

November 30, 2017

Docket Nos.: 52-025
52-026

ND-17-1955
10 CFR 50.90
10 CFR 52.63

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

Southern Nuclear Operating Company
Vogtle Electric Generating Plant Units 3 and 4
Request for License Amendment and Exemption:
Tier 1 and Tier 2* Editorial and Consistency Changes (LAR-17-042)

Ladies and Gentlemen:

Pursuant to 10 CFR 52.98(c) and in accordance with 10 CFR 50.90, Southern Nuclear Operating Company (SNC), the licensee for Vogtle Electric Generating Plant (VEGP) Units 3 and 4, requests an amendment to Combined License Numbers NPF-91 and NPF-92, for VEGP Units 3 and 4, respectively. The requested amendment includes changes to the Updated Final Safety Analysis Report (UFSAR) in the form of departures from the incorporated plant-specific Design Control Document (DCD) Tier 2* and Tier 2 information and related changes to the VEGP Units 3 and 4 COL Appendix C (and corresponding plant-specific DCD 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 Tier 1 material departures.

The requested amendment involves editorial changes to promote consistency within the information presented in COL Appendix C (and corresponding plant-specific Tier 1) and the UFSAR.

Enclosure 1 provides the description, technical evaluation, regulatory evaluation (including the Significant Hazards Consideration Determination), and environmental considerations for the proposed changes in the License Amendment Request (LAR).

Enclosure 2 provides the background and supporting basis for the requested exemption.

Enclosure 3 provides the proposed changes to the VEGP 3&4 licensing basis documents.

Enclosure 4 provides the proposed changes to the VEGP 3&4 licensing basis documents, which are considered proprietary information.

Enclosure 5 provides the proprietary version of incorporated by reference (IBR'd) document, APP-OCS-GEH-220 Rev. 5 "AP1000 Human Factors Engineering Task Support Verification Plan."

Enclosures 4 and 5 contain information that is considered proprietary; therefore, Enclosures 4 and 5 are requested to be withheld from disclosure to the public under 10 CFR 2.390.

Enclosure 6 provides the non-proprietary version of the IBR'd document, APP-OCS-GEH-222 Rev. 5 "AP1000 Human Factors Engineering Task Support Verification Plan."

An affidavit from SNC supporting withholding under 10 CFR 2.390 is provided as Enclosure 7. Enclosure 8 is Westinghouse's Proprietary Information Notice, Copyright Notice and CAW-17-4653, 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 that 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-17-4653 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 within this letter.

This letter has been reviewed and confirmed to not contain security-related information. This letter contains no regulatory commitments.

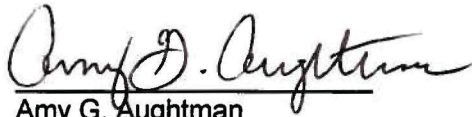
SNC requests staff approval of this license amendment by November 30th, 2018, to support closure of VEGP Units 3 and 4 Inspections, Tests, Analyses and Acceptance Criteria (ITAAC). Approval by this date will allow sufficient time to implement the licensing basis changes prior to the associated ITAAC activity. SNC expects to implement this proposed amendment (through incorporation into the licensing basis documents; e.g., the UFSAR) 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 by transmitting a copy of this letter and enclosures to the designated State Official.

Should you have any questions, please contact Ms. Paige Ridgway at (205) 992-7516.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 30th of November 2017.

Respectfully submitted,



Amy G. Aughtman
Nuclear Development Licensing Director, Regulatory Affairs
Southern Nuclear Operating Company

- Enclosures: 1) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 - Request for License Amendment: Tier 1 and Tier 2* Editorial and Consistency Changes (LAR-17-042)
- 2) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 - Exemption Request: Tier 1 and Tier 2* Editorial and Consistency Changes (LAR-17-042)
- 3) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 - Proposed Changes to the Licensing Basis Documents (LAR-17-042)
- 4) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 - Proposed Changes to the Licensing Basis Documents (LAR-17-042) **(Withheld Information)**
- 5) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – APP-OCS-GEH-220 Rev. 5 “AP1000 Human Factors Engineering Task Support Verification Plan” (LAR-17-042) **(Withheld Information)**
- 6) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – APP-OCS-GEH-222 Rev. 5 “AP1000 Human Factors Engineering Task Support Verification Plan” (LAR-17-042)
- 7) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Affidavit from Southern Nuclear Operating Company for Withholding Under 10 CFR 2.390 (LAR-17-042)
- 8) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Westinghouse Authorization Letter CAW-17-4653, Affidavit, Proprietary Information Notice and Copyright Notice

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Southern Nuclear Operating Company

ND-17-1955

Enclosure 1

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Request for License Amendment:

Tier 1 and Tier 2* Editorial and Consistency Changes

(LAR-17-042)

(Enclosure 1 consists of 19 pages, including this cover page.)

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Pursuant to 10 CFR 52.98(c) and in accordance with 10 CFR 50.90, Southern Nuclear Operating Company (SNC, or the "Licensee") hereby requests an amendment to Combined License (COL) Nos. NPF-91 and NPF-92 for Vogtle Electric Generating Plant (VEGP) Units 3 and 4, respectively.

1. SUMMARY DESCRIPTION

The requested amendment consists of multiple non-technical editorial changes, which provide consistency within the licensing basis. The proposed changes impact COL Appendix C (and associated plant-specific Tier 1) and Tier 2 and Tier 2* information in the Updated Final Safety Analysis Report (UFSAR).

The requested amendment requires changes to the UFSAR in the form of departures from the plant-specific DCD Tier 2 and Tier 2* information (as detailed in Section 2) and involves changes to COL Appendix C. This enclosure requests approval of the license amendment necessary to implement the COL Appendix C changes and the involved UFSAR changes. Another enclosure requests the exemption necessary to implement the involved changes to the Tier 1 information.

2. COMBINED DETAILED DESCRIPTION AND TECHNICAL EVALUATION

Design descriptions in the UFSAR are derived from plant design documents. 10 CFR 52, Appendix D, Section II.D states that Tier 1 design information is "derived from Tier 2 information." However, certain specific occurrences have been identified in which COL Appendix C (and associated plant-specific Tier 1) information is not consistent with its associated UFSAR design information. In addition, several editorial changes in COL Appendix C and Tier 2* information in the UFSAR are being proposed. The editorial and consistency changes described below are being made to enhance reader understanding of the information already included in the licensing basis.

1. Personnel Hatch and Radiation Monitor Elevation Discrepancies

Upper personnel hatch (CNS-MY-Y03) and lower personnel hatch (CNS-MY-Y04) are provided to allow personnel to enter containment at the 135'-3" and the 107'-2" elevations, respectively. To monitor radiation and limit radioactive release outside of containment, radiation monitors are provided inside the personnel hatches. The upper personnel hatch contains radiation monitor RMS-RE009 and the lower personnel hatch contains radiation monitor RMS-RE021.

COL Appendix C and the UFSAR inconsistently list the design details related to the personnel hatches and radiation monitoring equipment inside the hatches. Firstly, it was identified that COL Appendix C Table 2.2.1-1, UFSAR Table 3.2-3, and UFSAR Table 6.2.3-1 reference personnel hatches leading into containment, without clarification of which hatch is referenced (upper or lower). A clarification change is proposed to clearly differentiate between the upper personnel hatch (CNS-MY-Y03) and the lower personnel hatch (CNS-MY-Y04) in the three tables listed above. This change is consistent with the elevations for the hatches presented in UFSAR Table 3.2-3, which indicates that CNS-MY-Y03 is the tag number of the upper personnel hatch and CNS-MY-Y04 is the tag number of the lower personnel hatch. Additionally, COL Appendix C Table 3.5-5 and UFSAR Table 11.5-2 are revised to differentiate

between the upper and lower personnel hatches, and the elevations of both hatches are removed, since the elevations in the tables are no longer needed to distinguish between the hatches.

Secondly, it was identified that the elevations of each of the personnel hatches and associated radiation monitors are inconsistently listed in COL Appendix C Figure 2.2.1-1. The upper hatch is located at an elevation of 135'-3" and the lower hatch is located at an elevation of 107'-2", as indicated in UFSAR Figure 1.2-7, Figure 1.2-10, and Table 3.2-3. Therefore, it is proposed to revise COL Appendix C Figure 2.2.1-1 to correct the hatch elevations.

Lastly, an editorial change is proposed to COL Appendix C Figure 2.2.1-1. This figure identifies that the lower personnel hatch (CNS-MY-Y04) has a penetration tag number of H04 and the upper personnel hatch (CNS-MY-Y03) has a penetration tag number of H03. It is proposed to switch the personnel hatch numbers (H03 and H04) for these personnel hatches, so that the upper hatch corresponds to penetration tag number H04 and the lower hatch corresponds to penetration tag number H03. This is a purely editorial change which does not affect a design function related to the upper or lower containment penetrations at the personnel hatches. Inspections, tests, analyses, and acceptance criteria (ITAAC) related to the personnel hatches remain unaffected by this change because the personnel hatch tag numbers in the figure are not impacted by this change.

2. PMS Class 1E Display Discrepancies

The protection and safety monitoring system (PMS) provides safety-related display information for those important variables and components in the reactor coolant system (RCS), the secondary heat removal system, the containment, and the systems used for attaining a safe shutdown condition. Additionally, the post-accident monitoring instrumentation system (PAMS) provides the capability to monitor plant variables and system operating status during and following an accident. The qualified data processing system (QDPS) of the PMS provides data to support the safety-related display of selected parameters in the control room.

Information that is included as part of the PMS safety-related displays is, in some cases, inconsistently listed throughout the licensing basis.

COL Appendix C Table 2.2.5-1 indicates that valves, VES-PL-V005A/B and VES-PL-V022A/B, are not included as part of the PMS safety-related displays. However, these valves are Class 1E components that have component position feedback status on the safety displays as required for PAMS. This information is reflected in UFSAR Table 3.9-16, which indicates that each of these valves has remote position indication. Additionally, UFSAR Tables 3.11-1 and 7.5-1 list a "PAMS" function for these valves, with QDPS indication provided. The "PAMS" function refers to those components which provide the capability to monitor plant variables and system operating status during and following an accident. Therefore, it is proposed to update COL Appendix C Table 2.2.5-1 to show the valves as included with the PMS safety-related displays.

COL Appendix C Table 2.6.1-1 indicates that the reactor coolant pump (RCP) circuit breakers (ECS-ES-31/-32/-41/-42/-51/-52/-61/-62) are not included as part of the PMS

safety-related displays. The RCP circuit breakers are Class 1E components which have a position feedback status as required for PAMS. The breakers are shown as part of the PMS safety-related displays in COL Appendix C Table 2.1.2-3. Additionally, the circuit breakers are listed with PAMS functionality and QDPS indication provided as identified in UFSAR Tables 3.11-1 and 7.5-1. Therefore, it is proposed to update COL Appendix C Table 2.6.1-1 to show the RCP circuit breakers as included with the PMS safety-related displays.

The main control room (MCR) supply air radiation monitoring packages A and B each consist of a particulate detector, an iodine detector, and a gaseous radiation detector. COL Appendix C Table 3.5-1 and UFSAR Table 7.5-1 list the MCR supply air radiation monitoring packages as not being included as part of the PAMS displays. The MCR radiation monitors are included as part of the Class 1E QDPS, as required for PAMS. The MCR supply air radiation monitors are shown as PAMS components in UFSAR Table 3.11-1 and are discussed as being part of the Class 1E displays in UFSAR Subsection 11.5.2.3.1 and in UFSAR Figure 11.5-6. Therefore, it is proposed to update COL Appendix C Table 3.5-1 and UFSAR Table 7.5-1 to show MCR supply air radiation monitoring packages A and B as having QDPS indication.

Lastly, COL Appendix C Table 2.1.2-1 identifies RCS components which are designed and constructed in accordance with American Society of Mechanical Engineers (ASME) Code Section III requirements. Safety-related displays identified in Table 2.1.2-1 can be retrieved in the MCR. Three components, as described below, are currently shown in Table 2.1.2-1 as not being included as part of the PMS safety-related displays.

- a) RCP bearing water temperature sensors (RCS-TE211A/B/C/D, RCS-TE212A/B/C/D, RCS-TE213A/B/C/D, and RCS-TE214A/B/C/D)

The RCP bearing water temperature sensors are listed as part of the safety-related displays in UFSAR Subsection 5.2.5.6 and UFSAR Table 7.5-1, therefore, a consistency change is proposed to Table 2.1.2-1 to include these components.

- b) RCP speed sensors (RCS-ST281, RCS-ST282, RCS-ST283, and RCS-ST284)

These channels are used as inputs into the PMS to initiate a reactor trip on low RCS flow to preclude a departure from nucleate boiling in the core. This information is used to determine the safety status of the plant and, therefore, it is required to be on the safety-related displays. As such, a change is proposed to Table 2.1.2-1 to list these components as having a safety-related display.

- c) RCS hot leg flow sensors (RCS-FT101A/B/C/D and RCS-FT102A/B/C/D)

These channels are used as inputs into the PMS to initiate a reactor trip on low RCP speed to preclude a departure from nucleate boiling in the core. This information is used to determine the safety status of the plant and, therefore, it is required to be on the safety-related displays. As such, a change is proposed to Table 2.1.2-1 to list these components as having a safety-related display.

The changes above are consistency changes. As discussed in UFSAR Subsection 7.1.2.12, safety-related display instrumentation provides the operator with information to determine the effect of automatic and manual actions taken following reactor trip due to a Condition II, III, or IV event as defined in UFSAR Chapter 15. The RCP speed sensors and RCS hot leg flow sensors are used as inputs to initiate a trip on low RCP speed and low RCS flow, respectively, as discussed in the safety analyses, and can be used to assess the effect of operator actions following the events described in the safety analyses. Additionally, PMS functional diagrams for RCP speed sensors and the RCS hot leg flow sensors designate that the valve position indicators have qualified indication (QI) outputs. A QI point is used when the functional designer determines the signal should be available on the safety displays based upon consideration of plant operations during all operating modes, process variable inputs to the protection system, and internally calculated variables that provide useful information to the operator concerning the status of the plant.

3. Relief Valve (CVS-PL-V058) Inconsistency

Chemical and volume control system (CVS) relief valve CVS-PL-V058 protects the containment boundary between the inboard and outboard containment isolation valves on the CVS letdown line from thermal overpressurization. This valve relieves bottled fluid to the containment floor when the setpoint is reached.

This valve is included in COL Appendix C Figure 2.2.1-1 and Table 2.3.2-1 and in UFSAR Table 3.2-3 and Figure 9.3.6-1 but it was not included in the depiction of the CVS in COL Appendix C Figure 2.3.2-1. Therefore, this valve is added to COL Appendix C Figure 2.3.3-1 for consistency with other Figures and Tables in COL Appendix C and the UFSAR.

4. Code Case N-122-2 Title Discrepancy

UFSAR Table 5.2-3 contains a list of the ASME code cases which are used in the AP1000 design. Code Case N-122-2 is listed in this table with a title of "Stress Indices for Integral Structural Attachments Section III, Division 1, Class 1". However, the actual title of Code Case N-122-2 is "Procedure for Evaluation of the Design of Rectangular Cross Section Attachments on Class 1 Piping Section III, Division 1". Therefore, it is proposed to make an editorial change to the title of Code Case N-122-2 listed in UFSAR Table 5.2-3.

5. Tie Bar Yield Strength Change

The shield building is the structure and annulus area that surrounds the containment building. It shares a common basemat with the containment building and the auxiliary building. The shield building uses concrete-filled steel plate construction as well as reinforced concrete structure. The AP1000 design uses American Concrete Institute (ACI) Standard 349-01 as the applicable code for reinforced concrete design, as discussed in UFSAR Appendix A, Regulatory Guide (RG) 1.142 and throughout UFSAR Section 3.8. The shield building concrete-filled steel plate walls are anchored to the basemat and shield building concrete composite wall by mechanical connections, and these connections are discussed in Tier 2* incorporated by reference (IBR'd) document, APP-GW-GLR-602 (proprietary version) and APP-GW-GLR-603 (non-proprietary version) [ADAMS Accession Number ML110910541].

UFSAR Subsection 3.8.4.5.5.5 contains a discrepancy in the discussion of tie bar yield strength. UFSAR Subsection 3.8.4.5.5.5 states that, "the connection between the tie bars and the steel faceplates is designed to develop the full tensile strength of the tie bar." This text conflicts with the design of the shield building tie bars as discussed in APP-GW-GLR-602/-603, which states that, "tie bars are welded to the steel face plates using a weld detail that will develop 125% of the specified yield of the bar." A review of ACI 349-01 has indicated that the correct performance requirement of the tie bars is 125% of the specified yield strength of the bar.

UFSAR Subsection 3.8.4.5.5.5 is changed to state that the connection between the tie bar and the steel faceplates is designed to develop 125% of the specified yield strength of the tie bars. This consistency change aligns the design in UFSAR Subsection 3.8.4.5.5.5 with the design in IBR'd document, APP-GW-GLR-602/-603. The AP1000 uses industry standards as identified in ACI 349-01 for the design of safety-related concrete structures located outside of containment. This tie bar design meets the design requirements identified in ACI 349-01.

6. Remote Shutdown Workstation Minimum Inventory

The MCR and remote shutdown workstation (RSW) include appropriate plant displays, alarms, and controls needed to support a broad range of expected power generation, shutdown, and accident mitigation operations. During certain improbable weather conditions, it is possible for the pressure in the containment building to drop significantly below the outside atmospheric pressure if the containment purge inlet isolation valves are not open. The containment vacuum relief isolation valves can be opened to limit the negative pressure differential that can develop to prevent structural damage to the containment shell. Automatic and manual actuation signals can be used to open the containment vacuum relief isolation valves. Manual containment vacuum relief switches are included in both the MCR and RSW.

Containment vacuum relief switches are included in the minimum inventory of controls for both the MCR and RSW. One containment relief switch is available at each location, and actuation of each switch actuates manual containment vacuum relief. UFSAR Subsection 7.3.1.2.26, Table 7.3-1, Table 7.3-3, and Figure 7.2-1 support this design by discussing the two momentary controls which can be used for manual containment vacuum relief. Additionally, COL Appendix C Table 2.5.2-5 identifies that one of the manual containment vacuum relief switches is included in the MCR minimum inventory of controls.

The description of manual containment vacuum relief switches in the minimum inventory of controls which are included on the RSW is inconsistently listed in the licensing basis. COL Appendix C Table 2.5.4-1 and UFSAR Table 18.12.2-1 do not specifically list the manual containment vacuum relief switch with the minimum inventory of controls that is to be included on the RSW. For consistency with the design as described in UFSAR Chapter 7, the manual containment vacuum relief switches are added to the description of controls available in the RSW in COL Appendix C Table 2.5.4-1 and UFSAR Table 18.12.2-1.

7. Inconsistent Terminology for RNS Pump Manual Controls

The normal residual heat removal system (RNS) removes both residual and sensible heat from the RCS. The RNS includes two mechanical trains, and each train includes one RNS pump and one RNS heat exchanger located in the auxiliary building. RNS Pumps 1A and 1B have controls in the MCR which can be used to manually start the pumps.

The discussion of RNS pump manual controls within COL Appendix C Section 2.3.6 contains inconsistent terminology. COL Appendix C Table 2.3.6-4 contains discussion of a required "listed action" and "listed function" for the pumps, and this table cross references Table 2.3.6-3 as the location of the "listed action" and "listed function" in the design commitment and acceptance criteria for the ITAAC. However, similar text in Table 2.3.6-3 references a "control function" for the pump.

To enhance reader understanding and provide consistency with COL Appendix C terminology, it is proposed to change COL Appendix C Table 2.3.6-4 and Subsection 2.3.6 to replace "listed action" and "listed function" with "control function" for consistency with the description in COL Appendix C Table 2.3.6-3.

8. CVS Piping/Component Tier 1 Inconsistency

The COL Appendix C Table 2.3.2-4, item 14, design commitment and acceptance criteria both reference nonsafety-related CVS piping located inside containment and designed as a reactor coolant pressure boundary. Additionally, the acceptance criteria references Table 2.3.2-2, which includes a list of CVS piping lines and indication of whether they comply with ASME Section III requirements.

COL Appendix C Table 2.3.2-4, item 14, indicates that "inspection will be conducted of the as-built components as documented in the CVS Seismic Analysis Report". It is not appropriate to reference as-built components in this section, since this ITAAC intends to verify the design of CVS piping. Therefore, it is proposed to change item 14 in COL Appendix C Table 2.3.2-4 to state that "Inspection will be conducted of the as-built piping as documented in the CVS Seismic Analysis Report".

9. APP-OCS-GEH-220 Consistency Changes

APP-OCS-GEH-220 "AP1000 Human Factors Engineering Task Support Verification Plan" (and non-proprietary version APP-OCS-GEH-222) is a Tier 2* IBR'd document in UFSAR Subsection 18.11.2. The purpose of this document is to define the human factors engineering (HFE) task support verification plan for the AP1000 plant. Operational sequence analysis (OSA) is one of the main task analysis activities identified in the AP1000 HFE Program Plan. There are two separate parts to the OSA: OSA-1 and OSA-2. OSA-1 focuses on the operational requirements and task demands in terms of the operator actions and/or processes necessary to complete the required AP1000 control and monitoring tasks, abnormal/emergency tasks, and maintenance, testing, surveillance, and inspection tasks for a selection of operator tasks. OSA-2 addresses post-accident risk important human actions.

APP-OCS-GEH-220 contains discrepancies related to the scope of OSA-1 and OSA-2. UFSAR Subsections 18.5.2.2, 18.5.2.3, 18.5.2.4, and 18.5.2.5 contain an accurate description of the OSA-1 and OSA-2 verification activities. Therefore, it is proposed to change the scope of OSA-1 and OSA-2 as discussed within APP-OCS-GEH-220 for consistency with these UFSAR subsections. This portion of the change is a Tier 2* change, per the guidance of Note 2 in UFSAR Subsection 18.11.2. Additionally, as a result of this change, APP-OCS-GEH-220 is updated to Revision 5 in UFSAR Table 1.6-1 and Subsection 18.11.2. This is a Tier 2 change, per the guidance in UFSAR Subsection 18.11.2; however, this change is related to the Tier 2* change discussed above.

10. WWS-PL-L851 Description Clarification

Waste water system (WWS) lines, WWS-PL-L808 and WWS-PL-L851, are included in COL Appendix C Table 2.7.1-2 as pipe lines which must be designed to ASME Section III standards to maintain containment isolation functions. Both of these lines are waste water lines which extend through containment and drain into the WWS sumps. However, WWS-PL-L808 has been added to Table 2.7.1-2 as “Main Control Room Waste Water Line,” and WWS-PL-L851 has been added to the table with the line name “Main Control Room Water Line.”

The name of WWS-PL-L851 in COL Appendix C Table 2.7.1-2 is changed to “Main Control Room Waste Water Line” to enhance reader understanding with respect to the design function of WWS-PL-L851 and to provide consistency with the naming of similar piping WWS-PL-L808. This is a clarification change that only changes the title of WWS-PL-L851 in COL Appendix C Table 2.7.1-2.

11. Addition of Header to COL Appendix C Table 3.5-5

COL Appendix C Table 3.5-5, “Area Radiation Monitors,” is missing headers within the table for both of its columns. The columns are meant to indicate the “Equipment List” and the “Equipment Number,” consistent with the other tables under COL Appendix C Section 3.5. Therefore, it is proposed to add these headers to their respective columns within COL Appendix C Table 3.5-5. This is an editorial change to add appropriate headers to the table.

12. References to 10 CFR 52.47

Plant-specific Tier 1 Section 4.0 currently references 10 CFR 52.47(a)(1)(vii) as the appropriate regulation which specifies that interface requirements must be included in an application for design certification. Additionally, plant-specific Tier 1 Section 4.0 references 10 CFR 52.47(a)(1)(viii) as the appropriate regulation which specifies that those interface requirements must be verifiable through inspection, testing, or analysis. In each of the cases above, the plant-specific Tier 1 text references a section of 10 CFR 52.47 which does not exist. Both of the plant-specific Tier 1 sections above, along with appropriate UFSAR information, must update references to 10 CFR 52.47 to instead reference the correct 10 CFR 52.47 subsections which discuss this information.

Plant-specific Tier 1 Section 4.0 is changed to reference 10 CFR 52.47(a)(25) as the appropriate regulation which specifies that interface requirements must be included in an application for design certification. Plant-specific Tier 1 Section 4.0 is also changed to reference CFR 52.47(a)(26) as the appropriate regulation which specifies that those interface requirements must be verifiable through inspection, testing, or analysis.

Conforming UFSAR Sections 1.2, 1.8, 14.3, 14.3.4, and 14.3.5 are updated to reference 10 CFR 52.47(a)(25) instead of 10 CFR 52.47 (a)(1)(iii), 10 CFR 52.47 (a)(1)(vii), 10 CFR 52.47(a)(1)(viii), and 10 CFR 52.47(a)(1)(ix) as the appropriate regulation for interface requirements to be included in an application for design certification. Additionally, conforming UFSAR Section 14.3 is changed to reference 10 CFR 52.47(a)(26) as the appropriate regulation which specifies that those interface requirements must be verifiable through inspection, testing, or analysis.

Since Section 4.0 is only contained in plant-specific Tier 1, there would be no corresponding change to COL Appendix C.

13. RCS-PL-V010A/B Class 1E Power Discrepancy

The common discharge line for each group of automatic depressurization system (ADS) valves on the pressurizer is equipped with a vacuum breaker to maintain an atmospheric discharge piping pressure following valve discharges, which prevents water from being siphoned into the ADS discharge sparger from the in containment refueling water storage tank (IRWST) as steam in the pipe cools and condenses following valve discharge. The ADS discharge header vacuum relief valves, RCS-PL-V010A/B, prevent a vacuum from forming in ADS discharge piping due to steam condensation and prevent a vacuum formation during RCS draindown operations during plant shutdown. Each valve is designed with a set pressure of -0.5 psig and, therefore, the valves will automatically perform their active function once this pressure setpoint is reached.

Valves, RCS-PL-V010A/B, are currently listed in COL Appendix C Table 2.1.2-1 as being powered from a Class 1E power source. As discussed in UFSAR Table 3.9-16, the ADS discharge header vacuum relief valves do not require a Class 1E power source to perform the safety-related active function of transferring open. Therefore, COL Appendix C Table 2.1.2-1 proposes to remove the Class 1E designation from ADS discharge header vacuum relief valves, RCS-PL-V010A/B.

14. Radiation Monitoring Package Tag Number Correction

The MCR radiation monitoring packages are listed as components in COL Appendix C Table 3.5-1 and Table 3.5-7. Both tables use a different tag number to identify the radiation monitoring packages. COL Appendix C Table 3.5-1 uses VBS-JS01A/B for the radiation monitoring packages, however, COL Appendix C Table 3.5-7 uses VBS-RY01A/B for the packages. UFSAR Figure 9.4.1-1 (Sheet 5) identifies the monitoring packages with tag number VBS-JS01A/B, therefore, this tag numbering convention will be used for the radiation monitoring packages.

It is proposed to implement an editorial change to COL Appendix C Table 3.5-7 to reference tag number VBS-JS01A/B as the tag number for the MCR radiation monitoring

package A and B, respectively. This change provides alignment between the radiation monitoring package tag numbers listed in COL Appendix C Table 3.5-1 and Table 3.5-7.

15. VWS Cooling Coil Discrepancy

The central chilled water system (VWS), low capacity subsystem consists of two 100-percent capacity chilled water trains. Each train consists of a chilled water pump; an air-cooled chiller; an expansion tank; a chemical feed tank; and associated valves, piping, instrumentation, and controls. This configuration provides redundancy and independence of trains during the various modes of system operation.

The low capacity VWS supports the defense-in-depth function of providing chilled water to the RNS pump room unit coolers in the event that heat must be rejected from this room. COL Appendix C Figure 2.7.2-1 and UFSAR Figure 9.2.7-1 show the chiller pump VWS-MP-02 as providing water to the RNS pump room unit cooling coil, VAS-MY-C12A, and chiller pump, VWS-MP-03, as providing water to the RNS pump room unit cooling coil, VAS-MY-C12B. The tag numbers of the pump room unit cooling coils have been reversed and are changed because chiller pump, VWS-MP-02, provides water to the RNS pump room unit cooling coil, VAS-MY-C12B, and chiller pump, VWS-MP-03, provides water to the RNS pump room unit cooling coil, VAS-MY-C12A.

Additionally, an editorial change is required for the tag numbers of components identified in COL Appendix C Figure 2.7.2-1 (Sheets 1 and 2). This figure identifies cooling coils which use a different tag numbering convention than in COL Appendix C Table 2.7.2-2 and in UFSAR Figure 9.2.7-1. It is proposed to change the COL Appendix C Figure 2.7.2-1 tag numbers as identified below.

Figure 2.7.2-1 Tag Number	Proposed Change
VBS-MYC-01A/B	VBS-MY-C01A/B
VBS-MYC-02A/B	VBS-MY-C02A/B
VBS-MYC-02C/D	VBS-MY-C02C/D
VAS-MYC-07A/B	VAS-MY-C07A/B
VAS-MYC-12A/B	VAS-MY-C12A/B
VAS-MYC-06A/B	VAS-MY-C06A/B

This editorial change only impacts the tag numbers of the cooling coils and no design features are affected by the changes to the tag numbers.

16. COL Appendix C Table 3.2-1 Table Number Editorial Change

COL Appendix C Table 3.2-1 includes an extra period in the table number in the title bar. The table number is currently listed as "Table 3.2.-1," instead of "Table 3.2-1." The table number is changed for consistency with the table numbering throughout COL Appendix C.

Since this editorial change in Table 3.2-1 only impacts COL Appendix C, there would be no corresponding change to plant-specific Tier 1.

General Discussion of Changes

The proposed changes are consistency and editorial changes. These changes are proposed to maintain consistency between UFSAR and COL Appendix C design descriptions, tables and figures, and to propose editorial clarifications. No structure, system or component (SSC) design function or analysis as described in the UFSAR is affected. No defense-in-depth safety function is affected. There are no technical changes to plant-specific ITAAC line items.

The COL Appendix C information is the design information and functions subject to verification by the COL Appendix C ITAAC closure process. The proposed changes neither affect the ability to meet design criteria or functions, nor involve a decrease in the safety provided by the associated systems. COL Appendix C information and ITAAC continue to adequately validate their corresponding UFSAR design commitments.

The proposed changes do not affect an SSC, function or feature used for the prevention or mitigation of accidents or their safety / design analyses. The changes do not affect any SSC accident initiator or initiating sequence of events, or involve any safety-related SSC or function used to mitigate an accident.

The proposed changes do not involve a change to a fission product barrier. The changes do not result in a new failure mode, malfunction or sequence of events that could affect safety. The changes would not allow for a new fission product release path, result in a new fission product barrier failure mode, or create a new sequence of events that would result in significant fuel cladding failures.

The proposed changes do not affect any safety-related equipment, design code limit, safety-related function, safety-related design analysis, safety analysis input or result, or design or safety margin. No safety analysis or design basis acceptance limit or criterion would be challenged or exceeded.

In conclusion, the proposed changes do not involve a technical (design, analysis, function or qualification) change (e.g., there is no change to an associated calculation, design parameter or design requirement). Therefore, the changes would not result in a decrease in plant safety.

The proposed changes do not adversely impact the emergency plan or the physical security plan implementation, because there are no changes to physical access to credited equipment inside the Nuclear Island (including containment or the auxiliary building) and no adverse impact to plant personnel's ability to respond to any plant operations or security event.

The proposed changes associated with this license amendment request do not affect the containment, control, channeling, monitoring, processing or releasing of radioactive and non-radioactive materials. No effluent release path is involved. The types and quantities of expected effluents are not changed. Therefore, radioactive or non-radioactive material effluents are not affected.

Plant radiation zones (as described in UFSAR Section 12.3) control under 10 CFR 20, and expected amounts and types of radioactive materials are not affected by the proposed changes. Therefore, individual and cumulative radiation exposures are not changed.

Licensing Bases Change Descriptions:

COL Appendix C (and associated plant-specific Tier 1) Changes

- Table 2.1.2-1 removes the Class 1E designation from RCS-PL-V010A/B.
- Table 2.1.2-1 updates the following sensors as being included with the PMS safety-related displays:
 - RCS-211A/B/C/D
 - RCS-212A/B/C/D
 - RCS-213A/B/C/D
 - RCS-214A/B/C/D
 - RCS-281
 - RCS-282
 - RCS-283
 - RCS-284
 - RCS-101A/B/C/D
 - RCS-102A/B/C/D
- Table 2.2.1-1 differentiates between the upper personnel hatch, CNS-MY-Y03, and the lower personnel hatch, CNS-MY-Y04.
- Figure 2.2.1-1 changes the personnel hatch numbers (H03 and H04) for both personnel hatches.
- Figure 2.2.1-1 updates the upper personnel hatch elevation to 135'-3" and the lower personnel hatch elevation to 107'-2".
- Table 2.2.5-1 updates valves VES-PL-V005A/B and VES-PL-V022A/B as being included with the PMS safety-related displays.
- Table 2.3.2-4 changes the inspections, tests, and analyses of item 14 to state that "Inspection will be conducted of the as-built piping as documented in the CVS Seismic Analysis Report."
- Figure 2.3.2-1 adds relief valve CVS-PL-V058 to the related CVS piping.
- Subsection 2.3.6, design commitment 13, replaces "listed function" with "control function."
- Table 2.3.6-4, design commitment and acceptance criteria, replaces "listed action" and "listed function" with "control function."
- Table 2.5.4-1 adds manual containment vacuum relief switches to the minimum inventory of controls, displays and alerts that are to be included at the RSW.
- Table 2.6.1-1 updates the RCP circuit breakers to be shown as included with the PMS safety-related displays.

- Table 2.7.1-2 changes the title of WWS-PL-L851 to “Main Control Room Waste Water Line”.
- Figure 2.7.2-1 (Sheet 1) changes chiller pump, VWS-MP-02, to provide water to the RNS pump room unit cooling coil, VAS-MY-C12B.
- Figure 2.7.2-1 (Sheet 1) changes the tag number convention of cooling coils from VAS/VBS-MYC-xxx to VAS/VBS-MY-Cxxx.
- Figure 2.7.2-1 (Sheet 2) changes chiller pump, VWS-MP-03, to provide water to the RNS pump room unit cooling coil, VAS-MY-C12A.
- Figure 2.7.2-1 (Sheet 2) changes the tag number convention of cooling coils from VAS/VBS-MYC-xxx to VAS/VBS-MY-Cxxx.
- Table 3.5-1 is updated to show the MCR supply air radiation monitoring packages A and B as included with the PMS safety-related displays.
- Table 3.5-5 is revised to differentiate between the upper and lower personnel hatches. Additionally, the hatch elevations are removed from the table.
- Table 3.5-5 adds headers “Equipment List” to the top of the left column and “Equipment Number” to the top of the right column.
- Table 3.5-7 changes the tag numbers of MCR radiation monitoring packages A and B to VBS-JS01A and VBS-JS01B, respectively.

Plant-Specific Tier 1 Changes

- Section 4.0 is changed to reference 10 CFR 52.47(a)(25) as the appropriate regulation which specifies that interface requirements must be included in an application for design certification.
- Section 4.0 is changed to reference 10 CFR 52.47(a)(26) as the appropriate regulation which specifies that those interface requirements must be verifiable through inspection, testing, or analysis.

COL Appendix C Change

- Table 3.2-1 is changed to correct the table number for the table.

UFSAR Changes

- Section 1.2 is updated to reference 10 CFR 52.47(a)(25) as the appropriate regulation for interface requirements to be included in an application for design certification.
- Table 1.6-1 changes APP-OCS-GEH-220 to Revision 5.
- Section 1.8 is updated to reference 10 CFR 52.47(a)(25) as the appropriate regulation for interface requirements to be included in an application for design certification.
- Table 3.2-3 is updated to differentiate between the upper personnel hatch and the lower personnel hatch.

- Subsection 3.8.4.5.5.5 is changed to indicate that the connection between the tie bars and the steel faceplates is designed to develop 125% of the specified yield strength of the tie bars.
- Table 5.2-3 changes the title of Code Case N-122-2 to "Procedure for Evaluation of the Design of Rectangular Cross Section Attachments on Class 1 Piping Section III, Division 1."
- Table 6.2.3-1 is updated to differentiate between the upper personnel hatch and the lower personnel hatch.
- Table 7.5-1 is revised to show MCR supply air radiation as included in the QDPS indications.
- Figure 9.2.7-1 changes chiller pump, VWS-MP-02, to provide water to the RNS pump room unit cooling coil, VAS-MY-C12B.
- Figure 9.2.7-1 changes chiller pump, VWS-MP-03, to provide water to the RNS pump room unit cooling coil, VAS-MY-C12A.
- Table 11.5-2 is revised to differentiate between the upper and lower personnel hatches. Additionally, the hatch elevations are removed from the table.
- UFSAR Section 14.3 is updated to reference 10 CFR 52.47(a)(25) as the appropriate regulation for interface requirements to be included in an application for design certification.
- UFSAR Section 14.3 is changed to reference 10 CFR 52.47(a)(26) as the appropriate regulation which specifies that those interface requirements must be verifiable through inspection, testing, or analysis.
- UFSAR Section 14.3.4 is updated to reference 10 CFR 52.47(a)(25) as the appropriate regulation for interface requirements to be included in an application for design certification.
- UFSAR Section 14.3.5 is updated to reference 10 CFR 52.47(a)(25) as the appropriate regulation for interface requirements to be included in an application for design certification.
- Subsection 18.11.2 changes APP-OCS-GEH-220 to Revision 5.
- Table 18.12.2-1 adds manual containment vacuum relief switches to the minimum inventory of controls, displays and alerts that are to be included in the MCR and at the RSW.
- IBR'd document APP-OCS-GEH-220 updates the scope of OSA-1 and OSA-2 task support verification.

3. TECHNICAL EVALUATION (SEE SECTION 2)

4. REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

10 CFR 52.98(c) requires NRC approval for any modification to, addition to, or deletion from the terms and conditions of a COL, including any modification to, addition to, or deletion from the inspections, tests, analyses, or related acceptance criteria contained in the license. The proposed changes involve a departure from COL Appendix C Inspections, Tests, Analyses and Acceptance Criteria (ITAAC) information and involved UFSAR changes. Therefore, this activity requires an amendment to the COL. Accordingly, NRC approval is required prior to making the plant specific changes in this license amendment request.

10 CFR 52, Appendix D, Section VII.B.5.a allows an applicant or licensee who references this appendix to depart from Tier 2 information, without prior NRC approval, unless the proposed departure involves a change to or departure from Tier 1 information, Tier 2* information, or the Technical Specifications, or requires a license amendment under paragraphs B.5.b or B.5.c of the section. The proposed change involves a change to COL Appendix C (and associated plant-specific Tier 1) ITAAC information. Therefore, NRC approval is required prior to making the change to Tier 2 information.

10 CFR Part 50, Appendix A General Design Criterion (GDC) 13, "Instrumentation and Control" requires that instrumentation shall be provided to monitor variables and systems over their anticipated ranges for normal operation, for anticipated operational occurrences, and for accident conditions as appropriate to assure adequate safety, including those variables and systems that can affect the fission process, the integrity of the reactor core, the reactor coolant pressure boundary, and the containment and its associated systems. The proposed changes to COL Appendix C (and associated plant-specific Tier 1) information assures the continued ability of the PMS, the safety-related displays, and the monitored systems to monitor variables and systems. Therefore, the proposed changes comply with the requirements of GDC 13.

10 CFR Part 50, Appendix A GDC 19, "Control Room" includes a requirement that a control room be provided from which actions can be taken to operate the nuclear power unit safely under normal conditions and to maintain it in a safe condition under accident conditions, including loss-of-coolant accidents, and that equipment, including the necessary instrumentation, at appropriate locations outside the control room be provided with a design capability for prompt hot shutdown of the reactor. The proposed changes to COL Appendix C (and associated plant-specific Tier 1) information do not affect the ability of the control room operators to monitor plant status to maintain the plant in a safe condition and to promptly shutdown the reactor. Therefore, the proposed changes comply with the requirements of GDC 19.

10 CFR Part 50, Appendix A GDC 20, "Protection system functions" requires that the protection system shall be designed (1) to initiate automatically the operation of appropriate systems including the reactivity control systems, to assure that specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences and (2) to sense accident conditions and to initiate the operation of systems and components important to safety. The proposed changes to COL Appendix C (and associated plant-specific Tier 1) information do not adversely affect a

design function of the PMS, the safety-related displays, and the monitored systems. Therefore, the proposed changes comply with the requirements of GDC 20.

4.2 Precedent

None.

4.3 Significant Hazards Consideration Determination

The proposed changes revise Combined License (COL) Appendix C (and associated plant-specific Tier 1) information, and Tier 2 and Tier 2* information in the Updated Final Safety Analysis Report (UFSAR) to correct consistency and editorial errors.

An evaluation to determine whether or not a significant hazards consideration is involved with the proposed amendment was completed by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

4.3.1 Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No

The proposed consistency and editorial changes to COL Appendix C (and associated plant-specific Tier 1) and Tier 2 and Tier 2* information in the UFSAR do not involve a technical change, (e.g.; there is no design parameter or requirement, calculation, analysis, function or qualification change). No structure, system, or component (SSC) design or function would be affected. No design or safety analysis would be affected. The proposed changes do not affect any accident initiating event or component failure, thus the probabilities of the accidents previously evaluated are not affected. No function used to mitigate a radioactive material release and no radioactive material release source term is involved, thus the radiological releases in the accident analyses are not affected.

Therefore, the proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.

4.3.2 Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

The proposed consistency and editorial changes to COL Appendix C (and associated plant specific Tier 1) and Tier 2 and Tier 2* information in the UFSAR do not change the design or functionality of safety-related SSCs. The proposed change does not affect plant electrical systems, and does not affect the design function, support, design, or operation of mechanical and fluid systems. The proposed change does not result in a new failure mechanism or introduce any new accident precursors. No design function described in the UFSAR is affected by the proposed changes. Therefore, the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

4.3.3 Does the proposed amendment involve a significant reduction in a margin of safety?

Response: No

The proposed consistency and editorial changes to COL Appendix C (and associated plant specific Tier 1) and Tier 2 and Tier 2* information in the UFSAR do not involve any change to the design as described in the COL. There would be no change to an existing design basis, design function, regulatory criterion, or analysis. No safety analysis or design basis acceptance limit/criterion is involved. Therefore, the proposed amendment does not involve a significant reduction in a margin of safety.

Based on the above, it is concluded that the proposed amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of “no significant hazards consideration” is justified.

4.4 Conclusions

Based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission’s regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5. ENVIRONMENTAL CONSIDERATIONS

The proposed changes revise Combined License (COL) Appendix C (and associated plant-specific Tier 1) information, and Tier 2 and Tier 2* information in the Updated Final Safety Analysis Report (UFSAR) to correct consistency and editorial errors. No structure, system, or component (SSC), design function or analysis as described in the UFSAR would be affected by these non-technical and editorial changes.

(i) There is no significant hazards consideration.

As documented in Section 4.3, Significant Hazards Consideration Determination, of this license amendment request, an evaluation was completed to determine whether or not a significant hazards consideration is involved by focusing on the three standards set forth in 10 CFR 50.92, “Issuance of amendment.” The Significant Hazards Consideration Determination determined that (1) the proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated; (2) the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated; and (3) the proposed amendment does not involve a significant reduction in a margin of safety. Therefore, it is concluded that the proposed amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of “no significant hazards consideration” is justified.

- (ii) *There is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite.*

The proposed changes in the requested amendment identify editorial and consistency changes which do not affect an aspect of the AP1000 design. The proposed changes are unrelated to any aspect of plant construction or operation that would introduce any change to effluent types (e.g., effluents containing chemicals or biocides, sanitary system effluents, and other effluents) or affect any plant radiological or non-radiological effluent release quantities. Furthermore, the proposed changes do not affect any effluent release path or diminish the functionality of any design or operational features that are credited with controlling the release of effluents during plant operation. Therefore, it is concluded that the proposed amendment does not involve a significant change in the types or a significant increase in the amounts of any effluents that may be released offsite.

- (iii) *There is no significant increase in individual or cumulative occupational radiation exposure.*

The proposed changes in the requested amendment identify editorial and consistency changes which do not affect any aspect of the AP1000 design. The proposed changes in the requested amendment do not affect or alter any walls, floors, or other structures that provide shielding. Plant radiation zones and controls under 10 CFR 20 preclude a significant increase in occupational radiation exposure. Therefore, the proposed amendment does not involve a significant increase in individual or cumulative occupational radiation exposure.

Based on the above review of the proposed amendment, it has been determined that anticipated construction and operational effects of the proposed amendment do not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment and proposed exemption.

6. REFERENCES

None.

Southern Nuclear Operating Company

ND-17-1955

Enclosure 2

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Exemption Request:

Tier 1 and Tier 2* Editorial and Consistency Changes

(LAR-17-042)

(Enclosure 2 consists of 8 pages, including this cover page.)

1.0 PURPOSE

Southern Nuclear Operating Company (the Licensee) requests a permanent exemption from the provisions of 10 CFR 52, Appendix D, Section III.B, *Design Certification Rule for the AP1000 Design, Scope and Contents*, to allow a plant-specific departure from elements of the certification information in Tier 1 of the plant-specific AP1000 Design Control Document (DCD). The regulation, 10 CFR 52, Appendix D, Section III.B, requires an applicant or licensee referencing Appendix D to 10 CFR Part 52 to incorporate by reference and comply with the requirements of Appendix D, including certified information in DCD Tier 1. The Tier 1 information for which a plant-specific departure and exemption is being requested is to make editorial changes to promote consistency in Tier 1 information.

This request for exemption will apply the requirements of 10 CFR 52, Appendix D, Section VIII.A.4 to allow departures from Tier 1 information due to the following proposed consistency and editorial changes to the system-based design descriptions, as described below.

- Tier 1 Table 2.1.2-1:
 - Removes the Class 1E designation from RCS-PL-V010A/B.
 - Updates the following sensors as being included with the PMS safety-related displays:
 - RCS-211A/B/C/D
 - RCS-212A/B/C/D
 - RCS-213A/B/C/D
 - RCS-214A/B/C/D
 - RCS-281
 - RCS-282
 - RCS-283
 - RCS-284
 - RCS-101A/B/C/D
 - RCS-102A/B/C/D
- Tier 1 Table 2.2.1-1 differentiates between the upper hatch, CNS-MY-Y03, and the lower hatch, CNS-MY-Y04.
- Tier 1 Figure 2.2.1-1
 - Changes the personnel hatch numbers (H03 and H04) for both personnel hatches.
 - Updates the upper personnel hatch elevation to 135'-3" and the lower personnel hatch elevation to 107'-2."
- Tier 1 Table 2.2.5-1 updates valves VES-PL-V005A/B and VES-PL-V022A/B as being included with the PMS safety-related displays.

- Tier 1 Table 2.3.2-4 changes the inspections, tests, and analyses of item 14 to state that “Inspection will be conducted of the as-built piping as documented in the CVS Seismic Analysis Report.”
- Tier 1 Figure 2.3.2-1 adds relief valve CVS-PL-V058 to the related CVS piping.
- Tier 1 Subsection 2.3.6, design commitment 13, replaces “listed function” with “control function.”
- Tier 1 Table 2.3.6-4, design commitment and acceptance criteria, replace “listed action” and “listed function” with “control function.”
- Tier 1 Table 2.5.4-1 adds manual containment vacuum relief switches to the minimum inventory of controls, displays and alerts that are to be included at the RSW.
- Tier 1 Table 2.6.1-1 updates the RCP circuit breakers to be shown as included with the PMS safety-related displays.
- Tier 1 Table 2.7.1-2 changes the title of WWS-PL-L851 to “Main Control Room Waste Water Line”
- Tier 1 Figure 2.7.2-1 (Sheet 1):
 - Changes chiller pump, VWS-MP-02, to provide water to the RNS pump room unit cooling coil, VAS-MY-C12B.
 - Changes the tag number convention of cooling coils from VAS/VBS-MYC-xxx to VAS/VBS-MY-Cxxx.
- Tier 1 Figure 2.7.2-1 (Sheet 2)
 - Changes chiller pump, VWS-MP-03, to provide water to the RNS pump room unit cooling coil, VAS-MY-C12A.
 - Changes the tag number convention of cooling coils from VAS/VBS-MYC-xxx to VAS/VBS-MY-Cxxx.
- Tier 1 Table 3.5-1 is updated to show the MCR supply air radiation monitoring packages A and B as included with the PMS safety-related displays.
- Tier 1 Table 3.5-5:
 - Revised to differentiate between the upper and lower personnel hatches. Additionally, the hatch elevations are removed from the table.
 - Adds headers “Equipment List” to the top of the left column and “Equipment Number” to the top of the right column.
- Tier 1 Table 3.5-7 changes the tag numbers of MCR radiation monitoring packages A and B to VBS-JS01A and VBS-JS01B, respectively.
- Tier 1 Section 4.0:
 - Changed to reference 10 CFR 52.47(a)(25) as the appropriate regulation which specifies that interface requirements must be included in an application for design certification.

- Changed to reference 10 CFR 52.47(a)(26) as the appropriate regulation which specifies that those interface requirements must be verifiable through inspection, testing, or analysis.

This request will provide for the application of the requirements for granting exemptions from design certification information, as specified in 10 CFR Part 52, Appendix D, Section VIII.A.4, 10 CFR 52.63, §52.7, and §50.12.

2.0 BACKGROUND

The Licensee is the holder of Combined License Nos. NPF-91 and NPF-92, which authorize construction and operation of two Westinghouse Electric Company AP1000 nuclear plants, named Vogtle Electric Generating Plant (VEGP) Units 3 and 4, respectively.

Inconsistencies were identified that necessitate editorial and consistency changes to plant-specific Tier 1 information. Editorial changes are made to enhance reader understanding and consistency changes are made to provide consistency with the underlying design information contained in the Updated Final Safety Analysis Report (UFSAR).

An exemption from elements of the AP1000 certified (Tier 1) design information to allow a departure from the design description is requested.

3.0 TECHNICAL JUSTIFICATION OF ACCEPTABILITY

An exemption is requested to depart from AP1000 generic Design Control Document (DCD) Tier 1 material in regard to the AP1000 by correcting various editorial and consistency issues between Tier 1 and Tier 2 in Tier 1 text, tables and figures. The proposed exemption would allow a change to the plant-specific Tier 1 ITAAC information consistent with existing plant-specific DCD Tier 2 information.

The proposed changes to the description information presented in plant-specific Tier 1 are at a level of detail that is consistent with the information currently provided therein. The proposed changes neither adversely impact the ability to meet the design functions of the structures, systems, and components (SSCs) nor involve a significant decrease in the level of safety provided by the structures, systems, or components. Because the proposed editorial changes are consistent with plant-specific DCD Tier 2 information and the underlying plant design, the changes do not physically affect an SSC. The proposed changes to information in plant-specific DCD Tier 1 continue to provide the detail necessary to implement the corresponding ITAAC. Further, application of the current generic certified design information in Tier 1 as required by 10 CFR Part 52, Appendix D, Section III.B, in the particular circumstances discussed in this request would not serve the underlying purpose of the rule due to the apparent editorial inconsistencies with the existing design information provided in Tier 2 of the plant-specific DCD.

4.0 JUSTIFICATION OF EXEMPTION

10 CFR Part 52, Appendix D, Section VIII.A.4 and 10 CFR 52.63(b)(1) govern the issuance of exemptions from elements of the certified design information for AP1000 nuclear power

plants. Since SNC has identified consistency and clarification changes to the Tier 1 information as discussed in Enclosure 1 of the accompanying License Amendment Request, an exemption from the certified design information in Tier 1 is needed.

10 CFR Part 52, Appendix D, and 10 CFR 50.12, §52.7, and §52.63 state that the NRC may grant exemptions from the requirements of the regulations provided six conditions are met: 1) the exemption is authorized by law [§50.12(a)(1)]; 2) the exemption will not present an undue risk to the health and safety of the public [§50.12(a)(1)]; 3) the exemption is consistent with the common defense and security [§50.12(a)(1)]; 4) special circumstances are present [§50.12(a)(2)]; 5) the special circumstances outweigh any decrease in safety that may result from the reduction in standardization caused by the exemption [§52.63(b)(1)]; and 6) the design change will not result in a significant decrease in the level of safety [Part 52, App. D, VIII.A.4].

The requested exemption to allow editorial and consistency changes to the description of the components satisfies the criteria for granting specific exemptions, as described below.

1. This exemption is authorized by law

The NRC has authority under 10 CFR 52.63, §52.7, and §50.12 to grant exemptions from the requirements of NRC regulations. Specifically, 10 CFR 50.12 and §52.7 state that the NRC may grant exemptions from the requirements of 10 CFR Part 52 upon a proper showing. No law exists that would preclude the changes covered by this exemption request. Additionally, granting of the proposed exemption does not result in a violation of the Atomic Energy Act of 1954, as amended, or the Commission's regulations.

Accordingly, this requested exemption is "authorized by law," as required by 10 CFR 50.12(a)(1).

2. This exemption will not present an undue risk to the health and safety of the public

The proposed exemption from the requirements of 10 CFR 52, Appendix D, Section III.B would allow changes to elements of the Tier 1 DCD to depart from the AP1000 certified (Tier 1) design information. The plant-specific Tier 1 will continue to reflect the approved licensing basis for VEGP Units 3 and 4, and will maintain a consistent level of detail with that which is currently provided elsewhere in Tier 1 of the DCD. Therefore, the affected plant-specific Tier 1 ITAAC will continue to serve its required purpose.

Because the changes will not alter the operation of any plant equipment or system's ability to perform their design function, these changes do not present an undue risk to existing equipment or systems. The changes do not introduce any new industrial, chemical, or radiological hazards that would represent a public health or safety risk, nor do they modify or remove any design or operational controls or safeguards that are intended to mitigate any existing on-site hazards. Furthermore, the proposed changes would not allow for a new fission product release path, result in a new fission product barrier failure mode, or create a new sequence of events that would result in significant fuel cladding failures. Accordingly, these editorial and consistency changes do not present an undue risk from any new equipment or systems.

Therefore, the requested exemption from 10 CFR 52, Appendix D, Section III.B would not present an undue risk to the health and safety of the public.

3. The exemption is consistent with the common defense and security

The exemption from the requirements of 10 CFR 52, Appendix D, Section III.B would make editorial and consistency changes, as presented in plant-specific Tier 1 information, thereby departing from the AP1000 certified design information. The proposed exemption will enable performance of the ITAAC associated with these changed elements, by reflecting the revised design information in the text, tables and figures that are referenced in these ITAAC. The exemption does not alter or impede the design, function, or operation of any plant structures, systems, or components (SSCs) associated with the facility's physical or cyber security, and therefore does not affect any plant equipment that is necessary to maintain a safe and secure plant status. The proposed exemption has no impact on plant security or safeguards.

Therefore, the requested exemption is consistent with the common defense and security.

4. Special circumstances are present

10 CFR 50.12(a)(2) lists six "special circumstances" for which an exemption may be granted. Pursuant to the regulation, it is necessary for one of these special circumstances to be present in order for the NRC to consider granting an exemption request. The requested exemption meets the special circumstances of 10 CFR 50.12(a)(2)(ii). That subsection defines special circumstances as when "Application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule."

The rule under consideration in this request for exemption is 10 CFR 52, Appendix D, Section III.B, which requires that a licensee referencing the AP1000 Design Certification Rule (10 CFR Part 52, Appendix D) shall incorporate by reference and comply with the requirements of Appendix D, including Tier 1 information. The VEGP Units 3 and 4 COLs reference the AP1000 Design Certification Rule and incorporate by reference the requirements of 10 CFR Part 52, Appendix D, including Tier 1 information. The underlying purpose of Appendix D, Section III.B is to describe and define the scope and contents of the AP1000 design certification, and to require compliance with the design certification information in Appendix D.

The proposed editorial and consistency changes do not impact the ability of any SSCs to perform their functions or negatively impact safety. Accordingly, this exemption from the certification information will enable the licensee to safely construct and operate the AP1000 facility consistent with the design certified by the NRC in 10 CFR 52, Appendix D.

Therefore, special circumstances are present, because application of the current plant-specific certified design information in Tier 1 as required by 10 CFR Part 52, Appendix D, Section III.B in the particular circumstances discussed in this request is not necessary to achieve the underlying purpose of the rule.

5. The special circumstances outweigh any decrease in safety that may result from the reduction in standardization caused by the exemption.

Based on the nature of the changes to the plant-specific Tier 1 information and the understanding that these changes resolve editorial inconsistencies within the licensing basis, it is likely that other AP1000 licensees will request this exemption. However, if this is not the case, the special circumstances continue to outweigh any decrease in safety from the reduction in standardization because the design functions of the systems associated with this request will continue to be maintained. The proposed editorial and consistency changes are departures from information in the plant-specific AP1000 DCD. This exemption request and the associated mark-ups demonstrate that there is a minimal change from the plant-specific AP1000 DCD, minimizing the reduction in standardization and consequently the safety impact from the reduction.

Therefore, the special circumstances associated with the requested exemption outweigh any decrease in safety that may result from the reduction in standardization caused by the exemption.

6. The design change will not result in a significant decrease in the level of safety.

The requested exemption revises the plant-specific DCD Tier 1 information by making editorial and consistency changes in various systems. The changes for consistency and clarity do not affect any safety-related equipment or function, and the design functions of the associated systems continue to be met. Because these functions continue to be met, there is no reduction in the level of safety.

Therefore, the requested exemption does not involve a design change that would result in a significant decrease in the level of safety.

5.0 RISK ASSESSMENT

A risk assessment was not determined to be applicable to address the acceptability of this proposal.

6.0 PRECEDENT

None identified.

7.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed exemption does not involve (i) a significant hazards consideration, (ii) a significant change in the types or a significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Specific justification is provided in Section 5 of the corresponding license amendment request. Accordingly, the proposed exemption meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10

CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed exemption.

8.0 CONCLUSION

The proposed consistency changes to DCD Tier 1 are necessary to revise information in design descriptions in plant-specific Tier 1 information. The exemption request meets the requirements of 10 CFR 52.63, 10 CFR 52.7, 10 CFR 50.12, 10 CFR 51.22 and 10 CFR 52 Appendix D. Specifically, the exemption request meets the criteria of 10 CFR 50.12(a)(1) in that the request is authorized by law, presents no undue risk to public health and safety, and is consistent with the common defense and security. Furthermore, approval of this request does not result in a significant decrease in the level of safety, presents special circumstances, does not present a significant decrease in safety as a result of a reduction in standardization, and meets the eligibility requirements for categorical exclusion.

9.0 REFERENCES

None.

Southern Nuclear Operating Company

ND-17-1955

Enclosure 3

**Vogtle Electric Generating Plant (VEGP) Units 3 and 4
Proposed Changes to the Licensing Basis Documents
(LAR-17-042)**

Note:

Added text is shown as bold **Blue Underline**
Deleted text is shown as bold **~~Red Strikethrough~~**

(Enclosure 3 consists of 25 pages, including this cover page)

COL Appendix C (and associated plant-specific Tier 1) Table 2.1.2-1

Table 2.1.2-1- Revise the Class 1E designation and the safety-related display for the equipment described below.

Table 2.1.2-1									
Equipment Name	Tag No.	ASME Code Section III	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. for Harsh Envir.	Safety-Related Display	Control PMS/ DAS	Active Function	Loss of Motive Power Position
***	***	***	***	***	***	***	***	***	***
ADS Discharge Header A Vacuum Relief Valve	RCS-PL-V010A	Yes	Yes	No	Yes No/Yes	No	No/No	Transfer Open	-
ADS Discharge Header B Vacuum Relief Valve	RCS-PL-V010B	Yes	Yes	No	Yes No/Yes	No	No/No	Transfer Open	-
***	***	***	***	***	***	***	***	***	***
RCS Hot Leg 1 Flow Sensor	RCS-101A	-	Yes	-	Yes/Yes	No Yes	- / -	-	-
RCS Hot Leg 1 Flow Sensor	RCS-101B	-	Yes	-	Yes/Yes	No Yes	- / -	-	-
RCS Hot Leg 1 Flow Sensor	RCS-101C	-	Yes	-	Yes/Yes	No Yes	- / -	-	-
RCS Hot Leg 1 Flow Sensor	RCS-101D	-	Yes	-	Yes/Yes	No Yes	- / -	-	-
RCS Hot Leg 2 Flow Sensor	RCS-102A	-	Yes	-	Yes/Yes	No Yes	- / -	-	-

COL Appendix C (and associated plant-specific Tier 1) Table 2.1.2-1 (cont.)

Table 2.1.2-1									
Equipment Name	Tag No.	ASME Code Section III	Seismic Cat. I	Remotely Operated Valve	Class 1E/Qual. for Harsh Envir.	Safety-Related Display	Control PMS/DAS	Active Function	Loss of Motive Power Position
RCS Hot Leg 2 Flow Sensor	RCS-102B	-	Yes	-	Yes/Yes	No <u>Yes</u>	- / -	-	-
RCS Hot Leg 2 Flow Sensor	RCS-102C	-	Yes	-	Yes/Yes	No <u>Yes</u>	- / -	-	-
RCS Hot Leg 2 Flow Sensor	RCS-102D	-	Yes	-	Yes/Yes	No <u>Yes</u>	- / -	-	-
***	***	***	***	***	***	***	***	***	***
RCP 1A Bearing Water Temperature Sensor	RCS-211A	-	Yes	-	Yes/Yes	No <u>Yes</u>	- / -	-	-
RCP 1A Bearing Water Temperature Sensor	RCS-211B	-	Yes	-	Yes/Yes	No <u>Yes</u>	- / -	-	-
RCP 1A Bearing Water Temperature Sensor	RCS-211C	-	Yes	-	Yes/Yes	No <u>Yes</u>	- / -	-	-
RCP 1A Bearing Water Temperature Sensor	RCS-211D	-	Yes	-	Yes/Yes	No <u>Yes</u>	- / -	-	-
RCP 1B Bearing Water Temperature Sensor	RCS-212A	-	Yes	-	Yes/Yes	No <u>Yes</u>	- / -	-	-
RCP 1B Bearing Water Temperature Sensor	RCS-212B	-	Yes	-	Yes/Yes	No <u>Yes</u>	- / -	-	-
RCP 1B Bearing Water Temperature Sensor	RCS-212C	-	Yes	-	Yes/Yes	No <u>Yes</u>	- / -	-	-
RCP 1B Bearing Water Temperature Sensor	RCS-212D	-	Yes	-	Yes/Yes	No <u>Yes</u>	- / -	-	-

COL Appendix C (and associated plant-specific Tier 1) Table 2.1.2-1 (cont.)

Table 2.1.2-1									
Equipment Name	Tag No.	ASME Code Section III	Seismic Cat. I	Remotely Operated Valve	Class 1E/Qual. for Harsh Envir.	Safety-Related Display	Control PMS/DAS	Active Function	Loss of Motive Power Position
RCP 2A Bearing Water Temperature Sensor	RCS-213A	-	Yes	-	Yes/Yes	No <u>Yes</u>	- / -	-	-
RCP 2A Bearing Water Temperature Sensor	RCS-213B	-	Yes	-	Yes/Yes	No <u>Yes</u>	- / -	-	-
RCP 2A Bearing Water Temperature Sensor	RCS-213C	-	Yes	-	Yes/Yes	No <u>Yes</u>	- / -	-	-
RCP 2A Bearing Water Temperature Sensor	RCS-213D	-	Yes	-	Yes/Yes	No <u>Yes</u>	- / -	-	-
RCP 2B Bearing Water Temperature Sensor	RCS-214A	-	Yes	-	Yes/Yes	No <u>Yes</u>	- / -	-	-
RCP 2B Bearing Water Temperature Sensor	RCS-214B	-	Yes	-	Yes/Yes	No <u>Yes</u>	- / -	-	-
RCP 2B Bearing Water Temperature Sensor	RCS-214C	-	Yes	-	Yes/Yes	No <u>Yes</u>	- / -	-	-
RCP 2B Bearing Water Temperature Sensor	RCS-214D	-	Yes	-	Yes/Yes	No <u>Yes</u>	- / -	-	-
RCP 1A Pump Speed Sensor	RCS-281	-	Yes	-	Yes/Yes	No <u>Yes</u>	- / -	-	-
RCP 1B Pump Speed Sensor	RCS-282	-	Yes	-	Yes/Yes	No <u>Yes</u>	- / -	-	-
RCP 2A Pump Speed Sensor	RCS-283	-	Yes	-	Yes/Yes	No <u>Yes</u>	- / -	-	-
RCP 2B Pump Speed Sensor	RCS-284	-	Yes	-	Yes/Yes	No <u>Yes</u>	- / -	-	-

COL Appendix C (and associated plant-specific Tier 1) Table 2.2.1-1

Table 2.2.1-1- Revise the equipment name for the equipment described below.

Table 2.2.1-1									
Equipment Name	Tag No.	ASME Code Section III	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. for Harsh Envir.	Safety-Related Display	Control PMS/ DAS	Active Function	Loss of Motive Power Position
***	***	***	***	***	***	***	***	***	***
<u>Upper</u> Personnel Hatch	CNS-MY-Y03	Yes	Yes	-	- / -	-	- / -	-	-
<u>Lower</u> Personnel Hatch	CNS-MY-Y04	Yes	Yes	-	- / -	-	- / -	-	-
***	***	***	***	***	***	***	***	***	***

COL Appendix C (and associated plant-specific Tier 1) Table 2.2.5-1

Table 2.2.5-1 - Revise the safety-related display for the equipment described below.

Table 2.2.5-1									
Equipment Name	Tag No.	ASME Code Section III	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. for Harsh Envir.	Safety-Related Display	Control PMS	Active Function	Loss of Motive Power Position
***	***	***	***	***	***	***	***	***	***
MCR Air Delivery Isolation Valve A	VES-PL-V005A	Yes	Yes	Yes	Yes/No	No Yes	Yes	Transfer Open	Open
MCR Air Delivery Isolation Valve B	VES-PL-V005B	Yes	Yes	Yes	Yes/No	No Yes	Yes	Transfer Open	Open
MCR Pressure Relief Isolation Valve A	VES-PL-V022A	Yes	Yes	Yes	Yes/No	No Yes	Yes	Transfer Open	Open
MCR Pressure Relief Isolation Valve B	VES-PL-V022B	Yes	Yes	Yes	Yes/No	No Yes	Yes	Transfer Open	Open
***	***	***	***	***	***	***	***	***	***

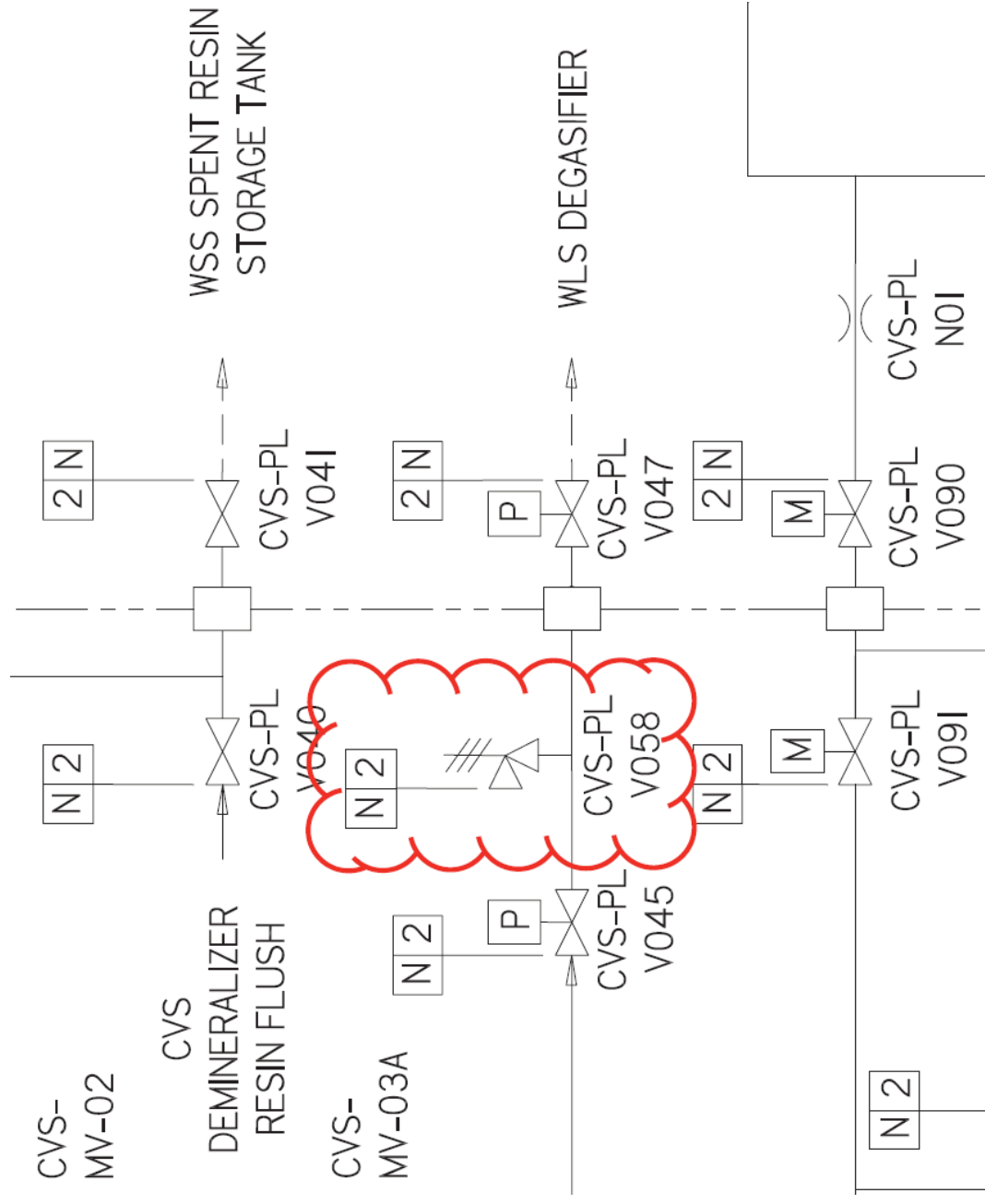
COL Appendix C (and associated plant-specific Tier 1) Table 2.3.2-4 “Inspections, Tests, Analysis, and Acceptance Criteria”

Table 2.3.2-4 - Revise the Inspections, Tests, Analyses column as shown below.

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
***	***	***
14. The nonsafety-related piping located inside containment and designated as reactor coolant pressure boundary, as identified in Table 2.3.2-2, has been designed to withstand a seismic design basis event and maintain structural integrity.	Inspection will be conducted of the as-built components <u>piping</u> as documented in the CVS Seismic Analysis Report.	The CVS Seismic Analysis Reports exist for the non-safety related piping located inside containment and designated as reactor coolant pressure boundary as identified in Table 2.3.2-2.

COL Appendix C (and associated plant-specific Tier 1) Figure 2.3.2-1 “Chemical and Volume System”

Table 2.3.2-1- Add valve, CVS-PL-V058, as shown below.



COL Appendix C (and associated plant-specific Tier 1) Subsection 2.3.6 “Normal Residual Heat Removal System”

Subsection 2.3.6 - Revise the Design Description for Item 13 as shown below.

13. Controls exist in the MCR to cause the pumps identified in Table 2.3.6-3 to perform the ~~listed~~ control function.

COL Appendix C (and associated plant-specific Tier 1) Table 2.3.6-4 “Inspections, Tests, Analyses and Acceptance Criteria”

Table 2.3.6-4 - Revise the Design Description and Acceptance Criteria, as shown below.

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
***	***	***
13. Controls exist in the MCR to cause the pumps identified in Table 2.3.6-3 to perform the listed <u>control</u> function.	Testing will be performed to actuate the pumps identified in Table 2.3.6-3 using controls in the MCR.	Controls in the MCR cause pumps identified in Table 2.3.6-3 to perform the listed <u>action control function</u> .
***	***	***

COL Appendix C (and associated plant-specific Tier 1) Table 2.5.4-1 “Minimum Inventory of Control, Displays, and Alerts at the RSW”

Table 2.5.4-1 - Add the “Manual Containment Vacuum Relief” description, as shown below.

Table 2.5.4-1 Minimum Inventory of Controls, Displays, and Alerts at the RSW			
Description	Control	Display	Alert ⁽¹⁾
***	***	***	***
Manual Containment Vacuum Relief	Yes	:	:

COL Appendix C (and associated plant-specific Tier 1) Table 2.6.1-1

Table 2.6.1-1 - Revise the safety-related display for the equipment described below.

Table 2.6.1-1				
Equipment Name	Tag No.	Seismic Category I	Class 1E/ Qual. For Harsh Envir.	Safety-Related Display
Reactor Coolant Pump (RCP) Circuit Breaker	ECS-ES-31	Yes	Yes/No (Trip open only)	No Yes
RCP Circuit Breaker	ECS-ES-32	Yes	Yes/No (Trip open only)	No Yes
RCP Circuit Breaker	ECS-ES-41	Yes	Yes/No (Trip open only)	No Yes
RCP Circuit Breaker	ECS-ES-42	Yes	Yes/No (Trip open only)	No Yes
RCP Circuit Breaker	ECS-ES-51	Yes	Yes/No (Trip open only)	No Yes
RCP Circuit Breaker	ECS-ES-52	Yes	Yes/No (Trip open only)	No Yes
RCP Circuit Breaker	ECS-ES-61	Yes	Yes/No (Trip open only)	No Yes
RCP Circuit Breaker	ECS-ES-62	Yes	Yes/No (Trip open only)	No Yes

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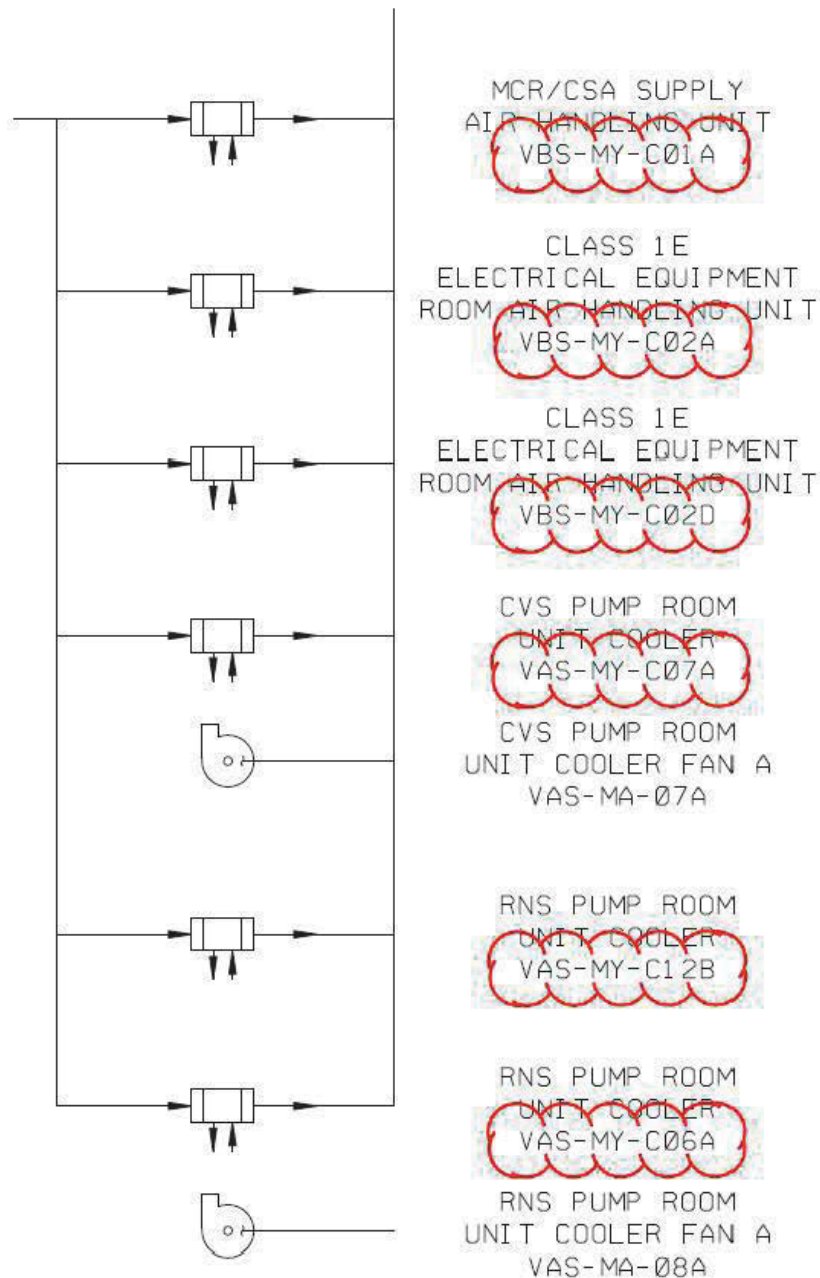
COL Appendix C (and associated plant-specific Tier 1) Table 2.7.1-2

Table 2.7.1-2- Revise the line name for the “Main Control Room Water Line,” as described below.

Table 2.7.1-2				
Line Name	Line Number	ASME Code Section III	Leak Before Break	Functional Capability Required
***	***	***	***	***
Main Control Room Waste Water Line	WWS-PL-L851	Yes	No	No

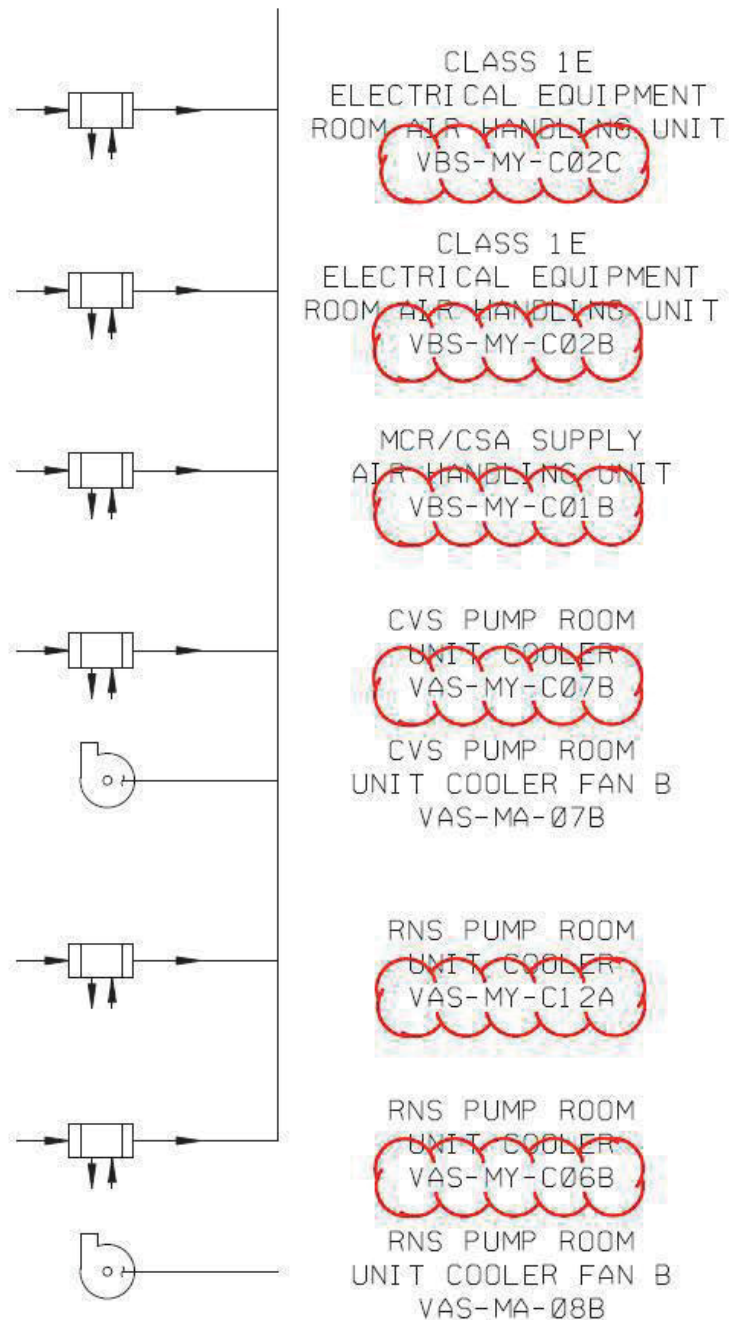
COL Appendix C (and associated plant-specific Tier 1) Figure 2.7.2-1 (Sheet 1) "Central Chilled Water System"

Figure 2.7.2-1 (Sheet 1) - Revise the tag number for the RNS Pump Room Unit Cooler and the coiling coils, as shown below.



COL Appendix C (and associated plant-specific Tier 1) Figure 2.7.2-1 (Sheet 2) "Central Chilled Water System"

Figure 2.7.2-1 (Sheet 2) - Revise the tag number for the RNS Pump Room Unit Cooler and the coiling coils, as shown below.



COL Appendix C Table 3.2-1 “Inspections, Tests, Analyses and Acceptance Criteria”

Table 3.2-1 - Revise the table number in the table title as shown below.

Table 3.2-1 Inspections, Tests, Analyses and Acceptance Criteria				
No.	ITAAC No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
***	***	***	***	***

COL Appendix C (and associated plant-specific Tier 1) Table 3.5-1

Table 3.5-1 - Revise the safety-related display for the equipment described below.

Table 3.5-1					
Equipment Name	Tag No.	Seismic Cat. I	Class 1E	Qual. for Harsh Envir.	Safety-Related Display
***	***	***	***	***	***
MCR Radiation Monitoring Package A ⁽¹⁾	VBS-JS01A	Yes	Yes	No	No <u>Yes</u>
MCR Radiation Monitoring Package B ⁽¹⁾	VBS-JS01B	Yes	Yes	No	No <u>Yes</u>
***	***	***	***	***	***

COL Appendix C (and associated plant-specific Tier 1) Table 3.5-5 “Area Radiation Monitor”

Table 3.5-5 – Add the table headers, remove the Personnel Hatch elevation and revise the names of the Personnel Hatches, as described below.

Table 3.5-5 Area Radiation Monitors	
<u>Equipment List</u>	<u>Equipment No.</u>
***	***
Containment Area – <u>Upper</u> Personnel Hatch Maintenance Level (135'-3" Elevation)	RMS-RE009
***	***
Containment Area – <u>Lower</u> Personnel Hatch Maintenance Level (100'-0" Elevation)	RMS-RE021

COL Appendix C (and associated plant-specific Tier 1) Table 3.5-7

Table 3.5-7 – Correct the tag numbers for the MCR Radiation Monitoring Package A/B, as described below.

Table 3.5-7		
Component Name	Tag No.	Component Location
***	***	***
MCR Radiation Monitoring Package A	VBS-RY01A <u>VBS-JS01A</u>	Auxiliary Building
MCR Radiation Monitoring Package B	VBS-RY01B <u>VBS-JS01B</u>	Auxiliary Building
***	***	***

Tier 1 Section 4.0 “Interface Requirements”

Section 4.0 – Correct the referenced regulations described in the paragraph below.

4.0 Interface Requirements

The 10 CFR 52.47 ~~(a)(25) (a)(1)(vii)~~ requires identification of the interface requirements to be met by those portions of the plant for which the application does not seek certification. The 10 CFR 52.47 ~~(a)(26) (a)(1)(viii)~~ requires justification that these interfaces be verifiable through inspection, testing (either in the plant or elsewhere), or analysis. An applicant for a combined license (COL) that references the Certified Design must provide design features or characteristics that comply with the interface requirements for the plant design and inspections, tests, analyses, and acceptance criteria (ITAAC) for the site-specific portion of the facility design, in accordance with 10 CFR 52.79 (c).

* * *

UFSAR Section 1.2 “General Plant Description”

Section 1.2 – Correct the referenced regulations described in the paragraph below.

1.2 General Plant Description

* * *

Design Certification is sought for the power generation complex, excluding those elements and features considered site-specific. The AP1000 design extends beyond those structures, systems, and equipment which are safety-related. All safety-related structures, systems, and components are located on the nuclear island and are to be included in the design certification. To provide a better understanding of the safety-related features of the AP1000, nonsafety-related features are also described in this DCD. In addition, some plant design features which are outside the boundary of the AP1000, and considered to be site-specific, are described for completeness and to provide a basis for quantification of the required interfaces, as required by 10 CFR 52.47 ~~(a)(25) (a)(1)(ix)~~. The site-specific structures located off the nuclear island are neither safety-related nor seismic Category I. A more complete description of interfaces for the standard design is contained in Section 1.8.

UFSAR Table 1.6-1 “Material Referenced”

Table 1.6-1 – Correct the revision number described in the paragraph below.

DCD Section Number	Westinghouse Topical Report Number	Title
***	***	***
18.11	[APP-OCS-GEH-220	AP1000 Human Factors Engineering Task Support Verification Plan,]* Revision 4 5 , Westinghouse Electric Company LLC
***	***	***

UFSAR Section 1.8 “Interfaces for Standard Design”

Section 1.8 – Correct the referenced regulations described in the paragraphs below.

1.8 Interfaces for Standard Design

This section identifies the AP1000 standard plant scope, interfaces related to design certification between the AP1000 plant design and the Combined License applicant, and the site-specific items to be included in an application for a Combined License. It is submitted to satisfy the requirements of 10 CFR 52.47 ~~(a)(1)(vii)~~ (a)(25).

* * *

Interfaces are listed in the order discussed in the DCD. General interfaces are listed as they relate to a particular section of this DCD. No specific system-by-system interface listings are required due to the complete nature of the AP1000 plant design. All safety-related systems are contained within the AP1000 plant design. The listing includes identification of the interface classification and the matching interface item to be specified by the Combined License applicant. In addition, the section of this DCD which addresses the listed interface is identified. To satisfy the requirements of 10 CFR 52.47 (a)(25) ~~(a)(1)(ix)~~, representative conceptual designs are included in this DCD for those portions of the plant for which Westinghouse does not seek certification to aid the NRC staff in its review of the DCD and the probabilistic risk assessment to be submitted in support of the application, and to permit assessment of the adequacy of interface requirements.

* * *

UFSAR Table 3.2-3 “AP1000 Classification of Mechanical and Fluid Systems, Components, and Equipment”

Table 3.2-3 – Correct descriptions of the Personnel Hatches, as shown below.

Tag Number	Description	AP1000 Class	Seismic Category	Principal Construction Code	Comments
***	***	***	***	***	***
Containment System (CNS)					
***	***	***	***	***	***
CNS-MY-Y03	<u>Upper</u> Personnel Hatch – 135'-3"	B	I	ASME III, MC	
CNS-MY-Y04	<u>Lower</u> Personnel Hatch – 107'-2"	B	I	ASME III, MC	
***	***	***	***	***	***

UFSAR Subsection 3.8.4.5.5.5 “Design of Shear Studs and Tie Bars”

Subsection 3.8.4.5.5.5 – Correct the descriptions of the connection between the tie bars and steel faceplates as described in the paragraph below.

3.8.4.5.5.5 Design of Shear Studs and Tie Bars

*The tie bars provide a structural framework for the modules, maintain the separation between the faceplates, support the modules during transportation and erection, and act as “form ties” between the faceplates when concrete is being placed. The tie bars provide additional shear capacity between the steel plates and concrete as well as additional strength similar to that provided by stirrups in reinforced concrete. The area and spacing of the tie bars satisfy the requirement for minimum shear reinforcement for beams given in the ACI codes. The connection between the tie bars and the steel faceplates is designed to develop 125% of the specified yield ~~the full tensile~~ strength of the tie bar.]**

UFSAR Table 5.2-3 “ASME Code Cases”

Table 5.2-3 – Correct the title of ASME Code Case N-122-2, as shown below.

Code Case Number	Title
***	***
[N-122-2	Stress Indices for integral Structural Attachments Section III, Division 1, Class 1 <u>Procedure for Evaluation of the Design of Rectangular Cross Section Attachments on Class 1 Piping Section III, Division 1]</u> *
***	***

UFSAR Table 6.2.3-1 “Containment Mechanical Penetrations and Isolation Valves”

Table 6.2.3-1– Correct the descriptions of the Personnel Hatches, as shown below.

System	Containment Penetration			Isolation Device						Test		
	Line	Flow	Closed Sys IRC	Valve/Hatch Identification	Pipe Length	DCD Subsection	Position N-S-A	Signal	Closure Times	Type ¹ & Note	Medium	Direction
CNS	***	***	***	***	***	***	***	***	***	***	***	***
	Upper Personnel Hatch	N/A	No	CNS-MY-Y03	-	6.2.5	C-C-C	None	N/A	B	Air	Forward
	Lower Personnel Hatch	N/A	No	CNS-MY-Y03	-	6.2.5	C-C-C	None	N/A	B	Air	Forward
* * *												

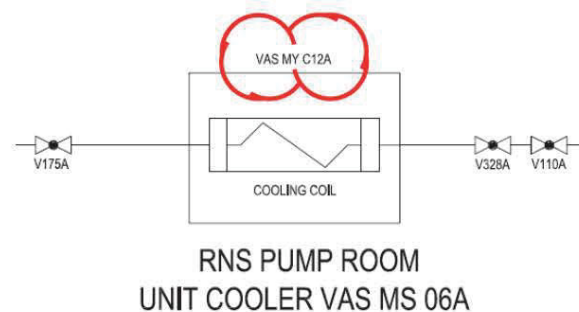
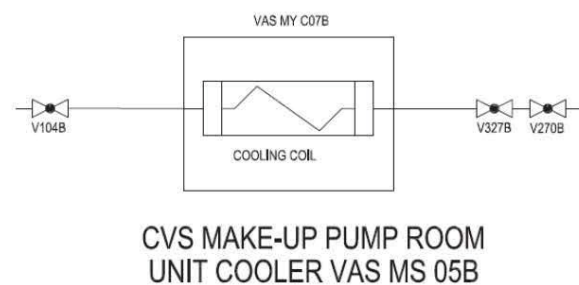
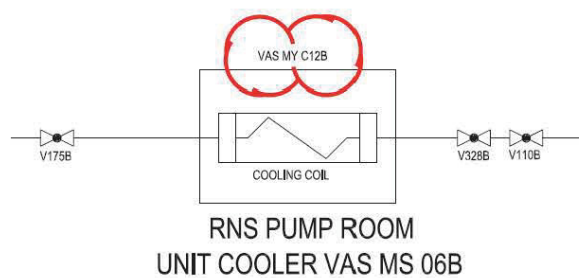
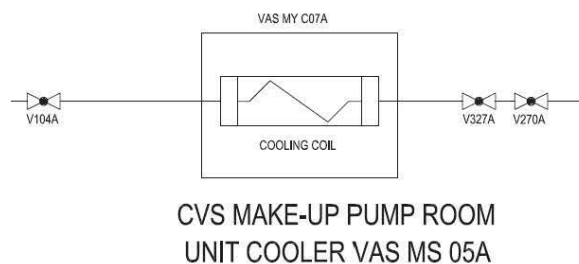
UFSAR Table 7.5-1 “Engineered Safety Features Actuation Signal”

Table 7.5-1 – Revise the QDPS Indication for the Main Control Room Supply Air Radiation variable, as shown below.

Variable	Range/ Status	Type/ Category	Qualification		Number of Instruments Required	Power Supply	QDPS Indication (Note 2)	Remarks
			Environmental	Seismic				
***	***	***	***	***	***	***	***	***
Main control room supply air radiation	Note 5	E3, F3	Mild	Yes	2 (Note 9)	1E	No <u>Yes</u>	
***	***	***	***	***	***	***	***	***

UFSAR Figure 9.2.7-1 (Sheet 2) “Simplified Central Chilled Water System Piping and Instrumentation Diagram (REF) VWS 007”

Figure 9.2.7-1 - Revise the tag number for the RNS Pump Room Unit Coolers, as shown in the two depictions below.



UFSAR Table 11.5-2 “Area Radiation Monitor Detector Parameters”

Table 11.5-2 – Revise the service description, as shown below.

Detector	Type	Service	Nominal Range
***	***	***	***
RMS-JE-RE009	Y	Containment Area <u>Upper</u> Personnel Hatch – Operating Deck –135'-3" Elevation	1.0E-1 to 1.0E+4 mR/hr (Note 1)
***	***	***	***
RMS-JE-RE021	Y	Containment Area <u>Lower</u> Personnel Hatch – Maintenance Level –100'-0" Elevation	1.0E-1 to 1.0E+04 mR/hr (Note 1)

UFSAR Section 14.3 “General Plant Description”

Section 14.3 – Correct the referenced regulations described in the paragraphs below.

14.3 Certified Design Material

The AP1000 Certified Design Material consists of the following:

- Design descriptions for selected systems that are within the scope of the AP1000 design certification, and the applicable portions of those selected systems that are only partially within the scope of the AP1000 design certification. The Certified Design Material design descriptions delineate the principal design bases and principal design characteristics that are referenced in the design certification rule. The design descriptions are accompanied by the inspections, tests, analyses, and acceptance criteria (ITAAC) required by 10 CFR 52.47 (a)(26) ~~(a)(1)(vi)~~ to be part of the design certification application. The ITAAC define verification activities that are to be performed for a facility with the objective of confirming that the plant is built and will operate in accordance with the design certification. Completion of these certified design ITAAC, together with the Combined License applicant's ITAAC for the site-specific portions of the plant, will be the basis for NRC authorization to load fuel per the provisions of 10 CFR Part 52.103.

- Interface requirements as defined by 10 CFR Part 52.47 (a)(25) ~~(a)(1)(vii)~~. Interface requirements are defined as those which must be met by the site-specific portions of the complete nuclear power plant that are not within the scope of the certified design. These requirements define characteristics of the site-specific features that must be provided for the certified design to comply with certification commitments. AP1000 has no interfaces meeting this definition. The Certified Design Material does not include ITAAC or a requirement for COL developed ITAAC for interface requirements.

UFSAR Subsection 14.3.4 “Certified Design Material Section 4.0, Interface Requirements”

Subsection 14.3.4 – Correct the referenced regulations described in the paragraph below.

14.3.4 Certified Design Material Section 4.0, Interface Requirements

Initial testing of interfacing non-safety systems in portions of the plant outside the scope of design certification is as discussed in Section 14.4. Section 1.8, Table 1.8-1, lists the interfacing systems and structures. Those systems that meet the requirements of 10 CFR 52.47 ~~(a)(25) (a)(1)(viii)~~ are tabulated in Subsection 14.4.5.

UFSAR Subsection 14.3.5 “CDM Section 5.0, Site Parameters”

Subsection 14.3.5 – Correct the referenced regulations described in the paragraph below.

14.3.5 CDM Section 5.0, Site Parameters

This section of the Certified Design Material defines the site parameters used as a basis for the design defined in the AP1000 certification application. These entries respond to the 10 CFR 52.47 ~~(a)(25) (a)(1)(viii)~~ requirement that the design certification documentation include site parameter information. It is intended that applicants referencing the AP1000 design certification demonstrate that these parameters for the selected site are within the certification envelope or provide additional analysis to show acceptability of deviations from the interface envelope.

UFSAR Subsection 18.11.2 “References”

Subsection 18.11.2 – The revision of Reference 4 is corrected, as shown below.

18.11.2 References

4. APP-OCS-GEH-220, “AP1000 Human Factors Engineering Task Support Verification Plan,”* Revision ~~4~~ 5, Westinghouse Electric Company LLC.⁽²⁾

UFSAR Table 18.12.2-1 “Minimum Inventory of Fixed Position Controls, Displays and Alerts”

Table 18.12.2-1 – Add the “Manual Containment Vacuum Relief” description, as shown below.

Description	Control	Display	Alert ⁽²⁾
***	***	***	***
<u>Manual Containment Vacuum Relief</u>	<u>X</u>		

APP-OCS-GEH-220 Rev. 5 “AP1000 Human Factors Engineering Task Support Verification Plan”

The markups for APP-OCS-GEH-220 are proprietary and included in Enclosure 4.

Southern Nuclear Operating Company

ND-17-1955

Enclosure 6

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

APP-OCS-GEH-222 Rev. 5

**“AP1000 Human Factors Engineering Task Support Verification Plan”
(LAR-17-042)**

(Enclosure 6 consists of 39 pages, excluding this cover page.)



Westinghouse Non-Proprietary Class 3

AP1000

**Human Factors Engineering Task Support
Verification Plan**

**APP-OCS-GEH-222,
Rev. 5**

November 2017

APPROVALS

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*Electronically approved records are authenticated in the electronic document management system.

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WESTINGHOUSE NON-PROPRIETARY CLASS 3

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REVISION HISTORY**RECORD OF CHANGES**

Revision	Author	Description	Completed
A	Todd W. Van Meter	Preliminary Issue	6/2008
B	Todd W. Van Meter	Revision was created to prepare the document with proprietary markings for transmittal.	4/2009
0	Julie I. Reed	<p>Incorporation of APP-GW-GEE-4051, Rev. 0.</p> <p>Numerous updates to the References and Bibliography in accordance with latest documents and revisions.</p> <p>Minor editorial clarifications throughout the document.</p> <p>Subsection 1.1.2, “Process Strategy”: Added description of the mechanism to deal with design and procedure changes post-task support verification, and added reference to APP-GW-G0Y-002, “AP1000 Configuration Management Plan” and WNA-PC-00005-WAPP, “AP1000 I&C Projects Configuration Management Plan”.</p> <p>Subsection 1.2.1, “Applicability”: Replaced “complete set of” with “full range of activities in the” to make a correction on the scope of OSA in terms of covered EOPs.</p> <p>Section 1.4, “List of Exceptions from WCAP-15860”: A new section is added.</p> <p>Section 2.1, “Background”: Clarified descriptions of OSA-1 and OSA-2 scope and methodologies.</p> <p>Section 2.2, “Verification Plan For Function-Based Task Analysis”: Deleted detailed information in description about APP-OCS-J1A-030. Deleted discrepancy worksheet and added information on the HF Tracking System into which discrepancy will be entered. This change is implemented across the document in all other relevant places.</p> <p>Subsection 2.3.1, “Prerequisite”: Changed “program wide database (PWD)” to “AP1000 design” and included design information as an input to the development of OSA-1.</p> <p>Subsection 2.4.1, “Prerequisite”: Added reference to APP-OCS-GLR-001, “AP1000 Post-Accident Risk-Important Human Actions Summary Report.”</p>	3/2013

AP1000

Human Factors Engineering Task Support Verification Plan

REVISION HISTORY (cont.)

RECORD OF CHANGES (cont.)

Revision	Author	Description	Completed
0 (cont.)	Julie I. Reed	<p>Section 2.6, “Verification Plan for Emergency Operations Facility and Technical Support Center Task Functions”: Added reference to APP-OCS-J0A-001, “AP1000 Human Factors Engineering Analysis to Support Technical Support Center and Emergency Operations Facility Design.”</p> <p>Section 3.1, “Verification Plan for Minimum Inventory Equipment”: Clarified that the commitments to be met are those specified in the AP1000 DCD for minimum inventory equipment.</p> <p>Subsection 4.2.1, “AP1000 Implementation”: Changed to reflect revision 0 of the OCS System Specification document and to include a reference to APP-OCS-J1-024, “AP1000 Operation and Control Centers Presentation of Safety Functions Design Basis”.</p> <p>Subsection 4.4.2, “Verification Plan”: Added the automatic depressurization system operation controls to the verification plan.</p> <p>Section 4.5, “10 CFR 50.34(f)(2)(viii) – Post-Accident Sampling”: Deleted statement about contingency plans and post-accident access areas.</p> <p>Section 4.11, “10 CFR 50.34(f)(2)(xix) – Post-Accident Monitoring Instrumentation”: Deleted sentence “The normal control room display system is used for the display of non-safety-related signals which are not required to be displayed by a qualified system”.</p> <p>Subsection 4.13.1, “AP1000 Implementation”: Clarified that it is the MCR emergency habitability system that functions to protect the operators and support the MCR equipment and HSI resources. The last paragraph was moved to be the first paragraph in this section.</p> <p>Section 5.1, “Resource Assignment”: Changed ‘OCS Product Manager’ to ‘HF Manager’ (in multiple sections). Changed definition of ‘independent verifier’ and included reference to NSNP 3.3.3, “Design Verification by Independent Review or Alternate Calculations.”</p> <p>Section 5.2, “Personnel Requirements and Techniques”: Changed “HSI resources” to “item”.</p>	3/2013

REVISION HISTORY (cont.)**RECORD OF CHANGES (cont.)**

Revision	Author	Description	Completed
0 (cont.)	Julie I. Reed	Section 5.3, “Documenting and Resolving Human Engineering Discrepancies”: Deleted information describing the process for defining HEDs, creating justifications for discrepancies, prioritization of HEDs, and the process to resolve HEDs. Deleted “priority 1 and priority 2.” Changed the description of task support verification completion from approval of the HED resolution report (APP-OCS-GER-420) to the approval of the design verification results (APP-OCS-GER-220). Section 5.4, “Human Factors Discrepancy Form Requirements”: Updated the details and the example of discrepancy worksheet in Section 5.4 and Appendix A to the current Task Support Verification form in the HF Tracking System. Section 5.5, “Deliverables”: Clarifications are made on the process for discrepancy resolution.	3/2013
1	Julie I. Reed	Incorporation of APP-GW-GEE-4523, Rev. 0. Updated document revision numbers in the Bibliography. Section 1.4, “List of Exceptions from WCAP-15860,” Item 1: Added a reference to APP-GW-GJP-150, “Operating Procedures Verification and Validation.” Section 1.4, “List of Exceptions from WCAP-15860,” Item 3: Corrected text to state that the HSI characteristics of accuracy and precision are in scope of task support verification, and dynamic response is not in scope. Section 2.5, “Verification Plan for MTIS Activities”: Corrected typographical error. Section 4, “Verification Process for 10 CFR 50.34 Requirements”: Administrative changes made to proprietary markings. Note: An alternative document number is APP-OCS-GEH-222 (non-proprietary version).	8/2013
2	Julie I. Reed Steven P. Kerch	Incorporation of APP-GW-GEE-4692, Rev. 0, and APP-GW-GEE-4937, Rev. 0. Updated the References and Bibliography Sections to be in-line with the current document revisions. Updated Acronyms and Trademarks Section.	12/2014

AP1000**Human Factors Engineering Task Support Verification Plan****REVISION HISTORY (cont.)****RECORD OF CHANGES (cont.)**

Revision	Author	Description	Completed
3	Julie I. Reed Steven P. Kerch	Incorporation of APP-GW-GEE-4937, Rev. 0. Section 2.2, "Verification Plan for Function-Based Task Analysis": Deleted cross-reference to subsection of FBTA summary report (Subsection 5.2.2.2) and clarified the scope of FBTA.	12/2014
4	Julie I. Reed Steven P. Kerch	Incorporation of APP-GW-GEE-4937, Rev. 0. Section 2.2, "Verification Plan for Function-Based Task Analysis": Replaced "provides recommendations for" with "identifies" in order to more clearly state that FBTA Summary Report results provide interface requirements and not recommendations. This change only affects the Westinghouse HF and Operations group and resulted from a meeting with the U.S. NRC on Revision 3.	1/2015
5	Julie I. Reed	Incorporated APP-OCS-GEH-222, Rev. 5, ADL Section 1.2.2, "Function-Based Task Analysis and Operational Sequence Analyses (OSAs)": Updated to state that the task analyses for the MTIS activities and the EOF and TSC activities which are associated with the HSI resources in the MCR are within the scope of OSA-1, and not OSA-2.	See PRIME

DOCUMENT TRACEABILITY & COMPLIANCE

Created to Support the Following Document(s)	Document Number	Revision
AP1000 Human Factors Engineering Program Plan	APP-OCS-GBH-001	1

OPEN ITEMS

Item	Description	Status
None.		

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None.		

ACRONYMS AND TRADEMARKS

Acronyms used in the document are defined in WNA-PS-00016-GEN, “Standard Acronyms and Definitions” (Reference 1), or included below to ensure unambiguous understanding of their use within this document.

Acronyms	Definition
HED	Human Engineering Discrepancy
HF	Human Factors
MTIS	Maintenance, Test, Inspection and Surveillance
TMI	Three Mile Island

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GLOSSARY OF TERMS

Standard terms used in the document are defined in WNA-PS-00016-GEN, “Standard Acronyms and Definitions” (Reference 1), or included below to ensure unambiguous understanding of their use within this document.

Term	Definition
Independent Verifier	Any competent individual(s) or group(s) other than those who performed the original design work, but who may be from the same organization or group
Task Support Verification	An evaluation to confirm that the human-system interface (HSI) resources are available to accommodate human capabilities and limitations as identified in the project’s task analyses.

REFERENCES

Following is a list of references used throughout this document.

1. APP-GW-J9Y-001, Rev. 1 (WNA-PS-00016-GEN, Rev. 6), “Standard Acronyms and Definitions,” Westinghouse Electric Company LLC. (Proprietary)
2. APP-OCS-GBH-001, Rev. 1, “AP1000 Human Factors Engineering Program Plan,” Westinghouse Electric Company LLC. (Proprietary)
3. APP-OCS-GEH-020, Rev. 2 (WCAP-15860), “Programmatic Level Description of the AP1000 Human Factors Verification and Validation Plan,” Westinghouse Electric Company LLC.
4. NUREG-0711, Rev. 2, “Human Factors Engineering Program Review Model,” U.S. Nuclear Regulatory Commission.
5. APP-GW-G0Y-002, Rev. 3, “AP1000 Configuration Management Plan,” Westinghouse Electric Company LLC. (Proprietary)
6. WNA-PC-00005-WAPP, Rev. 4, “AP1000 I&C Projects Configuration Management Plan,” Westinghouse Electric Company LLC. (Proprietary)
7. 10 CFR 50.34, “Contents of Construction Permit and Operating License Applications; Technical Information,” U.S. Nuclear Regulatory Commission.
8. Regulatory Guide 1.47, Rev. 1, “Bypassed and Inoperable Status Indication for Nuclear Power Plant Safety Systems,” U.S. Nuclear Regulatory Commission, February 2010.
9. WEC 3.3.3, Rev. 1.0, “Design Verification,” Westinghouse Electric Company LLC, effective November 28, 2013.

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Following is a list of sources that were considered in preparing this document. Revisions cited were consulted at the time of writing. Revisions to the documents listed below do not require a revision to this document; therefore users should consult the latest approved revision.

1. APP-OCS-GEH-120, Rev. 3, "AP1000 Human Factors Engineering Design Verification Plan," Westinghouse Electric Company LLC. (Proprietary)
2. APP-OCS-GEH-320, Rev. 5, "AP1000 Human Factors Engineering Integrated System Validation Plan," Westinghouse Electric Company LLC. (Proprietary)
3. APP-OCS-GEH-420, Rev. 2, "AP1000 Human Engineering Discrepancy Resolution Process," Westinghouse Electric Company LLC. (Proprietary)
4. APP-OCS-GEH-520, Rev. 4, "AP1000 Plant Startup Human Factors Engineering Design Verification Plan," Westinghouse Electric Company LLC. (Proprietary).
5. APP-OCS-J1R-100, Rev. 1, "Function-Based Task Analysis Methodology and Implementation for AP1000," Westinghouse Electric Company LLC. (Proprietary)
6. APP-OCS-J1R-110, Rev. 2, "Operational Sequence Analysis Methodology," Westinghouse Electric Company LLC. (Proprietary)
7. APP-OCS-J1R-210, Rev. 2, "AP1000 Operational Sequence Analysis (OSA-2) Implementation Plan," Westinghouse Electric Company LLC. (Proprietary)
8. APP-GW-GL-700, Rev. 19, "AP1000 Design Control Document," Westinghouse Electric Company LLC.
9. APP-GW-GJP-150, Rev. 0, "Operating Procedures Verification and Validation," Westinghouse Electric Company LLC. (Proprietary)
10. APP-OCS-J1A-030, Rev. 2, "Function-Based Task Analysis Summary Report," Westinghouse Electric Company LLC. (Proprietary)
11. APP-OCS-J1R-120, Rev. 4, "AP1000 Operational Sequence Analysis (OSA-1) Summary Report," Westinghouse Electric Company LLC. (Proprietary)
12. APP-GW-GL-011, Rev. 0, "AP1000 Identification of Critical Human Action and Risk Important Tasks," Westinghouse Electric Company LLC.
13. APP-OCS-GLR-001, Rev. 2, "AP1000 Post-Accident Risk-Important Human Actions Summary Report," Westinghouse Electric Company LLC. (Proprietary)

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14. APP-OCS-J1R-220, Rev. 2, "AP1000 Operational Sequence Analysis (OSA-2) Summary Report," Westinghouse Electric Company LLC.
15. APP-OCS-J0A-001, Rev. 0, "AP1000 Human Factors Engineering Analysis to Support Technical Support Center and Emergency Operations Facility Design," Westinghouse Electric Company LLC. (Proprietary)
16. APP-OCS-J7-001, Rev. 0, "AP1000 Operations and Control Centers System System Specification Document," Westinghouse Electric Company LLC. (Proprietary)
17. APP-OCS-J1-024, Rev. 1, "AP1000 Operation and Control Centers Presentation of Safety Functions Design Basis." (Proprietary)
18. Federal Register, Volume 65, Number 211, October 31, 2000.
19. NUREG-0737, "Clarification of TMI Action Plan Requirements," November 1980.
20. Regulatory Guide 1.97, Rev. 4, "Criteria for Accident Monitoring Instrumentation for Nuclear Power Plants," June 2006, U.S. Nuclear Regulatory Commission.

(Last Page of Front Matter)

SECTION 1 INTRODUCTION

1.1 OVERVIEW

1.1.1 Purpose

This document defines the Human Factors Engineering (HFE) task support verification plan for the AP1000® plant. It is an integral part of the APP-OCS-GBH-001, “AP1000 Human Factors Engineering Program Plan” (Reference 2).

This document is based on the information and guidance described in APP-OCS-GBH-001, “AP1000 Human Factors Engineering Program Plan” (Reference 2); APP-OCS-GEH-020 (WCAP-15860), “Programmatic Level Description of the AP1000 Human Factors Verification and Validation Plan” (Reference 3); and NUREG-0711, “Human Factors Engineering Program Review Model” (Reference 4).

1.1.2 Process Strategy

The HFE task support verification plan is one of several verification and validation (V&V) activities performed on human-system interface (HSI) resources and Operation and Control Centers (OCS), where applicable. Formal V&V activities are an integral part of the overall HFE design process. These activities and associated documents include the following as defined in the AP1000 HFE Program Plan (Reference 2):

- APP-OCS-GEH-120, “AP1000 Human Factors Engineering Design Verification Plan” (Bibliog 1)
- APP-OCS-GER-120, “AP1000 Human Factors Engineering Design Verification Report” [LATER]
- APP-OCS-GER-220, “AP1000 Human Factors Engineering Task Support Verification Report” [LATER]
- APP-OCS-GEH-320, “AP1000 Human Factors Engineering Integrated System Validation Plan” (Bibliog 2)
- APP-OCS-GER-320, “AP1000 Human Factors Engineering Integrated System Validation Report” [LATER]
- APP-OCS-GEH-420, “AP1000 Human Engineering Discrepancy Resolution Process” (Bibliog 3)
- APP-OCS-GER-420, “AP1000 Human Engineering Discrepancy Resolution Report” [LATER]

- APP-OCS-GEH-520, “Plant Startup Human Factors Engineering Design Verification Plan” (Bibliog 4)
- APP-OCS-GER-520, “Plant Startup Human Factors Engineering Design Verification Report” [LATER]

These V&V activities are a final check of the adequacy of the HFE design of the HSI resources and Operation and Control Centers System (OCS) design. [

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1.2 SCOPE

1.2.1 Applicability

Per APP-OCS-GEH-020, “Programmatic Level Description of the AP1000 Human Factors Verification and Validation Plan” (Reference 3), the HSI task support verification plan includes the methodology by which the HSI resources, and Operation and Control Centers are checked against the information and control requirements identified in:

- Function-based task analyses (FBTA)
- Operational sequence task analyses for important and representative tasks
- Operational sequence task analyses performed for risk-important personnel tasks as defined by the Probabilistic Risk Assessment (PRA)

- Operational sequence task analyses performed for the full range of activities in the emergency operating procedures (EOPs)
- Required minimum inventory of alarms, displays, and controls
- Required federally mandated 10 CFR 50.34 (Reference 7) indications and control features

1.2.2 Function-Based Task Analysis and Operational Sequence Analyses (OSAs)

As part of the AP1000 HFE Program Plan (Reference 2), three separate task analyses are performed:

- APP-OCS-J1R-100, “Function-Based Task Analysis Methodology and Implementation for AP1000” (Bibliog 5)
- APP-OCS-J1R-110, “Operational Sequence Analysis Methodology” (Bibliog 6)
- APP-OCS-J1R-210, “AP1000 Operational Sequence Analysis (OSA-2) Implementation Plan” (Bibliog 7)

Section 2, “Verification Processes for FBTA and Operational Sequence Analysis,” contains the verification plans for each of these task analyses.

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1.2.3 Minimum Inventory Equipment

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Section 3, “Verification Process for Minimum Inventory Equipment,” describes the verification plan for the HSI resources associated with the minimum inventory equipment.

1.2.4 10 CFR 50.34(f) Requirements

The requirements and specifications in 10 CFR 50.34(f) are derived from the Three Mile Island (TMI) accident. The AP1000 Design Control Document (Bibliog 8), Section 1.9.3, evaluates each requirement in detail. Based on the “AP1000 Response” for each requirement, specific sections of 10 CFR 50.34(f) are included as part of the AP1000 task support verification plan.

Specifically, only the sections in 10 CFR 50.34(f) involving the availability of HSI resources (i.e., displays, alarms, and controls) in the final plant design are applicable to the task support verification assessment. For example, if the “AP1000 Response” specifies a requirement as “not applicable” to the AP1000 design, then no verification plan for that requirement is included in this document. Also, the 10 CFR 50.34(f) requirements which are not applicable to HSI resources are excluded from this document; for example, 10 CFR 50.34(f)(1)(vi) states, “Perform a study to identify practicable system modifications that would reduce challenges and failure of relief valves, without compromising the performance of the valves or other systems.”

Section 4, “Verification Processes for 10 CFR 50.34(f) Requirements,” identifies the applicable requirements and describes the verification plans for these requirements.

1.2.5 Limitation of Scope

No critical human actions have been identified for the AP1000 plant. Therefore, the verification of critical human actions is not required.

1.3 OBJECTIVE

The overall objective of Human Factors V&V is to ensure that the AP1000 design attains a high standard of human factors adequacy and thereby contributes to the safety, operability and maintainability of the plant.

The objective of the task support verification activities is to confirm the availability of the required OCS and HSI resources in the final AP1000 design, identify deviations, and formally document the results.

1.4 LIST OF EXCEPTIONS FROM WCAP-15860

The HFE task support verification complies with WCAP-15860, “Programmatic Level Description of the AP1000 Human Factors Verification and Validation Plan” (Reference 3). However, WCAP-15860 was issued relatively early in the design stage of AP1000, and therefore based on the current AP1000 design, four adjustments were required. These are described below:

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AP1000

Human Factors Engineering Task Support Verification Plan

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(Last Page of Section 1)

SECTION 2

VERIFICATION PROCESSES FOR FBTA AND OPERATIONAL SEQUENCE ANALYSIS

2.1 BACKGROUND

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2.2 VERIFICATION PLAN FOR FUNCTION-BASED TASK ANALYSIS

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] ^{a,c} For each identified “Fail,” a discrepancy is entered into the HF Tracking System (see Section 5.3, “Documenting and Resolving Human Engineering Discrepancies” and Section 5.4, “Human Factors Discrepancy Form Requirements” for details).

2.3 VERIFICATION PLAN FOR OSA-1

2.3.1 Prerequisite

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2.3.2 Verification Plan

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]^{a,c} For each HSI resource that is evaluated as “Fail,” a discrepancy is entered into the HF Tracking System (see Section 5.3, “Documenting and Resolving Human Engineering Discrepancies” and Section 5.4, “Human Factors Discrepancy Form Requirements” for details).

2.4 VERIFICATION PLAN FOR OSA-2 – RISK-IMPORTANT TASKS AND TASKS THAT HAVE HUMAN PERFORMANCE CONCERNS

2.4.1 Prerequisite

As part of the task support verification activities, a qualified independent verifier will confirm that no new critical human tasks, risk-important tasks, or tasks that have human performance concerns have been identified since the completion of OSA-2. This can be confirmed by checking APP-OCS-J1R-210, “AP1000 Operational Sequence Analysis (OSA-2) Implementation Plan” (Bibliog 7), Tables 2.1-1 and 2.1-2, against the information provided in APP-GW-GL-011, “AP1000 Identification of Critical Human Actions and Risk Important Tasks” (Bibliog 12) and APP-OCS-GLR-001, “AP1000 Post-Accident Risk-Important Human Actions Summary Report” (Bibliog 13). [

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2.4.2 Verification Plan

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] ^{a,c} For each HSI resource that is evaluated as “Fail,” a discrepancy is entered into the HF Tracking System (see Section 5.3, “Documenting and Resolving Human Engineering Discrepancies” and Section 5.4, “Human Factors Discrepancy Form Requirements” for details).

2.5 VERIFICATION PLAN FOR MTIS ACTIVITIES

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For each HSI resource that is evaluated as “Fail,” a discrepancy is entered into the HF Tracking System (see Section 5.3, “Documenting and Resolving Human Engineering Discrepancies” and Section 5.4, “Human Factors Discrepancy Form Requirements” for details).

2.6 VERIFICATION PLAN FOR EMERGENCY OPERATIONS FACILITY AND TECHNICAL SUPPORT CENTER TASK FUNCTIONS

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^{a,c} For each HSI resource that is evaluated as “Fail,” a discrepancy is entered into the HF Tracking System (see Section 5.3, “Documenting and Resolving Human Engineering Discrepancies” and Section 5.4, “Human Factors Discrepancy Form Requirements” for details).

(Last Page of Section 2)

SECTION 3

VERIFICATION PROCESS FOR MINIMUM INVENTORY EQUIPMENT

3.1 VERIFICATION PLAN FOR MINIMUM INVENTORY EQUIPMENT

For each control, display, and alert identified in APP-GW-GL-700, “AP1000 Design Control Document” (Bibliog 8), Table 18.12.2-1, a qualified independent verifier will ensure the availability and HFE adequacy of the HSI resource. [

] ^{a,c} For each HSI

Resource that is evaluated as “Fail,” a discrepancy is entered into the HF Tracking System (see Section 5.3, “Documenting and Resolving Human Engineering Discrepancies” and Section 5.4, “Human Factors Discrepancy Form Requirements” for details).

(Last Page of Section 3)

SECTION 4 VERIFICATION PROCESSES FOR 10 CFR 50.34 REQUIREMENTS

4.1 BACKGROUND

The applicability of 10 CFR 50.34(f), as implemented in the AP1000 design, is detailed in the AP1000 Design Control Document (DCD) (Bibliog 8), Section 1.9.3. Based on the “AP1000 Response” sections within the DCD and the guidance stated in APP-OCS-GEH-020, “Programmatic Level Description of the AP1000 Human Factors Verification and Validation Plan” (Reference 3), the following sections of 10 CFR 50.34(f) are addressed in the task support verification process.

Note

The “AP1000 Implementation” sections below are not identical to the “AP1000 Response” sections in the AP1000 Design Control Document. The “AP1000 Implementation” sections are structured to provide clarity to the verification process.

4.2 10 CFR 50.34(f)(2)(iv) – SAFETY PARAMETER DISPLAY SYSTEM

Provide a plant safety parameter display console that will display to operators a minimum set of parameters defining the safety status of the plant, capable of displaying a full range of important plant parameters and data trends on demand, and capable of indication when process limits are being approached or exceeded.

4.2.1 AP1000 Implementation

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4.2.2 Verification Plan

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4.3 10 CFR 50.34(f)(2)(v) – SAFETY SYSTEM STATUS INDICATION

Provide for automatic indication of the bypassed and [in]operable status of safety systems.

4.3.1 AP1000 Implementation

Plant safety parameters, protection system status, and plant component status signals are processed by the protection and safety monitoring system (PMS). These signals are shared via the redundant monitor bus. Class 1E signals are provided to the qualified data processor, which is part of the PMS for accident monitoring displays. The display of this data is incorporated into the process data displays on the graphic VDU-based workstations for the safety control system in the AP1000 MCR.

4.3.2 Verification Plan

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] ^{a,c} For each item that “Fails,” a discrepancy is entered into the HF Tracking System (see Section 5.3, “Documenting and Resolving Human Engineering Discrepancies” and Section 5.4, “Human Factors Discrepancy Form Requirements” for details).

4.4 10 CFR 50.34(f)(2)(vi) – REACTOR COOLANT SYSTEM HIGH POINT VENTS

Provide the capability of high point venting of non-condensable gases from the reactor coolant system, and other systems that may be required to maintain adequate core cooling. Systems to achieve this capability shall be capable of being operated from the control room and their operation shall not lead to an unacceptable increase in the probability of loss-of-coolant accident or an unacceptable challenge to containment integrity.

4.4.1 AP1000 Implementation

In the AP1000 design, the capability for remotely operated high point venting of the reactor coolant system is provided by the safety-related automatic depressurization system valves and the safety-related reactor vessel head vent system. Both of these vent paths discharge to the containment refueling water storage tank.

During loss of cooling accident events, the automatic depressurization system automatically depressurizes the reactor coolant system so that the passive core cooling system may effectively deliver core cooling flow. Depressurization via the automatic depressurization system results in creation of a gas-steam volume in the upper region of the vessel. This vapor volume expands down to the inside of the hot leg before it begins venting through the hot leg either via the automatic depressurization system paths connected to the pressurizer or directly from the hot legs via the fourth stage automatic depressurization system paths. This process provides an open injection and steam venting flow path through the reactor vessel, maintaining required core cooling flow.

The reactor vessel head vent system can also be operated from the MCR to directly vent from the top of the reactor vessel head. Section 5.4.12 of the AP1000 DCD (Bibliog 8) provides additional information pertaining to the reactor coolant system venting capabilities.

4.4.2 Verification Plan

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] ^{a,c} For each

HSI resource that “Fails,” a discrepancy is entered into the HF Tracking System (see Section 5.3, “Documenting and Resolving Human Engineering Discrepancies” and Section 5.4, “Human Factors Discrepancy Form Requirements” for details).

4.5 10 CFR 50.34(f)(2)(viii) – POST-ACCIDENT SAMPLING

Provide a capability to promptly obtain and analyze samples from the reactor coolant system and containment that may contain TID-14844 source term radioactive materials without radiation exposures to any individual exceeding 5 rem to the whole-body or 50 rem to the extremities. Materials to be analyzed and quantified include certain radionuclides that are indicators of degree of core damage (e.g., noble gases, iodines and cesiums, and non-volatile isotopes) hydrogen in the containment atmosphere, dissolved gases, chloride, and boron concentrations.

4.5.1 AP1000 Implementation

The NRC published a model safety evaluation report on eliminating post-accident sampling system requirements from technical specifications for operating plants (Federal Register, Volume 65, Number 211, October 31, 2000, Bibliog 18). The AP1000 sampling design is consistent with the approach in the model safety evaluation report and not the guidance outlined in NUREG-0737 (Bibliog 19) and Regulatory Guide 1.97 (Bibliog 20). The primary sampling system design includes capabilities to obtain and analyze highly radioactive post-accident samples from the reactor coolant system, the containment sump, and the containment atmosphere.

4.5.2 Verification Plan

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For each HSI component that “Failed,” a discrepancy is entered into the HF Tracking System (see Section 5.3, “Documenting and Resolving Human Engineering Discrepancies” and Section 5.4, “Human Factors Discrepancy Form Requirements” for details).

4.6 10 CFR 50.34(f)(2)(ix) – HYDROGEN CONTROL

Provide a system for hydrogen control that can safely accommodate hydrogen generated by the equivalent of a 100 percent fuel-clad metal-water reaction. Preliminary design information on the tentatively preferred system option of those being evaluated in paragraph (1)(xii) of this section (50.34) is sufficient at the construction permit stage. The hydrogen control system and associated systems shall provide, with reasonable assurance, that:

- (A) Uniformly distributed hydrogen concentrations in the containment do not exceed 10 percent during and following an accident that releases an equivalent amount of hydrogen as would be generated from a 100 percent fuel-clad metal-water reaction, or that the post-accident atmosphere will not support hydrogen combustion.*
- (B) Combustible concentrations of hydrogen will not collect in areas where unintended combustion or detonation could cause loss of containment integrity or loss of appropriate mitigating features.*
- (C) Equipment necessary for achieving and maintaining safe shutdown of the plant and maintaining containment integrity will perform its safety function during and after being exposed to the environmental conditions attendant with the release of hydrogen generated by the equivalent of a 100 percent fuel-clad metal-water reaction including the environmental conditions created by activation of the hydrogen control system.*
- (D) If the method chosen for hydrogen control is a post-accident inerting system, inadvertent actuation of the system can be safely accommodated during plant operation.*

4.6.1 AP1000 Implementation

Continuous indication of hydrogen concentration in the containment atmosphere is provided. The containment hydrogen control system maintains hydrogen concentrations below 10 percent following the reaction of 100 percent of the active Zircaloy cladding. Hydrogen igniters control rapid release of hydrogen during and after postulated degraded core and core melt accidents to maintain concentration below 10 percent. In addition, sufficient vent area is provided for each subcompartment in the containment to prevent high local concentrations of hydrogen. See Section 6.2.4 of the AP1000 Design Control Document (Bibliog 8) for additional information.

4.6.2 Verification Plan

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AP1000

Human Factors Engineering Task Support Verification Plan

For each HSI resource that “Fails,” a discrepancy is entered into the HF Tracking System (see Section 5.3, “Documenting and Resolving Human Engineering Discrepancies” and Section 5.4, “Human Factors Discrepancy Form Requirements” for details).

4.7 10 CFR 50.34(f)(2)(xi) – VALVE POSITION INDICATION

Provide direct indication of relief and safety valve position (open or closed) in the control room.

4.7.1 AP1000 Implementation

Direct indication of relief and safety valve position (open or closed) is provided in the MCR. The AP1000 design does not include power-operated relief valves and their associated block valves from the reactor coolant system.

4.7.2 Verification Plan

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] ^{a,c} For each HSI resource that “Fails,” a discrepancy is entered into the HF Tracking System (see Section 5.3, “Documenting and Resolving Human Engineering Discrepancies” and Section 5.4, “Human Factors Discrepancy Form Requirements” for details).

4.8 10 CFR 50.34(f)(2)(xii) – AUXILIARY FEEDWATER SYSTEM INITIATION AND INDICATION

Provide automatic and manual auxiliary feedwater system initiation, and provide auxiliary feedwater system flow indication in the control room.

4.8.1 AP1000 Implementation

The AP1000 design includes a non-safety-related startup feedwater system, but not an auxiliary feedwater system. Flow indication of the startup feedwater system is provided in the MCR. The startup feedwater pumps automatically start following anticipated transients resulting in low steam generator level. The startup feedwater control valves automatically control feedwater flow to the steam generators during operation. They can also be operated manually from the MCR.

The safety-related passive core cooling system provides for emergency core decay heat removal during transients, accidents, or conditions during which the normal heat removal paths are unavailable. Automatic and manual actuation and flow rate indication are available in the MCR.

4.8.2 Verification Plan

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] ^{a,c} For each HSI resource that “Fails,” a discrepancy is entered into the HF Tracking System (see Section 5.3, “Documenting and Resolving Human Engineering Discrepancies” and Section 5.4, “Human Factors Discrepancy Form Requirements” for details).

4.9 10 CFR 50.34(f)(2)(xvii) – SPECIFIC ACCIDENT MONITORING INSTRUMENTATION

“Provide instrumentation to measure, record and readout in the control room: (A) containment pressure, (B) containment water level, (C) containment hydrogen concentration, (D) containment radiation intensity (high level), and (E) noble gas effluents at all potential accident release points. Provide for continuous sampling of radioactive iodines and particulates in gaseous effluents from all potential accident release points, and for onsite capability to analyze and measure these samples.”

4.9.1 AP1000 Implementation

AP1000 post-accident monitoring is described in Chapter 7 of the AP1000 Design Control Document (Bibliog 8).

AP1000 post-accident monitoring provides for indication of the specified parameters as follows:

- Containment pressure
- Containment water level
- Containment radiation intensity (high level)
- Noble gas effluents – to ascertain reactor coolant system integrity

Other noble gas effluents are designated Type E variables and include information to permit the operators to:

- Monitor the habitability of the MCR
- Monitor plant areas where access may be required to service equipment necessary to monitor or mitigate the consequences of an accident
- Estimate the magnitude of release of radioactive materials through identified pathways
- Monitor radiation levels and radioactivity in the environment surrounding the plant

Section 11.5.5 of the AP1000 DCD includes additional information on measurement of radioactive effluents and conformance with Regulatory Guide 1.97 (Bibliog 20).

The AP1000 primary sampling system is designed to provide post-accident sampling functions. See subsection 9.3.3.1 of the AP1000 DCD for additional information on the post-accident sampling system.

4.9.2 Verification Plan

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] ^{a,c} For each HSI resource that “Fails,” a discrepancy is entered into the HF Tracking System (see Section 5.3, “Documenting and Resolving Human Engineering Discrepancies” and Section 5.4, “Human Factors Discrepancy Form Requirements” for details).

4.10 10 CFR 50.34(f)(2)(xviii) – INADEQUATE CORE COOLING INSTRUMENTATION

Provide instruments that provide in the control room an unambiguous indication of inadequate core cooling, such as primary coolant saturation meters in PWRs, and a suitable combination of signals from indicators of coolant level in the reactor vessel and in-core thermocouples in PWRs and BWRs.

4.10.1 AP1000 Implementation

The AP1000 reactor system includes instrumentation for detecting voids in the reactor vessel head and other reactor vessel inventory deficits that could lead to inadequate core cooling.

The available instrumentation includes core subcooling margin monitors, core exit thermocouples, pressurizer level indicators, reactor coolant system reactor vessel level, and reactor coolant pump status (motor current). Reactor vessel level indication is provided from a range in the vessel from the bottom of the hot leg to approximately the reactor vessel mating flange via level instrumentation connected to the hot legs.

The AP1000 features that provide margin to or indication of inadequate core cooling include the following:

- A larger pressurizer than most current pressurized water reactors (PWRs), with a pressurizer that is located above the reactor pressure vessel head
- No automatic power-operated relief valves
- An improved reactor vessel head venting capability

- A passive core cooling system
- A passive containment cooling system
- No dependence on alternating current (ac) power to maintain adequate core and containment cooling
- Reactor coolant system hot leg level instrumentation
- Improved reactor system instrumentation
- Core subcooling monitoring

4.10.2 Verification Plan

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]^{a,c} For each HSI resource that “Fails,” a discrepancy is entered into the HF Tracking System (see Section 5.3, “Documenting and Resolving Human Engineering Discrepancies” and Section 5.4, “Human Factors Discrepancy Form Requirements” for details).

4.11 10 CFR 50.34(f)(2)(xix) – POST-ACCIDENT MONITORING INSTRUMENTATION

Provide instrumentation adequate for monitoring plant conditions following an accident that includes core damage.

4.11.1 AP1000 Implementation

The AP1000 post-accident monitoring system was developed by using Regulatory Guide 1.97 (Bibliog 20) as a guidance document.

Data used for post-accident monitoring is displayed either by the normal control room display system or by the qualified data processing system. The qualified data processing system provides the display of signals which must be displayed by a qualified system. The qualified data processing system is a microprocessor-based, safety-related system that provides instrumentation to monitor the plant variables and systems during and following an accident. The system consists of two independent, electrically isolated, physically separated divisions.

Chapter 7 of the AP1000 DCD (Bibliog 8) has additional details pertaining to this requirement.

4.11.2 Verification Plan

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4.12 10 CFR 50.34(f)(2)(xxvii) – IN-PLANT MONITORING

Provide for monitoring of in-plant radiation and airborne radioactivity as appropriate for a broad range of routine and accident conditions.

4.12.1 AP1000 Implementation

Area radiation monitors (ARMs) are provided to supplement the personnel and area radiation survey provisions of the AP1000 health physics program described in Section 12.5 of the AP1000 DCD (Bibliog 8). In addition to the installed detectors, periodic plant environmental surveillance is established.

4.12.2 Verification Plan

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] ^{a,c} For each HSI resource that “Fails,” a discrepancy is entered into the HF Tracking System (see Section 5.3, “Documenting and Resolving Human Engineering Discrepancies” and Section 5.4, “Human Factors Discrepancy Form Requirements” for details).

4.13 10 CFR 50.34(f)(2)(xxviii) – CONTROL ROOM HABITABILITY

Evaluate potential pathways for radioactivity and radiation that may lead to control room habitability problems under accident conditions resulting in a TID-14844 source term release, and make necessary design provisions to preclude such problems.

4.13.1 AP1000 Implementation

The non-safety-related HVAC system, equipped with a refrigeration-type air conditioning unit, normally provides MCR cooling. During a loss of power, this equipment is powered from the on-site diesel generators. If the normal HVAC system is not available, outside air is not allowed into the MCR, and the safety-related compressed-air storage system is actuated.

A non-safety-related heating, ventilation and air conditioning (HVAC) system maintains the AP1000 MCR slightly pressurized to prevent infiltration of air from other plant areas. During accident conditions, a safety-related isolation of the MCR is automatically actuated.

Upon the loss of non-safety-related ac power, the MCR Emergency Habitability System protects the operators and support the MCR equipment and HSI resources necessary to establish and maintain safe shutdown conditions for the plant following a postulated design basis accident. The radiation sources are based on the core activity release model from Regulatory Guide 1.183, which supersedes the TID-14844 source term assumptions as reflected in Regulatory Guide 1.4.

The MCR is sealed with safety-related connections to a safety-related compressed-air breathing source. This compressed-air system provides continued pressurization and a source of fresh air for operator habitability. The air supply is sized to last for 72 hours following an accident. It is expected that the on-site non-safety-related normal HVAC system will be operational before the installed compressed-air supply is exhausted.

4.13.2 Verification Plan

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]^{a,c} For each

compressed-air system component and associated sealed connections that is evaluated as “Fail,” a discrepancy is entered into the HF Tracking System (see Section 5.3, “Documenting and Resolving Human Engineering Discrepancies” and Section 5.4, “Human Factors Discrepancy Form Requirements” for details).

(Last Page of Section 4)

SECTION 5 METHODOLOGY AND MEASURES

5.1 RESOURCE ASSIGNMENT

The HF Manager is responsible for identifying the HFE evaluation team. The HFE evaluation team will consist of independent verifiers and the design engineering team. See WEC 3.3.3, “Design Verification” (Reference 9), for additional guidance on personnel independence and qualifications.

5.2 PERSONNEL REQUIREMENTS AND TECHNIQUES

To ensure an independent and unbiased review, the task support verification process is performed by independent verifiers with input from other design team members. As necessary, the design engineers will provide all design configuration and control documentation related to the item under evaluation to the independent verifier.

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The independent verifiers will produce the HFE Task Support Verification Summary Report. This will record the task support verification discrepancies and any recommendations and improvements (e.g., lessons learned) to help in future design projects or task support verification activities.

5.3 DOCUMENTING AND RESOLVING HUMAN ENGINEERING DISCREPANCIES

Discrepancies are identified as human engineering discrepancies (HEDs) and are required to be resolved by the formal resolution process described in APP-OCS-GEH-420, “AP1000 Human Engineering Discrepancy Resolution Process” (Bibliog 3).

The HFE task support verification activity is considered complete when HEDs are entered into the tracking database and the formal “AP1000 HFE Task Support Verification Report” is approved.

5.4 HUMAN FACTORS DISCREPANCY FORM REQUIREMENTS

An HF Task Support Verification Discrepancy Form is used to document discrepancies identified during the task support verification process. Appendix A, “HF Task Support Verification Discrepancy Form” provides an example screen shot of a form to ensure complete coverage and promote consistency in documentation.

AP1000

Human Factors Engineering Task Support Verification Plan

The HFE discrepancy form includes the following type of information:

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5.5 DELIVERABLES

Deliverables from the HFE task support verification plan are defined by the APP-OCS-GBH-001, “AP1000 Human Factors Engineering Program Plan” (Reference 2).

The results of the task support verification process are used to develop “HFE Task Support Verification Summary Report.” [

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(Last Page of Section 5)

APPENDIX A
HF TASK SUPPORT VERIFICATION DISCREPANCY FORM

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Figure A-1. HF Task Support Verification Discrepancy Form in HF Tracking System

(Last Page of Appendix A)

Southern Nuclear Operating Company

ND-17-1955

Enclosure 7

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

**Affidavit from Southern Nuclear Operating Company for Withholding Under 10 CFR 2.390
(LAR-17-042)**

(Enclosure 7 consists of 2 pages, excluding this cover page.)

Affidavit of Amy G. Aughtman

1. My name is Amy G. Aughtman. I am the Nuclear Development Licensing 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, Request for License Amendment and Exemption: Tier 1 and Tier 2* Editorial and Consistency Changes (LAR-17-042), also referred to as APP-FSAR-GLN-986, (Westinghouse LAR-148), Revision 0. 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 4 of SNC letter ND-17-1955 for Vogtle Electric Generating Plant Units 3 and 4, Request for License Amendment and Exemption: Tier 1 and Tier 2* Editorial and Consistency Changes (LAR-17-042).
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.

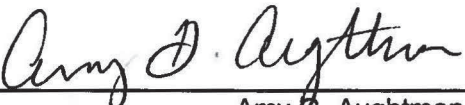
ND-17-1955

Enclosure 7

Affidavit from Southern Nuclear Operating Company for Withholding Under 10 CFR 2.390
(LAR-17-042)

- b. The information is of a type customarily held in confidence by SNC and Westinghouse Electric Company and not customarily disclosed to the public.
 - 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 in Enclosure 7 of SNC letter ND-17-1955 for Vogtle Electric Generating Plant Units 3 and 4, Request for License Amendment and Exemption: Tier 1 and Tier 2* Editorial and Consistency Changes (LAR-17-042), 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.



Amy G. Aughtman

Executed on 11/30/17
Date

Southern Nuclear Operating Company

ND-17-1955

Enclosure 8

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

**Westinghouse Authorization Letter CAW-17-4653, Affidavit, Proprietary
Information Notice and Copyright Notice**

(Enclosure 8 consists of 7 pages, excluding this cover page.)

Westinghouse Non-Proprietary Class 3

CAW-17-4653

November 15, 2017

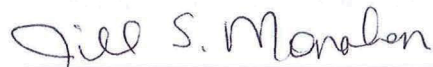
AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

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COUNTY OF BUTLER:

I, Jill S. Monahan, 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.



Jill S. Monahan, Manager
Licensing Special Programs

Date: 11/15/2017

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- (1) I am Manager, Licensing Special Programs, 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

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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.

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- (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-OCS-GEH-220, "AP1000 Human Factors Engineering Task Support Verification Plan", Revision 5 (Proprietary), for submittal to the Commission, being transmitted by Southern Nuclear Company letter. The proprietary information as submitted by Westinghouse is that associated with License Amendment Request 17-042, and may be used only for that purpose.
- (a) This information is part of that which will enable Westinghouse to:
 - (i) Complete Human Factors Engineering task support verification for the AP1000 plant.

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- (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 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.

ENCLOSURE 2 to CAW-17-4653

PROPRIETARY INFORMATION NOTICE and COPYRIGHT NOTICE

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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).

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