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Southern Nuclear Operating Company  
Vogtle Electric Generating Plant Units 3 and 4  
Supplement to Request for License Amendment and Exemption:  
Pipe Rupture Hazard and Flooding Analysis (LAR-17-010S2)

Ladies and Gentlemen:

Pursuant to 10 CFR 52.98(c) and in accordance with 10 CFR 50.90, Southern Nuclear Operating Company (SNC) requests an amendment to the combined licenses (COLs) for Vogtle Electric Generating Plant (VEGP) Units 3 and 4 (License Numbers NPF-91 and NPF-92, respectively). The requested amendment proposes to depart from approved AP1000 Design Control Document (DCD) Tier 2 information (text, tables, and figures) [as incorporated into the Updated Final Safety Analysis Report (UFSAR) as plant-specific DCD information], and involves related changes to COL Appendix C information, with corresponding changes to the associated plant-specific Tier 1 information. Pursuant to the provisions of 10 CFR 52.63(b)(1), an exemption from elements of the design as certified in the 10 CFR Part 52, Appendix D, design certification rule is also requested for the plant-specific DCD Tier 1 material departures.

The requested amendment proposes changes to the COL, COL Appendix C (and to plant-specific Tier 1 information) and associated Tier 2 information to address mitigation of fire protection system flooding of the Auxiliary Building identified during completion of the pipe rupture hazards analysis (PRHA).

Enclosures 1 through 4 were provided with the original LAR. Enclosures 5 and 6 were provided on August 21, 2017, with SNC letter ND-17-1465, in response to 5 of 7 NRC Staff requests for additional information (RAIs) dated July 20, 2017 (ADAMS accession number ML17201Q412). Enclosure 7 provides responses to the two remaining RAIs asked by the Staff and includes supplemental information responding to public discussions held on September 7, 2017, as well as an additional minor revision to Enclosure 1 identified during SNC review of the original submittal. Enclosure 7 identifies impacts and Enclosure 8 provides associated revisions to the licensing basis document changes requested in the original LAR. Enclosure 11 provides information discussed in the other Enclosures that is either identified as proprietary or security related, Sensitive Unclassified Non-Safeguards Information (SUNSI), and thus, is requested to be withheld from public disclosure under the provisions of 10 CFR 2.390(d).

An affidavit from SNC supporting withholding under 10 CFR 2.390 is provided as Enclosure 9. Enclosure 10 is Westinghouse's Proprietary Information Notice, Copyright Notice and CAW-17-4607, Application for Withholding Proprietary Information from Public Disclosure and Affidavit. The affidavit sets forth the basis upon 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-17-4607 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. Correspondence with respect to proprietary aspects of this letter and its enclosures should also be addressed to Brian H. Whitley at the contact information on the first page of this letter.

The supplemental information provided in this LAR supplement does not impact the scope, technical content, or conclusions of the Technical Evaluation, Significant Hazards Consideration Determination, or Environmental Considerations of the original LAR, LAR-17-010, provided in Enclosure 1 of SNC letter ND-17-0496.

SNC now requests staff approval of the license amendment and associated exemption by December 15, 2017, to support continued construction activities and ITAAC closure activities. SNC expects to implement the proposed amendment (through incorporation into the licensing basis documents; e.g., the Updated Final Safety Analysis Report) within 30 days of approval of the requested changes.

In accordance with 10 CFR 50.91, SNC is notifying the State of Georgia of this LAR supplement by transmitting a copy of this letter and enclosures to the designated State Official.

This letter contains no regulatory commitments. This letter, including enclosures, has been reviewed and confirmed to not contain security-related information, other than as previously identified in Enclosure 11.

Should you have any questions, please contact Ms. Amy Chamberlain at (205) 992-6361.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 9<sup>th</sup> day of October 2017.

Respectfully submitted,



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B. H. Whitley  
Director, Regulatory Affairs  
Southern Nuclear Operating Company

BHW/ERG/ljs

- Enclosures: 1) – 4) (Previously submitted with original LAR-17-010 via ND-17-0496)  
5) – 6) (Previously submitted as supplemental information with LAR-17-010S1 via ND-17-1465)  
7) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Response to NRC Request for Additional Information Regarding the LAR-17-010 Review (LAR-17-010S2)  
8) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Revised Proposed Changes to Licensing Basis Documents (Publicly Available Information) (LAR-17-010S2)  
9) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Affidavit from Southern Nuclear Operating Company for Withholding Under 10 CFR 2.390 (LAR-17-010S2)  
10) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Westinghouse Authorization Letter CAW-17-4607 Affidavit and Proprietary Information Notice and Copyright Notice (LAR-17-010S2)  
11) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Revised Proposed Changes to Licensing Basis Documents (**WITHHELD from Public Disclosure**) (LAR-17-010S2)

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**Southern Nuclear Operating Company**

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**Enclosure 7**

**Vogtle Electric Generating Plant (VEGP) Units 3 and 4**

**Response to NRC Request for Additional Information**

**Regarding the LAR-17-010 Review**

**(LAR-17-010S2)**

**(This Enclosure consists of 24 pages, including this cover page.)**

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Response to NRC Request for Additional Information Regarding the LAR-17-010 Review  
(LAR-17-010S2)

#### Disposition of Requests for Additional Information

- Question 1, RPAC (Submitted August 21, 2017, via ND-17-1465)
- Question 2, RPAC (Submitted August 21, 2017, via ND-17-1465)
- Question 3, RPAC
- Question 4, ICE – Supplement to Submittal of August 21, 2017 (via ND-17-1465)
- Question 5, MEB
- Question 6, MEB (Submitted August 21, 2017, via ND-17-1465)
- Question 7, SEB – Supplement to Submittal of August 21, 2017 (via ND-17-1465)

#### Supplemental Revision to Original LAR Enclosure 1.

- Listing of Changes to UFSAR Table 3D.5-4

**Question 3 (RPAC):**

GDC 2, "Design bases for protection against natural phenomena," requires in part that SSCs shall be designed to withstand the effects of natural phenomena without loss of capability to perform their safety functions and shall reflect, in part, the importance of the safety functions to be performed.

GDC 60, "Control of releases of radioactive materials to the environment," requires that the nuclear power unit design shall include means to control suitably the release of radioactive materials in gaseous and liquid effluents and to handle radioactive solid wastes produced during normal reactor operation, including anticipated operational occurrences. Sufficient holdup capacity shall be provided for retention of gaseous and liquid effluents containing radioactive materials, particularly where unfavorable site environmental conditions can be expected to impose unusual operational limitations upon the release of such effluents to the environment.

GDC 61, "Fuel storage and handling and radioactivity control," requires in part that the fuel storage and handling, radioactive waste, and other systems with may contain radioactivity shall be designed to assure adequate safety under normal and postulated accident conditions and shall be designed with appropriate containment, confinement, and filtering systems, among other aspects.

10 CFR 20.1101(b) requires that the licensee shall use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are as low as is reasonably achievable (ALARA).

10 CFR 20.1406 requires that the design minimize, to the extent practicable, contamination of the facility and the environment, facilitate eventual decommissioning, and minimize, to the extent practicable, the generation of radioactive waste.

LAR 17-010 discusses the potential for major flooding in the Auxiliary Building due to potential fire protection system piping failures. The potential flooding events include the potential for flooding portions of the Auxiliary Building that contain Radwaste systems and components. This includes the potential for significant flooding of the rail car bay which, as described in UFSAR Section 11.4, contains mobile solid waste management systems, spent resin storage tanks, high-integrity containers containing resin, and other including spent filters. The potential flooding events could result in the spread and potential release of other radioactive material due to equipment damage, radioactive sumps and drains overflowing, overflowing the holdup tanks (flood water greatly exceeds the capacity of the waste holdup tanks, where sumps are routed), high-integrity containers and other stored waste being spilled or released due to the flooding, etc. There is no discussion in the LAR of the potential radiological impacts of the internal flooding events.

RG 1.29, "Seismic Design Classification for Nuclear Power Plants," specifies that systems that contain or may contain radioactive material and the postulated failure of which would result in conservatively calculated potential offsite doses that are more than 500 mRem total effective dose equivalent be designed Seismic Category I (RG 1.29, Section C.1.g) and that those portions of SSCs of which failure could reduce the functioning of any plant feature and result in exceeding this criteria, also be designed to Seismic Category I criteria (RG 1.29, Section C.1.i). RG 1.26, "Quality Group Classifications and Standards for Water-, Steam-, and Radioactive-Waste-



Containing Components of Nuclear Power Plants,” contains similar guidance for classifying systems as Quality Group C (and therefore, designing to those standards). As indicated in LAR 17-010, the fire protection piping assumed to fail is not seismically qualified and in reviewing design criteria in DCD Table 3.2-3, much of the fire protection piping in the Auxiliary Building would not meet the Quality Group C criteria. The staff has the following comments/questions:

- a) Update the LAR to describe the worst case radiological release from flooding scenarios due to the possible fire protection piping failures and evaluate if the release exceeds the offsite doses described above. Explain the approach used and how the results were reached. If the potential for offsite doses exceeding the regulatory criteria exists, provide additional details about how the facility will meet the regulatory requirements (this could include descriptions of relevant design changes, etc., as appropriate).
- b) If no design changes are considered and the potential for the flooding events described in the LAR still exist, describe how the design is consistent with limiting occupational and public radiation exposure ALARA, consistent with 10 CFR 20.1101(b) and minimizing contamination consistent with 10 CFR 20.1406. Include in the discussion how the design will ensure that contaminated flood water will not spread to other areas of the plant beyond those areas discussed in the LAR (e.g. through piping penetrations, ventilation ducting, etc.), how the spread of contamination to the environment is minimized, how the water will be collected and treated for release, and how effluent releases will be adequately controlled.

### **RESPONSE to Question 3:**

#### **Item a): Radiological Release**

#### **Worst-Case Radiological Release and Consideration of Offsite Dose**

The worst-case radiological release resulting from the postulated fire-protection-system-driven flooding events described in LAR-17-010 would involve flooding of the Railcar Bay (Room 12371), which would then be available to transport any available surface contamination below the flood height to the environment through the exterior door.

The consequences of such an event are bounded by existing analyses or consideration of radiological consequences described in the UFSAR, and remain within applicable safety and regulatory limits.

#### **Approach Used**

Note that when considering the flooding events described in LAR-17-010, these events are postulated to occur following a seismic event, which is infrequent and not a normal operating condition. Therefore, the event and postulated flood following the event, are not consistent with normal operations and not considered explicitly in light of expected releases.

As indicated above, the impacts of numerous postulated radioactivity releases are discussed in UFSAR Section 15.7. The discussion of these events cover:

- Gas waste management system leak or failure

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- Liquid waste management system leak or failure
- Release of radioactivity to the environment via liquid pathways
- Fuel handling accident (FHA)
- Spent fuel cask drop accident

The auxiliary building is separated into the radiologically controlled area and nonradiologically controlled area. These areas are served by separate drain systems (WRS and WWS) and are completely separated by a three-foot thick structural wall (UFSAR Subsection 3.4.1.2.2.2).

Thus, only floods which originate in the radiologically controlled area need to be evaluated for potential radioactivity releases as this separation prevents any contaminated flood water from spreading to other areas of the plant beyond those areas discussed in the LAR.

Due to the arrangement of the radioactive waste handling systems there is not a postulated flood such that, as a consequence, resin could be transported outside of the auxiliary building. For example,

- The spent resin tanks (WSS-MV-01A and B) located in Room 12373 only communicate with the rail car bay (Room 12371) above elevation 110'-0" (which is above the maximum flood in either Room 12371 or Room 12373).
- The resin sampling operations performed in Room 12372 are designed to sample a fixed volume of resin.
- Postulated pipe break flowrates during sampling or sluicing in Room 12372 are not sufficient to cause flooding which would cause resin to be transported outside of the auxiliary building.

As stated in the Westinghouse response to RAI 460.007, Revision 1 (ML030760701), the AP1000 design does not incorporate waste solidification; however, the design does include packaging of resin into high integrity containers (HICs) which may be considered analogous. A standard HIC provides more than 120-days of storage capacity. Space is available in Room 12374 of the auxiliary building for the storage of the HIC.

The maximum flood height criterion in Room 12374 is 3" which would not impact a HIC and would not result in additional release of radioactivity, and, therefore, no additional considerations are made for radiation releases from flooding in Room 12374. Room 12374 only communicates with the rail car bay (Room 12371) above elevation 110'-0" (which is above the maximum flood elevation in either Room 12374 or Room 12373).

Refer to UFSAR Figure 1.2-7 and Figure 1.1-13 for a depiction of the room arrangement.

The systems which contain a sufficient volume to cause the limiting flooding event described in the subject License Amendment Request, LAR-17-010, are non-potentially-radioactive sources (e.g., the fire protection system) – thus, these events would only transport surface contamination or dilute other sources and do not present a source of radioactivity themselves which must be considered significant for the purposes of effluents or offsite dose.

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Note that UFSAR Table 15.7-1 lists the radiation source term used for fuel handling accident radiological consequences. The FHA analysis assumes that ~210 Ci of I-131 are released to the environment. Conservatively ignoring the impact of other iodine isotopes and the noble gases, a loose surface contamination level of  $\sim 1.6E+02 \mu\text{Ci}/\text{cm}^2$  in the rail car bay (approximate floor area of 130 m<sup>2</sup>) would be required to produce a similar offsite dose consequence to FHA during a flooding event. Such a high level of surface contamination is significantly in excess of levels that produce measurable dose rates and would be considered a High Contamination Area that would require significant action within the context of the Radiation Protection Program (described in Section 12AA of the UFSAR) by the site Radiation Protection staff. Note that such levels of contamination may even prevent its use as a loading area. Thus, this level of contamination would not be present and the radiological consequences following a release of floodwater containing surface contamination are bounded by other discussed events.

The analysis of the failure of small lines carrying primary coolant outside containment (UFSAR Subsection 15.6.2) are based on a conservative break flow of 130 gpm with flashing which would be bounding for airborne doses of the liquid-only releases postulated for breaks in the rail car bay above.

Therefore, it is concluded that the analysis for the radiological consequences of a small line break outside of containment and a WLS tank rupture (as discussed in UFSAR Subsection 2.4.13) are limiting and no additional analysis is performed.

#### **Item b): Radiation Exposure**

##### **Consistency with 10 CFR 20.1101(b) and 10 CFR 20.1406**

Requirements in 10 CFR 20.1101(b) convey the application of the ALARA principle to occupationally exposed individuals and also to members of the public. As described in the response to a), above, the postulated flooding events are considered following an infrequent seismic event. Based upon the frequency of the postulated event, the extent of design changes needed to preclude such events, and the dose benefits from such changes (which are likely small), the design change presented in LAR-17-010 is consistent with the ALARA principle. Note that this supports the guidance conveyed in Regulatory Guide 8.8, which states that: "Reasonably achievable" is judged by considering the state of technology and the economics of improvements in relation to all the benefits from these improvements." Therefore, the AP1000 design remains consistent with 10 CFR 20.1101(b) requirements.

Separately, 10 CFR 20.1406 conveys requirements regarding minimization of contamination. The AP1000 design includes significant design features and modifications that address these requirements. These features were discussed in APP-GW-GLN-098 (ADAMS accession number ML071010536). The features described in AP1000 Technical Report 98 minimize the potential for contamination and the spread of contamination. These features remain unchanged as presented in LAR-17-010, and the AP1000 design remains compliant with 10 CFR 20.1406 as discussed in Sections 11.2.1.3, 11.3.1.3, 11.4.1.4, and 12.1.2.4, of the UFSAR.

The considerations above illustrate that the design remains consistent with 10 CFR 20.1101(b) and minimizing contamination consistent with 10 CFR 20.1406 [see APP-GW-GLN-098].

### **Assurance of Preventing the Spread of Contaminated Floodwater to Other Plant Areas**

As described in the response to item a), physical barriers separate the radiologically-controlled portion of the AP1000 plant from the non-radiologically-controlled portion. Penetrations in this significant concrete barrier are minimized to the maximum extent practical. The very limited number of penetrations that do exist below the maximum flood elevation conveyed in LAR-17-010 are required to be designed to serve as a flooding and ventilation barrier, ensuring that floodwaters which may be postulated to contain contamination do not spread to clean portions of the plant. These features minimize the potential for flood waters to migrate from the RCA-side of the auxiliary building to the non-RCA side of the building, thus preventing the spread of contamination consistent with the plant design.

### **Minimization of the Spread of Contamination to the Environment**

Note that APP-GW-GLN-098 describes multiple design features – such as waterproofing of concrete - that are useful in minimizing the spread of contamination to the environment. Other plant design features, such as the application of surface coatings to concrete floors and surfaces in the RCA (UFSAR Subsection 12.5.3.7) further preclude and minimize the potential for the spread of contamination to the environment.

Although not credited in the evaluations discussed above, as noted in NUREG-1793, Supplement 2 “all seismic Category I SSCs below grade (below ground level) are designed to withstand hydrostatic pressures, and they are protected against flooding by a water barrier consisting of waterstops and a waterproofing system.” This installation provides additional protection from the effects of external flooding and would also serve to limit any leakage of floodwater out of the auxiliary building and minimize the spread of contamination to the environment.

### **Water Collection and Treatment**

Per UFSAR Subsections 11.2.1.2.1 and 11.2.2.5.2, temporary equipment may be brought on site to collect, process, and remove the liquid waste resulting from a flooding event. Collected water is not expected to be stored in the auxiliary building or any other adjacent building.

### **Control of Effluent Releases**

Following a postulated flooding event, any collected water would be released as effluent in accordance with applicable discharge requirements (such as those in 10 CFR 20, Appendix B, or other applicable, local requirements).

### **Additional Justification for Consideration**

It is also noted that the auxiliary building is not classified as a RW-IIB or IIC structure in accordance with Regulatory Guide 1.143, and systems in the auxiliary building containing high levels of activity are currently treated in accordance with category RW-IIA design guidance in Regulatory Guide 1.143 as described in Appendix 1A of the UFSAR. Therefore, the auxiliary building is considered to be conservatively designed for potential offsite dose consequences that may exceed those in Regulatory Guide 1.143, Revision 2, Section 5.1. Additionally, offsite dose

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consequences are not an input to the design of waste management systems with respect to the guidance in Regulatory Guide 1.143 and commitments to follow this regulatory guide.

Based upon the considerations that enveloping events are analyzed for radiological consequences in UFSAR Chapter 15, that offsite dose consequences are not an input to commitments to Regulatory Guide 1.143 for the auxiliary building, and that the design basis flooding event presented in LAR-17-010 is based on a postulated break in a non-radiological system with limited potential impacts to radiological equipment, an offsite dose analysis is not required and would provide little insight or utility for the plant design.

Note that in the surface contamination assessment presented above, iodine-131 is selected as a representative nuclide for the purposes of considering the amount of surface contamination needed to create an unbounded offsite dose concern. This nuclide is selected because (a) releases of this nuclide have already been analyzed and described in UFSAR Chapter 15, (b) the dose conversion factors associated with intake of this nuclide are significant, meaning the ratio of dose consequence to quantity released is conservative for the purposes of most consequence analyses, and (c) the nuclide also emits beta-gamma radiation of sufficient quantity and frequency that its presence can be measured, relatively easily, by standard portable survey instruments and radiation monitoring equipment. Note that other common nuclides that may be detected by portable survey instruments (such as cobalt-60 or cesium-137) convey smaller dose consequences associated with intake (meaning these nuclides have smaller dose conversion factors and releases of these nuclides in similar magnitudes to those of iodine-131 would elicit consequences that are bounded by the iodine-131 assessments). Other nuclides, such as iron-55 and nickel-63, may be less easily-detectable while conveying sufficient dose hazards associated with intake; however, there is no credible means for these “hard-to-detect” nuclides to be present on their own in sufficient quantity so as not be bounded by the assessment of iodine-131, and they would only be expected to be present with other corrosion products – like cobalt-60, which is considered above. Therefore, iodine-131 is suitable and appropriate for the high-level evaluation described above.

**Question 4 (ICE):** – Supplement to Submittal of August 21, 2017 (via ND-17-1465) addressing new item e).

- e) While the licensee did provide additional technical detail about the new safety-related level switches in its response to the staff's request for additional information (RAI), it did not provide the material (additional and altered text) in the associated licensing documentation for the Protection and Safety Monitoring System (PMS). For example, no mention was made of the anticipated impact to the WCAP-16675-P, "AP1000 Protection and Safety Monitoring System Architecture Report, Revision 5, which discusses the architectural layout of the PMS and its various functions. Per the LAR, this additional functionality is not described in the report as would be expected.

Another example would be WCAP-16438-P, "FMEA of the AP1000 Protection and Safety Monitoring System," Revision 3. Again, no additional information was added to the report, as would be expected, when adding new equipment to the design of the system, as its failure mode would likely be discussed in this report.

Provide all relevant and related information to the affected licensing documents, some of which are listed above, that are impacted by the addition of the new safety-related PMS level switches and related alarm or notification functions.

**RESPONSE to Question 4 (Supplemental):**

- e) This design change does not impact WCAP-16675-P and WCAP-16438-P.

The proposed change adds two seismically qualified, Class 1E level sensors (WLS-400A/B) to the Auxiliary Building radiologically controlled area. The sensors are classified as safety-related; however, the information provided by the sensors is not used to initiate a safety-related action. The proposed change also adds the associated alarms to notify the operators in the main control room of any potential flooding event. The operator uses the alarm information to locally close valves required to terminate the flood (e.g., Fire Protection System (FPS) valves) to avoid auxiliary building flooding.

The two sensors are categorized as Class 1E and have safety-related display for flood indication, but do not perform any safety-related function. The level information is not required for post-accident monitoring indication (The equipment and components at these Level 1 and 2 elevations required for safe shutdown of the plant are not affected by the postulated flooding of the auxiliary building RCA to 19 feet). Because these sensors perform no safety-related PMS function, the functionality of the level sensors is not described in the PMS documents incorporated by reference in the UFSAR.

The purpose of WCAP-16675 is to describe the PMS architecture (Section 2), external system interfaces and communication (Section 3), and the qualified data display system (Section 4), the Common Q Platform (Section 5), and maintenance, testing, and calibration (Section 6). It should be noted that WCAP-16675 Section 3.4.2 provides a discussion on manual component-level control provided by PMS however, as stated above, the FPS valves are not controlled by the PMS. They are manually manipulated locally at the valve.

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WCAP-16438 only analyzes PMS failures. The new level sensors do not input into the PMS for any safety-related function, therefore it is unnecessary to evaluate their failure in the FMEA.

The same discussion applies for the other PMS licensing documents.

In summary, no additional PMS functionality is proposed. Therefore, there is no impact to any PMS incorporated by reference documents.

**Question 5 (MEB):**

10 CFR 50, Appendix A, GDC 1 requires that structures, systems, and components important to safety shall be designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety function to be performed.

LAR 17-010, Enclosure 1, Section 2, "Detailed Description," in the section titled "Auxiliary Building Level 1 (Elevation 66'-6") and Level 2 (Elevation 82'-6")," (page 7 of 40) states the following regarding containment isolation valves below the maximum flood level:

The maximum flood level on Level 2 of the Auxiliary Building RCA reaches Elevation 85'-6" and requires the limit switches located at this elevation for outside containment isolation valves WLS-PL-V057 (Sump Containment Isolation valve), WLS-PL-V068 (Reactor Coolant Drain Tank (RCDT) Gas Containment Isolation valve), the limit switch and solenoid for CVS-PL-V047 (Letdown Flow Containment Isolation valve), and valve CVS-PL-V090 (Makeup Line Containment Isolation valve) to be qualified for operation during submergence from a MELB. Qualifying the limit switches for operation during submergence allows the switches to perform their indication function and the containment isolation valves to perform their containment isolation design function in the post-MELB condition. Other containment isolation valves below the maximum flood level are either air operated and fail closed or remain closed during safe shutdown operation. The general RCA flooding discussion in Subsection 3.4.1.2.2.2 (Containment Flooding Events) indicates that these valves fail closed or remain closed during safe shutdown operation.

LAR 17-010, Enclosure 1, Section 2, "Detailed Description," in the section titled "Plant-specific Tier 2 changes" (page 11 of 40) states the following:

Subsection 3.4.1.2.2.2, Auxiliary Building Flooding Events, General, Radiologically Controlled Areas, 1st paragraph, regarding the containment isolation valves that are located near the containment vessel and are above elevation 82'-6", is revised to indicate that the containment isolation valves below the maximum flood level are either air operated and fail closed or remain closed during a safe shutdown operation. This change further describes components that are located below the flood level of 85'-6" on RCA Level 2.

LAR 17-010, Enclosure 1, Section 2, "Detailed Description," in the section titled "Licensing Basis Change Descriptions for Auxiliary Building Levels 1 and 2," (page 13 of 40) states the following regarding revisions to Table 3.11-1, "Environmentally Qualified Electrical and Mechanical Equipment," regarding equipment qualification for submergence:

- Is revised to indicate that the Letdown Flow Containment Isolation valve outside reactor containment CVS-PL-V047 valve limit switch (CVS-PL-V047-L) and solenoid valve (CVS-PL-V047-S1) are required to be qualified for submergence resulting from a MELB because they are below the flood level on RCA Level 2;
- Is revised to indicate that valve limit switches for the Sump Containment Isolation valve outside reactor containment WLS-PL-V057, the Reactor Coolant Drain Tank Gas Containment Isolation valve outside reactor containment WLS-PL-V068, and the Makeup Line Containment Isolation valve outside reactor containment CVS-PLV090 (WLS-PL-V057-L, WLS-PL-V068-L, and CVS-PL-V090-L, respectively) are required to be qualified



for operation during submergence from a MELB because they are below the flood level on RCA Level 2; and

- Is revised to indicate that Resin Flush Containment isolation valve outside reactor containment, CVS-PL-V041 (manual valve), located on RCA Level 2 is required to be qualified for submergence resulting from a MELB.

LAR 17-010, Enclosure 1, Section 2, "Detailed Description," in the section titled "Auxiliary Building Level 3 (elevation 100'0") and above," (page 17 of 40) states the following regarding submerged isolation valves Level 3 of the Auxiliary Building:

- The spent fuel pool level transmitters SFS-JE-LT019A and SFSJE-LT019C and the spent fuel cooling system isolation valves are located in Room 12365. The maximum flood level in this room is approximately 108 inches. The aforementioned safe shutdown components are located below this flood level. The spent fuel pool level transmitters SFS-JE-LT019A and SFS-JE-LT019C are qualified for submergence. The isolation valves are manual valves and only require their pressure boundary to be maintained following a PRHA event. The flood elevation in Room 12354 does not affect the structural adequacy of the adjacent floor and walls. The only safety-related equipment below the flood level in Room 12354 is the valve body for PCS-PL-V026, which is unaffected by the flooding.

The staff requests the licensee to provide the following information regarding submergence of safety-related valves:

- a) Identify all safety-related valves, operators, and associated subcomponents (e.g., limit switches and solenoid valves) that are submerged or partially submerged as a result of the as-designed pipe rupture hazards analysis. Identify the type of operator (i.e., motor operator or air operator). Does UFSAR Table 3.11-1, "Environmentally Qualified Electrical and Mechanical Equipment," identify that submergence testing is required for each valve, operator, and subcomponent? If not, provide a basis for concluding that submergence testing is not required for these valves, operators, and associated subcomponents.
- b) The licensee states that containment isolation valves below the maximum flood level are either air operated and fail closed or remain closed during safe shutdown operation. Are these valves required to operate when submerged? Are these valves qualified for submergence? If not, provide a basis for concluding that submergence testing is not required for these valves and operators.
- c) CVS-PL-V090 is a motor operated valve that is normally open (Tier 1 Figure 2.2.1-1) and now, due to this change, it is below the water flood level (i.e., submerged). The safety function of this valve as identified in DCD Tier 2, Table 3.9-16 is maintain close/transfer close. Therefore, please explain if this motor operated valve (including the operator) is required to operate while submerged. Is this valve qualified for submergence? If not, provide a basis for concluding that submergence testing is not required for this valve and operator.
- d) The proposed revision in UFSAR Section 3.11, Table 3.11-1, "Environmentally Qualified Electrical and Mechanical Equipment," identifies equipment in the as-designed pipe rupture hazards analysis that is submerged. However, note 6 of Table 3.11-1, states that these components are qualified for operation with spray from a moderate-energy pipe

crack or spray from a cold high energy pipe crack. The licensee is requested to explain the basis for stating that submerged components are qualified for operation with spray.

**RESPONSE to Question 5:**

- a) Table 1 (included at the end of this response) identifies the safety-related valves, valve operators, and associated valve subcomponents that are submerged or partially submerged as a result of the as-designed pipe rupture hazards analysis (including analysis of high energy and moderate energy pipe failures). UFSAR Table 3.11-1, "Environmentally Qualified Electrical and Mechanical Equipment," identifies that spray and/or submergence for these components and thus requires the appropriate testing (where the components would be subject to submersion or spray due to high-energy pipe failures). LAR-17-010 states the limit switches for valves CVS-PL-V090; WLS-PL-V057; and WLS-PL-V068 are located beneath the flood level in AB Level 2. However, this subsequent review has determined that the limit switches for the three valves are located above the flood level.

LAR-17-010 is supplemented to indicate the limit switches for valves WLS-PL-V057, WLS-PL-V068, and CVS-PL-V090 are located above the Auxiliary Building Level 2 85'-6" flood elevation, and to indicate the limit switches are not required to be qualified for submergence. Note, the 'S' is not removed from the limit switch for CVS-PL-V090; because this component is still required to be qualified for spray.

Markup for Supplement 2 to LAR-17-010: ND-17-0496, Enclosure 1, page 7 of 40:

The maximum flood level on Level 2 of the Auxiliary Building RCA reaches Elevation 85'-6" ~~and requires the limit switches located at this elevation for outside containment isolation valves WLS-PL-V057 (Sump Containment Isolation valve), WLS-PL-V068 (Reactor Coolant Drain Tank (RCDT) Gas Containment Isolation valve), the limit switch and solenoid for CVS-PL-V047 (Letdown Flow Containment Isolation valve), and valve CVS-PL-V090 (Makeup Line Containment Isolation valve) to be qualified for operation during submergence from a MELB. The limit switches located at this elevation for outside containment isolation valves WLS-PL-V057 (Sump Containment Isolation valve), WLS-PL-V068 (Reactor Coolant Drain Tank (RCDT) Gas Containment Isolation valve) are located above 85'-6". The limit switch and solenoid for CVS-PL-V047 (Letdown Flow Containment Isolation valve) are located below 85'-6" and are required to be qualified for operation during submergence. The limit switch for valve CVS-PL-V090 (Makeup Line Containment Isolation valve) is located above 85'-6" and is required to be qualified for operation with spray from a HELB. Qualifying the limit switches for operation....~~

Markup for Supplement 2 to LAR-17-010: ND-17-0496 Enclosure 1, page 13 of 40:

- Table 3.11-1, Environmentally Qualified Electrical and Mechanical Equipment:

...

- Is revised to indicate that the valve limit switches for the ~~Sump Containment Isolation valve outside reactor containment WLS-PL-V057, the Reactor Coolant Drain Tank Gas Containment Isolation valve outside reactor containment WLS-PL-V068, and the~~ Makeup Line Containment Isolation valve outside reactor containment CVS-PL-V090 (~~WLS-PL-V057-L, WLS-PL-V068-L, and CVS-PL-V090-L, respectively~~) are is required to be qualified for operation ~~during submergence from a MELB because they are below the flood level on RCA Level 2 with spray from a HELB;~~ and...

Markup for Supplement 2 to LAR-17-010: ND-17-0496 Enclosure 1, page 31 of 40:

Limit switches for outside containment isolation valves WLS-PL-V057 (Sump Containment Isolation valve), WLS-PL-V068 (Reactor Coolant Drain Tank (RCDT) Gas Containment Isolation valve), and CVS-PL-V090 (Makeup Line Containment Isolation valve), ~~and the limit switch and solenoid for CVS-PL-V047 (Letdown Flow Containment Isolation valve),~~ are located above the on Auxiliary Building RCA Level 2 flood elevation of at Elevation 85'-6". ~~Valve CVS-PL-V041 (Resin Flush Containment isolation manual valve) is also located on Auxiliary Building RCA Level 2.~~ The limit switch for valve CVS-PL-V090 is qualified for operation with spray from a HELB. Because the Auxiliary Building RCA flooding level can reach Elevation 85'-6" and the limit switch and solenoid for CVS-PL-V047 (Letdown Flow Containment Isolation valve), and valve CVS-PL-V041 (Resin Flush Containment isolation manual valve) are located on Auxiliary Building RCA Level 2 below Elevation 85'-6", the valve, ~~limit level~~ switches, and solenoid can become submerged. Therefore, these components are to be qualified for operation during submergence from a MELB as shown in UFSAR Table 3.11-1, so that they are able to close or remain closed as described in UFSAR Subsection 3.4.1.2.2.2.

Markup for Supplement 2 to LAR-17-010: ND-17-0496 Enclosure 1, page 32 of 40:

As shown in UFSAR Table 3.9-16, containment isolation valves WLS-PL-V057, WLS-PL-V068, CVS-PL-V090 and CVS-PL-V047 have the safety-related function to maintain close and transfer close, while CVS-PL-V041 has the safety-related function of maintain close only. The proposed change to qualify these valves and necessary components, ~~their associated limit switch and the solenoid for CVS-PL-V047~~ for submergence allows their safety-related function to be maintained.

Markups for Supplement 2 to LAR-17-010: ND-17-0496 **Enclosure 3** are provided in **Enclosure 8**.

b) See table below and response to a) above.

This table provides a key for the information included in the “Comments” column of Table 1 (which identifies the flooded safety-related valves.)

| What is flooded                           | Consequence   |
|---|---|
| Valve body flooded only                   | No impact to safety function - Similar to piping, the additional external pressure of the flood is not an impact; environmental effects of the flood (e.g., pressure) are considered in the abnormal environmental conditions for the room which are applied to the relevant environmental qualification of the valve.  |
| Valve operator is designed to Fail-Closed | No impact to safety function - Fail-closed air operated valves will close upon loss of air and/or if flooding affects the solenoids (whose failure mode is to vent air and cause the valve to transfer closed).<br>Note, impacted valves are normally closed.   |
| Manual Valve                              | No impact to safety function - This valve may require manual operation later in the event (no valves are required to be operated when flooded). Similar to piping, the additional external pressure of the flood is not an impact; environmental effects of the flood (e.g., pressure) are considered in the abnormal environmental conditions for the room which are applied to the relevant environmental qualification of the valve. |
| Check Valve, Self-actuated                | No impact to safety function - Similar to piping, the additional external pressure of the flood is not an impact; environmental effects of the flood (e.g., pressure) are considered in the abnormal environmental conditions for the room which are applied to the relevant environmental qualification of the valve.  |

c) The valve operator for CVS-PL-V090 is not submerged and the required valve safety functions (transfer closed or maintain closed) are not impacted by postulated flooding events. The valve operator and limit switch are located greater than 5' above the Room 12244 floor (flooding in the room is postulated to be 3' above the floor or less).

d) Table 3.11-1 states that equipment marked with S must be qualified for submergence or operation with spray from pipe ruptures excluding forces (or both). It is not stated that being qualified for submergence qualifies for spray and vice versa. Required testing for spray and/or submergence is described in UFSAR Appendix 3D.

The proposed update to UFSAR Subsection 3D.5.2.2 (in the LAR) states that *“For certain plant applications, qualification for abnormal environments is not necessary when*

*equipment is located in environmental zones that do not exceed manufacturer's design limits for equipment operation, or – for flooding/wetting – if qualified in accordance with applicable criteria in subsection 3.11.1.2.”*

As stated in UFSAR Subsection 3.11.1.2:

*“In the event of potential flooding/wetting, one of the following criteria is applied for protection of equipment for service in such an environment:*

- *Equipment will be qualified for submergence due to flooding/wetting.*
- *Equipment will be protected from wetting due to spray.*
- *Equipment will be evaluated to show that failure of the equipment due to flooding/wetting is acceptable since its safety-related function is not required or has otherwise been accomplished.”*

As stated in UFSAR Subsection 3D.5.5.1.7, Submergence, *“Performance of equipment in a submerged condition is verified by a test that replicates the actual conditions with appropriate margin.”*

- e) The designator “S” already exists in the UFSAR to identify spray (added in Revision 6). The proposed changes to add an “S” designator increases the scope of the qualification of equipment to require spray and/or submergence qualification. Moving or relocating the “S” designator within the column is for consistency of presentation only and has no effect on the qualification program.

| <b>Table 1 - Flooded Safety-related Valves</b> |   |                          |   |
|--|---|--------------------------|---|
| <b>Tag number</b>                              | <b>Description</b>  | <b>Active Component?</b> | <b>Comments</b>                               |
| CVS-PL-V041                                    | Resin Flush ORC Isol  | Non-Active               | None  |
| CVS-PL-V047                                    | Letdown Containment Isol ORC                                | Active                   | Valve body                                    |
| CVS-PL-V047 – L                                | Letdown Containment Isol ORC Limit Switch                   | N/A                      | None  |
| CVS-PL-V047 - S1                               | Letdown Containment Isol ORC Solenoid                       | Active                   | Valve operator is designed to Fail-Closed     |
| CVS-PL-V090                                    | Makeup Line Cont Isolation – ORC                            | Active                   | Valve operator / Limit switch are not flooded |
| FHS-PL-V001                                    | Fuel Transfer Tube Gate Valve                               | Active                   | Manual Valve                                  |
| FPS-PL-V050                                    | Fire Water Containment Supply Isolation                     | Non-Active               | None  |
| PCS-PL-V005                                    | PCCWST Supply to FPS Isolation Valve                        | Active                   | Manual Valve                                  |
| PCS-PL-V015                                    | Water Bucket Makeup Line Drain Valve                        | Active                   | Manual Valve                                  |
| PCS-PL-V020                                    | Water Bucket Makeup Line Isolation Valve                    | Active                   | Manual Valve                                  |
| PCS-PL-V023                                    | PCS Recirculation Return Isolation Valve                    | Active                   | Manual Valve                                  |
| PCS-PL-V026                                    | Makeup to Dist Bucket Isolation Valve                       | Non-Active               | None  |
| PCS-PL-V029                                    | PCCWST Isolation Valve Leakage Detection Drain              | Non-Active               | None  |
| PCS-PL-V030                                    | PCCWST Isolation Valve Leakage Detection Crossconnect Valve | Non-Active               | None  |
| PCS-PL-V033                                    | Recirc Pump Suction from Long Term Makeup Isolation Valve   | Non-Active               | None  |
| PCS-PL-V039                                    | PCCWST Long-Term Makeup Check Valve                         | Active                   | Check Valve, Self-actuated                    |
| PCS-PL-V042                                    | PCCWST Long Term Makeup Isolation Drain Valve               | Active                   | Manual Valve                                  |
| PCS-PL-V049                                    | PCCWST Drain Valve  | Active                   | Manual Valve                                  |
| PCS-PL-V050                                    | Recirc Heater Discharge to SFS Pool Isol Valve              | Active                   | Manual Valve                                  |
| PCS-PL-V060A                                   | Shutoff Valve for Leakage Sensor                            | Non-Active               | None  |
| PCS-PL-V060B                                   | Shutoff Valve for Leakage Sensor                            | Non-Active               | None  |
| PCS-PL-V304                                    | Recirc Header Discharge to SFS Pool Drain Isolation Valve   | Non-Active               | None  |
| PCS-PL-V305                                    | PCCWST Recirculation Return Drain Isolation Valve           | Non-Active               | None  |
| RNS-PL-V005A                                   | RNS Pump A Suction Isolation                                | Non-Active               | None  |
| RNS-PL-V005B                                   | RNS Pump B Suction Isolation                                | Non-Active               | None  |

| <b>Table 1 - Flooded Safety-related Valves</b> |  |                          |   |
|--|--|--------------------------|---|
| <b>Tag number</b>                              | <b>Description</b>                                     | <b>Active Component?</b> | <b>Comments</b>                               |
| RNS-PL-V006A                                   | RNS HX A Outlet Flow Control                           | Non-Active               | None  |
| RNS-PL-V006B                                   | RNS HX B Outlet Flow Control                           | Non-Active               | None  |
| RNS-PL-V007A                                   | RNS Pump A Discharge Isolation                         | Non-Active               | None  |
| RNS-PL-V007B                                   | RNS Pump B Discharge Isolation                         | Non-Active               | None  |
| RNS-PL-V008A                                   | RNS HX A Bypass Flow Control                           | Non-Active               | None  |
| RNS-PL-V008B                                   | RNS HX B Bypass Flow Control                           | Non-Active               | None  |
| RNS-PL-V010                                    | RNS Disch Cont Isol Valve Test                         | Non-Active               | None  |
| RNS-PL-V011                                    | RNS Disch Cont. Isol – ORC                             | Active                   | Valve operator / Limit switch are not flooded |
| RNS-PL-V031A                                   | RNS Train A Disch. Flow Inst. Isolation                | Non-Active               | None  |
| RNS-PL-V031B                                   | RNS Train B Disch. Flow Inst. Isolation                | Non-Active               | None  |
| RNS-PL-V032A                                   | RNS Train A Disch. Flow Inst. Isolation                | Non-Active               | None  |
| RNS-PL-V032B                                   | RNS Train B Disch. Flow Inst. Isolation                | Non-Active               | None  |
| RNS-PL-V034A                                   | RNS Pump A Discharge Pressure Inst. Isolation          | Non-Active               | None  |
| RNS-PL-V034B                                   | RNS Pump B Discharge Pressure Inst. Isolation          | Non-Active               | None  |
| RNS-PL-V036A                                   | RNS Pump A Suction Piping Drain Isolation              | Non-Active               | None  |
| RNS-PL-V036B                                   | RNS Pump B Suction Piping Drain Isolation              | Non-Active               | None  |
| RNS-PL-V048A                                   | RNS Pump Seal Cooler A Vent Isolation                  | Non-Active               | None  |
| RNS-PL-V048B                                   | RNS Pump Seal Cooler B Vent Isolation                  | Non-Active               | None  |
| RNS-PL-V049A                                   | RNS Pump Seal Cooler A Drain Isolation                 | Non-Active               | None  |
| RNS-PL-V049B                                   | RNS Pump Seal Cooler B Drain Isolation                 | Non-Active               | None  |
| RNS-PL-V050                                    | RNS Pump A Casing Drain Isolation                      | Non-Active               | None  |
| RNS-PL-V051                                    | RNS Pump B Casing Drain Isolation                      | Non-Active               | None  |
| RNS-PL-V055                                    | RNS Suction from Cask Loading Pit Isolation Valve      | Non-Active               | None  |
| RNS-PL-V057B                                   | RNS Train B Miniflow Isolation Valve                   | Non-Active               | None  |
| RNS-PL-V059                                    | RNS Pump Suction Containment Isolation Test Connection | Non-Active               | None  |
| RNS-PL-V065                                    | RNS Train A Disch. Drain Valve                         | Non-Active               | None  |
| RNS-PL-V071A                                   | RNS Heat Exchanger A Channel Head Drain Valve          | Non-Active               | None  |
| RNS-PL-V071B                                   | RNS Heat Exchanger B Channel Head Drain Valve          | Non-Active               | None  |

| <b>Table 1 - Flooded Safety-related Valves</b> |   |                          |   |
|--|---|--------------------------|---|
| <b>Tag number</b>                              | <b>Description</b>                              | <b>Active Component?</b> | <b>Comments</b>                               |
| RNS-PL-V072A                                   | RNS Heat Exchanger A Channel Head Drain Valve   | Non-Active               | None  |
| RNS-PL-V072B                                   | RNS Heat Exchanger B Channel Head Drain Valve   | Non-Active               | None  |
| RNS-PL-V073A                                   | RNS Heat Exchanger A Channel Head Drain Valve   | Non-Active               | None  |
| RNS-PL-V073B                                   | RNS Heat Exchanger B Channel Head Drain Valve   | Non-Active               | None  |
| RNS-PL-V074A                                   | RNS Heat Exchanger A Channel Head Drain Valve   | Non-Active               | None  |
| RNS-PL-V074B                                   | RNS Heat Exchanger B Channel Head Drain Valve   | Non-Active               | None  |
| RNS-PL-V075A                                   | RNS Heat Exchanger A Channel Head Drain Valve   | Non-Active               | None  |
| RNS-PL-V075B                                   | RNS Heat Exchanger B Channel Head Drain Valve   | Non-Active               | None  |
| SFS-PL-V040                                    | SFS Fuel Transfer Canal Suction Isolation       | Non-Active               | None  |
| SFS-PL-V041                                    | SFS Cask Loading Pit Suction Isolation          | Non-Active               | None  |
| SFS-PL-V042                                    | SFS Cask Loading Pit to Pumps Suction Isolation | Active                   | Manual Valve                                  |
| SGS-PL-V056B                                   | PT063 Root Isolation Valve                      | Non-Active               | None  |
| SGS-PL-V057A                                   | SG 1 Main Feedwater Isolation Valve             | Active                   | Valve operator / Limit switch are not flooded |
| SGS-PL-V057B                                   | SG 2 Main Feedwater Isolation Valve             | Active                   | Valve operator / Limit switch are not flooded |
| SGS-PL-V058A                                   | SG 1 Main Feedwater Check Valve                 | Non-Active               | None  |
| SGS-PL-V058B                                   | SG 2 Main Feedwater Check Valve                 | Non-Active               | None  |
| SGS-PL-V062A                                   | FT055A Root Isolation Valve                     | Non-Active               | None  |
| SGS-PL-V062B                                   | FT056A Root Isolation Valve                     | Non-Active               | None  |
| SGS-PL-V063A                                   | FT055A Root Isolation Valve                     | Non-Active               | None  |
| SGS-PL-V063B                                   | FT056A Root Isolation Valve                     | Non-Active               | None  |
| SGS-PL-V064A                                   | FT055B Root Isolation Valve                     | Non-Active               | None  |
| SGS-PL-V064B                                   | FT056B Root Isolation Valve                     | Non-Active               | None  |
| SGS-PL-V065A                                   | FT055B Root Isolation Valve                     | Non-Active               | None  |
| SGS-PL-V065B                                   | FT056B Root Isolation Valve                     | Non-Active               | None  |
| SGS-PL-V066A                                   | FT055C,D,E Root Isolation Valve                 | Non-Active               | None  |



| <b>Table 1 - Flooded Safety-related Valves</b> |  |                          |   |
|--|--|--------------------------|---|
| <b>Tag number</b>                              | <b>Description</b>                             | <b>Active Component?</b> | <b>Comments</b>                               |
| SGS-PL-V066B                                   | FT056C,D,E Root Isolation Valve                | Non-Active               | None  |
| SGS-PL-V067A                                   | SG 1 Startup Feedwater Isolation Valve         | Active                   | Valve operator / Limit switch are not flooded |
| SGS-PL-V067B                                   | SG 2 Startup Feedwater Isolation Valve         | Active                   | Valve operator / Limit switch are not flooded |
| SGS-PL-V068A                                   | FT055C,D,E Root Isolation Valve                | Non-Active               | None  |
| SGS-PL-V068B                                   | FT056C,D,E Root Isolation Valve                | Non-Active               | None  |
| SGS-PL-V100A                                   | SG 1 SFW Line Drain                            | Non-Active               | None  |
| SGS-PL-V100B                                   | SG 2 SFW Line Drain                            | Non-Active               | None  |
| SGS-PL-V101A                                   | SG 1 MFW Line Drain                            | Non-Active               | None  |
| SGS-PL-V101B                                   | SG 2 MFW Line Drain                            | Non-Active               | None  |
| SGS-PL-V102A                                   | SG 1 SFW Line Vent                             | Non-Active               | None  |
| SGS-PL-V102B                                   | SG 2 SFW Line Vent                             | Non-Active               | None  |
| SGS-PL-V103A                                   | SG 1 MFW Line Vent                             | Non-Active               | None  |
| SGS-PL-V104A                                   | SG 1 MFW Line Drain                            | Non-Active               | None  |
| SGS-PL-V104B                                   | SG 2 MFW Line Drain                            | Non-Active               | None  |
| SGS-PL-V250A                                   | SG 1 Main Feedwater Control Valve              | Active                   | Valve operator / Limit switch are not flooded |
| SGS-PL-V250B                                   | SG 2 Main Feedwater Control Valve              | Active                   | Valve operator / Limit switch are not flooded |
| SGS-PL-V255A                                   | SG 1 Startup Feedwater Control Valve           | Active                   | Valve operator / Limit switch are not flooded |
| SGS-PL-V255B                                   | SG 2 Startup Feedwater Control Valve           | Active                   | Valve operator / Limit switch are not flooded |
| SGS-PL-V256A                                   | SG 1 Startup Feedwater Check Valve             | Non-Active               | None  |
| SGS-PL-V256B                                   | SG 2 Startup Feedwater Check Valve             | Non-Active               | None  |
| VFS-PL-V003                                    | Containment Purge Inlet Containment Isol – ORC | Active                   | Valve operator / Limit switch are not flooded |
| WLS-PL-V057                                    | Sump Discharge Containment Isolation ORC       | Active                   | Valve operator / Limit switch are not flooded |

ND-17-1725

Enclosure 7

Response to NRC Request for Additional Information Regarding the LAR-17-010 Review  
(LAR-17-010S2)

| <b>Table 1 - Flooded Safety-related Valves</b> |   |                          |   |
|--|---|--------------------------|---|
| <b>Tag number</b>                              | <b>Description</b>                                      | <b>Active Component?</b> | <b>Comments</b>                               |
| WLS-PL-V068                                    | RCDT Gas Outlet Containment Isolation ORC               | Active                   | Valve operator / Limit switch are not flooded |
| RNS-PL-V056                                    | RNS Suction from Cask Loading Pit Check Valve           | Non-Active               | None  |
| RNS-PL-V081                                    | RNS Cask Loading Pit Suction Line Vent                  | Non-Active               | None  |
| SFS-PL-V028                                    | LT020 Root Isolation Valve                              | Non-Active               | None  |
| SFS-PL-V043                                    | Cask Loading Pit Level Transmitter Root Isolation Valve | Non-Active               | None  |
| SFS-PL-V045                                    | SFS Discharge Line To Cask Loading Pit Isolation        | Active                   | Manual Valve                                  |
| SFS-PL-V049                                    | SFS Cask Loading Pit Drain to WLS Isolation             | Active                   | Manual Valve                                  |
| SFS-PL-V066                                    | SFS Spent Fuel Pool to Cask Washdown Pit Isolation      | Active                   | Manual Valve                                  |
| SFS-PL-V068                                    | SFS Cask Washdown Pit Drain Isolation                   | Active                   | Manual Valve                                  |

**Question 7 (SEB):**

The response to items a), b) and c) provided in LAR-17-010S1 are revised as indicated below. Changes are shown in redline/strikeout.

- a) In addition to the information provided August 21, 2017, via ND-17-1465:

Table 2 provides PRHA and tank/vessel rupture flood heights for rooms in the radiologically controlled area (RCA) of the Auxiliary Building. Figures 1 through 5 correlate the rooms listed in Table 2 to rooms and wall thicknesses shown in UFSAR Section 3.7, Figure 3.7.2-12, Sheets 1 through 5 for nuclear island key structural dimensions.

Note that Table 2 is Proprietary Information and the figures are security related information. As such, these are provided in Enclosure 11 and requested to be withheld from public disclosure.

- b) In addition to the information provided August 21, 2017, via ND-17-1465:

Auxiliary Building walls within the RCA were reviewed from EL 66'-6" to EL 100'-0". The walls containing elements with the highest peak demand ratios are as follows:

| Direction  | Wall | Elevation | Maximum Demand Ratio | Load Combination                 |
|------------|------|-----------|----------------------|----------------------------------|
| Horizontal | 1    | 82'-6"    | 0.999                | LC 7<br>(SSE + Accident Thermal) |
| Vertical   | 1    | 66'-6"    | 0.996                | LC 7<br>(SSE + Accident Thermal) |

The maximum peak calculated demand ratios are less than 1. The methodology and inputs used to perform the wall calculations are conservative. When the demand ratio is less than 1, there is no need to refine the calculations for additional margin. Load Combination 4, which includes flooding, does not govern these walls.

- c) The information provided August 21, 2017, via ND-17-1465, is revised as shown below:

The Auxiliary Building stairwell S04 louvers are devices that, in the event of a 4-inch fire protection system moderate-energy line break in stairwell S04 (Room 12S04), allow water to flow into the adjacent corridor, Room 12161, and limit the flood height within the stairwell below the maximum flood height.

The louvers are located at elevation 66'-6". The Auxiliary Building stairwell S04 louver dampers are to open and remain open when the differential pressure exceeds 1.3 psi.

The louver is categorized as AP1000 equipment classification C, seismic Category I, with principal design and construction code AISC N690. The louver frame is attached to the floor using anchor bolts. The louver is fastened to the concrete in accordance with ACI

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Enclosure 7

Response to NRC Request for Additional Information Regarding the LAR-17-010 Review  
(LAR-17-010S2)

349-01, Appendix B, "Anchoring to Concrete." The louver is constructed with bolts that meet ASTM A193, "Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service".

The Auxiliary Building stairwell S04 louvers also function as a fire protection barrier with a rating of 2.0 hours, per UFSAR Figure 9A-1. Sealant is applied around the assembly to create a sealed boundary around the frame and the wall and meet the fire requirements.

d) Response to item d) is unchanged.

e) Response to item e) is unchanged.

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Enclosure 7

Response to NRC Request for Additional Information Regarding the LAR-17-010 Review  
(LAR-17-010S2)

Supplemental Revision to Original LAR Enclosure 1.

- Listing of Changes to UFSAR Table 3D.5-4

SNC has determined that the original LAR Enclosure 1, page 31 of 40, inadvertently omitted Room 12158 in the list of affected rooms.

The pertinent revised listing item identifying the Plant-Specific Changes is provided in redline format below.

UFSAR Table 3D.5-4

Add flood levels and considerations for flooded/wetted condition in Rooms 12154, 12156, 12158, 12258, and 12452.

**Southern Nuclear Operating Company**

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**Enclosure 8**

**Vogtle Electric Generating Plant (VEGP) Units 3 and 4**

**Revised Proposed Changes to Licensing Basis Documents  
(Publicly Available Information)**

**(LAR-17-010S2)**

**(This Enclosure consists of 2 pages, including this cover page.)**

**UFSAR Section 3.11, Table 3.11-1, as provided in LAR-17-010, (ND-17-0496) Enclosure 3, page 15 of 30, is revised as shown below.**

| Description                    | AP1000 Tag No. | Envir. Zone (Note 2) | Function (Note 1) | Operating Time Required (Note 5) | Qualification Program (Note 6) |
|--------------------------------|----------------|----------------------|-------------------|----------------------------------|--------------------------------|
| * * *                          | * * *          | * * *                | * * *             | * * *                            | * * *                          |
| <b>ACTIVE VALVES</b>           |                |                      |                   |                                  |                                |
| * * *                          | * * *          | * * *                | * * *             | * * *                            | * * *                          |
| Sump Containment Isolation ORC | WLS-PL-V057    | 7                    | ESF               | 5 min                            | M <del>S</del> ** <u>S</u>     |
| Limit Switch                   | WLS-PL-V057-L  | 7                    | PAMS              | 2 wks                            | E ** <del>S</del>              |
| Solenoid Valve                 | WLS-PL-V057-S1 | 7                    | ESF               | 5 min                            | E **                           |
| * * *                          | * * *          | * * *                | * * *             | * * *                            | * * *                          |
| RCDT Gas Containment Isolation | WLS-PL-V068    | 7                    | ESF               | 5 min                            | M <del>S</del> ** <u>S</u>     |
| Limit Switch                   | WLS-PL-V068-L  | 7                    | PAMS              | 2 wks                            | E ** <del>S</del>              |
| Solenoid Valve                 | WLS-PL-V068-S1 | 7                    | ESF               | 5 min                            | E **                           |
| * * *                          | * * *          | * * *                | * * *             | * * *                            | * * *                          |

**Southern Nuclear Operating Company**

**ND-17-1725**

**Enclosure 9**

**Vogtle Electric Generating Plant (VEGP)Units 3 and 4**

**Affidavit from Southern Nuclear Operating Company for Withholding Under 10 CFR 2.390**

**(LAR-17-010S2)**

**(This Enclosure consists of 2 pages, plus this cover page.)**



Affidavit of Brian H. Whitley

1. My name is Brian H. Whitley. I am the Regulatory Affairs Director for Southern Nuclear Operating Company (SNC). I have been delegated the function of reviewing proprietary information sought to be withheld from public disclosure and am authorized to apply for its withholding on behalf of SNC.
2. I am making this affidavit on personal knowledge, in conformance with the provisions of 10 CFR Section 2.390 of the Commission's regulations, and in conjunction with SNC's filing on dockets 52-025 and 52-026, Vogtle Electric Generating Plant Units 3 and 4, Supplement to Request for License Amendment and Exemption: Pipe Rupture Hazard and Flooding Analysis (LAR-17-010S2). I have personal knowledge of the criteria and procedures used by SNC to designate information as a trade secret, privileged or as confidential commercial or financial information.
3. Based on the reason(s) at 10 CFR 2.390(a)(4), this affidavit seeks to withhold from public disclosure Enclosure 11 of Vogtle Electric Generating Plant Units 3 and 4, Supplement to Request for License Amendment and Exemption: Pipe Rupture Hazard and Flooding Analysis (LAR-17-010S2).
4. The following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.
  - a. The information sought to be withheld from public disclosure has been held in confidence by SNC and Westinghouse Electric Company.
  - b. The information is of a type customarily held in confidence by SNC and Westinghouse Electric Company and not customarily disclosed to the public

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Enclosure 9

Affidavit from Southern Nuclear Operating Company for Withholding Under 10 CFR 2.390  
(LAR-17-010S2)

- c. The release of the information might result in the loss of an existing or potential competitive advantage to SNC and/or Westinghouse Electric Company.
  - d. Other reasons identified by Westinghouse Electric Company in Enclosure 10 of Vogtle Electric Generating Plant Units 3 and 4, Supplement to Request for License Amendment and Exemption: Pipe Rupture Hazard and Flooding Analysis (LAR-17-010S2) (dockets 52-025 and 52-026), and those reasons are incorporated here by reference.
5. Additionally, release of the information may harm SNC because SNC has a contractual relationship with the Westinghouse Electric Company regarding proprietary information. SNC is contractually obligated to seek confidential and proprietary treatment of the information.
  6. 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.
  7. To the best of my knowledge and belief, 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.

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

  
\_\_\_\_\_  
Brian H. Whitley

Executed on 10/9/17  
Date

**Southern Nuclear Operating Company**

**ND-17-1725**

**Enclosure 10**

**Vogtle Electric Generating Plant (VEGP) Units 3 and 4**

**Westinghouse Authorization Letter CAW-17-4607 Affidavit and  
Proprietary Information Notice and Copyright Notice**

**(LAR-17-010S2)**

**(This Enclosure consists of 6 pages, plus this cover page.)**

October 4, 2017

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 declare 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

Date: 10/4/17

- (1) I am Director, 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 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, 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-57G P-Attachment, "RAI for LAR-17-010 SPSB, Flood Projection" (Proprietary), for submittal to the Commission, being transmitted by Southern Nuclear Company letter. The proprietary information as submitted by Westinghouse is that associated with Pipe Rupture Hazards Analysis (PRHA) Flooding Changes in the Auxiliary Building, and may be used only for that purpose.
- (a) This information is part of that which will enable Westinghouse to:
    - (i) Create and update auxiliary building 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 designing auxiliary building designs.
- (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/or non-proprietary versions of documents 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).

### **COPYRIGHT NOTICE**

The reports transmitted herewith each bear a Westinghouse copyright notice. The NRC is permitted to make the number of copies of the information contained in these reports which are necessary for its internal use in connection with generic and plant-specific reviews and approvals as well as the issuance, denial, amendment, transfer, renewal, modification, suspension, revocation, or violation of a license, permit, order, or regulation subject to the requirements of 10 CFR 2.390 regarding restrictions on public disclosure to the extent such information has been identified as proprietary by Westinghouse, copyright protection notwithstanding. With respect to the non-proprietary versions of these reports, the NRC is permitted to make the number of copies beyond those necessary for its internal use which are necessary in order to have one copy available for public viewing in the appropriate docket files in the public document room in Washington, DC and in local public document rooms as may be required by NRC regulations if the number of copies submitted is insufficient for this purpose. Copies made by the NRC must include the copyright notice in all instances and the proprietary notice if the original was identified as proprietary.

**Southern Nuclear Operating Company**

**ND-17-1725**

**Enclosure 11**

**Vogtle Electric Generating Plant (VEGP) Units 3 and 4**

**Revised Proposed Changes to Licensing Basis Documents  
(WITHHELD from Public Disclosure)**

**(LAR-17-010S2)**

**(This Enclosure consists of 9 pages, including this cover page.)**