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ND-18-1454
10 CFR 50.90
10 CFR 52.63

U.S. Nuclear Regulatory Commission
ATTN: 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:
Changes to Passive Residual Heat Removal (PRHR) Instrumentation
Minimum Inventory Displays (LAR-18-030)

Ladies and Gentlemen:

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

The requested amendment proposes changes to identify passive residual heat removal (PRHR) heat exchanger (HX) inlet isolation valve status and PRHR HX control valve status as requiring main control room (MCR) and remote shutdown workstation (RSW) display and alert indications. Additionally, a change is proposed to remove duplicate Tier 2 information from a document that is incorporated by reference into the UFSAR.

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

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

Enclosure 3 identifies the requested changes and provides markups depicting the requested changes to the VEGP Units 3 and 4 licensing basis documents.

Enclosure 4 provides the information-only changes to the VEGP Units 3 and 4 Technical Specifications Bases document.

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

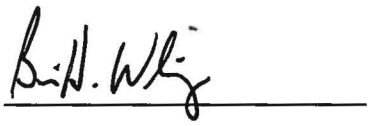
SNC requests NRC staff review and approval of this license amendment request (LAR) no later than June 19, 2019. Approval by this date will allow sufficient time to incorporate the licensing basis changes necessary to implement the associated protection and safety monitoring system (PMS) software changes. SNC expects to implement the proposed amendment within 30 days of approval of the LAR.

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

Should you have any questions, please contact Mr. Wesley A. Sparkman at (205) 992-5061.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 13th of December 2018.

Respectfully submitted,



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

Enclosures
1) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Request for License Amendment: Changes to Passive Residual Heat Removal (PRHR) Instrumentation Minimum Inventory Displays (LAR-18-030)
2) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Exemption Request: Changes to Passive Residual Heat Removal (PRHR) Instrumentation Minimum Inventory Displays (LAR-18-030)
3) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Proposed Changes to Licensing Basis Documents (LAR-18-030)
4) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Conforming Changes to the Technical Specifications Bases (For Information Only) (LAR-18-030)

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Southern Nuclear Operating Company

ND-18-1454
Enclosure 1

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Request for License Amendment: Changes to Passive Residual Heat Removal (PRHR) Instrumentation Minimum Inventory Displays

(LAR-18-030)

(Enclosure 1 consists of 16 pages, including this cover page.)

Table of Contents

Pursuant to 10 CFR 52.98(c) and in accordance with 10 CFR 50.90, Southern Nuclear Operating Company (SNC) 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 proposed changes would revise the COL and licensing basis documents to identify passive residual heat removal (PRHR) heat exchanger (HX) inlet isolation valve status and PRHR HX control valve status as requiring main control room (MCR) and remote shutdown workstation (RSW) display and alert indications. Additionally, a change is proposed to remove duplicate Tier 2 information from a document that is incorporated by reference into the UFSAR.

The requested amendment requires a departure from the Updated Final Safety Analysis Report (UFSAR) Tier 2 information that involves a change to the COL Appendix C (and plant-specific Tier 1) information in Tables 2.5.2-5 and 2.5.4-1 and UFSAR Tier 2 Table 1 8.12.2-1 to reflect PRHR valve status separate from the existing PRHR Flow item. Corresponding changes are made to remove reliance upon the use of PRHR HX outlet temperature (RCS-TE161) as the diverse measurement to PRHR HX flow, and to make other changes to consistently describe the post-accident monitoring system (PAMS) "PRHR Outlet Temperature" and "PRHR HX Outlet Temperature" variables to be consistent with the description provided in UFSAR Table 7.5-1. This enclosure requests approval of the license amendment necessary to implement these changes. All discussions of changes to COL Appendix C are also understood to impact the corresponding plant-specific Tier 1 Tables 2.5.2-5 and 2.5.4-1. Enclosure 2 requests the exemption necessary to implement the involved changes to the plant-specific Tier 1 information.

2. DETAILED DESCRIPTION

Passive Core Cooling System

The passive core cooling system (PXS) provides core cooling during abnormal plant conditions. The PXS includes the PRHR HX and the in-containment refueling water storage tank (IRWST). During design basis events, the PRHR HX transfers heat from the reactor coolant system (RCS) to the IRWST. The IRWST is the credited heat sink for accident analysis. The IRWST is the heat sink for conditions where the steam generators are not available.

As detailed in UFSAR Table 6.3-1, there is a normally-open, motor-operated inlet isolation valve (PXS-V101) upstream of the PRHR HX and two normally-closed, air-operated outlet control valves (PXS-V108A/B) in parallel downstream of the PRHR HX.

During an accident, the PRHR HX is actuated when the outlet control valves are opened by a signal from the protection and safety monitoring system (PMS). Once the control valves are open, the relatively hot reactor coolant in the core flows upward and the relatively cold reactor coolant from the PRHR HX flows downward into the core due to natural circulation. The heat from the coolant that flows through the PRHR HX is transferred to the water in the IRWST.

A pitot tube and two redundant flow transmitters (PXS-FT049A/B) are used to determine the primary post-accident monitoring (PAM) parameter for PRHR heat removal (i.e., heat sink maintenance) by measuring flow through the PRHR HX. Both are required to be operable per Technical Specification Table 3.3.17-1, "Post-Accident Monitoring Instrumentation," Function 12. PXS-FT049A and PXS-FT049B are identified in plant-specific Tier 1 and COL Appendix C Table

2.2.3-1 as seismic Category 1, Class 1E, harsh-environment qualified, and being available on the PMS safety-related displays. The PRHR outlet temperature element (RCS-TE161) is credited as a backup to the two redundant flow transmitters for indicating PRHR flow. According to TS Bases 3.3.17, Item 12, RCS-TE161 can satisfy one of the two required channels when the PRHR flow channel in the same electrical division is inoperable.

Post-Accident Monitoring

The AP1000 provides PAM capability for indication of certain plant variables during accident conditions. The PAM variables provide information required to permit the operator to take preplanned manual actions to accomplish safe plant shutdown, determine whether the systems are performing their intended functions, provide information related to the radioactivity release barriers, and make appropriate decisions during an accident. Critical Category 1 PAM variables are displayed on PMS Divisions B and C. PMS Division B and C displays are powered for 72 hours by the Class 1E dc and uninterruptible power supply system (IDS) Divisions B and C batteries after all ac power sources are lost. The ancillary diesel generator can energize the power supply system if ac power is lost for a period exceeding 72 hours.

UFSAR Subsection 7.5.4 discusses processing and display equipment. Class 1E position indication signals for valves and electrical breakers may be powered by an electrical division with 24-hour battery capacity. This is necessary to make full use of all four Class 1E electrical divisions to enhance fire separation criteria. The power associated with the actuation signal for each of these valves or electrical breakers is provided by an electrical division with 24-hour battery capacity, so there is no need to provide position indication beyond this point. The operator will verify that the valves or electrical breakers have achieved the proper position for long-term stable plant operation before position indication is lost. Once the position indication is lost, there is no need for further monitoring since the operator does not have any remote capability for changing the position of these components.

PAM variables are grouped into the following types:

- Type A variables are those that are needed for an operator to take manual actions to accomplish a safety function, for which no automatic control is provided. The AP1000 has no Type A variables.

- Type B variables are those that provide information to indicate whether the plant safety functions are being accomplished.

- Type C variables are those that provide information to indicate the potential for fission product barrier breaches.

- Type D variables are those that provide information to indicate the operation of individual safety systems and other systems important to safety.

- Type E variables are those that are used to determine the magnitude of a radioactive materials release.

- Type F variables are those that provide information to manually actuate and monitor the performance of nonsafety-related systems to prevent unnecessary actuation of safety-related systems following plant events.

Within each type of PAM instrumentation there are three categories that are related to the qualification and reliability of the specific instrumentation. UFSAR Subsection 7.5.2.2 states that the qualification requirements of the Types A, B, C, D, E, and F accident monitoring instrumentation are subdivided into three categories. Descriptions of the three categories are summarized in UFSAR Table 7.5-2. Regulatory Guide 1.97, Rev. 3, indicates that, in general, Category 1 provides for full qualification, redundancy, and continuous real-time display and requires onsite (standby) power. Category 2 provides for qualification but is less stringent in that it does not (of itself) include seismic qualification, redundancy, or continuous display and requires only a high-reliability power source (not necessarily standby power). Category 3 is the least stringent. It provides for high-quality commercial-grade equipment that requires only offsite power. Regulatory Guide 1.97 Table 1 provides the design and qualification criteria for Category 1, 2, and 3 PAM variables.

UFSAR Table 7.5-1 lists the PAM variables used in the AP1000, along with their category, type, and other relevant information. Technical Specification (TS) Table 3.3.17-1 provides a list of the Category 1 PAM variables. UFSAR Tables 7.5-5, 7.5-6, 7.5-7, 7.5-8, and 7.5-9 provide a listing of the Type B, C, D, E, and F variables, along with the function/system supported by each variable. As is evident from these tables, a given variable can fall into multiple Type/Category classifications if a variable is used to support more than one function or system. Where such multiple uses occur, the instrumentation meets the more stringent requirements.

According to these UFSAR and TS tables, the two redundant PRHR HX flow transmitters are Type B, Category 1 PAM variables for heat sink maintenance and, therefore, are used to satisfy the two required channels of PRHR heat removal specified on TS Table 3.3.17-1 for Function 12. PXS-FT049A provides flow indication to PMS Division C 72-hour safety displays and PXS-FT049B provides flow indication to PMS Division B 72-hour safety displays. Since the PRHR outlet temperature acts as a backup to the two redundant HX flow transmitters, it is also listed as a B1 variable for heat sink maintenance.

The normal residual heat removal system (RNS) performs post-accident recovery by removing heat from the core and the reactor coolant system following successful mitigation of an accident by the passive core cooling system.

Reason for the Change

Regulatory Guide 1.97, Rev. 3, states:

> *"Where failure of one accident-monitoring channel results in information ambiguity (that is, the redundant displays disagree) that could lead operators to defeat or fail to accomplish a required safety function, additional information should be provided to allow the operators to deduce the actual conditions of the plant."*

The current AP1000 design has PRHR flow channel transmitters as the primary flow indication. There is a temperature sensor on the PRHR outlet that is qualified for post-accident monitoring. However, the PRHR outlet temperature alone cannot detect the flow; it is the change in temperature (ΔT) across the PRHR HX that is an indication of flow. But since the inlet temperature element is not qualified to the standards for Category 1 post-accident monitoring parameters, the ΔT information is not able to be credited as being available post-accident.

The current design relies on the PRHR HX outlet temperature element, RCS-TE161, to meet the Regulatory Guide 1.97, Rev. 3, requirement and resolve the ambiguity in cases when a single flow transmitter fails and introduces a difference between the two flow transmitter indications. The design is updated to clarify that the two channels of PRHR flow, or alternatively, two channels of PRHR HX control valve status with the confirmation that the PRHR HX inlet isolation valve is open, are provided to monitor primary system heat removal during accident conditions when the steam generators are not available.

The TS Bases 3.3.17, Function 12 description also requires an update to clarify that two channels of PRHR flow, or alternatively, two channels of PRHR HX control valve status with the confirmation that the PRHR HX inlet isolation valve is open, are provided to monitor primary system heat removal during accident conditions when the steam generators are not available. The discussion pertaining to PRHR outlet temperature should be deleted as this variable would no longer perform a primary PRHR heat removal PAMS function.

Additionally, the PRHR Flow line items in the Minimum Inventory of Displays, Alerts, and Fixed Position Controls tables should be updated to reflect the required instruments. Therefore, a change is needed in Tier 1 Tables 2.5.2-5 and 2.5.4-1 and UFSAR Tier 2 Table 18.12.2-1 to reflect PRHR valve status separate from the existing PRHR Flow item.

Also, the current licensing basis is inconsistent in the usage of descriptions of the PAMS “PRHR Outlet Temperature” variable and “PRHR HX Outlet Temperature” variable. These descriptions should be consistent with the description listed in UFSAR Table 7.5-1, which includes the abbreviation “HX” to more specifically identify the location of this variable.

Description of the Activity

The activity addresses changes to how a PRHR HX potential flow ambiguity is resolved. Instead of using PRHR HX outlet temperature (RCS-TE161) as the diverse measurement to PRHR HX flow, the position indicators on the PRHR HX inlet isolation valve (PXS-V101) and the PRHR HX control valves (PXS-V108A/B) are used to determine whether there is flow through the PRHR HX. The valve positions remove the ambiguity that may result due to a failed PRHR HX flow transmitter (PXS-FT049A/B). If PXS-V101 is open and one of the PXS-V108A/B valves is open, then a flow path through the PRHR HX exists and as PRHR is a passive function, the PAM function of PRHR can be confirmed. If PXS-V101 is closed or if PXS-V108A and PXS-V108B are both closed, a flow path through the PRHR HX will not exist.

A change is needed in Tier 1 Tables 2.5.2-5 and 2.5.4-1 and UFSAR Tier 2 Table 18.12.2-1 to reflect PRHR valve status separate from the existing PRHR Flow item. Specifically, a new row is added to the aforementioned tables to add PRHR HX inlet isolation and control valve status as an entry with a display and alert requirement.

UFSAR Table 7.5-7 currently identifies the PRHR HX inlet isolation valve status and control valve status as Type D, Category 3 and Type D, Category 2 variables, respectively. However, because these variables will now be used as the diverse variables to the PRHR flow transmitters, they are given an additional classification of Type B, Category 1 for heat sink maintenance in UFSAR Table 7.5-5 and in UFSAR Table 7.5-1. Additionally, UFSAR Table 7.5-1 lists the PRHR HX inlet isolation valve status as a Type/Category D2 variable. Therefore, PXS-V101 valve status is changed to Type D, Category 2 in UFSAR Table 7.5-7.

Accordingly, because the PRHR HX outlet temperature element (RCS-TE161) is no longer used as a primary source for PRHR flow indication, it is reclassified from Type/Category B1 to Type/Category B2 for heat sink maintenance in UFSAR Table 7.5-5 and in UFSAR Table 7.5-1.

A change is made to update the TS Bases 3.3.17, Function 12 description to clarify that two channels of PRHR flow, or alternatively, two channels of PRHR HX control valve status with the confirmation that the PRHR HX inlet isolation valve is open, are provided to monitor primary system heat removal during accident conditions when the steam generators are not available. Discussion pertaining to PRHR outlet temperature is deleted as this variable would no longer perform a primary PRHR heat removal PAMS function. The change to TS Bases 3.3.17, Function 12 is provided for information only in Enclosure 4 of this letter.

Also, the current licensing basis descriptions of the PAMS "PRHR Outlet Temperature" variable are updated to "PRHR HX Outlet Temperature" consistent with the description listed in UFSAR Table 7.5-1 and documented in the supporting design documentation.

Changes to WCAP-15776

WCAP-15776, "Safety Criteria for the AP1000 Instrumentation and Control Systems," Rev 0, is an incorporated-by-reference (IBR) document in the VEGP Units 3 and 4 licensing basis. Review of the Minimum Inventory of Fixed Position Controls, Displays, and Alerts indicates that this content is duplicated in the VEGP Units 3 and 4 licensing basis between WCAP-15776, Table 2-3 and UFSAR Table 18.12.2-1. As it is undesirable and unnecessary to have duplicate information regarding the Minimum Inventory of Fixed Position Controls, Displays, and Alerts in the licensing basis, a change is proposed to delete Table 2-3 from WCAP-15776. This change is reflected in the VEGP Units 3 and 4 licensing basis as changes to UFSAR Section 7A.5.

Licensing Basis Change Descriptions:

- COL Appendix C Table 2.5.2-5, "Minimum Inventory of Displays, Alerts, and Fixed Position Controls in the MCR"
    - Change "PRHR Outlet Temperature" to "PRHR HX Outlet Temperature"
    - Add new row as follows: Description "PRHR HX Inlet Isolation and Control Valve Status"; Control "-"; Display "Yes"; Alert "Yes"
- COL Appendix C Table 2.5.4-1, "Minimum Inventory of Controls, Displays, and Alerts at the RSW"
    - Change "PRHR Outlet Temperature" to "PRHR HX Outlet Temperature"
    - Add new row as follows: Description "PRHR HX Inlet Isolation and Control Valve Status"; Control "-"; Display "Yes"; Alert "Yes"

- UFSAR Table 7.5-1, "Post-Accident Monitoring System" is updated as follows:
  - PRHR HX outlet temperature: Delete "B1" and replace with "B2." Delete "Diverse variable to PRHR flow" from "Remarks" column.
  - PRHR Flow: In "Remarks" column, delete "Diverse measurement: PRHR outlet temperature"; add "Diverse measurement: PRHR HX inlet isolation valve status together with PRHR HX control valve status."
  - PRHR HX inlet isolation valve status: "B1" is added as a new Type/Category. In "Remarks" column, add "Together with PRHR HX control valve status as diverse variables to PRHR flow."
  - PRHR HX control valve status: "B1" is added as a new Type/Category. In "Remarks" column, add "Together with PRHR HX inlet isolation valve status as diverse variables to PRHR flow."

- UFSAR Table 7.5-5, "Summary of Type B Variables"
  - Heat Sink Maintenance Function, PRHR outlet temperature variable: Change Variable name to "PRHR HX Outlet Temperature"; Change Type/Category from "B1" to "B2."
  - Add "PRHR HX inlet isolation valve status" and "PRHR HX control valve status" as variables to the heat sink maintenance function. Both variables are assigned Type/Category "B1."

- UFSAR Table 7.5-7, "Summary of Type D Variables"
  - Safeguards System, PRHR heat exchanger inlet isolation valve status Variable: Change from Type/Category "D3" to "D2."

- UFSAR Subsection 7A.5, WCAP-15776
  - Delete the listing of Table 2-3 from the List of Tables.
  - Change bulleted item "Revise Table 2-3, "Minimum Inventory of Fixed Position Controls, Displays, and Alerts" as follows:" to state "Delete Table 2-3, "Minimum Inventory of Fixed Position Controls, Displays, and Alerts" as follows:"
  - Delete tabular supplement of WCAP-15776, Table 2-3 in its entirety
  - Revise Section 2.4 under the heading "Fixed Position Displays" by replacing "Table 2-3 lists" with "Section 18.12.2 of the DCD provides information on"
  - Revise Section 3.17 by replacing "Table 2-3" with "Table 18.12.2-1 in the DCD"

- UFSAR Table 18.12.2-1, "Minimum Inventory of Fixed Position Controls, Displays, and Alerts"
  - Change PRHR outlet temperature to "PRHR HX outlet temperature"
  - Add new row as follows: Description "PRHR HX Inlet Isolation and Control Valve Status"; Control column is left empty; Display "x"; Alert "x"

3. TECHNICAL EVALUATION

UFSAR Table 7.5-7 currently identifies the PRHR HX inlet isolation valve status and control valve status as Type D, Category 3 and Type D, Category 2 variables, respectively. However, because these variables will now be used as the diverse variables to the PRHR flow transmitters, they are given an additional classification of Type B, Category 1 for heat sink maintenance in UFSAR Table 7.5-5 and in UFSAR Table 7.5-1. They are Type B because they will indicate whether plant safety functions are being accomplished (i.e., PRHR actuation). They are Category 1 because they would be used as a primary variable to indicate the accomplishment of the safety function.

As previously indicated, UFSAR Table 7.5-7 identifies the PRHR HX inlet isolation valve status as a Type D, Category 3 variable. However, the PRHR HX inlet isolation valve (PXS-V101) status is also a Type D, Category 2 variable. Additionally, UFSAR Table 7.5-1 lists the PRHR HX inlet isolation valve status as a Type/Category D2 variable. PXS-V101 is a primary Type D variable, which provides sufficient information to the main control room operating staff to monitor the performance of plant safety-related systems used for mitigating the consequences of an accident and subsequent plant recovery to attain a safe shutdown condition. Therefore, PXS-V101 valve status is changed to Type D, Category 2 in UFSAR Table 7.5-7 consistent with UFSAR Table 7.5-1 and Section 7.5.3.4.

Accordingly, because the PRHR HX outlet temperature element (RCS-TE161) is no longer used as a primary source for PRHR flow indication, it is reclassified from Type/Category B1 to Type/Category B2 for heat sink maintenance in UFSAR Table 7.5-5 and in UFSAR Table 7.5-1. PRHR HX outlet temperature is selected as a PAMS B2 backup variable because it is useful in directly assessing the operation of PRHR as a heat sink. By tracking RCS hot leg temperature compared to PRHR outlet temperature, PRHR HX performance can be monitored over time to identify changes in heat removal rate which might occur due to steam voiding in the RCS or lowering of IRWST level. This comparison is particularly useful when using PRHR to maintain safe shutdown conditions during long term operation of PRHR.

Flow transmitters PXS-FT049A/B continue to be used to meet the two-channel requirement identified in TS Table 3.3.17-1, Function 12 for PRHR Heat Removal. In support of this proposed change activity, TS Bases 3.3.17, Function 12 description is updated to clarify that two channels of PRHR flow, or alternatively, two channels of PRHR HX control valve status with the confirmation that the PRHR HX inlet isolation valve is open, are provided to monitor primary system heat removal during accident conditions when the steam generators are not available. Discussion pertaining to PRHR outlet temperature is deleted as this variable no longer performs a primary PRHR heat removal PAMS function. The changes to TS Bases 3.3.17, Function 12 are provided for information only in Enclosure 4 of this letter.

The position indicators on the PRHR HX inlet isolation valve (PXS-V101) and the PRHR control valves (PXS-V108A/B) are used as a diverse variable to determine whether there is flow through the PRHR HX. As such, the isolation valve and the two control valve position indicators meet the Regulatory Guide 1.97, Rev. 3 requirements for Category 1 PAMS instrumentation, as shown below:

- Unambiguous Indication: The isolation and control valve positions resolve any PRHR HX flow ambiguity. If the data from the flow transmitters do not agree (i.e., one flow transmitter indicates there is flow through the PRHR HX and the other flow transmitter indicates there is not flow through the PRHR HX), then the valves resolve the ambiguity in one of two ways:

    1) The valves indicate flow through the PRHR HX if the isolation valve and one of the control valves indicates 'not closed.' Note that the required flow through the PRHR HX can be met with only one control valve open.

    2) The valves indicate no flow through the PRHR HX if either the isolation valve indicates closed or both of the control valves indicate closed.

- Qualification: The isolation and control valves are provided with a set of external stem-mounted limit switches qualified for a harsh environment and classified as seismic Category I.

- Continuous, Real-Time Display: The indication for the control valves is provided continuously, and in real-time, to all four PMS divisions. The inlet isolation valve indication is provided to PMS Division A and is only available for 24 hours following an accident. However, like other PMS data, this indication is also provided to the other three PMS divisions and displayed on the other three safety displays. Therefore, after 24 hours the position of the inlet isolation valve is lost on the Division A safety display, but its last known value is "latched" on the PMS Division B and Division C safety displays. This last known "latched" value is adequate because motor operator valves are fail as-is components and the inlet isolation valve is normally in the correct post-accident position with the power locked out.

- Onsite Standby Power: Power is provided for PAM display from IDS Divisions B and C for 72 hours after a loss of all ac power. After 72 hours, the ancillary diesel generators provide the necessary onsite standby power.

- Electrical independence: A loss of any one PMS or IDS division would not prevent an operator from unambiguously determining if there is flow through the PRHR HX because each parameter is displayed on both Division B and Division C safety displays and the displays are powered by IDS Divisions B and C (Division A position indications are shared with Divisions B and C).

    - <u>Flow Transmitters (PXS-FT049A/B)</u>

      PXS-FT049A provides flow indication to PMS Division C and PXS-FT049B provides its flow indication to PMS Division B. They are powered by IDS Divisions C and B, respectively.

    - <u>Control Valves (PXS-V108A/B)</u>

      There are four close position indicators on each of the two control valves. Each of the four position indicators provides data to the four respective PMS divisions. They are powered by the IDS Divisions A, B, C and D, respectively. There is one Open position indicator on each of the two control valves powered by the same IDS Division as the

valve power supply (i.e., IDS Division A for PXS-V108A and IDS Division B for PXS-V108B).

- Inlet Isolation Valve (PXS-V101)

  The inlet isolation valve has three Open and three Closed position indicators; i.e., an Open and Closed safety related external limit switch, an Open and Closed safety related internal position switch, and an Open and Closed non-safety related external limit switch. The external safety-related limit switches provide data to Division A safety displays. However, as with other PMS indication, this information is also provided to the other three divisions of safety displays. The safety-related limit switches are powered by IDS Division A.

Because the isolation valve and the two control valve position indicators are re-categorized as Category 1 variables, they are to be included in the set of minimum inventory displays and alerts identified in COL Appendix C / Tier 1 Table 2.5.2-5 and Table 2.5.4-1, and in UFSAR Table 18.12.2-1. This will be added to these tables under new item 'PRHR HX Inlet Isolation and Control Valve Status.'

Also, the current licensing basis descriptions of the PAMS "PRHR Outlet Temperature" variable are updated to "PRHR HX Outlet Temperature" consistent with the description listed in UFSAR Table 7.5-1.

As such, the proposed changes to the PAMS PRHR Heat Removal function and Minimum Inventory Tables for PRHR HX Valve Status to resolve a potential PRHR flow ambiguity does not constitute a modification, addition to, or removal of a structure, system, or component (SSC) such that PXS or PAMS design function as described in the UFSAR is adversely affected.

Changes to WCAP-15776

WCAP-15776, Rev. 0 is an IBR document in the VEGP Units 3 and 4 licensing basis. Review of the Minimum Inventory of Fixed Position Controls, Displays, and Alerts indicates that this content is duplicated in the VEGP Units 3 and 4 licensing basis between IBR WCAP-15776, Table 2-3 and in UFSAR Table 18.12.2-1. As it is unnecessary to have diverse, duplicate information regarding the Minimum Inventory of Fixed Position Controls, Displays, and Alerts in the licensing basis, a change is proposed to delete Table 2-3 from IBR WCAP-15776 and in UFSAR Subsection 7A.5 as well as updating the WCAP-15776 cross-references from Table 2-3 to the pertinent licensing basis sections/tables which otherwise contain this information for the minimum inventory of fixed position controls, displays, and alerts. This is consistent with the proposed updates to WCAP-15776 as part of this change activity.

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 Combined License (COL). This activity involves a

departure from COL Appendix C ITAAC; therefore, this activity requires a proposed amendment to the COL.

10 CFR Part 52, Appendix D, Section VIII.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. This activity involves changes to plant-specific Tier 1 information, and thus requires prior NRC approval prior to making the UFSAR Tier 2 changes in this license amendment request.

10 CFR 50 Appendix A, "General Design Criteria for Nuclear Power Plants," General Design Criterion (GDC) 13, "*Instrumentation and Control,*" states, in relevant part, 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 the PRHR HX inlet isolation valve status and PRHR HX control valve status does not adversely impact the ability of the post-accident monitoring system (PAMS) instrumentation to monitor variables and systems over their anticipated ranges to assure adequate safety, as the ability to provide main control room (MCR) and remote shutdown workstation (RSW) display and alert indications of the PRHR flow variable to the main control room (MCR) and remote shutdown workstation (RSW) are maintained post-accident. Therefore, compliance with GDC 13 is maintained.

10 CFR 50 Appendix A, GDC 20, "*Protection System Functions,*" states, in relevant part, 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 the PRHR HX inlet isolation valve status and PRHR HX control valve status does not adversely impact the functionality of the post-accident monitoring system (PAMS), as the ability to provide main control room (MCR) and remote shutdown workstation (RSW) display and alert indications of the PRHR flow variable to the main control room (MCR) and remote shutdown workstation (RSW) are maintained post-accident. Therefore, compliance with GDC 20 is maintained.

10 CFR 50 Appendix A, GDC 22, "*Protection System Independence,"* states, in relevant part, that the protection system shall be designed to assure that the effects of natural phenomena, and of normal operating, maintenance, testing, and postulated accident conditions on redundant channels do not result in the loss of the protection function or shall be demonstrated to be acceptable on some other defined basis. The proposed changes do not adversely impact the electrical independence or the physical separation characteristics of the PAMS. Changing the design as described in the Detailed Description does not alter the design of any isolation devices or the Class 1E electrical divisions that power these PAMS instrumentation or the associated displays in the MCR or RSW. Therefore, the requirements of 10 CFR 50 Appendix A, GDC 22 are satisfied.

The proposed changes have been evaluated to determine whether applicable 10 CFR 50 Appendix A General Design Criteria (GDC) continue to be met. It was determined that the proposed changes do not affect conformance with the GDC differently than described in the plant-specific DCD or UFSAR.

4.2 Precedent

No precedent is identified.

4.3 Significant Hazards Consideration

Southern Nuclear Operating Company (SNC) is requesting an amendment to Combined License (COL) Nos. NPF-91 and NPF-92 for Vogtle Electric Generating Plant (VEGP) Units 3 and 4, respectively. The proposed changes would revise the Updated Final Safety Analysis Report (UFSAR) Tier 2 information, which involves a change to the COL Appendix C and corresponding plant-specific Tier 1 information in Tables 2.5.2-5 and 2.5.4-1 to identify passive residual heat removal (PRHR) heat exchanger (HX) inlet isolation valve status and PRHR HX control valve status as requiring main control room (MCR) and remote shutdown workstation (RSW) display and alert indications. Corresponding changes are made to remove reliance upon the use of PRHR HX outlet temperature (RCS-TE161) as the diverse measurement to PRHR HX flow, and to make other changes to consistently describe the post-accident monitoring system (PAMS) “PRHR Outlet Temperature” and “PRHR HX Outlet Temperature” variables to be consistent with the description provided in UFSAR Table 7.5-1. Additionally, a change is proposed to remove duplicate Tier 2 information from a document that is incorporated by reference into the UFSAR.

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(c), “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 changes would revise the Updated Final Safety Analysis Report (UFSAR) Tier 2 information, which involves a change to the COL Appendix C and corresponding plant-specific Tier 1 information in Tables 2.5.2-5 and 2.5.4-1 to identify passive residual heat removal (PRHR) heat exchanger (HX) inlet isolation valve status and PRHR HX control valve status as requiring main control room (MCR) and remote shutdown workstation (RSW) display and alert indications. Corresponding changes are made to remove reliance upon the use of PRHR HX outlet temperature (RCS-TE161) as the diverse measurement to PRHR HX flow, and to make other changes to consistently describe the post-accident monitoring system (PAMS) “PRHR Outlet Temperature” and “PRHR HX Outlet Temperature” variables to be consistent with the description provided in UFSAR Table 7.5-1. Additionally, a change is proposed to remove duplicate Tier 2 information from a document that is incorporated by reference (IBR) into the UFSAR.

The proposed changes to the post-accident monitoring system (PAMS) PRHR heat removal function, including changes to the classification of the PRHR HX outlet temperature variable, and the Minimum Inventory Tables for PRHR HX Valve Status do not constitute a modification, addition to, or removal of a structure, system, or component (SSC) such that a PXS or PAMS design function as described in the UFSAR is adversely affected. The instrumentation affected by this activity is not an initiator of an accident condition or of any accident analyzed in Chapter 15 of the UFSAR. The changes do not involve an interface with any SSC accident initiator or initiating sequence of events, and thus, the probabilities of the accidents evaluated in the UFSAR are not affected. The proposed changes do not involve a change to any mitigation sequence or the predicted radiological releases due to postulated accident conditions, thus, the consequences of the accidents evaluated in the UFSAR are not affected. The deletion of IBR information from the UFSAR is an administrative change that removes unnecessary duplicate information from the licensing basis.

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 change will continue to maintain required functional capability of the safety systems for previously evaluated accidents, including those involving a loss of the normal core decay heat removal path. The instrumentation affected by this activity is not an initiator of an accident condition or of any accident analyzed in Chapter 15 of the UFSAR. The changes do not involve an interface with any SSC accident initiator or initiating sequence of events, and thus, the probabilities of the accidents evaluated in the UFSAR are not affected. The changes do not introduce a new interface with any SSC accident initiator or initiating sequence of events, and thus, the possibility of a new accident is not created. The proposed changes do not change the function of the related systems, and thus, the changes do not introduce a new failure mode, malfunction or sequence of events that could adversely affect safety or safety-related equipment.

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 changes to the PAMS PRHR heat removal function and Minimum Inventory Tables for PRHR HX Valve Status continue to comply with the applicable design criteria addressing instrumentation and controls, protection system functions, and protection system independence. The addition of these variables under the same type/category as the current PRHR outlet temperature variable will

ensure the heat sink maintenance function will be satisfied. The proposed changes do not change the function of the related systems or affect the margins provided by the systems, and thus, the changes do not affect any safety-related design code, function, design analysis, safety analysis input or result, or existing design/safety margin. No safety analysis or design basis acceptance limit/criterion is challenged or exceeded by the requested changes.

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. Therefore, it is concluded that the requested 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.

5. ENVIRONMENTAL CONSIDERATIONS

The proposed changes would revise the Updated Final Safety Analysis Report (UFSAR) Tier 2 information, which involves a change to the COL Appendix C and corresponding plant-specific Tier 1 information in Tables 2.5.2-5 and 2.5.4-1 to identify passive residual heat removal (PRHR) heat exchanger (HX) inlet isolation status and PRHR HX control valve status as requiring main control room (MCR) and remote shutdown workstation (RSW) display and alert indications. Additionally, a change is proposed to remove duplicate Tier 2 information from a document that is incorporated by reference into the UFSAR. Corresponding changes are made to remove reliance upon the use of PRHR HX outlet temperature (RCS-TE161) as the diverse measurement to PRHR HX flow, and to make other changes to consistently describe the post-accident monitoring system (PAMS) "PRHR Outlet Temperature" and "PRHR HX Outlet Temperature" variables to be consistent with the description provided in UFSAR Table 7.5-1. This review supports a request to amend the COL to allow a departure from the UFSAR incorporated plant-specific design control document information.

A review has determined that the proposed changes require an amendment to the COL. However, a review of the anticipated construction and operational effects of the requested amendment has determined that the requested amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9), in that:

(i) There is no significant hazards consideration.

As documented in Section 4.3, Significant Hazards Consideration, 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 evaluation 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 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 change in the requested amendment does not affect the shielding capability of, 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-18-1454
Enclosure 2

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Exemption Request:
Changes to Passive Residual Heat Removal (PRHR) Instrumentation Minimum Inventory Displays

(LAR-18-030)

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

1.0 Purpose

Southern Nuclear Operating Company (the Licensee) requests a permanent exemption from the provisions of 10 CFR Part 52, Appendix D, Section III.B, *Design Certification Rule for the AP1000 Design, Scope and Contents*, to allow a departure from elements of the certification information in Tier 1 of the generic AP1000 Design Control Document (DCD). The regulation, 10 CFR Part 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 includes changes to reflect a change to identify passive residual heat removal (PRHR) heat exchanger (HX) inlet isolation valve status and PRHR HX control valve status as requiring main control room (MCR) and remote shutdown workstation (RSW) display and alert indications in plant-specific Tier 1 Tables 2.5.2-5 and 2.5.4-1, respectively.

This request for exemption provides the technical and regulatory basis to demonstrate that 10 CFR 52.63, §52.7, and §50.12 requirements are met and will apply the requirements of 10 CFR Part 52, Appendix D, Section VIII.A.4 to allow departures from generic Tier 1 information due to proposed changes to Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) related Tables 2.5.2-5 and 2.5.4-1 for the minimum inventory of displays, alerts, and controls in the main control room (MCR) and at the remote shutdown workstation (RSW), respectively.

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.

The passive core cooling system (PXS) provides core cooling during abnormal plant conditions. The PXS includes the PRHR HX and the in-containment refueling water storage tank (IRWST). During design basis events, the PRHR HX transfers heat from the reactor coolant system (RCS) to the IRWST. The IRWST is the credited heat sink for accident analysis. The IRWST is the heat sink for conditions where the steam generators are not available.

During an accident, the PRHR HX is actuated when the outlet control valves are opened by a signal from the protection and safety monitoring system (PMS). Once the control valves are open, the relatively hot reactor coolant in the core flows upward and the relatively cold reactor coolant from the PRHR HX flows downward into the core due to natural circulation. The heat from the coolant that flows through the PRHR HX is transferred to the water in the IRWST.

The normal residual heat removal system (RNS) performs post-accident recovery by removing heat from the core and the reactor coolant system following successful mitigation of an accident by the passive core cooling system.

The AP1000 provides post-accident monitoring (PAM) capability for indication of certain plant variables during accident conditions. The PAM variables provide information required to permit the operator to take preplanned manual actions to accomplish safe plant shutdown, determine whether the systems are performing their intended functions, provide information related to the radioactivity release barriers, and make appropriate decisions during an accident.

The current AP1000 design has PRHR flow channel transmitters as the primary flow indication. The two redundant PRHR HX flow transmitters are Type B, Category 1 PAM variables for heat sink maintenance and, therefore, are used to satisfy the two required channels of PRHR heat removal specified in TS Table 3.3.17-1 for Function 12.

The current design relies on the PRHR HX outlet temperature element to resolve a potential ambiguity in cases when a single flow transmitter fails and introduces a difference between the two flow transmitter indications. There is a temperature sensor on the PRHR outlet that is qualified for post-accident monitoring. However, the PRHR outlet temperature alone cannot detect the flow, it is the change in temperature (ΔT) across the PRHR HX that is an indication of flow. But since the inlet temperature element is not qualified to the standards for Category 1 post-accident monitoring parameters, the ΔT information is not able to be credited as being available post-accident.

Alternatively, two channels of PRHR HX control valve status with the confirmation that the PRHR HX inlet isolation valve is open will be credited for monitoring primary system heat removal during accident conditions when the steam generators are not available. Accordingly, the PRHR Flow line items in the minimum inventory tables should be updated to reflect the required instruments. Therefore, a change is needed in Tier 1 Tables 2.5.2-5 and 2.5.4-1 to reflect PRHR valve status separate from the existing PRHR Flow item. This change requires an exemption from the generic AP1000 DCD Tier 1 information, which does not currently include these two variables in Tier 1 Tables 2.5.2-5 and 2.5.4-1.

Additional details regarding the background for this request for exemption is provided in Section 2 of the associated License Amendment Request in Enclosure 1 of this letter.

3.0 Technical Justification of Acceptability

The changes described in this exemption request would revise the plant-specific Tier 1 information in Table 2.5.2-5 and Table 2.5.4-1 to identify PRHR HX inlet isolation valve status and PRHR HX control valve status as requiring MCR and RSW display and alert indications.

UFSAR Table 7.5-7 currently identifies the PRHR HX inlet isolation valve status and control valve status as Type D, Category 3 and Type D, Category 2 variables, respectively. However, because these variables will now be used as the diverse variables to the PRHR

flow transmitters, they are given an additional classification of Type B, Category 1 for heat sink maintenance in UFSAR Table 7.5-5 and in UFSAR Table 7.5-1. They are Type B because they will indicate whether plant safety functions are being accomplished (i.e., PRHR actuation). They are Category 1 because they would be used as a primary variable to indicate the accomplishment of the safety function.

Flow transmitters PXS-FT049A/B continue to be used to meet the two-channel requirement for PRHR Heat Removal. By this proposed change activity, two channels of PRHR flow, or alternatively, two channels of PRHR HX control valve status with the confirmation that the PRHR HX inlet isolation valve is open, are provided to monitor primary system heat removal during accident conditions when the steam generators are not available. The PRHR outlet temperature variable no longer performs a primary PRHR heat removal PAMS function.

The position indicators on the PRHR HX inlet isolation valve (PXS-V101) and the PRHR control valves (PXS V108A/B) are used as a diverse variable to determine whether there is flow through the PRHR HX. As such, the isolation valve and the two control valve position indicators meet the Regulatory Guide 1.97, Rev. 3 requirements for Category 1 PAMS instrumentation, and are to be included in the set of minimum inventory displays and alerts identified in plant-specific Tier 1 Table 2.5.2-5 and Table 2.5.4-1. This will be added to these tables under new item 'PRHR HX Inlet Isolation and Control Valve Status.'

The proposed changes to the PAMS PRHR Heat Removal function and Minimum Inventory Tables for PRHR HX Valve Status to resolve a potential PRHR flow ambiguity does not constitute a modification, addition to, or removal of a structure, system, or component (SSC) such that PXS or PAMS design function as described in the UFSAR is adversely affected, and consistent with the proposed change to UFSAR Table 18.12.2-1 in the enclosed License Amendment Request.

Additional details and technical justification supporting this request for exemption is provided in Section 3 of the associated License Amendment Request in Enclosure 1 of this letter.

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 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 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 plant-specific Tier 1 information to depart from the AP1000 certified (Tier 1) design information. The plant-specific Tier 1 information 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.

The proposed changes do not represent any adverse impact to the design function of the systems, structures and components (SSCs) and the SSCs will continue to protect the health and safety of the public in the same manner. 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 intended to mitigate any existing on-site hazards. Furthermore, the proposed change 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 fuel cladding failures. Accordingly, this change does not present an undue risk from any existing or proposed 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 requested exemption from the requirements of 10 CFR 52, Appendix D, Section III.B would allow the licensee to depart from elements of the plant-specific DCD Tier 1 design information. The proposed exemption does not alter the design, function, or operation of

any structures or plant equipment that is necessary to maintain a safe and secure status of the plant. The proposed exemption has no impact on plant security or safeguards procedures.

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 Part 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 revised MCR and RSW display and alert indications provide the necessary post-accident monitoring capabilities for heat sink maintenance while maintaining the design functions of the passive core cooling system (PXS). The proposed changes do not affect any function or feature used for the prevention or mitigation of accidents or their safety analyses. The proposed changes neither involve nor interface with any SSC accident initiator or initiating sequence of events related to the accidents evaluated, and therefore, do not have an adverse effect on any SSC's design function. 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 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 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 have been determined to not impact the design function of the related SSCs, it is expected that this exemption may be requested by other AP1000 licensees and applicants. However, a review of the reduction in standardization resulting

from the departure from the standard DCD determined that even if other AP1000 licensees and applicants do not request this same departure, the special circumstances will continue to outweigh any decrease in safety from the reduction in standardization because the key design functions of the structures associated with this request will continue to be maintained. Furthermore, the justification provided in the license amendment request and this exemption request and the associated mark-ups demonstrate that there is a limited change from the standard information provided in the generic AP1000 DCD, which is offset by the special circumstances identified above.

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 exemption impacts the plant-specific DCD Tier 1 information by identifying PRHR HX inlet isolation valve status and PRHR HX control valve status as requiring MCR and RSW display and alert indications, as discussed in Section 2.0. The revised MCR and RSW display and alert indications provide the necessary post-accident monitoring capabilities for heat sink maintenance while maintaining the design functions of the passive core cooling system (PXS), and thus do not impact the design requirements of the related SSCs. Because the SSC functions continue to be met, there is no reduction 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 Exemptions

None

7.0 Environmental Consideration

The Licensee requests a departure from elements of the certified information in Tier 1 of the generic AP1000 DCD. The Licensee has determined that the proposed departure would require a permanent exemption from the requirements of 10 CFR Part 52, Appendix D, Section III.B, *Design Certification Rule for the AP1000 Design, Scope and Contents,* with respect to installation or use of facility components located within the restricted area, as defined in 10 CFR Part 20, or which changes an inspection or a surveillance requirement; however, the Licensee evaluation of the proposed exemption

has determined that the proposed exemption meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9).

Based on the above review of the proposed exemption, the Licensee has determined that the proposed activity does 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 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), an environmental impact statement or environmental assessment of the proposed exemption is not required.

Specific details of the environmental considerations supporting this request for exemption are provided in Section 5 of the associated License Amendment Request provided in Enclosure 1 of this letter.

8.0 Conclusion

The proposed changes to Tier 1 are necessary to identify PRHR HX inlet isolation valve status and PRHR HX control valve status as requiring MCR and RSW display and alert indications. The exemption request meets the requirements of 10 CFR 52.63, *Finality of design certifications*, 10 CFR 52.7, *Specific exemptions*, 10 CFR 50.12, *Specific exemptions*, and 10 CFR 52 Appendix D, *Design Certification Rule for the AP1000*. 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, satisfies the underlying purpose of the AP1000 Design Certification Rule, and does not present a significant decrease in safety as a result of a reduction in standardization.

9.0 References

None

Southern Nuclear Operating Company

ND-18-1454
Enclosure 3

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Proposed Changes to Licensing Basis Documents

(LAR-18-030)

Insertions Denoted by Blue Underline and Deletions by ~~Red Strikethrough~~
Omitted text is identified by three asterisks (* * *)

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

Revise COL Appendix C Table 2.5.2-5, and corresponding plant-specific Tier 1 Table 2.5.2-5, "Minimum Inventory of Displays, Alerts, and Fixed Position Controls in the MCR," as shown below.

Table 2.5.2-5 Minimum Inventory of Displays, Alerts, and Fixed Position Controls in the MCR			
Description	**Control**	**Display**	**Alert(1)**
* * *	* * *	* * *	* * *
PRHR HX Outlet Temperature	-	Yes	Yes
PRHR HX Inlet Isolation and Control Valve Status	-	Yes	Yes

Note: Dash (-) indicates not applicable.

1. These parameters are used to generate visual alerts that identify challenges to the critical safety functions. For the main control room, the visual alerts are embedded in the safety-related displays as visual signals.

Revise COL Appendix C Table 2.5.4-1, and corresponding plant-specific Tier 1 Table 2.5.4-1, "Minimum Inventory of Controls, Displays, and Alerts at the RSW," as shown below.

Table 2.5.4-1 Minimum Inventory of Controls, Displays, and Alerts at the RSW			
Description	**Control**	**Display**	**Alert(1)**
* * *	* * *	* * *	* * *
PRHR HX Outlet Temperature	-	Yes	Yes
PRHR HX Inlet Isolation and Control Valve Status	-	Yes	Yes
Passive Containment Cooling System (PCS) Storage Tank Water Level	-	Yes	No
* * *	* * *	* * *	* * *

Note: Dash (-) indicates not applicable.

1. These parameters are used to generate visual alerts that identify challenges to the critical safety functions. For the RSW, the visual alerts are embedded in the nonsafety-related displays as visual signals.

* * *

Revise Tier 2 information in UFSAR Table 7.5-1 (Sheet 2 of 12), "Post-Accident Monitoring System," as follows:

Variable	Range/ Status	Type/ Category	Qualification		Number of Instruments Required	Power Supply	QDPS Indication (Note 2)	Remarks
			Environmental	Seismic				
* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *
PRHR HX outlet temperature	50-500ºF	~~B1~~B2, D2	Harsh	Yes	1	1E	Yes	~~Diverse variable to PRHR flow~~
PRHR flow	700-3000 gpm	B1, D2, F2	Harsh	Yes	2	1E	Yes	Diverse measurement: ~~PRHR outlet temperature~~ PRHR HX inlet isolation valve status together with PRHR HX control valve status
* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *

Revise Tier 2 information in UFSAR Table 7.5-1 (Sheet 8 of 12), "Post-Accident Monitoring System," as follows:

Variable	Range/ Status	Type/ Category	Qualification		Number of Instruments Required	Power Supply	QDPS Indication (Note 2)	Remarks
			Environmental	Seismic				
* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *
PRHR HX inlet isolation valve status	Open/Closed	B1, D2	Harsh	Yes	1 (Note 7)	1E	Yes	Together with PRHR HX control valve status as diverse variables to PRHR flow
PRHR HX control valve status	Open/Closed	B1, D2	Harsh	Yes	1/valve (Note 7)	1E	Yes	Together with PRHR HX inlet isolation valve status as diverse variables to PRHR flow
* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *

Revise Tier 2 information in UFSAR Table 7.5-5, "Summary of Type B Variables," as follows:

Function Monitored	Variable	Type/Category
* * *	* * *	* * *
Heat Sink Maintenance	IRWST wide range water level	B1
	PRHR flow	B1
	PRHR HX outlet temperature	~~B1~~ B2
	PRHR HX inlet isolation valve status	B1
	PRHR HX control valve status	B1
	PCS storage tank water level	B1
	Passive containment cooling water flow	B1
	IRWST to RNS suction valve status	B1
* * *	* * *	* * *

Revise Tier 2 information in UFSAR Table 7.5-7 (Sheet 2 of 5), "Summary of Type D Variables," as follows:

System	Variable	Type/Category
* * *	* * *	* * *
Safeguards	* * *	* * *
	PRHR heat exchanger inlet isolation valve status	~~D3~~ D2
	* * *	* * *
* * *		

Revise Tier 2 information in UFSAR Subsection 7A.5, "WCAP-15776, 'Safety Criteria for the AP1000 Instrumentation and Control Systems,' April 2002," as follows:

Add a bullet / change description prior to the change to Section 2.4, as follows:

- Revise the List of Tables by deleting the entry for Table 2-3, "Minimum Inventory of Fixed Position Controls, Displays, and Alerts"

Add the following bullet / change description after the bullet describing the change to Section 2.4:

- Revise Section 2.4, "Design Basis: Minimum Criteria for Manual Actions (Paragraph 4.5 of IEEE 603-1991)," under the heading, **Fixed Position Displays**, as follows:

  The AP1000 human system interface design includes a minimum inventory of dedicated or fixed-position displays and controls. The minimum inventory of fixed-position instrumentation includes those displays, controls, and alarms used to monitor the status of critical safety functions and to manually actuate the safety systems that achieve these critical safety functions. ~~Table 2-3 lists~~ Section 18.12.2 of the DCD provides information on the minimum inventory of fixed-position displays, alarms, and controls. Although not continuously displayed, the fixed-position displays and alarms are quickly and easily retrievable.

Replace the bullet identifying changes to Table 2-3, "Minimum Inventory of Fixed Position Controls, Displays, and Alerts," including the tabular supplement identifying changes to Table 2-3, with a bullet stating the following:

- Delete Table 2-3, "Minimum Inventory of Fixed Position Controls, Displays, and Alerts"

Add the following bullet / change description after the identified change to Section 3.9:

- Revise Section 3.17, "Conformance to Requirements for Location of Displays (Paragraph 5.8.4 of IEEE 603-1991), second paragraph, as follows:

  The AP1000 human system interface design includes a minimum inventory of dedicated or fixed-position displays and controls. The minimum inventory of fixed-position instrumentation includes those displays, controls, and alarms used to monitor the status of critical safety functions and to manually actuate the safety systems that achieve these critical safety functions. ~~Table 2-3~~ Table 18.12.2-1 in the DCD lists the minimum inventory of fixed-position displays, alarms, and controls.

Revise Tier 2 information in UFSAR Table 18.12.2-1, "Minimum Inventory of Fixed Position Controls, Displays, and Alerts," as follows:

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

Description	Control	Display	Alert(2)
* * *	* * *	* * *	* * *
PRHR Flow		x	x
PRHR HX outlet temperature		x	x
PRHR HX inlet isolation and control valve status		x	x
PCS storage tank water level		x	
* * *	* * *	* * *	* * *

* * *

2. These parameters are used to generate visual alerts that identify challenges to the critical safety functions. For the main control room, the visual alerts are embedded in the safety-related displays as visual signals. For the remote shutdown workstation, the visual alerts are embedded in the nonsafety-related displays as visual signals.

* * *

Southern Nuclear Operating Company

ND-18-1454
Enclosure 4

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Conforming Changes to the Technical Specifications Bases
(For Information Only)

(LAR-18-030)

Insertions Denoted by Blue Underline and Deletions by ~~Red Strikethrough~~
Omitted text is identified by three asterisks (* * *)

(Enclosure 4 consists of two pages, including this cover page.)

Technical Specifications Bases 3.3.17, *Post Accident Monitoring (PAM) Instrumentation*, Function 12, *Passive Residual Heat Removal (PRHR) Heat Removal*, is revised as follows:

12. Passive Residual Heat Removal (PRHR) Heat Removal

~~Two channels of PRHR Flow are provided to monitor primary system heat removal during accident conditions when the steam generators are not available. PRHR Heat Removal provides primary protection for non-LOCA events when the normal heat sink is lost.~~

~~One channel of PRHR outlet temperature is provided to monitor primary system heat removal during accident conditions when the steam generators are not available. The PRHR outlet temperature channel can be used to satisfy one of the two required channels when the PRHR Flow channel in the same electrical division is inoperable. PRHR Heat Removal provides primary protection for non-LOCA events when the normal heat sink is lost.~~

Two channels of PRHR Flow are provided to monitor primary system heat removal during accident conditions when the steam generators are not available. PRHR Heat Removal provides protection for non LOCA events when the normal heat sink is lost.

Alternatively, two channels of not closed position indication for the PRHR HX control valves are also provided to monitor primary system heat removal during accident conditions when the steam generators are not available. These two channels, along with the confirmation that the PRHR HX inlet isolation valve is open per SR 3.5.4.2, are sufficient to verify that PRHR heat removal is fulfilled.

The PRHR HX control valves are redundant to each other; they are located in parallel flow paths and only one valve is required to open to satisfy the heat sink function.

Note also that the flow channels and valve position channels cannot be mixed.