Lingam	NRC NRR Project Manager for PVNGS
M. M. Watford	NRC NRR Project Manager
C. A. Peabody	NRC Senior Resident Inspector for PVNGS
T. Morales	Arizona Radiation Regulatory Agency (ARRA)

Enclosure

Supplemental Response to Request for Additional Information Regarding License Amendment Request to Revise Technical Specifications to Incorporate Updated Criticality Safety Analysis – Nuclear Performance and Code Review Branch (SNPB)

Contents

Introduction

By letter dated November 25, 2015 [Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML15336A251 and ML15336A087] (Reference 1), as supplemented by letters dated January 29 (Reference 2), June 30 (Reference 3), October 6 (Reference 4), November 9 (Reference 6), November 23, 2016 (Reference 7), and March 3, 2017 (Reference 9), (ADAMS Accession Nos. ML16043A361, ML16182A519, ML16286A240, ML16321A002, ML16328A426 and ML17062B036, respectively), Arizona Public Service Company (APS) submitted a license amendment request (LAR) to amend Facility Operating License Nos. NPF-41, NPF-51, and NPF-74, and revise the Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3, Technical Specifications (TSs). The LAR proposes to credit installed NETCO-SNAP-IN® neutron absorbing rack inserts into some spent fuel pool (SFP) storage rack cells coupled with six classifications of fuel (i.e., regions) by initial enrichment, burnup, and decay time in six storage configurations (i.e., arrays) for criticality control. Approval of the license amendment will establish the new licensing basis for how APS meets the effective neutron multiplication factor ($k_{effective}$ or k_{eff}) criticality control requirements.

The U.S. Nuclear Regulatory Commission (NRC) Nuclear Performance and Code Review Branch (SNPB) provided official requests for additional information (RAIs) by Reference 8 (ADAMS Accession No. ML16197A006). Each of the NRC staff information requests of Reference 8 were addressed in References 4 and 9 and supplemental documents provided by References 6 and 7. On April 11 and 26, 2017, conference calls were held with the NRC staff regarding the LAR. Specifically, the NRC staff requested clarification regarding the storage of used fuel assemblies in the spent fuel pool that are missing fuel pins (rods).

This enclosure contains the clarifying information, within the context of the original SNPB RAI-1, subpart d, response. This response supersedes the previous response provided as SNPB RAI-1, subpart d, in Reference 9. The changes are indicated with margin bars. The APS responses to SNPB RAI-1, subparts a through c and e through g of Reference 9 remain unchanged. This enclosure also provides additional information related to the implementation of in-cell blocking devices described in the APS response to RAI-12 of Reference 4.

The introduction of the SNPB RAI-1 is restated first with SNPB RAI-1, subpart d, followed by the updated APS response to SNPB RAI-1, subpart d. The additional implementation information regarding in-cell blocking devices follows the SNPB RAI-1, subpart d, response.

SNPB RAI-1

WCAP-18030-P, Revision 0, "Criticality Safety Analysis for Palo Verde Nuclear Generating Station Units 1, 2, and 3 (Proprietary)," dated September 2015, fuel assembly reconstitution as normal condition is described as follows, "Fuel assembly reconstitution is defined as either pulling damaged fuel rods [pins] out of an assembly and reinserting intact rods with less reactivity than the damaged rod, or as removing undamaged rods from a damaged assembly for insertion in a new assembly. In most cases damaged rods will be replaced with stainless steel rods. Natural uranium rods may also be used. Additional information is provided in Section 5.4.2 of WCAP-18030-P." Please provide a full description of the fuel assembly reconstitution process, which includes at least the following:

d. What is the maximum number of fuel pins that can be missing for a given reconstituted assembly at one time? Please justify any limitation or lack thereof.

APS Response:

SNPB RAI-1, Subpart d:

It is preferable that fuel assemblies stored in the spent fuel pool contain the full complement of 236 pins. Operational and maintenance activities have resulted in fuel assemblies that are missing one or more pins. One of the purposes of the criticality analysis is to provide clear guidance on how to store these non-standard fuel assemblies in accordance with the requirements of 10 CFR 50.68 and storage arrays of PVNGS TS 3.7.17.

Fuel assemblies that contain <236 pins will be subject to the following restrictions:

1) An assembly with ≤32 pins is qualified for Region 6 and can be stored in any location in Arrays A through F in the proposed TS 3.7.17
2) Fuel assemblies currently being stored with <236 pins shall be stored in accordance with Tables 1 and 3
3) An assembly that contains >32 pins and <236 pins can be stored in Array A if that fuel assembly has accrued a burnup of ≥3 GWd/MTU
4) An assembly with > 32 pins must have accrued at least 3 GWd/MTU (an assembly which has accrued < 3 GWd/MTU burnup must contain a full complement of 236 pins)
5) Any assembly that cannot meet one of these criteria shall be stored in Region 1 separated by 1 empty cell in each direction from other fuel assemblies

A study was performed by Westinghouse to provide the technical justification for each of these items. This study examined the reactivity impact of the removal of fuel pins from assemblies in both Array A and Array F, containing Region 1 (fresh 4.65 percent) fuel. The specific results of the analysis (k_{eff} and Δk_{eff}) are provided in Attachment 2 of this enclosure. The missing pin arrangements evaluated are shown in Attachment 3 of this enclosure.

It is important to note that this study is considered representative, based on engineering judgment as to which pin arrangements are likely to increase reactivity. The results presented in Attachment 2 of this enclosure are not intended to be bounding, rather they provide an understanding of the behavior and relative magnitude of reactivity changes in Arrays A and F as pins are removed from the fuel lattice.

The technical justification for each of these items, as well as a discussion of the potential impact to the limiting accident analysis follows.

Treatment of Assemblies Containing ≤32 pins

Fuel assemblies, by design, are under-moderated. As fuel pins are removed from a fuel assembly the increased moderator, in some cases, outweighs the decrease in reactivity due to removing fissile content. After a certain number of pins are removed, however, the loss of fissile material from the removal of another fuel pin outweighs any positive reactivity from increased moderation, such that removing additional fuel pins decreases the reactivity of the lattice. The study performed by Westinghouse for PVNGS fuel indicated that the most

reactive PVNGS fuel lattice analyzed for Array F contained 204 pins. As the study was intended to be representative of fuel behavior, the highest reactivity would be expected to be between 220 pins and 188 pins remaining. If a fuel assembly contains approximately 204 pins, every case analyzed with increasing number of missing fuel pins would be expected to result in a decrease in reactivity.

This result was demonstrated by evaluating Array F, modeled as an infinite array of 2x2 fuel assemblies of fresh fuel at 4.65% ^{235}U enrichment with no NETCO-SNAP-IN® neutron absorbing rack inserts, with increasing numbers of missing pins. Detailed results of this study are given in Attachment 2 of this enclosure. Removing pins initially resulted in an increase in reactivity. The study further indicates that a fresh fuel assembly containing 60 pins of fresh 4.65% ^{235}U enrichment has a k_{eff} that is 0.15 Δk_{eff} lower than the Array F 5.0% ^{235}U enrichment target k_{eff}, while a fuel assembly containing only 10 pins has a k_{eff} that is more than 0.60 Δk_{eff} lower than the Array F 5.0% ^{235}U enrichment target k_{eff}. This provides high confidence that a fuel assembly with 32 pins is less reactive than the design basis assembly, described in WCAP-18030, regardless of enrichment or burnup and can be safely stored in any array described in the LAR. Therefore, fuel assemblies containing ≤32 pins qualify for Region 6 and can be stored in any location in Arrays A through F in the proposed TS 3.7.17.

Treatment of Currently Existing Fuel Assemblies Containing <236 pins.

There are currently seven fuel assemblies in storage at PVNGS that contain <236 pins. Additionally, there are four grid cages that contain no special nuclear material. A complete listing of the fuel assemblies containing special nuclear material but containing less than 236 pins is provided in Table 1.

Table 1: PVNGS Fuel Assemblies Containing <236 pins

PVNGS Unit	Fuel Assembly	Initial Enrichment (percent)	Burnup (GWd/MTU)	Discharge Cycle Decay Time (yr)	# of Missing Pins	Proposed Region Qualification per WCAP-18030	Excess Burnup (GWd/MTU)[3]
1	PXXU01[1]	3.23	14.010	>20	232	6	n/a[4]
1	P1D002	3.89	49.618	>20	6	6	14.177
1	P1E001	4.01	42.402	>20	6	6	5.679
2	P2L510	4.23	26.013	16	2	3	5.048
2	P2L401[2]	4.23	25.997	16	235.5	6	n/a[4]
3	P3F101	3.81	51.446	>20	2	6	16.870
3	P3F322	3.45	56.312	18	10	6	24.856

Notes:

1. PXXU01 was originally P1D128. 232 pins were moved to a new host cage in their corresponding locations; however, four pins could not be removed due to the potential for further damage and remained in the original grid cage. The original cage was renamed PXXU01 and the new cage named P1D128. The four pins that remained in PXXU01 were replaced with stainless steel pins in the renamed assembly P1D128, such that it has 236 pins.
2. The pins from P2L401 were moved to a new host cage, PXXU08. One pin was broken during this pin movement with a portion of the pin remaining in P2L401. The remaining portion of the

pin cannot be removed without unacceptable risk of additional damage. PXXU08 contains 236 pins, three of which are stainless steel.
3. Excess burnup is the burnup accrued in excess of the required burnup to qualify for the proposed region in WCAP-18030.
4. PXXU01 and P2L401 have no burnup requirements as they each contain <32 pins. The excess burnup described in Note 3 is not applicable to these assemblies

The reactivity impact of the excess burnup can be estimated using the burnup measurement uncertainties documented in Tables 5-8, 5-9, and 5-11 of WCAP-18030. The calculated differential burnup reactivity worth is documented in the Table 2.

Table 2: Differential Reactivity Worth

	Initial Enrichment percent ^{235}U		
Detail	3	4	5
Array C Δk/(GWd/MTU)	0.0085	0.0066	0.0027
Array F Δk/(GWd/MTU)	0.0054	0.0051	0.0047

To determine the acceptance criteria, the missing pin study for Array F was used. The study utilized four fresh fuel assemblies with an initial ^{235}U enrichment of 4.65% for each of the four assemblies, so if a pin is removed from one assembly, it is removed in each assembly. Cases containing fewer pins were compared to the case with fuel assemblies having 236 pins.

An acceptance criterion of 0.011 Δk_{eff} was selected based on Table 2-1 in Attachment 2 of this enclosure. To conservatively convert burnup to reactivity, the lowest derivative was selected for each array; for example, the 5% Array F derivative is used.

Table 3: Excess Reactivity Worth and Acceptance of Legacy Fuel Assemblies

PVNGS Unit	Fuel Assembly	Initial Enrichment (percent)	Burnup (GWd/MTU)	# of Missing Pins	Proposed Region Qualification per WCAP-18030	Excess Burnup (GWd/ MTU)	Excess Burnup Worth (Δk_{eff})	Meets Acceptance Criterion (Y/N)
1	P1D002	3.89	49.618	6	6	14.177	0.0664	Y
1	P1E001	4.01	42.402	6	6	5.679	0.0266	Y
2	P2L510	4.23	26.013	2	3	5.048	0.0135	Y
3	P3F101	3.81	51.446	2	6	16.870	0.0790	Y
3	P3F322	3.45	56.312	10	6	24.856	0.1164	Y

The legacy fuel assemblies with more than 32 pins but less than 236 pins have a k_{eff} at least 0.0135 Δk_{eff} lower than the design basis assembly in the region for which they qualify. In

addition, unquantified additional margin exists as the fuel assemblies operated at less limiting conditions than the depletion analysis assumes in WCAP-18030, for assembly and moderator temperatures, boron concentration, burnable absorber use, etc.

Treatment of Fuel Assemblies with 33 to 235 Fuel Pins

While APS does not plan on creating additional fuel assemblies with <236 pins, other non-conformances, or future operating events, such as damage to a fuel assembly grid cage or operation with lead test pins, may necessitate performing fuel assembly reconstitution with resulting fuel assemblies that could be stored with <236 pins but more than 32 pins.

To demonstrate the impact of removing fuel pins from fuel assemblies stored in Region 1 the study for Array F was expanded to use fresh fuel assemblies and assemblies with 3 GWd/MTU of burnup stored in Array A. The isotopes for the 3 GWd/MTU were generated using the core conditions and methodology described in WCAP-18030, Revision 1. Both the fresh and 3 GWd/MTU fuel assemblies increase in reactivity until a highest analyzed reactivity increase is reached at 48 pins removed. The behavior of the trend is informative. The results for the pins removed are given in Attachment 2 of this enclosure, Tables 2-2 through 2-5.

Tables 2-2 through 2-5 of Attachment 2 of this enclosure demonstrate that for the cases examined, 3 GWd/MTU of exposure ensures that Array A with missing pins is less reactive than Array A with fresh fuel assemblies with all pins at 4.65% ^{235}U enrichment. Therefore, it is acceptable to store fuel assemblies with more than 32 pins but less than 236 pin in Array A, if the fuel assembly has at least 3 GWd/MTU of burnup.

Other Missing Pin Arrangements

If a fuel assembly has more than 32 pins but less than 236 pins and less than 3 GWd/MTU of burnup or it is a fresh assembly with <236 pins, it shall only be stored in Region 1 with a one cell gap between it and other fuel assemblies.

Reconstitution

Reconstitution will be performed only in Region 1, which is any combination of Array A and Array B. There will be a one cell gap of empty water in each direction around the reconstitution activity.

Impact to Accident Analysis

Removing pins from a fuel assembly may increase the reactivity of the fuel assembly, depending on the number and location of the removed pins, and will alter the boron worth in that array. To confirm that the accident analysis in WCAP-18030 remains bounding, the Array A study was repeated with 1600 ppm boron. A boron concentration of 1600 ppm is credited in TS 4.3.1 to maintain $k_{eff} \leq 0.95$ in the limiting accident, the multiple misload accident. The study demonstrates that an infinite array of fresh fuel at 4.65% ^{235}U enrichment is most reactive, highest k_{eff}, with a full contingent of pins. Any removal of pins reduces the k_{eff} of the array. The study was repeated with 3 GWd/MTU yielding the same results. At 1600 ppm boron the fuel assembly with 236 pins has the highest k_{eff}. This

demonstrates that the multiple misload described in 5.6.1.2 of WCAP-18030 remains bounding.

Alternatively, to ensure that the reconstituted fuel assembly with non-original pins remains bounded by the design basis fuel assembly, the reconstituted fuel assembly will be controlled as described in Section 5.4.2 of WCAP-18030, Revision 1, and in SNPB RAI-1, Subpart e, below.

Table 4 describes one fuel assembly in the Unit 2 spent fuel pool, P2F003, which was damaged during Unit 2 Cycle 6 in 1996 (legacy corrective action number 260049 and APS letter 102-03728, dated July 3, 1996, ADAMS Accession Number 9607100042). The damage to the fuel assembly caused some of the pins to move axially downward in the lower end fitting. There are 236 fuel pins in the assembly and the cladding is considered intact. The fuel assembly is provided with special rigging to prevent axial separation, which causes the fuel assembly to sit about 2.5 inches higher in the spent fuel rack. The special rigging consists of hardware on the upper and lower end fittings attached with 3/32 inch thick aircraft wire. This fuel assembly has resided in the Unit 2 spent fuel pool in location A-38 since its discharge from the core.

Based on burnup, enrichment and decay time, P2F003 requires 36297 MWD/MTU to qualify for storage in Region 6 of the spent fuel pool. Fuel assembly P2F003 exceeds this burnup requirement by 1854 MWD/MTU. In addition to the excess burnup, uncredited neutron leakage reduces the reactivity of the A-38 storage location which is on the pool periphery. Fuel assembly P2F003 can remain stored in spent fuel pool location A-38 as part of Array F, as the excess burnup and uncredited neutron leakage offset any potential reactivity impacts from the structural damage or special rigging. Figure 3-1 of WCAP-18030-P, Revision 1, contains a map of the spent fuel pool for Palo Verde Units 1, 2, and 3.

Table 4: Technical Description of P2F003

PVNGS Unit	Fuel Assembly	Initial Enrichment (weight percent)	Burnup (MWD/MTU)	Discharge Cycle	Discharge Date	Missing Pins
2	P2F003	3.970	38151	6	03/16/1996	0

Finally, an administrative error was identified in WCAP-18030-P, Revision 1, Section 5.2.3.1.4, *Fission Product and Minor Actinide Worth Bias*, subsequent to submittal by Reference 6. This administrative error has been entered into the Westinghouse corrective action program and is being tracked by PVNGS corrective action number 17-02936. Specifically, page 5-12 includes a uranium isotope (^{236}U) in a list of major actinides and O-16 assessed in establishing the fission product and minor actinide worth bias. This is an administrative error only. Isotope ^{236}U is treated consistently with the guidance in NUREG-7109. Only the text description is incorrect. The final results, conclusions, and storage requirements are not affected. The only correction would be to remove ^{236}U from the list of isotopes itemized in the first paragraph on page 5-12 of WCAP-18030-P, Revision 1. The calculations were performed using the methodology described in the guidance of NUREG-7109 which excludes ^{236}U as part of the applicable calculation step.

In-Cell Blocking Devices Implementation

The APS response to RAI-12 (Reference 4) described the planned use of in-cell blocking devices. The response did not, however, describe when the in-cell blocking devices would be installed as part of the transition plan to implement the proposed license amendment. APS plans to install the in-cell blocking devices in Region 1 of each of the PVNGS spent fuel pools as a first step in the transition plan. The reasons for this approach are as follows:

1. As described in the response to RAI-12, during fuel movement in the Fall 2015 and Spring 2016 refueling outages fresh fuel assemblies came into contact with cell blocking devices from an adjacent cell, damaging grid straps. Fuel assembly grid strap damage was identified again in the recent Unit 2 Spring 2017 refueling outage. The original causal investigation identified the above rack blocking device design to be a cause of the fuel assembly grid strap damage. The existing spent fuel pool cell blocking device design is a metal plate that rests diagonally across the top of the blocked cell and does not extend down into the active region of the fuel. The new in-cell blocking device design does not extend above the rack and is intended to eliminate the fuel assembly grid strap damage events, due to above rack blocking devices, for fuel assembly moves in the spent fuel pool.

2. The in-cell blocking device is described in greater detail in Section 5.2.1 of WCAP-18030-P (Reference 6). This blocking device consists of a stainless steel pipe, support plate and cap that meet the blocking device criteria described on page 16 of the LAR enclosure (Reference 1).

3. Westinghouse analyzed the proposed blocking device in Array A in WCAP-18030-P (Reference 6) which is equivalent to the current Region 1 of the PVNGS spent fuel pools. As all cases showed no increase in reactivity, the replacement of the existing blocking devices with the in-cell blocking devices is planned to be independent of the full transition of each spent fuel pool rack to the new criticality analysis described in Section 3.3 of the LAR enclosure (Reference 1).

The in-cell and above rack blocking devices perform the same function to provide a physical barrier to a fuel assembly misload event. As a result, either design is acceptable for the function. The implementation of the in-cell blocking devices for Array C is planned to be completed as part of the full transition of each spent fuel pool rack to the new criticality analysis described in Section 3.3 of the LAR enclosure (Reference 1).

References:

1. APS letter number 102-07149, *License Amendment Request to Revise Technical Specifications to Incorporate Updated Criticality Safety Analysis,* dated November 25, 2015, (ADAMS Accession Numbers ML15336A251 and ML15336A087)
2. APS letter number 102-07181, *Supplemental Information Regarding License Amendment Request to Revise Technical Specifications to Incorporate Updated Criticality Safety Analysis,* dated January 29, 2016 (ADAMS Accession Number ML16043A361)
3. APS letter number 102-07275, *Response to Request for Additional Information Regarding License Amendment Request to Revise Technical Specifications to Incorporate Updated Criticality Safety Analysis,* dated June 30, 2016 (ADAMS Accession Number ML16182A519)

4. APS letter number 102-07342, *Response to Request for Additional Information Regarding License Amendment Request to Revise Technical Specifications to Incorporate Updated Criticality Safety Analysis,* dated October 6, 2016 (ADAMS Accession Number ML16286A240)
5. CE Topical Report CENPD-289-P-A, Use *of Inert Replacement Rods in ABB CENF Fuel Assemblies*, dated July 1999
6. APS letter number 102-07360, *Response to Request for Additional Information Regarding License Amendment Request to Revise Technical Specifications to Incorporate Updated Criticality Safety Analysis – Revised Technical Specifications and Bases and WCAP-18030, Revision 1,* dated November 9, 2016 (ADAMS Accession Number ML16321A002)
7. APS letter number 102-07384, *Response to Request for Additional Information Regarding License Amendment Request to Revise Technical Specifications to Incorporate Updated Criticality Safety Analysis – Revised Technical Specification Page***,** dated November 23, 2016 (ADAMS Accession Number ML16328A426)
8. NRC document *Palo Verde 1, 2, and 3 – Official RAIs from SNPB for LAR that Requested Revision of TSs to Incorporate Updated Criticality Safety Analysis,* dated July 14, 2016 (ADAMS Accession Number ML16197A006)
9. APS letter number102-07449, *Supplemental Response to Request for Additional Information Regarding License Amendment Request to Revise Technical Specifications to Incorporate Updated Criticality Safety Analysis*, dated March 3, 2017 (ADAMS Accession Number ML17062B036)

Attachment 1

Westinghouse Electric Company Letter CAW-17-4572, dated May 19, 2017

Application for Withholding Proprietary Information from Public Disclosure

Subject: *Suggested Response Supplement: Data to Support Proposed Fuel Rod Reconstitution Requirements for Palo Verde Units 1, 2, and 3*

(7 pages not including this cover page)

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CAW-17-4572

May 19, 2017

APPLICATION FOR WITHHOLDING PROPRIETARY INFORMATION FROM PUBLIC DISCLOSURE

Subject: Suggested Response Supplement: Data to Support Proposed Fuel Rod Reconstitution Requirements for Palo Verde Units 1, 2, and 3 (Proprietary)

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 Nuclear Regulatory Commission's ("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-17-4572 signed by the owner of the proprietary information, Westinghouse. 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 Arizona Public Service.

Correspondence with respect to the proprietary aspects of the Application for Withholding or the Westinghouse Affidavit should reference CAW-17-4572, 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.

James A. Gresham, Manager
Regulatory Compliance

CAW-17-4572

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 declare that the averments of fact set forth in this Affidavit are true and correct to the best of my knowledge, information, and belief.

Executed on: 5/19/17

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 Nuclear Regulatory Commission's ("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 CVER-17-23, "Suggested Response Supplement: Data to Support Proposed Fuel Rod Reconstitution Requirements for Palo Verde Units 1, 2, and 3" (Proprietary), for submittal to the Commission, being transmitted by Arizona Public Service letter. The proprietary information as submitted by Westinghouse is that associated with Palo Verde Units 1, 2, and 3 Spent Fuel Pool Criticality Safety Analysis, and may be used only for that purpose.

(a) This information is part of that which will enable Westinghouse to continue to consider our analytical methods and results proprietary.

(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 performing additional spent fuel pool criticality analyses in the future.

(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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