

August 10, 2018

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52-026

ND-18-1037
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:
Power Operated Relief Valve (PORV) Noise Mitigation (LAR-18-021)

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 Tier 2 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 license amendment request (LAR) proposes to depart from Tier 2 information in UFSAR Figure 10.3.2-1 (Sheets 1 and 2) and Tables 3.9-16, 6.2.3-1, and 10.3.3-1 by relocating the power operated relief valve (PORV) branch lines upstream of the branch lines to the main steam safety valves and changing the PORV block valves from gate valves to globe valves. The requested amendment also involves related changes to plant-specific Tier 1 Figure 2.2.4-1 (Sheets 1 and 2), with corresponding changes to the associated COL Appendix C information.

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 conforming Technical Specification Bases changes for information only.

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

SNC requests NRC staff approval of the license amendment by February 5, 2019, to support completion of Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) activities associated with main steam piping in the auxiliary building. SNC expects to implement this proposed amendment within 30 days of approval of the requested changes.

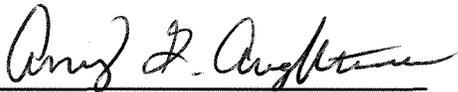
SNC expects to submit a preliminary amendment request (PAR) by November 16, 2018 to support installation of main steam piping in the auxiliary building.

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 its enclosures to the designated State Official.

Should you have any questions, please contact Mr. Adam Quarles at (205) 992-7031.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 10th of August 2018.

Respectfully submitted,



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

- Enclosures
- 1) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Request for License Amendment: Power Operated Relief Valve (PORV) Noise Mitigation (LAR-18-021)
 - 2) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Exemption Request: Power Operated Relief Valve (PORV) Noise Mitigation (LAR-18-021)
 - 3) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Proposed Changes to Licensing Basis Documents (LAR-18-021)
 - 4) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Conforming Technical Specifications Bases Changes (For Information Only) (LAR-18-021)

cc:

Southern Nuclear Operating Company / Georgia Power Company

Mr. S. E. Kuczynski (w/o enclosures)

Mr. D. G. Bost (w/o enclosures)

Mr. M. D. Meier (w/o enclosures)

Mr. D. H. Jones (w/o enclosures)

Mr. J. B. Klecha

Mr. G. Chick

Mr. D. L. McKinney (w/o enclosures)

Mr. T. W. Yelverton (w/o enclosures)

Mr. B. H. Whitley

Ms. C. A. Gayheart

Mr. C. R. Pierce

Ms. A. G. Aughtman

Mr. D. L. Fulton

Mr. M. J. Yox

Mr. E. W. Rasmussen

Mr. J. Tupik

Mr. W. A. Sparkman

Ms. A. C. Chamberlain

Ms. A. L. Pugh

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Nuclear Regulatory Commission

Mr. W. Jones (w/o enclosures)

Ms. J. Dixon-Herrity

Mr. C. Patel

Ms. J. M. Heisserer

Mr. B. Kemker

Mr. G. Khouri

Ms. S. Temple

Mr. F. Brown

Mr. T.E. Chandler

Ms. P. Braxton

Mr. T. Brimfield

Mr. C. J. Even

Mr. A. Lerch

State of Georgia

Mr. R. Dunn

Oglethorpe Power Corporation

Mr. M. W. Price

Ms. A. Whaley

Municipal Electric Authority of Georgia

Mr. J. E. Fuller

Mr. S. M. Jackson

Dalton Utilities

Mr. T. Bundros

Westinghouse Electric Company, LLC

Mr. L. Oriani (w/o enclosures)

Mr. C. Churchman (w/o enclosures)

Mr. M. Corletti

Mr. M. L. Clyde

Ms. L. Iller

Mr. D. Hawkins

Mr. J. Coward

Other

Mr. S. W. Kline, Bechtel Power Corporation

Ms. L. A. Matis, Tetra Tech NUS, Inc.

Dr. W. R. Jacobs, Jr., Ph.D., GDS Associates, Inc.

Mr. S. Roetger, Georgia Public Service Commission

Ms. S. W. Kernizan, Georgia Public Service Commission

Mr. K. C. Greene, Troutman Sanders

Mr. S. Blanton, Balch Bingham

Mr. R. Grumbir, APOG

NDDocumentinBox@duke-energy.com, Duke Energy

Mr. S. Franzone, Florida Power & Light

Southern Nuclear Operating Company

ND-18-1037

Enclosure 1

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Request for License Amendment:

Power Operated Relief Valve (PORV) Noise Mitigation

(LAR-18-021)

(This Enclosure consists of 14 pages, including this cover page.)

ND-18-1037

Enclosure 1

Request for License Amendment Regarding Power Operated Relief Valve (PORV) Noise Mitigation (LAR-18-021)

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ND-18-1037

Enclosure 1

Request for License Amendment Regarding Power Operated Relief Valve (PORV) Noise Mitigation (LAR-18-021)

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 change would revise the COLs by relocating the power operated relief valve (PORV) branch lines upstream of the main steam safety valves in Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) Figure 2.2.4-1 (Sheets 1 and 2) of COL Appendix C. Additionally, the change involves changing the PORV block valves from gate valves to globe valves in the Updated Final Safety Analysis Report (UFSAR).

The requested amendment proposes changes to plant-specific Design Control Document (DCD) Tier 2 information in the UFSAR that involve changes to COL Appendix C, and corresponding changes to plant-specific Tier 1 information. This enclosure requests approval of the license amendment necessary to implement the COL Appendix C and UFSAR changes. Enclosure 2 requests the exemption necessary to implement the involved changes to the plant-specific Tier 1 information.

2. DETAILED DESCRIPTION AND TECHNICAL EVALUATION

COL Appendix C Subsection 2.2.4 contains ITAAC for the steam generator system (SGS). COL Appendix C Figure 2.2.4-1 (sheets 1 and 2) shows the SGS piping from the steam generators through the auxiliary building. This figure depicts the power operated relief valve (PORV) as located downstream of the main steam safety valves (MSSVs).

Design Function Related to Activity

Power-Operated Relief Valves (PORV) (SGS-PL-V233A/B)

The PORVs perform the safety-related functions of steam generator isolation and steam generator relief isolation. During plant operations, the PORVs are automatically controlled by steam line pressure. The valves modulate open and exhaust to the atmosphere whenever the steam line pressure exceeds an operator established set point. When needed for plant cooldown, the PORVs are automatically controlled by steam line pressure with remote manual adjustment of the pressure set point from the control room or remote shutdown workstation. In order to cooldown the plant, the operator manually adjusts the pressure set point downward in discrete steps or takes manual control of the valve position.

Each PORV is installed in a branch line off the safety-related portion of the main steam line upstream of the main steam isolation valve (MSIV).

PORV Block Valves (SGS-PL-V027A/B)

The PORV block valves perform the safety-related functions of containment isolation, steam generator isolation, and steam generator relief isolation. The PORV block valves also provide the capability to isolate a leaking or stuck-open PORV. The PORV block valves are AP1000 Safety Class B and close automatically on a Low-2 steam line pressure signal generated in the Protection and Safety Monitoring System (PMS).

Each PORV block valve is located in the branch line upstream of the PORV. The upstream location allows maintenance of the PORV at power.

Containment Isolation

The containment isolation system meets the design requirements set forth in General Design Criteria (GDC) 55, 56 and 57 of Appendix A to Title 10 of the Code of Federal Regulations (CFR) Part 50. A regulatory requirement common to all containment isolation valves governed by GDCs 55, 56, and 57 is isolation valves outside containment be located as close to the containment as practical. The intent of this design requirement is to minimize the probability that containment integrity could be compromised due to dynamic effects or natural events. UFSAR Table 6.2.3-1 lists the nominal length of pipe between each containment penetration and the containment isolation valve.

Reason for Activity

During testing of the PORVs in operation at another facility, the noise level in the MCR was approximately 85 dB(A) and the noise level at the PORVs was approximately 110 dB(A). The size and geometry of the PORV block valves cause a high flow velocity (~800 ft/sec) and Helmholtz resonance which results in an increase in noise level. Since the PORV block valves are located in rooms adjacent to the MCR, the sound from the PORV block valves is transmitted into the MCR. Changes to the PORV block valves are necessary in order to reduce the noise contribution to the MCR and improve human factors with the PORVs in operation.

Description of Activity

To reduce noise contribution to the MCR from the PORV block valves, the PORV block valve size is proposed to be changed from 6-inch to 12-inch. The branch line that the PORV block valves are installed in is also proposed to be changed from 6 inches to 12 inches. These changes reduce the flow velocity to less than 200 ft/sec and as a result the noise level is reduced. The Technical Specification (TS) Bases B 3.7.10 currently states that this branch line is 6 inches. TS 3.7.10 Actions and Surveillance Requirements are not associated with the size of the branch line. Since the specific size of the branch line is not important to TS 3.7.10, the bases is revised to remove the size of the branch line that the PORV is installed in.

Changes are proposed to the PORV block valves to change the valve type from a gate valve to a globe valve to remove geometry susceptible to a Helmholtz resonance. The globe valve is qualified for the same environmental and pressure/temperature conditions. UFSAR Table 3.9-16, Table 10.3.3-1, and Figure 10.3.2-1 (Sheets 1 and 2) are proposed to be revised to change the PORV block valves from gate valves to globe valves.

Due to layout constraints with the proposed changes, the location of the branch line that the PORV block valves are installed in is moved upstream of the main steam safety valves (MSSVs) branch connections. UFSAR Table 6.2.3-1 is revised to change the pipe length from each containment penetration to valves SGS-PL-V027A and SGS-PL-V027B to 26 feet. COL Appendix C (Plant-specific Tier 1) Figure 2.2.4-1 (Sheets 1 and 2) and UFSAR

Figure 10.3.2-1 (Sheets 1 and 2) are revised to show the PORV branch line upstream of the MSSVs.

MCR noise levels will be verified as part of the AP1000 human factors engineering verification and validation program as described in UFSAR Subsection 18.11.

Proposed Licensing Basis Changes

The proposed changes to COL Appendix C (and corresponding plant-specific Tier 1) and the UFSAR related to relocating the power operated relief valve (PORV) branch lines upstream of the main steam safety valves branch connections and changing the PORV block valves from gate valves to globe valves are as follows:

1. COL Appendix C (plant-specific Tier 1) Figure 2.2.4-1 (Sheets 1 and 2) are revised to move the PORV branch line upstream of the MSSVs.
2. UFSAR Table 3.9-16, Table 10.3.3-1, and Figure 10.3.2-1 (Sheets 1 and 2) are revised to change the Main Steam line PORV block valves (SGS-PL-V027A/B) from gate valves to globe valves.
3. UFSAR Table 6.2.3-1 is revised to change the pipe length from each containment penetration to valves SGS-PL-V027A and SGS-PL-V027B to 26 feet.
4. UFSAR Figure 10.3.2-1 (Sheets 1 and 2) is revised to move the PORV branch line upstream of the MSSVs.
5. Technical Specifications Bases B 3.7.10 is revised to remove the size of the branch line that the PORV is installed in.

Technical Evaluation

With the proposed changes, the PORV block valves are still able to perform the safety-related functions of containment isolation, steam generator isolation, and steam generator relief isolation. There is no change to the PORV block valves safety class or safety-related functions.

The relocation of the branch line that the PORV block valves are installed in allows the PORV block valves to be closer to the containment penetration and maintain compliance with GDC 57 for locating containment isolation valves as close to the containment as practical.

There is no impact to ITAAC 2.2.05.12 and ITAAC 2.7.01.14 because the tests measure background noise for the main control room emergency habitability system (VES) and nuclear island nonradioactive ventilation system (VBS), respectively. Noise from the PORVs is not considered to be background noise because PORV operation is not a frequent occurrence.

There is no impact to Chapter 15 evaluations. Changes to the PORV block valve and line size do not impact the mass releases to the atmosphere during a Steam Generator Tube Rupture accident. The mass release is limited by the PORV which is more restrictive than the PORV block valve and line size.

There is no impact to any assumed leakage through the PORV line. The existing 12-inch PORV has a design function to limit leakage through the PORV line. Increasing the PORV block valve to 12 inches will increase the leakage through the PORV block valve; however, it will be at the same leakage rate as the 12-inch PORV. Therefore, the leakage rate through the PORV line does not increase and there is no impact to radiation doses.

There is no impact to the assumptions or analysis in the completed safety analysis for radiation doses as a result of the change.

There is no impact to the conclusions of the Pipe Rupture Hazard Analysis (PRHA) because the PORV line is Break Exclusion Zone (BEZ) piping. The proposed changes do not result in any new postulated break locations. Updated analyses confirm that the integrity of the wall adjacent to the MCR is unaffected by a postulated main steam line break that causes the PORV line to impact the wall.

There is no change to the valve motor operator. The current motor operator is sufficient to operate the new 12-inch globe valve. Therefore, there is no impact to the class 1E dc and UPS system (IDS) battery sizing. There is no change to the valve stroke time; therefore, there is no impact to valve open/closure times.

The proposed changes do not result in a modification to, addition to, or removal of a structure, system, or component (SSC) such that a design function is adversely affected, have no impact on plant operating procedures or a method of control that adversely affects a design function, do not result in an adverse change to a method of evaluation or use of an alternate method of evaluation, do not represent tests or experiments outside the reference bounds of the design basis, and do not alter the assumptions or results of the ex-vessel severe accident assessment.

The proposed changes do not revise any aspects of the plant that could have any adverse effect on safety and security, including the site emergency plan.

3. TECHNICAL EVALUATION

The Technical Evaluation is included in 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. These proposed changes involve a departure from COL Appendix C; therefore, this activity requires a proposed amendment to the COL.

10 CFR 52, Appendix D, VIII.A.4 states that exemptions from Tier 1 information are governed by the requirements in 10 CFR 52.63(b)(1) and 52.98(f). 10 CFR 52.63(b)(1) allows a licensee who references a design certification rule to request an exemption from Tier 1 information. 10 CFR 52.98(f) requires NRC approval for any modification to, addition to, or deletion from the terms and conditions of a COL. These proposed

changes involve changes to figures in COL Appendix C, with corresponding changes to Tier 1 information in the associated plant-specific DCD. Therefore, NRC approval is required prior to making the proposed plant-specific changes in this license amendment request.

10 CFR 52, Appendix D, Section VIII.B.5.a allows a licensee who references Appendix D 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 Section VIII. As discussed above, the proposed changes to UFSAR Figure 10.3.2-1 (Sheets 1 and 2) and Table 6.2.3-1 involve changes to Tier 1 information. Therefore, an exemption request is submitted with this license amendment request.

10 CFR Part 50, Appendix A, General Design Criterion (GDC) 55, "Reactor coolant pressure boundary penetrating containment," requires that each line that is part of the reactor coolant pressure boundary and that penetrates primary reactor containment shall be provided with containment isolation valves as follows, unless it can be demonstrated that the containment isolation provisions for a specific class of lines, such as instrument lines, are acceptable on some other defined basis:

- (1) One locked closed isolation valve inside and one locked closed isolation valve outside containment; or
- (2) One automatic isolation valve inside and one locked closed isolation valve outside containment; or
- (3) One locked closed isolation valve inside and one automatic isolation valve outside containment. A simple check valve may not be used as the automatic isolation valve outside containment; or
- (4) One automatic isolation valve inside and one automatic isolation valve outside containment. A simple check valve may not be used as the automatic isolation valve outside containment.

Isolation valves outside containment shall be located as close to containment as practical and upon loss of actuating power, automatic isolation valves shall be designed to take the position that provides greater safety.

Other appropriate requirements to minimize the probability or consequences of an accidental rupture of these lines or of lines connected to them shall be provided as necessary to assure adequate safety. Determination of the appropriateness of these requirements, such as higher quality in design, fabrication, and testing, additional provisions for inservice inspection, protection against more severe natural phenomena, and additional isolation valves and containment, shall include consideration of the population density, use characteristics, and physical characteristics of the site environs. The PORV block valves will continue to perform their design function of automatic containment isolation in their new locations. Additionally, relocating the

branch lines for the PORV block valves to upstream of the branch connections for the MSSVs moves them closer to containment, consistent with GDC 55.

10 CFR Part 50, Appendix A, GDC 56, "Primary containment isolation," requires that each line that connects directly to the containment atmosphere and penetrates primary reactor containment shall be provided with containment isolation valves as follows, unless it can be demonstrated that the containment isolation provisions for a specific class of lines, such as instrument lines, are acceptable on some other defined basis:

- (1) One locked closed isolation valve inside and one locked closed isolation valve outside containment; or
- (2) One automatic isolation valve inside and one locked closed isolation valve outside containment; or
- (3) One locked closed isolation valve inside and one automatic isolation valve outside containment. A simple check valve may not be used as the automatic isolation valve outside containment; or
- (4) One automatic isolation valve inside and one automatic isolation valve outside containment. A simple check valve may not be used as the automatic isolation valve outside containment.

Isolation valves outside containment shall be located as close to the containment as practical and upon loss of actuating power, automatic isolation valves shall be designed to take the position that provides greater safety. The PORV block valves will continue to perform their design function of automatic containment isolation in their new locations. Additionally, relocating the branch lines for the PORV block valves to upstream of the branch connections for the MSSVs moves them closer to containment, consistent with GDC 56

10 CFR Part 50, Appendix A, GDC 57, "Closed system isolation valves," requires that each line that penetrates primary reactor containment and is neither part of the reactor coolant pressure boundary nor connected directly to the containment atmosphere shall have at least one containment isolation valve which shall be either automatic, or locked closed, or capable of remote manual operation. This valve shall be outside containment and located as close to the containment as practical. A simple check valve may not be used as the automatic isolation valve. The PORV block valves will continue to perform their design function of automatic containment isolation in their new locations. Additionally, relocating the branch lines for the PORV block valves to upstream of the branch connections for the MSSVs moves them closer to containment, consistent with GDC 57.

4.2 Precedent

No precedent is identified.

4.3 Significant Hazards Consideration

The requested amendment proposes a change to Updated Final Safety Analysis Report (UFSAR) Tier 2 information, which involves a change to Combined License (COL) Appendix C (and the corresponding plant-specific Design Control Document (DCD) Tier 1) information related to relocating the power operated relief valve (PORV) branch lines upstream of the main steam safety valves and changing the PORV block valves from gate valves to globe valves.

The requested amendment proposes changes to Tier 2 information in UFSAR Figure 10.3.2-1 (Sheets 1 and 2) and Tables 3.9-16, 6.2.3-1, and 10.3.3-1, which involve changes to Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) Figure 2.2.4-1 (Sheets 1 and 2) of COL Appendix C (and corresponding changes to the plant-specific DCD Tier 1 information).

The change to the UFSAR proposes relocating the power operated relief valve (PORV) branch lines upstream of the branch lines to the main steam safety valves and changing the PORV block valves from gate valves to globe valves. The PORV block valves will continue to perform their design function of automatic containment isolation in their new locations. Additionally, relocating the branch lines for the PORV block valves to upstream of the branch connections for the MSSVs moves them closer to containment, consistent with GDC 55, 56, and 57.

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 changes do not affect the operation or reliability of any system, structure or component (SSC) required to maintain a normal power operating condition or to mitigate anticipated transients without safety-related systems. With the proposed changes, the PORV block valves are still able to perform the safety-related functions of containment isolation, steam generator isolation, and steam generator relief isolation. There is no change to the PORV block valves safety class or safety-related functions.

The relocation of the branch line in which the PORV block valves are installed in allows the PORV block valves to be closer to the containment penetration and maintain compliance with General Design Criterion (GDC) 57 for locating containment isolation valves as close to the containment as practical.

There is no impact to Chapter 15 evaluations. Changes to the PORV block valve and line size do not impact the mass releases to the atmosphere during a Steam Generator Tube Rupture accident. The mass release is limited by the PORV which is more restrictive than the PORV block valve and line size.

There is no impact to any assumed leakage through the PORV line. The existing 12-inch PORV has a design function to limit leakage through the PORV line. Increasing the PORV block valve to 12 inches will increase the leakage through the PORV block valve however it will be that same leakage rate as the 12-inch PORV. Therefore, the leakage rate through the PORV line does not increase and there is no impact to radiation doses.

There is no impact to the assumptions or analysis in the completed safety analysis for radiation doses as a result of the change.

There is no impact to the conclusions of the Pipe Rupture Hazard Analysis (PRHA) because the PORV line is Break Exclusion Zone (BEZ) piping. The proposed changes do not result in any new postulated break locations. Updated analyses confirm that the integrity of the wall adjacent to the MCR is unaffected by a postulated main steam line break that causes the PORV line to impact the wall.

There is no change to the valve motor operator. The current motor operator is sufficient to operate the new 12-inch globe valve. Therefore, there is no impact to the Class 1E dc and UPS System (IDS) battery sizing. There is no change to the valve stroke time, therefore there is no impact to valve open/closure times.

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 changes do not affect the operation of systems or equipment that could initiate a new or different kind of accident, or alter any SSC such that a new accident initiator or initiating sequence of events is created. With the proposed changes, the PORV block valves are still able to perform the safety-related functions of containment isolation, steam generator isolation, and steam generator relief isolation. There is no change to the PORV block valves safety class or safety-related functions.

The relocation of the branch line in which the PORV block valves are installed in allows the PORV block valves to be closer to the containment penetration and maintain compliance with General Design Criterion (GDC) 57 for locating containment isolation valves as close to the containment as practical.

There is no impact to Chapter 15 evaluations. Changes to the PORV block valve and line size do not impact the mass releases to the atmosphere during a Steam Generator Tube Rupture accident. The mass release is limited by the PORV which is more restrictive than the PORV block valve and line size.

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There is no impact to the assumptions or analysis in the completed safety analysis for radiation doses as a result of the change.

There is no impact to the conclusions of the Pipe Rupture Hazard Analysis (PRHA) because the PORV line is Break Exclusion Zone (BEZ) piping. The proposed changes do not result in any new postulated break locations. Updated analyses confirm that the integrity of the wall adjacent to the MCR is unaffected by a postulated main steam line break that causes the PORV line to impact the wall.

There is no change to the valve motor operator. The current motor operator is sufficient to operate the new 12-inch globe valve. Therefore, there is no impact to the Class 1E dc and UPS System (IDS) battery sizing. There is no change to the valve stroke time, therefore there is no impact to valve open/closure times.

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 do not affect existing safety margins. With the proposed changes, the PORV block valves are still able to perform the safety-related functions of containment isolation, steam generator isolation, and steam generator relief isolation. There is no change to the PORV block valves safety class or safety-related functions.

The relocation of the branch line in which the PORV block valves are installed in allows the PORV block valves to be closer to the containment penetration and maintain compliance with General Design Criterion (GDC) 57 for locating containment isolation valves as close to the containment as practical.

There is no impact to Chapter 15 evaluations. Changes to the PORV block valve and line size do not impact the mass releases to the atmosphere during a Steam Generator Tube Rupture accident. The mass release is limited by the PORV which is more restrictive than the PORV block valve and line size.

There is no impact to any assumed leakage through the PORV line. The existing 12-inch PORV has a design function to limit leakage through the

PORV line. Increasing the PORV block valve to 12 inches will increase the leakage through the PORV block valve however it will be that same leakage rate as the 12-inch PORV. Therefore, the leakage rate through the PORV line does not increase and there is no impact to radiation doses.

There is no impact to the assumptions or analysis in the completed safety analysis for radiation doses as a result of the change.

There is no impact to the conclusions of the Pipe Rupture Hazard Analysis (PRHA) because the PORV line is Break Exclusion Zone (BEZ) piping. The proposed changes do not result in any new postulated break locations. Updated analyses confirm that the integrity of the wall adjacent to the MCR is unaffected by a postulated main steam line break that causes the PORV line to impact the wall.

There is no change to the valve motor operator. The current motor operator is sufficient to operate the new 12-inch globe valve. Therefore, there is no impact to the Class 1E dc and UPS System (IDS) battery sizing. There is no change to the valve stroke time, therefore there is no impact to valve open/closure times.

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. The above evaluations demonstrate that the requested changes can be accommodated without an increase in the probability or consequences of an accident previously evaluated, without creating the possibility of a new or different kind of accident from any accident previously evaluated, and without a significant reduction in a margin of safety. Having arrived at negative declarations with regard to the criteria of 10 CFR 50.92, this assessment determined that the requested change does not involve a Significant Hazards Consideration.

5. ENVIRONMENTAL CONSIDERATIONS

Southern Nuclear Operating Company (SNC or “Licensee”) 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 requested amendment proposes a change to Updated Final Safety Analysis Report (UFSAR) Tier 2 information, which involves a

change to COL Appendix C (and the corresponding plant-specific Design Control Document (DCD) Tier 1) information related to relocating the power operated relief valve (PORV) branch lines upstream of the main steam safety valves branch connections and changing the PORV block valves from gate valves to globe valves.

The requested amendment proposes changes to Tier 2 information in UFSAR Table 3.9-16, Table 10.3.3-1, and Figure 10.3.2-1 (Sheets 1 and 2), which involve changes to Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) Figure 2.2.4-1 (Sheets 1 and 2) of COL Appendix C, and corresponding changes to the plant-specific DCD Tier 1 information.

The change to the UFSAR proposes relocating the power operated relief valve (PORV) branch lines upstream of the branch lines to the main steam safety valves and changing the PORV block valves from gate valves to globe valves.

Sections 2 and 3 of this license amendment request provide the details of the proposed changes.

The Licensee has determined that the anticipated construction and operational effects of the proposed amendment meet 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 determined that (1) the requested amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated; (2) the requested amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated; and (3) the requested amendment does not involve a significant reduction in a margin of safety. 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.

(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 do not affect any aspect of plant construction or operation that introduces a change to any effluent types (for example effluents containing chemicals or biocides, sanitary system effluents, and other effluents), and do not affect any plant radiological or non-radiological effluent release quantities. There is no impact to any assumed leakage through the PORV line. The existing 12-inch PORV has a design function to limit leakage through the PORV line. Increasing the PORV block valve to 12 inches will increase the leakage through the PORV block valve however it will be that same leakage rate as the 12-inch PORV. Therefore, the leakage rate through the PORV line does not increase and there is no impact to radiation doses. There is no impact to the assumptions or analysis in the completed safety analysis for radiation doses as a

result of the change. Accordingly, there is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite. Therefore, it is concluded that the requested 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 do not affect walls, floors, or other structures that provide radiation shielding. There is no impact to any assumed leakage through the PORV line. The existing 12-inch PORV has a design function to limit leakage through the PORV line. Increasing the PORV block valve to 12 inches will increase the leakage through the PORV block valve however it will be that same leakage rate as the 12-inch PORV. Therefore, the leakage rate through the PORV line does not increase and there is no impact to radiation doses. There is no impact to the assumptions or analysis in the completed safety analysis for radiation doses as a result of the change. Accordingly, there is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite. Furthermore, company and station policies maintain radiation exposure of personnel within limits defined by 10 CFR Part 20, "Standards for Protection Against Radiation." Administrative procedures and practices are implemented to maintain radiation exposure of personnel as low as is reasonably achievable. Therefore, it is concluded that the requested amendment does not involve a significant increase in individual or cumulative occupational radiation exposure.

Based on the above review of the requested amendment, it has been determined that anticipated construction and operational effects of the requested 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 requested 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), an environmental impact statement or environmental assessment of the proposed amendment is not required.

6. REFERENCES

None.

Southern Nuclear Operating Company

ND-18-1037

Enclosure 2

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Exemption Request:

Power Operated Relief Valve (PORV) Noise Mitigation

(LAR-18-021)

(This Enclosure 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 departure from elements of the certification information in Tier 1 of the generic 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 includes relocating the power operated relief valve (PORV) branch lines upstream of the branch lines to the main steam safety valves.

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 52, Appendix D, Section VIII.A.4 to allow departures from generic Tier 1 information due to a proposed change to Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) Figure 2.2.4-1 (Sheets 1 and 2) to depict relocation of the power operated relief valve (PORV) branch lines upstream of the branch lines to the main steam safety valves.

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.

Design Function Related to Activity

Power-Operated Relief Valves (PORV) (SGS-PL-V233A/B)

The PORVs perform the safety-related functions of steam generator isolation and steam generator relief isolation. During plant operations, the PORVs are automatically controlled by steam line pressure. The valves modulate open and exhaust to the atmosphere whenever the steam line pressure exceeds an operator established set point. When needed for plant cooldown, the PORVs are automatically controlled by steam line pressure with remote manual adjustment of the pressure set point from the control room or remote shutdown workstation. In order to cooldown the plant, the operator manually adjusts the pressure set point downward in discrete steps or takes manual control of the valve position.

Each PORV is installed in a branch line off the safety-related portion of the main steam line upstream of the main steam isolation valve (MSIV).

PORV Block Valves (SGS-PL-V027A/B)

The PORV block valves perform the safety-related functions of containment isolation, steam generator isolation, and steam generator relief isolation. The PORV block valves also provide the capability to isolate a leaking or stuck-open PORV. The PORV block

valves are AP1000 Safety Class B and close automatically on a Low-2 steam line pressure signal generated in the Protection and Safety Monitoring System (PMS).

Each PORV block valve is located in the branch line upstream of the PORV. The upstream location allows maintenance of the PORV at power.

Containment Isolation

The containment isolation system meets the design requirements set forth in General Design Criteria (GDC) 55, 56 and 57 of Appendix A to Title 10 of the Code of Federal Regulations (CFR) Part 50. A regulatory requirement common to all containment isolation valves governed by GDCs 55, 56, and 57 is isolation valves outside containment be located as close to the containment as practical. The intent of this design requirement is to minimize the probability that containment integrity could be compromised due to dynamic effects or natural events. UFSAR Table 6.2.3-1 lists the nominal length of pipe between each containment penetration and the containment isolation valve.

Reason for Activity

During testing of the PORVs in operation at another facility, the noise level in the MCR was approximately 85 dB(A) and the noise level at the PORVs was approximately 110 dB(A). The size and geometry of the PORV block valves cause a high flow velocity (~800 ft/sec) and Helmholtz resonance which results in an increase in noise level. Since the PORV block valves are located in rooms adjacent to the MCR, the sound from the PORV block valves is transmitted into the MCR. Changes to the PORV block valves are necessary in order to reduce the noise contribution to the MCR and improve human factors with the PORVs in operation.

Description of Activity

To reduce noise contribution to the MCR from the PORV block valves, the PORV block valve size is proposed to be changed from 6-inch to 12-inch. The branch line that the PORV block valves are installed in is also proposed to be changed from 6 inches to 12 inches. These changes reduce the flow velocity to less than 200 ft/sec and as a result the noise level is reduced.

Due to layout constraints with the proposed changes, the location of the branch line that the PORV block valves are installed in is moved upstream of the main steam safety valves (MSSVs) branch connections. Plant-specific Tier 1 ITAAC Figure 2.2.4-1 (Sheets 1 and 2) is revised to show the PORV branch line upstream of the MSSVs.

3.0 Technical Justification of Acceptability

With the proposed changes, the PORV block valves are still able to perform the safety-related functions of containment isolation, steam generator isolation, and steam generator relief isolation. There is no change to the PORV block valves safety class or safety-related functions.

The relocation of the branch line that the PORV block valves are installed in allows the PORV block valves to be closer to the containment penetration and maintain compliance with GDC 57 for locating containment isolation valves as close to the containment as practical.

There is no impact to the assumptions or analysis in the completed safety analysis for radiation doses as a result of the change.

There is no impact to the conclusions of the Pipe Rupture Hazard Analysis (PRHA) because the PORV line is Break Exclusion Zone (BEZ) piping. The proposed changes do not result in any new postulated break locations. Updated analyses confirm that the integrity of the wall adjacent to the MCR is unaffected by a postulated main steam line break that causes the PORV line to impact the wall.

The proposed changes do not result in a modification to, addition to, or removal of a structure, system, or component (SSC) such that a design function is adversely affected, have no impact on plant operating procedures or a method of control that adversely affects a design function, do not result in an adverse change to a method of evaluation or use of an alternate method of evaluation, do not represent tests or experiments outside the reference bounds of the design basis, and do not alter the assumptions or results of the ex-vessel severe accident assessment.

Detailed 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 DCD to depart from the AP1000 certified (Tier 1) design information. The plant-specific DCD 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 DCD Tier 1 ITAAC will continue to serve its required purpose.

The proposed change to relocate the power operated relief valve (PORV) branch lines upstream of the branch lines to the main steam safety valves does not represent an adverse impact to the design functions provided by the steam generator system (SGS), which will continue to protect the health and safety of the public by performing its safety related function of containment isolation. The change does 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 are 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 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 exemption would relocate the power operated relief valve (PORV) branch lines upstream of the branch lines to the main steam safety valves.

The proposed exemption does not adversely affect the design function of the steam generator system, because the PORV block valves are still able to perform the safety-related functions of containment isolation, steam generator isolation, and steam generator relief isolation. There is no change to the PORV block valves safety class or safety-related functions. Additionally, the relocation of the branch line that the PORV block valves are installed in allows the PORV block valves to be closer to the containment penetration and maintain compliance with GDC 57 for locating containment isolation valves as close to the containment as practical

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 support the design function of the supported equipment, 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 equipment 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 revises the plant-specific DCD Tier 1 information to relocate the power operated relief valve (PORV) branch lines upstream of the branch lines to the main steam safety valves. With the proposed changes, the PORV block valves are still able to perform the safety-related functions of containment isolation, steam generator isolation, and steam generator relief isolation. There is no change to the PORV block valves safety class or safety-related functions. Additionally, the relocation of the branch line that the PORV block valves are installed in allows the PORV block valves to be closer to the containment penetration and maintain compliance with GDC 57 for locating containment isolation valves as close to the containment as practical. Because these 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 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 relocate the power operated relief valve (PORV) branch lines upstream of the branch lines to the main steam safety valves. 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-18-1037

Enclosure 3

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Proposed Changes to Licensing Basis Documents

(LAR-18-021)

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

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

Revise COL Appendix C (and corresponding plant-specific Tier 1) Figure 2.2.4-1, sheet 1 to relocate the branch line to the PORV as shown below:

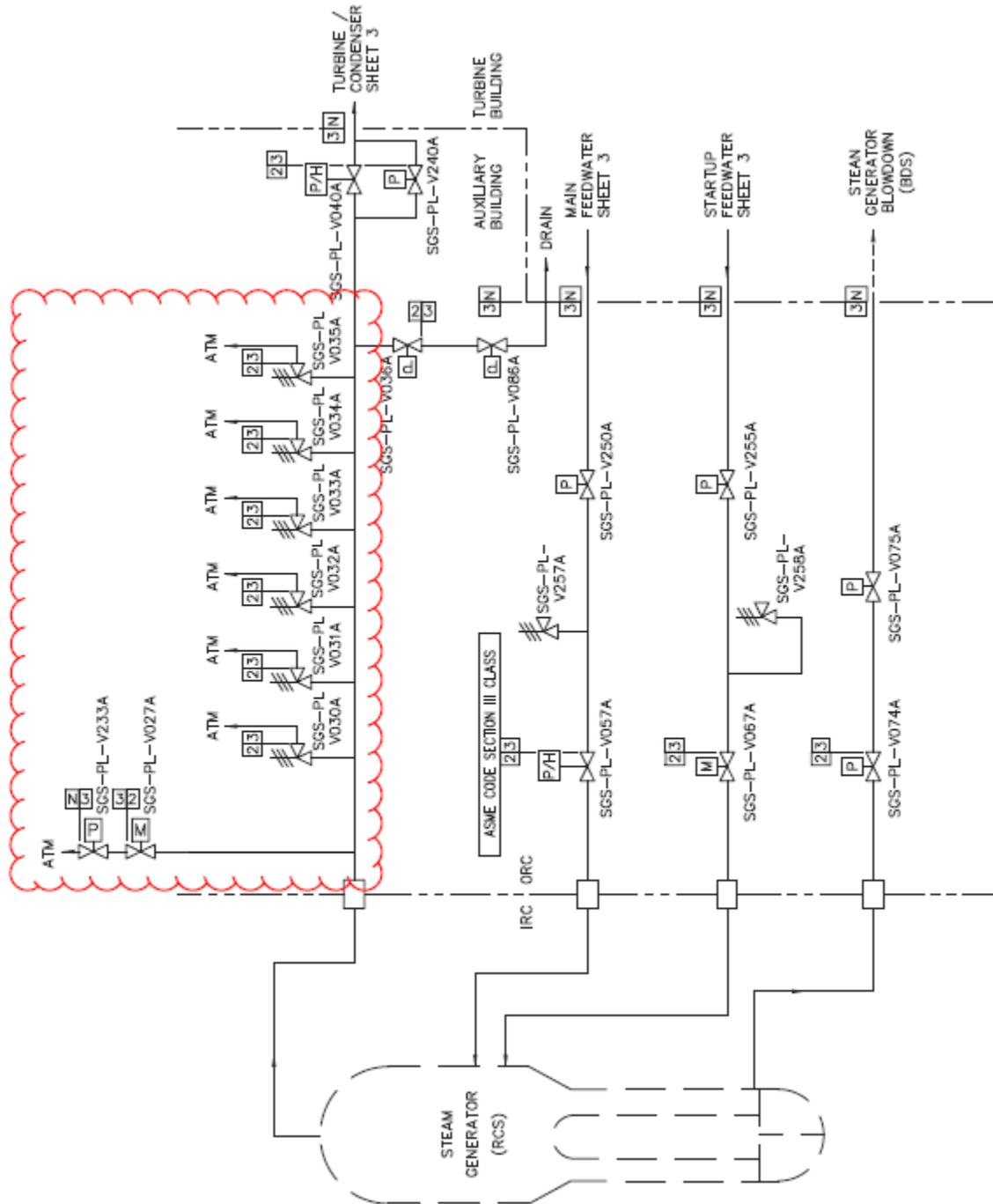


Figure 2.2.4-1 (Sheet 1 of 3)
Steam Generator System

Revise COL Appendix C (and corresponding plant-specific Tier 1) Figure 2.2.4-1, sheet 2 to relocate the branch line to the PORV as shown below:

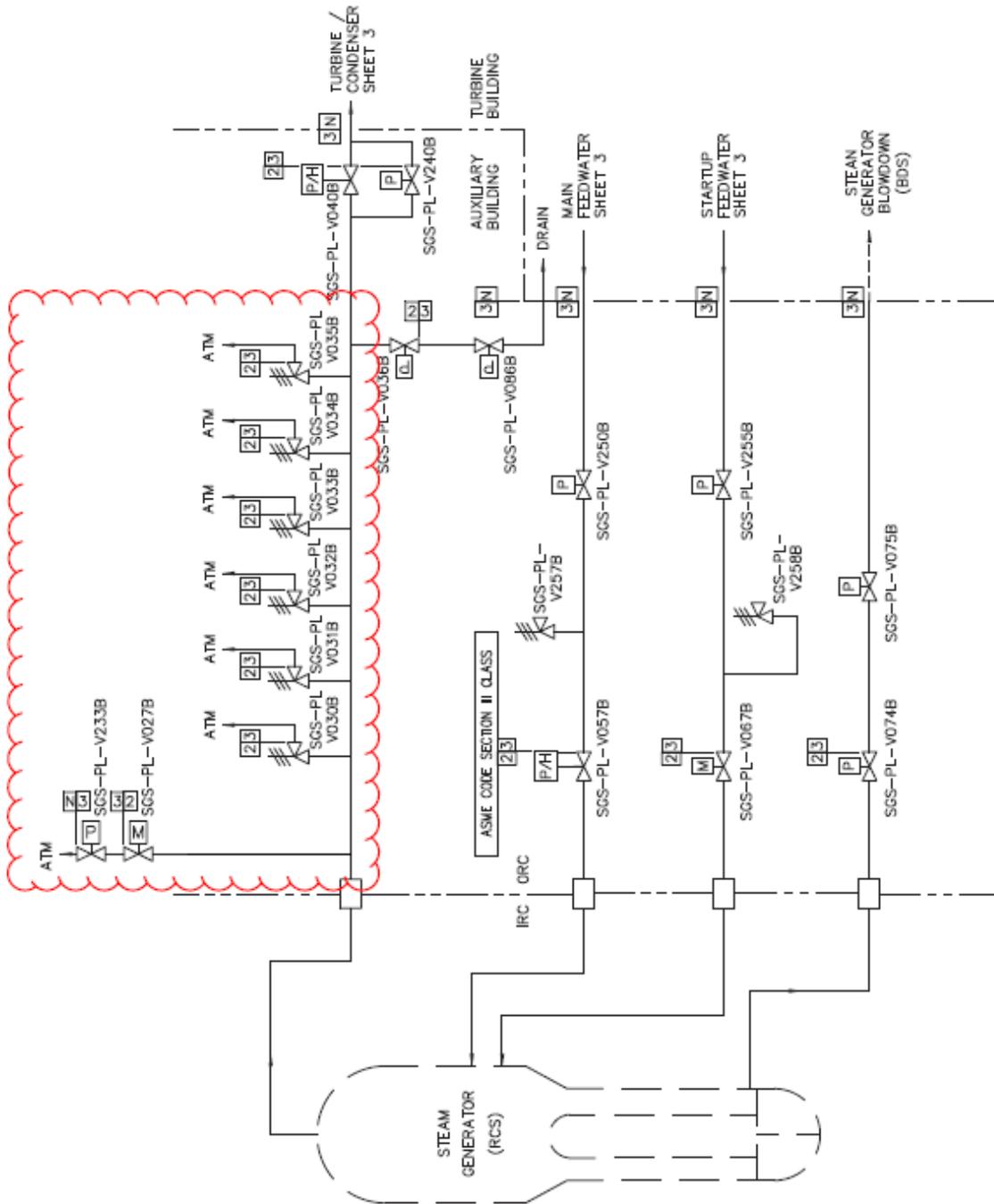


Figure 2.2.4-1 (Sheet 2 of 3)
Steam Generator System

Revise UFSAR Table 3.9-16, to change the Valve/Actuator type for SGS-PL-V027A and SGS-PL-V027B from Gate to Globe, as shown below:

Valve Tag Number	Description ⁽¹⁾	Valve/Actuator Type	* * *
* * *	* * *	* * *	* * *
SGS-PL-V027A	Power-Operated Relief Valve Block Valve Steam Generator 01	Remote MO GATE <u>Globe</u>	* * *
SGS-PL-V027B	Power-Operated Relief Valve Block Valve Steam Generator 02	Remote MO GATE <u>Globe</u>	* * *
* * *	* * *	* * *	* * *

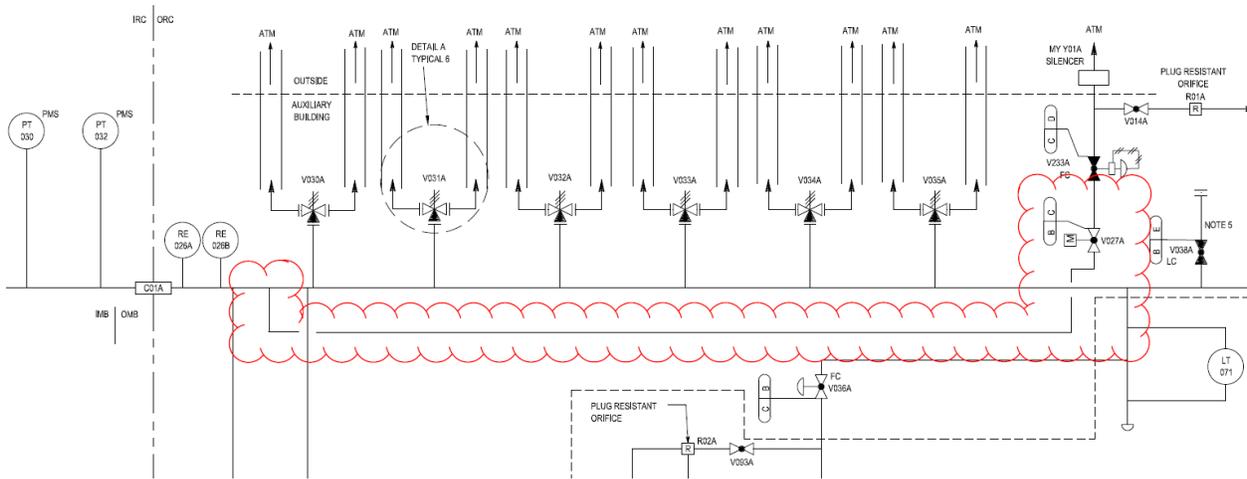
Revise UFSAR Table 6.2.3-1, to change the pipe length from the main steam line penetrations to SGS-PL-V027A and SGS-PL-V027B, as shown below:

System	Line	* * *	Valve/Hatch Identification	Pipe Length	* * *
SGS	Main steam line 01	* * *	* * *	* * *	* * *
		* * *	SGS-PL-V027A(7)	62 26	* * *
		* * *	* * *	* * *	* * *
	Main steam line 01	* * *	* * *	* * *	* * *
		* * *	SGS-PL-V027B(7)	63 26	* * *
		* * *	* * *	* * *	* * *

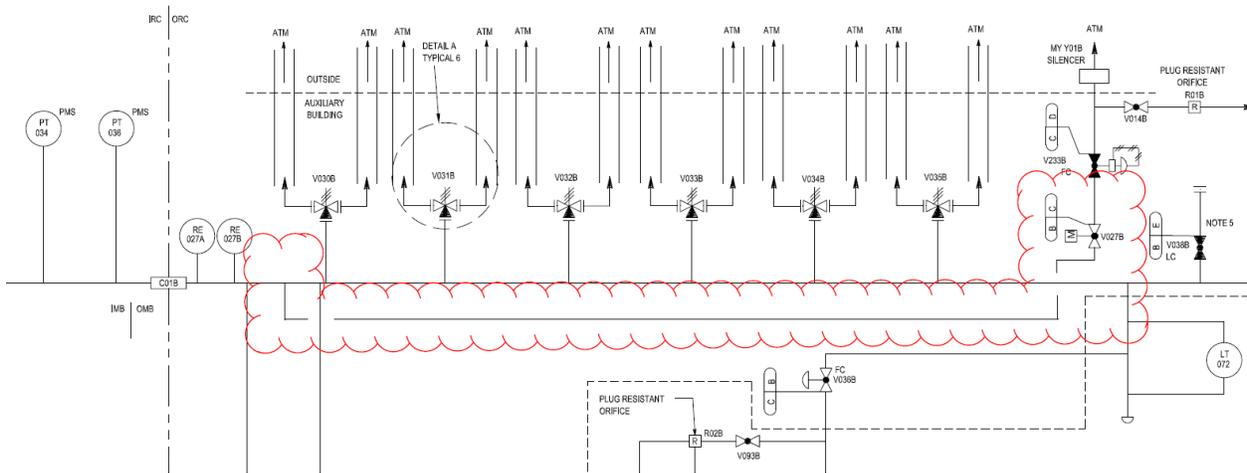
Revise UFSAR Table 10.3.3-1, to change the PORV block valve type from gate valve to globe valve, as shown below:

Item	Description of Component	* * *
* * *	* * *	* * *
3	Main steam line PORV block valve V027A(B), normally open fail as is motor-operated gate <u>globe</u> valve	* * *
* * *	* * *	* * *

Revise UFSAR Figure 10.3.2-1 (Sheet 1), to change relocate the branch line to the PORV and PORV block valve and to change the PORV block valve from a gate valve to globe valve, as shown below:



Revise UFSAR Figure 10.3.2-1 (Sheet 2), to change relocate the branch line to the PORV and PORV block valve and to change the PORV block valve from a gate valve to globe valve, as shown below:



Southern Nuclear Operating Company

ND-18-1037

Enclosure 4

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Conforming Technical Specifications Bases Changes (For Information Only)

(LAR-18-021)

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

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

ND-18-1037

Enclosure 4

Conforming Technical Specifications Bases Changes (For Information Only) (LAR-18-021)

B 3.7 PLANT SYSTEMS

B 3.7.10 Steam Generator (SG) Isolation Valves

BASES

BACKGROUND

* * *

A PORV is installed in a ~~6-inch~~ branch line off of the main steam line piping from each steam generator, to provide for controlled removal of reactor cooldown when the main steam isolation valves are closed or the turbine bypass system is not available.

* * *
