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Serial: NPD-NRC-2016-010
February 9, 2016

10 CFR 52.79

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

LEVY NUCLEAR PLANT, UNITS 1 AND 2
DOCKET NOS. 52-029 AND 52-030
REVISED VOLUNTARY SUPPLEMENTAL RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 130 RELATED TO STANDARD REVIEW PLAN SECTION 12.03-12.04, RADIATION PROTECTION DESIGN FEATURES QUESTIONS 12.03-2, 12.03-6 and 12.03-9, FOR THE LEVY NUCLEAR PLANT, UNITS 1 AND 2, COMBINED LICENSE APPLICATION

References:

1) Letter from Donald Habib (NRC) to Christopher M. Fallon (DEF), dated August 7, 2015, "Request For Additional Information Letter No. 130 Related to Standard Review Plan Section 12.03-12.04, Radiation Protection Design Features, for the Levy Nuclear Plant Units 1 and 2 Combined License Application" (ML15219A536).

2) Letter from Christopher Fallon (DEF) to Nuclear Regulatory Commission (NRC), dated July 1, 2015, "Revised Response to Request for Additional Information Letter No. 121 Related to SRP Sections 6.2.5 and 6.4 for the Levy Nuclear Plant, Units 1 and 2 Combined License Application" Serial: NPD-NRC-2015-027 (ML15189A247).

3) Letter from Christopher Fallon (DEF) to Nuclear Regulatory Commission (NRC), dated November 2, 2015, "Response to Request for Additional Information Letter No. 130 Related to SRP Section 12.03-12.04, Radiation Protection Features, for the Levy Nuclear Plant, Units 1 and 2 Combined License Application", Serial: NPD-NRC-2015-042 (ML15308A383)

4) Letter from Christopher Fallon (DEF) to Nuclear Regulatory Commission (NRC), dated February 1, 2016, "Voluntary Supplemental Response to Request for Additional Information Letter No. 130 Related to SRP Section 12.03-12.04, Radiation Protection Features Questions 12.03-2, 12.03-6 and 12.03-9, for the Levy Nuclear Plant, Units 1 and 2 Combined License Application", Serial: NPD-NRC-2016-007

Ladies and Gentlemen:

Duke Energy Florida, LLC (DEF) hereby submits our revised voluntary supplemental response to the Nuclear Regulatory Commission's (NRC) request for additional information provided in Reference 1. This revision supersedes the information provided in NPD-NRC-2016-007

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(Reference 4). The information provided (Enclosure 1) offers additional detail intended to facilitate NRC reviews of AP1000 submissions supporting References 2 and 3. Additional detail and perspective on the topics of general considerations for direct dose within the Main Control Room (MCR) envelope, adjacent-room radiation zoning in relation to direct radiation dose within the MCR, conservatisms present in the operator dose analysis, the effects of drain line piping and penetrations, additional penetrations of the MCR envelope, generic approaches to addressing penetrations, and the treatment concrete shield wall thickness tolerances are provided to support the response to RAI questions 12.03-2, 12.03-6, and 12.03-9 provided in Reference 3. Attachment A to Enclosure 1 contains the non-proprietary version of the response and Attachment B to Enclosure 1 contains the proprietary version of the response.

Also enclosed is the Westinghouse Application for Withholding Proprietary Information from Public Disclosure CAW-16-4353, accompanying Affidavit, Proprietary Information Notice, and Copyright Notice. (Enclosures 2 and 3).

As Attachment B to Enclosure 1 contains information proprietary to Westinghouse Electric Company LLC, it is supported by an Affidavit signed by Westinghouse, the owner of the information. The Affidavit 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 Section 2.390 of the Commission's regulations. Accordingly, it is respectfully requested that the information which is proprietary to Westinghouse be withheld from public disclosure in accordance with 10 CFR Section 2.390 of the Commission's regulations.

Correspondence with respect to the copyright or proprietary aspects of the items listed above or the supporting Westinghouse Affidavit should reference CAW-16-4328 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.

If you have any further questions, or need additional information, please contact Bob Kitchen at (704) 382-4046, or me at (704) 382-9248.

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

Executed on February 9, 2016.

Sincerely,

Christopher M. Fallon

Christopher M. Fallon
Vice President
Nuclear Development

Enclosures/Attachments:
1. Revised Voluntary Supplemental Response to NRC RAI Letter No. 130 Questions 12.03-2, 12.03-6 and 12.03-9.
   A. Revised Voluntary Supplemental Response to NRC RAI 130 Questions 12.03-2, 12.03-6 and 12.03-9. (Non-Proprietary)
   B. Revised Voluntary Supplemental Response to NRC 130 Questions 12.03-2, 12.03-6 and 12.03-9. (Proprietary)
2. Westinghouse Application Letter CAW-16-4353 and Affidavit
3. Proprietary Information Notice and Copyright Notice

cc (w/o enclosures): U.S. NRC Region II, Deputy Regional Administrator
cc (w/ enclosures): Mr. Donald Habib, U.S. NRC Project Manager

Levy Nuclear Plant Units 1 and 2 (LNP)
Revised Voluntary Supplemental Response to NRC Request For Additional Information Letter No. 130 Questions 12.03-2, 12.03-6 and 12.03-9 Related To Standard Review Plan Section 12.03-12.04, Radiation Protection Design Features, dated August 7, 2015

NRC RAI #	Duke Energy RAI #	Duke Energy Response
12.03-2	L-1180	Revised Voluntary supplemental response enclosed– see following pages
12.03-6	L-1181	Revised Voluntary supplemental response enclosed– see following pages
12.03-9	L-1182	Revised Voluntary supplemental response enclosed– see following pages

NRC Letter No.: LNP-RAI-LTR-130

NRC Letter Date: August 7, 2015

NRC Review of Final Safety Analysis Report

NRC RAI NUMBER: 12.03-2, 12.03-6 and 12.03-9

Text of NRC RAI:
As the RAI question contain proprietary information, see Reference 1 for text of NRC questions.

DEF RAI ID#: L-1180, L-1181 and L-1182

DEF Revised Response to NRC RAI:

See Attachment A for the non-proprietary, redacted version of the revised voluntary supplemental response to NRC RAI 130 Questions 12.03-2, 12.03-6 and 12.03-9.

See Attachment B for the proprietary version of the revised response to voluntary supplemental response to NRC RAI 130 Questions 12.03-2, 12.03-6 and 12.03-9.

Associated LNP COL Application Revision:

None

Attachments to Response to NRC:

A. Non-proprietary version of the revised voluntary supplemental response to NRC RAI 130 Questions 12.03-2, 12.03-6 and 12.03-9.

B. Proprietary version of the revised voluntary supplemental response to NRC RAI 130 Questions 12.03-2, 12.03-6 and 12.03-9.

Attachment A
Revised Voluntary Supplemental Response to NRC RAI 130 Questions 12.03-2, 12.03-6 and 12.03-9 (Non - Proprietary)

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REQUEST FOR ADDITIONAL INFORMATION (RAI)

Title: Supplemental and Revised Information for DEF NRC RAI Letter No 130 Related to Main Control Room Dose

Request:

This supplement supersedes the information supplied in APP-GW-GF-102 (or NPD-NRC-2016-007) in its entirety. Changes with respect to the information provided in the document APP-GW-GF-102 (or NPD-NRC-2016-007) are indicated in red, underlined text for additions; or red, stricken text for deletions. The content of this supplement provides additional technical details and quantitative information on a more mechanistic evaluation of operator doses considering VBS operation when the VES actuation setpoint is not exceeded, and also corrects previous submittals that characterized the absence of liner plates from radiation transport as a significant conservatism.

This document provides additional detail supporting the response to questions 12.03-2, 12.03-6, and 12.03-9 from NRC RAI letter 130 for the Levy Nuclear Plant which were provided in NPD-NRC-2015-042. Within this supplement, additional detail and perspective on the topics of general considerations for direct dose within the Main Control Room (MCR) envelope, adjacent-room radiation zoning in relation to direct radiation dose within the MCR, conservatisms present in the operator dose analysis, the effects of drain line piping and penetrations, additional penetrations of the MCR envelope, generic approaches to addressing penetrations, and the treatment concrete shield wall thickness tolerances are provided. These responses ~~do not contradict any of the information supplied previously and instead~~ offer additional detail intended to facilitate NRC reviews of AP1000 submissions supporting NPD-NRC-2015-027 and NPD-NRC-2015-042.

Response Information

This supplement supersedes the information supplied in APP-GW-GF-102 (or NPD-NRC-2016-007) in its entirety. Changes with respect to the information provided in the document APP-GW-GF-102 (or NPD-NRC-2016-007) are indicated in red, underlined text for additions; or red, stricken text for deletions. The content of this supplement provides additional technical details and quantitative information on a more mechanistic evaluation of operator doses considering VBS operation when the VES actuation setpoint is not exceeded, and also corrects previous submittals that characterized the absence of liner plates from radiation transport as a significant conservatism

Within this supplement, additional perspective on the topics of general considerations for direct dose within the Main Control Room envelope, adjacent-room radiation zoning in relation to direct radiation dose within the MCR, conservatisms present in the operator dose analysis, the effects of drain line piping and penetrations, additional penetrations of the MCR envelope, generic approaches to addressing penetrations, and the treatment concrete shield wall thickness tolerances are provided. These responses ~~do not contradict any of the information supplied previously and instead~~ offer additional detail intended to facilitate NRC reviews of AP1000 submissions supporting NPD-NRC-2015-027 and NPD-NRC-2015-042.

General Considerations for Direct Dose within the MCR Envelope

When considering this information and the topic of direct radiation dose calculations for MCR operators, it is important to note some significant considerations related to the primary concern of these calculations and the importance of existing penetrations in the MCR envelope as they relate to direct dose.

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First, the calculations used to determine direct radiation dose in the MCR are primarily concerned with resolving the maximum dose within the occupied space of the MCR envelope (Figure 6.4-1 of the AP1000 licensing basis). Dose rate increases are only significant if the results show an increase in the calculated dose rate at the maximum-dose location within the occupied space of the envelope, or if the results show that the maximum-dose rate location has changed to a new location that also exhibits higher dose rates. This would apply to any particular design feature. For any design feature being considered, such a feature would only be significant from a post-accident, direct dose perspective if the result of the feature – either when considered on its own or in conjunction with other such design features – caused an increase to dose rates at the existing maximum-dose location within the occupied envelope of the MCR, or if the result was an increase in localized dose rates in another area of the MCR to such an extent that these increased, localized dose rates were of sufficient magnitude to exceed the currently-calculated dose rates at the maximum-dose location.

Secondly, as conveyed in Figure 12.3-2 Sheet 1 of the AP1000 DCD, the AP1000 design has been assessed for various post-accident radiation sources. These sources include contributions from SCC – the shielded containment cloud, and CPS- containment and penetration radiation streaming. The SCC contribution identifies the contribution resulting from sources within containment that are shielded by the AP1000 containment and shield building structure. The CPS contribution identifies the contribution arising from radiation streaming through penetrations and openings in the AP1000 containment and shield building structure. Detailed analyses supporting these determinations for the MCR are documented in APP-SSAR-GSC-722, revision 3. The results show that, for the limiting dose rate location within the MCR envelope, [ ] (a,c) can be attributed to CPS, or streaming through electrical and mechanical penetrations in the containment and shield building. Note that the streaming component described here is streaming through the shield building, and not the MCR envelope.

[

] (a,c) This quantitatively supports the conclusion that contributions of radiation streaming through the MCR walls and floors dominate the direct dose calculation for MCR operators, and streaming through the existing penetrations in the MCR

[[1]

] (a,c)

envelope is not significant at the maximum-dose location.

Considered together, these considerations inform analysts that only the peak dose rate within the MCR occupied envelope is significant when calculating direct doses to operators within the control room, that most of the radiation contributing to a direct radiation dose in the control room streams through containment and shield building penetrations, and that radiation streaming through the existing MCR penetrations is not significant.

Adjacent-Room Radiation Zoning in Relation to Direct Radiation Dose in the MCR

Use of Post-Accident Radiation Zone designations provided in DCD Figure 12.3-2 to assess radiation streaming through MCR boundary wall penetrations from adjacent rooms can result in over-estimates of MCR dose rate contributions from adjacent rooms, if further adjustments are not used. Understanding of methods applied in establishing Figure 12.3-2 radiation zone designations is necessary to understand their limitations when performing independent confirmatory MCR dose calculations.

As stated in Section 12.3.2.3 of the licensing basis, "the actual anticipated radiation level in each plant area is less than this maximum dose and consequently less than the radiation zone upper limit." Table 102-1, at the end of this response, provides a comparison of the total, peak post-accident dose rate compared to the assigned radiation zone upper dose rate bound for several rooms near the MCR, and illustrates that significant margin often exists between the design basis dose rate and the radiation zone upper bound.

When considering penetrations and designed openings in and around the MCR envelope, it is important to note that the radiation level on one side of a penetration or designed opening is not adequately represented by assuming the maximum dose rate corresponding to the radiation zone designation of the room, especially for spaces and areas that are removed from a shield building penetration in a room dominated by streaming from sources within containment. Even if a lower radiation dose rate is assumed in specific situations, applying the assumption that photons are isotropcially incident on the MCR boundary penetration entrance is not representative of the directional bias of incident photon radiation in adjacent rooms from SCC and CPS sources. If rooms adjacent to the MCR are treated as isotropic radiation sources corresponding to radiation zone maximum dose rate, calculations will result in conservatively high dose rate results within occupied spaces of the MCR.

Additionally, analyses supporting the direct dose determination submitted in NPD-NRC-2015-027 are consistent with Section 12.4.1.8 of the licensing basis which states that "analyses that confirm that the individual personnel exposure limits following an accident are not exceeded reflect the time-dependency of the area dose rates and the required post-accident access times." The time-dependency of radiation fields reflects phenomena occurring within containment resulting in a removal of airborne radiation sources. These phenomena are discussed in Section 15B of the licensing basis. As an illustration of this, [

] (a,c) considering occupancy factors shown in Table 15.6.5-2 of the DCD as a function of time over the course of 30 days. For the AP1000 design, the peak direct dose rate occurs at 1.97 hours, calculated to be [ ] (a,c) in the Operator Break Room (OBR) portion of the MCR, and results in an integrated dose over the course of 30 days of [ ] (a,c) To generalize this result, the peak dose rate can be multiplied [ ] (a,c) to determine the 30-day integrated direct dose in the MCR, considering occupancy and the time-dependency of the source.

Stated differently, Westinghouse calculations for direct dose to individuals in the MCR use calculated radiation field values (as opposed to maximum radiation zone dose rate values), consider the directional dependence of photon flux in adjacent rooms, and allow for time-dependent radiation field behavior when determining the integrated personnel dose from direct radiation.

Conservatisms Present in the Operator Dose Analysis

Westinghouse underscores the many conservatisms that are applied in the calculation of dose to individuals in the MCR. These conservatisms bias the calculated dose well above the actual anticipated dose, even under accident conditions, and include:

- Conservatisms in the treatment of concrete in radiation shielding calculations. These conservatisms were described previously, and significantly bias calculated dose rate and integrated dose values upwards. Specific conservatisms in the treatment of concrete for radiation shielding include:
  - As described in the response to 12.03-9, a uniform concrete density of 140 pcf is used in shielding calculations. This density [ ] (a,c) is used as an input in shielding calculations. [ ] (a,c) This 140 pcf uniform concrete density assumption is consistent with Section 12.3.2.3 of the licensing basis.
  - As described in the response to 12.03-6 and mentioned in 12.03-9, shielding calculations do not include consideration of rebar, nelson studs, structural or mechanical connections, and other steel supports that are present within the concrete structures. Figures 3H.5-3 through 3H.5-6, and 3H.5-13 in the licensing basis depict the application of rebar and steel supports in some aspects of AP1000 design and construction. As described previously, crediting rebar and structural supports in shielding calculations would significantly decrease calculated dose rates and integrated doses when considered separately. A quantitative estimate of the effects of considering rebar was provided in the response to 12.03-6.
- Conservatisms introduced in the analysis by neglecting physical AP1000 design features that would attenuate direct radiation. These conservatisms are applied, in part, to simplify shielding calculations, and involve the assumption that space occupied by SSCs in the plant can be assumed to be occupied by air or a material that is less effective in shielding calculations. The result is that attenuation that will actually be provided at the plant is not reflected in the calculation results. Some significant examples of these conservatisms include:
  - ~~Shield building steel liner plates [ ] (a,c) These plates are described in Section 3.8.4.1.1 of the licensing basis and depicted in Figures 3H.5-11 and 3H.5-13 of the licensing basis. These plates would reduce the calculated direct dose if they had been included in the calculations.~~
  - The floor below the main control area of the MCR (and above the Division A and Division C I&C Rooms shown in Figure 3.3-6 of the licensing basis) is provided as a floor module with module plates and steel fins. These fins and the related structure would provide shielding and are neglected in shielding calculations. Finned floors are discussed in Section 3.8.4.1.2 and depicted in Figure 3H.5-9 of the licensing basis.
  - [

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- o
- o

] (a,c)

- o Penetration sealant. This material is present in the AP1000 design, but is completely neglected in post-accident shielding calculations, leading to an over-estimation of the penetration streaming component. Previous estimates have shown that the shielding provided by this sealant would have an effect on streaming through the shield building and would result in a reduction of calculated dose rates and integrated doses. [

] (a,c)

- Conservatism in the spatial treatment of dose rates values. By selecting bounding locations for the purposes of quantifying a direct dose value, conservatisms are introduced in the analysis. These include:
  - o Direct dose calculations assume occupancy in the limiting dose location for the duration of the event (considering applicable occupancy factors shown in DCD Table 15.6.5-2). This means that the calculated direct dose result is representative of an individual occupying – and not moving from - the limiting dose rate location (which happens to be near an electrical panel and not far from a stairwell) in the OBR area of the MCR envelope for the duration of the 30 day occupancy. [

] (a,c)

  - o Total dose calculations assume simultaneous occupancy in the limiting direct dose location AND the limiting filter dose location for the duration of the 30 occupancy. These two locations are several feet apart. While this conservatism is not significant for the VBS case (i.e., filter shine inside MCR limited to 0.03 rem), it is likely significant for the VES case. Quantifying this conservatism for the VES case is difficult without performing a coupled 3D radiation field analysis considering multiple

radiation sources.

- [

] (a,c) Thus, the airborne dose value provided in NPD-NRC-2015-027 for VBS operation contains significant conservatism introduced by neglecting the operation of VES under the design basis accident conditions otherwise being evaluated.

- Consistent with Section 15.6.5.3.7.3 and 15A.3.3 of the licensing basis, further conservatism in the analysis relates to the atmospheric dispersion factors applied to radioactivity releases supporting the dose values submitted in NPD-NRC-2015-027. These atmospheric dispersion factors are standard plant dispersion factors, selected with the intent of bounding the actual dispersion factors at a given site. This is true for the Levy site, where the site-specific atmospheric dispersion factors are below those applied in the standard plant calculations. Because the bulk of the calculated 30-day integrated dose results from airborne activity entering the MCR - 3.70 rem of the 4.33 rem total under VES operation and 4.50 rem of the 4.84 rem for VBS operation, as noted in NPD-NRC-2015-014 and NPD-NRC-2015-027, Enclosure 4, Table 15.6-204 - the use of bounding standard plant dispersion factors represents a conservatism in MCR dose calculations from a site-specific perspective. As an under-representative and approximate quantification of this conservatism, consider the 2-8 hour χ/Q values for the VBS intake location under conditions of a ground level release from containment and the direct relationship between χ/Q values and airborne doses. The standard plant dispersion factor value for this circumstance is 3.6E-03 s/m^3 from Table 15A-6 of the DCD, and the value specified in Table 2.0-202 of the Levy application is 3.5E-03 s/m^3, or 97.2% of the standard plant value (note that other site-specific dispersion factors contain even greater margin with respect to the standard plant dispersion factor than the 2-8 hour period mentioned here). Considering a 2.8% reduction in airborne dose would yield a decrease of about 0.126 rem for the case where VBS is operating. Therefore, the conservatism present in using standard plant dispersion factors represents conservatism on the order of at least 0.126 rem for AP1000 units situated at the Levy County site. The magnitude of this conservatism represents about 42% of the direct dose value which provides some perspective relative to the magnitude and importance of

direct dose indicated in NPD-NRC-2015-027.

While this is not an all-inclusive list of conservatisms present in analyses related to GDC 19 and the AP1000 PWR, it does provide some perspective on the robust plant design in relation to radiological consequences of design basis accidents.

Even with these conservatisms included, the direct dose contribution to the total integrated 30-day MCR dose for the Loss of Coolant Accident is calculated to be [ ] (a,c) This calculated value of [ ] (a,c) is rounded to 0.3 rem in the licensing submittal NPD-NRC-2015-014 [ ] (a,c) before adding dose components from other pathways (which vary with the HVAC system in operation, as shown in NPD-NRC-2015-027, Enclosure 4, Table 15.6-204). Thus, an added conservatism included in the submission is the inclusion of [ ] (a,c) margin in the direct radiation dose value used in the total MCR dose summation. This margin is not included to account for any specific factor or known phenomenon.

Effects of Drain Line Piping and Penetrations

The MCNP model of the MCR boundary used for the purposes of determining direct dose does not include all drain line penetrations or embedded piping described in design documents. The MCNP model includes all design features that are important to ensure a conservative MCR direct dose result. Design features of significance in the MCR direct dose calculation include the containment source model, containment and shield building structures, and MCR boundary walls, floors, and ceilings. Shielding design details, such as penetrations, are included in the MCNP model when these features are located between the containment source and MCR occupants such that they must be modelled to ensure a conservative direct dose result.

[

] (a,c)

The floor drains located in the northern section of the MCR and in the western section of the OBR are associated with fixtures and plumbing designed in this portion of the room. The drain lines and piping in these areas exist over the Remote Shutdown Room, 12303, that is assigned a peak post-accident radiation zone of IV (<100 mrem/hr) as indicated in Figure 12.3-2 (Sheets 6 and 7) of the licensing basis. As described above, the radiation source for this room is

containment and calculated dose rates in Room 12303 are lower than 100 mrem/hr, precluding the potential for any streaming from this room to increase operator direct dose above the values provided. This is also true for the floor drain located near the middle of the OBR.

The other aspect of drain lines in the MCR relates to the drain line and embedded piping in the eastern portion of the room, under the main control area. Much of this piping also exists over a room assigned as zone IV in DCD revision 19, while some of the piping is near and above Room 12302, which is a Zone VI room as shown on Figure 12.3-2 of the licensing basis. While Room 12302 is reported as Zone VI, the calculated direct dose rate is [

] (a,c)

When considering post-accident direct dose in the control room, it is also important to note that the AP1000 design contains no significant, fixed, post-accident radiation sources in the rooms above, below, or adjacent to the MCR. The post-accident radiation in these rooms arises from radiation sources originating in containment, and not from sources such as recirculation piping. For direct dose, the photons passing through these rooms have a strong directional bias radiating away from containment. Considering this directional bias, there is no direct, line-of-sight pathway from the containment source through MCR floor penetrations, or through embedded piping that does not involve steep angles of penetration that tend to increase the effective shielding thickness of the MCR floor.

Additional Penetrations of the MCR Envelope

Reviewing the MCR design in detail revealed penetrations in the floor of the southern portion of the operator break room, near the limiting tally location for direct dose and passing into a room that is assigned a high post-accident radiation zone in Figure 12.3-2. These penetrations were not modelled or discussed in APP-SSAR-GSC-722, revision 3. The review also identified four penetrations passing through the MCR wall along column line 1059'-9" on the south side of the room that are not modelled or discussed in APP-SSAR-GSC-722, revision 3. These penetrations have a near line-of-sight view of the shield building, which directly faces the containment structure and post-accident containment source term, and the penetrations also pass into a room that is assigned a high post-accident radiation zone in Figure 12.3-2 of the licensing basis.

During face-to-face discussions on 13 January 2016, the NRC Staff challenged the Westinghouse technical staff on certain assumptions regarding penetrations that are implicit in the calculations supporting operator dose following a design basis accident. Westinghouse has considered assumptions related to these penetrations and notes that these designed openings do not impact the direct dose value previously submitted, and have a negligible impact on the calculated direct dose impacts.

[

] (a,c)

These considerations uphold the previously-submitted direct dose value in NPD-NRC-2015-027 as appropriately conservative and bounding for the purposes of satisfying radiological safety criteria (GDC 19) with regards to personnel in the MCR.

Generic Approaches to Addressing Penetrations

Through the efforts to quantify direct dose to operators in the MCR, the existing AP1000 control room penetrations have been identified and assessed. This is based upon reviews of archived concrete drawings, archived penetration drawings, and completed design change packages. Reviews of the AP1000 plant 3D software model have also been performed to verify that the full scope of penetrations has been identified and considered. Additionally, as indicated in this supplemental document, Westinghouse sensitivities have shown that the contributions to direct dose from streaming through the existing penetrations in the MCR envelope are not as significant as the through-wall and through-floor contributions near the southern wall of the OBR. This conclusion remains valid after detailed consideration of the localized effects of the full range of penetrations and embedded pipe included in the AP1000 MCR boundary design.

Treatment of Concrete Shield Wall Thickness Tolerance

As further consideration of the impact of the hypothetical situation where a wall is uniformly at the minimum thickness allowed by established tolerances, Westinghouse performed some

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additional reviews of information previously supplied. These reviews reached the same conclusions submitted in the response to 12.03-9.

[

] (a,c)

Based on the initial response to 12.03-9, as supplemented by information provided above, as well as consideration of the conservatisms described in this submittal, tolerances on wall thickness are not significant from the perspective the reported MCR operator dose results and GDC 19 compliance.

These clarifications further support the responses and information provided previously.

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(a,c)

[
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(a,c)

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(a,c)

[

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Westinghouse Application Letter CAW-16-4353 and Affidavit
(8 pages including cover page)

Westinghouse Electric Company
Engineering, Equipment and Major Projects
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USA

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Proj letter: APC_APG_000355

CAW-16-4353

February 9, 2016

APPLICATION FOR WITHHOLDING PROPRIETARY
INFORMATION FROM PUBLIC DISCLOSURE

Subject: Supplemental and Revised Information for Main Control Room Dose Submittal

The proprietary information for which withholding is being requested in the above-referenced application is further identified in Affidavit CAW-16-4353 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 APOG.

Correspondence with respect to the proprietary aspects of the Application for Withholding or the Westinghouse Affidavit should reference CAW-16-4353, 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,

Paul A. Russ, Director
Licensing & Regulatory Support

/Enclosures

CAW-16-4353

February 9, 2016

1. Affidavit, Proprietary Information Notice, Copyright Notice, dated February 9, 2016

2. APP-GW-GF-106 Revision 0, "Supplemental and Revised Information for DEF NRC RAI Letter No 130 Related to Main Control Room Dose" (Proprietary)

3. Non-proprietary response for APP-GW-GEF-106, "Supplemental and Revised Information for DEF NRC RAI Letter No 130" (Non-Proprietary)

CAW-16-4353
February 9, 2016

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

ss

COUNTY OF BUTLER:

I, Paul A. Russ, 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.

Paul A. Russ, Director
Licensing & Regulatory Support

(1) I am Director, U.S. Licensing & Regulatory Support, 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 APP-GW-GF-106 Revision 0, "Supplemental and Revised Information for DEF NRC RAI Letter No 130 Related to Main Control Room Dose" (Proprietary), for submittal to the Commission, being transmitted by APOG 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 the Main Control Room Dose Submittal and may be used only for that purpose.

(a) This information is part of that which will enable Westinghouse to:

(i) Manufacture and deliver products to utilities based on proprietary designs.

(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 licensing of new nuclear power stations.

(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 and Copyright Notice
(2 pages including cover)

PROPRIETARY INFORMATION NOTICE

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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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