Southern Nuclear

B. H. Whitley
Director
Regulatory Affairs

Southern Nuclear
Operating Company, Inc.
42 Inverness Center Parkway
Birmingham, AL 35242
Tel 205.992.7079
Fax 205.992.5296

April 21, 2017

Docket Nos.: 52-025
52-026

ND-17-0614
10 CFR 50.90
10 CFR 52.63

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

Southern Nuclear Operating Company
Vogtle Electric Generating Plant Units 3 and 4
Request for License Amendment and Exemption:
Addition of Steam Generator System (SGS) Thermal Relief Valves (LAR-17-012)

Ladies and Gentlemen:

Pursuant to 10 CFR 52.98(c) and in accordance with 10 CFR 50.90, Southern Nuclear Operating Company (SNC), the licensee for Vogtle Electric Generating Plant (VEGP) Units 3 and 4, requests an amendment to Combined License (COL) Numbers NPF-91 and NPF-92, for VEGP Units 3 and 4, respectively. The requested amendment proposes to depart from approved AP1000 Design Control Document (DCD) Tier 2 information (text, tables and figures) as incorporated into the Updated Final Safety Analysis Report (UFSAR) as plant-specific DCD information, and also proposes to depart from involved plant-specific Tier 1 information (and 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 Tier 1 material departures.

The requested amendment proposes changes to COL Appendix C (and plant-specific Tier 1) Table 2.2.4-1 and Figure 2.2.4-1 (Sheets 1 and 2) to add two main feedwater thermal relief valves and two start-up feedwater thermal relief valves. The proposed COL Appendix C (and plant-specific DCD Tier 1) changes require additional changes to corresponding Tier 2 information in UFSAR Chapters 3 and 10.

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

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

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

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

SNC requests staff approval of this license amendment by October 2, 2017, to support installation of steam generator piping, valves and supports. SNC expects to implement this proposed amendment (through incorporation into the licensing basis documents; e.g., the UFSAR) within 30 days of approval of the requested changes. The requested approval date for the Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3 license amendment request for this topic will be October 13, 2017.

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

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

Mr. Brian H. Whitley states that: he is the Regulatory Affairs Director of Southern Nuclear Operating Company; he is authorized to execute this oath on behalf of Southern Nuclear Operating Company; and to the best of his knowledge and belief, the facts set forth in this letter are true.

Respectfully submitted,

SOUTHERN NUCLEAR OPERATING COMPANY

B. H. Whitley

Brian H. Whitley

BHW/PTR/ljs

Sworn to and subscribed before me this 21st *day of* April, *2017*

Notary Public: Lisa Myrick Spears

My commission expires: June 18, 2019

Enclosures: 1) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Request for License Amendment: Addition of Steam Generator System (SGS) Thermal Relief Valves (LAR-17-012)

2) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Exemption Request: Addition of Steam Generator System (SGS) Thermal Relief Valves (LAR-17-012)

3) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Proposed Changes to the Licensing Basis Documents (LAR-17-012)

cc:

Southern Nuclear Operating Company / Georgia Power Company
Mr. S. E. Kuczynski (w/o enclosures)
Mr. M. D. Rauckhorst
Mr. D. G. Bost (w/o enclosures)
Mr. M. D. Meier (w/o enclosures)
Mr. D. H. Jones (w/o enclosures)
Ms. K. D. Fili (w/o enclosures)
Mr. D. L. McKinney (w/o enclosures)
Mr. T.W. Yelverton (w/o enclosures)
Mr. B. H. Whitley
Mr. J.J. Hutto
Mr. C. R. Pierce
Ms. A. G. Aughtman
Mr. D. L. Fulton
Mr. M. J. Yox
Mr. E. W. Rasmussen
Mr. T. R. Takats
Mr. W. A. Sparkman
Mr. J. P. Redd
Ms. A. C. Chamberlain
Mr. M. K. Washington
Document Services RTYPE: VND.LI.L00
File AR.01.02.06

Nuclear Regulatory Commission
Mr. W. Jones (w/o enclosures)
Ms. J. Dixon-Herrity
Mr. C. Patel
Mr. W. C. Gleaves
Ms. R. Reyes
Ms. J. M. Heisserer
Mr. B. Davis
Mr. P. Kallan
Mr. G. Khouri
Mr. J. D. Fuller
Ms. S. Temple
Ms. V. Ordaz
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
Mr. K. T. Haynes
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. R. Easterling (w/o enclosures)
Mr. G. Koucheravy (w/o enclosures)
Mr. C. D. Churchman (w/o enclosures)
Mr. P. A. Russ
Mr. A. F. Dohse
Mr. M. L. Clyde
Mr. C. A. Castell
Ms. K. Chesko
Mr. J. Hopkins
Mr. D. Hawkins

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
Mr. N. R. Kellenberger, South Carolina Electric & Gas Company
Mr. D. Kersey, South Carolina Electric & Gas Company
NDDocumentinBox@duke-energy.com, Duke Energy
Mr. S. Franzone, Florida Power & Light

Southern Nuclear Operating Company

ND-17-0614

Enclosure 1

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Request for License Amendment:

Addition of Steam Generator System (SGS) Thermal Relief Valves

(LAR-17-012)

(Enclosure 1 consists of 17 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, or the "Licensee") hereby requests an amendment to Combined License (COL) Nos. NPF-91 and NPF-92 for Vogtle Electric Generating Plant (VEGP) Units 3 and 4, respectively.

1. SUMMARY DESCRIPTION

The requested amendment involves changes to add main feedwater and startup feedwater thermal relief valves to COL Appendix C (and plant-specific Tier 1) Table 2.2.4-1 and Figure 2.2.4-1 (Sheets 1 and 2). The main feedwater thermal relief valves are added to the main feedwater line between the main feedwater isolation valves (MFIVs) and main feedwater control valves (MFCVs). The startup feedwater thermal relief valves are added between the startup feedwater isolation valves (SFIVs) and startup feedwater control valves (SFCVs).

The following Updated Final Safety Analysis Report (UFSAR) text, tables and figures are also changed by the proposed activity to add the thermal relief valves to the steam generator system (SGS):

- Table 3.2-3
- Table 3.9-12
- Table 3.9-16
- Table 3.11-1
- Table 3I.6-3
- Figure 10.3.2-1 (Sheets 1 and 2)
- Subsection 10.4.7.2.1
- Subsection 10.4.7.2.2
- Subsection 10.4.9.2.1
- Subsection 10.4.9.2.2

The requested amendment requires changes to COL Appendix C and corresponding changes to plant-specific Tier 1 information and the UFSAR. 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

The proposed change to add main feedwater thermal relief valves between the main feedwater isolation and control valves impacts COL Appendix C (and plant-specific Tier 1) Table 2.2.4-1 and Figure 2.2.4-1. This table and figure are also revised to add startup feedwater thermal relief valves between the startup feedwater isolation and check valves.

During the isolation of the main feedwater and startup feedwater lines, a significant ambient temperature increase may occur in the room in which the feedwater isolation and control valves are located (i.e., Main Steam Isolation Valve (MSIV) compartments, rooms 12404 and 12406). As a result, thermal expansion of the trapped volumes of fluid between the isolation and control valves may occur. Significant room heatup can occur in a loss of offsite power (LOOP) event, loss of ac event, or other loss of all heating, ventilation and cooling. Heatup can also occur during more severe events such as steam line or feed line breaks. The trapped

volumes of concern for the main feedwater lines are between the MFIVs, SGS-PL-V057A/B, and MFCVs, SGS-PL-V250A/B. The trapped volumes of concern for the startup feedwater lines are between the SFIVs, SGS-PL-V067A/B, and the SFCVs, SGS-PL-V255A/B. Main feedwater and startup feedwater lines may exhibit an undesirable overpressure condition due to thermal expansion of trapped fluid volumes if ambient temperatures increase in the area. The potential overpressure condition can occur when both the isolation valve and control valve in either the main or startup feedwater lines are closed following actuation of engineered safety features (ESF) signals for feedwater or containment isolation, and the fluid in the lines is initially below the maximum ambient temperature. This can occur for main feedwater during heatup, hot standby and power operation up to 10%. This can occur for startup feedwater during operation at greater than 5% power. Overpressure in these lines has the potential to impact the safety functions of containment isolation and steam generator isolation performed by the isolation and control valves. Therefore, thermal relief valves are added to the main and startup feedwater lines to preclude potential overpressure conditions. Changes are proposed to add these valves to COL Appendix C (and plant-specific Tier 1) Table 2.2.4-1, Figure 2.2.4-1 and associated UFSAR text, tables, and figures.

Four 1"x1" thermal relief valves are added to the SGS main and startup feedwater lines. The main feedwater relief valves, SGS-PL-V257A and SGS-PL-V257B, are located off the main lines. The startup feedwater relief valves, SGS-PL-V258A and SGS-PL-V258B, are located off the startup feedwater lines. These valves are safety-related, Class C, as they are required to mitigate design basis events. The valves perform an active function of changing position to open (“transfer open”) in order to prevent overpressure in the line when both the isolation and control valves are closed. These valves are normally closed and provide the safety function of remaining closed (“maintain closed”) when isolation is required in the feedwater lines and ambient temperatures do not produce overpressure conditions of the trapped fluid in between the isolation and control valves. The valves also have the safety function to re-close after they open to relieve pressure (“transfer closed”) in order to restore the isolation boundary. The added valves are needed to support the safety-related SGS.

The valves are constructed in accordance with American Society of Mechanical Engineers (ASME) Code Section III requirements consistent with the design and construction of the lines to which they are added, per UFSAR Subsections 10.4.7.1.1 and 10.4.9.1.1. These valves are seismic Category I, as they are required to function following a seismic event. The valves are not designed to Class 1E criteria, as the valves are mechanical components with no electrical characteristics.

The parameters of the valves described above are captured in the following changes to the UFSAR design information as shown in the markups. Descriptions of remaining valve parameters are also provided below, as necessary.

- Combined License (COL) Appendix C (and plant-specific Tier 1) Table 2.2.4-1
    - This table is revised to add the main feedwater thermal relief valves, SGS-PL-V257A/B and startup feedwater thermal relief valves, SGS-PL-V258A/B. These valves retain their pressure boundary integrity at their design pressure. The valves are not remotely-operated as designated with a “No” in the applicable column. The qualification for Class 1E or harsh

environment, safety-related display, and control PMS columns are not applicable to the valves as designated by a dashed line, as these are not remotely-operated valves. Loss of motive power position is not applicable to these valves as they are not automatic valves. These changes identify the parameters of the valve and are associated with inspections, tests, analyses and acceptance criteria (ITAAC). Per the associated ITAAC, the thermal relief valves are designed and constructed in accordance with ASME Code Section III requirements. Pressure boundary welds meet ASME Code Section III requirements and retain pressure boundary integrity at design pressure. The valves can withstand seismic design basis loads per the seismic Category I qualification. Closure of these ITAAC is not adversely impacted as all requirements are met by the design, construction and qualification of the thermal relief valves.

- COL Appendix C (and plant-specific Tier 1) Figure 2.2.4-1 (Sheets 1 and 2)
    - Figure 2.2.4-1 (Sheet 1) is revised to add main feedwater relief valve, SGS-PL-V257A, between valves SGS-PL-V057A and SGS-PL-V250A and to add startup feedwater relief valve, SGS-PL-V258A, between valves SGS-PL-V067A and SGS-PL-V255A.
    - Figure 2.2.4-1 (Sheet 2) is revised to add main feedwater relief valve, SGS-PL-V257B, between valves SGS-PL-V057B and SGS-PL-V250B and to add startup feedwater relief valve, SGS-PL-V258B, between valves SGS-PL-V067B and SGS-PL-V255B.
- UFSAR Table 3.2-3, AP1000 Classification of Mechanical and Fluid Systems, Components and Equipment
    - This table is revised to add the main and startup feedwater thermal relief valves, SGS-PL-V257A/B and SGS-PL-V258A/B, respectively. No comments are added.
- UFSAR Table 3.9-12, List of ASME Class 1, 2 and 3 Active Valves
    - This table is revised to add the main feedwater thermal relief valves, SGS-PL-V257A/B and startup feedwater thermal relief valves, SGS-PL-V258A/B as part of the SGS. The function listed for each valve is “3, 4” which represents accident mitigation (3) and safe shutdown (4) as these valves are required for both mitigating design basis accidents and safe shutdown following an event when the main and startup feedwater isolation and control valves are closed.
- UFSAR Table 3.9-16, Valve Inservice Test Requirements
    - This table is revised to add the main feedwater thermal relief valves, SGS-PL-V257A/B and startup feedwater thermal relief valves, SGS-PL-V258A/B to the inservice testing (IST) program. These valves are

listed as thermal relief type valves per their function to relieve pressure when fluid volumes expand in high temperature scenarios. The IST Category is "C" which represents safety-related, self-actuated valves. The inservice testing type and frequency is listed as thermal relief valve replacement every 10 years. This is consistent with current Category C requirements for thermal relief valves in the IST program. IST notes are not added.

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

    - This table is revised to add the main feedwater thermal relief valves, SGS-PL-V257A/B and startup feedwater thermal relief valves, SGS-PL-V258A/B. These valves are identified as being located in environmental zone 5 (auxiliary building – non-radiological – MSIV compartments). The function listed for the valves is "ESF" as the main and startup feedwater isolation and control valves close on feedwater isolation signals, which are engineered safety features (ESF) signals. The thermal relief valves function to localize, control, mitigate and terminate accidents and maintain radiation exposure levels to the public below applicable limits and guidelines in accordance with the definition of engineered safety features in UFSAR Chapter 6. The thermal relief valves themselves do not actuate upon receipt of an ESF signal, as they are mechanically operated to lift at a specified set pressure. The designation of "ESF" is consistent with thermal relief valves with active safety functions in UFSAR Table 3.11-1. The operating time required following an accident is 24 hours based on post-accident operability requirements for the safety-related function of relieving pressure as necessary. The qualification program for the valves is designated by "M*" to represent the mechanical equipment program and a harsh environment as the valves are mechanical in operation and located in a harsh environment. Equipment qualified to a harsh environment has a qualified life of 60 years and is designed to perform under the harsh environmental conditions. The valves are designed to withstand harsh environment conditions and do not contain material that degrades in harsh environments.

- UFSAR Table 3I.6-3, List of AP1000 Safety-Related Electrical and Mechanical Equipment Not High Frequency Sensitive

    - This table is revised to add the main feedwater thermal relief valves, SGS-PL-V257A/B, and startup feedwater thermal relief valves, SGS-PL-V258A/B. These valves are safety-related equipment and are not sensitive to high frequencies as they do not contain electrical components. Comment 2 is listed for the valves to denote these relief valves are AP1000 safety-related seismically qualified valves, in accordance with the ASME code for structural integrity to a maximum acceleration of 6 g in all three principal orthogonal axes. This comment is appropriate as the valves are designed to ASME Code Section III and are seismic Category I valves.

- UFSAR Figure 10.3.2-1 (Sheets 1 and 2)
    - Revise Sheet 1 to add main feedwater thermal relief valve, SGS-PL-V257A, between valves SGS-PL-V057A and SGS-PL-V250A, and to add startup feedwater thermal relief valve, SGS-PL-V258A, between valves SGS-PL-V067A and SGS-PL-V256A. The location of the startup feedwater check valve, SGS-PL-V256A, does not adversely affect the relieving capabilities of the new thermal relief valve as the check valve serves to prevent backflow.
    - Revise Sheet 2 to add main feedwater thermal relief valve, SGS-PL-V257B, between valves SGS-PL-V057B and SGS-PL-V250B, and add startup feedwater thermal relief valve, SGS-PL-V258B, between valves SGS-PL-V067B and SGS-PL-V256B. The location of the startup feedwater check valve, SGS-PL-V256B, does not adversely affect the relieving capabilities of the new thermal relief valve as the check valve serves to prevent backflow.
- UFSAR Subsection 10.4.7.2.1
    - This section is revised to add a description of the thermal relief valves on the main feedwater lines between the control valve and isolation valve and their function to prevent overpressure due to thermal expansion when both isolation and control valves are closed.
- UFSAR Subsection 10.4.7.2.2
    - This section is revised to include a paragraph describing the feedwater thermal relief valves located on the main feedwater lines between the MFIVs and MCIVs and their function to prevent overpressurization.
- UFSAR Subsection 10.4.9.2.1
    - This section is revised to add a description of the thermal relief valves on the startup feedwater lines between the check valve and isolation valve and their function to prevent overpressure due to thermal expansion when both isolation and control valves are closed.
- UFSAR Subsection 10.4.9.2.2
    - This section is revised to include a paragraph describing the startup feedwater thermal relief valves located between the check valves and isolation valves and their function to prevent overpressurization.

Licensing Basis Change Descriptions

The following changes to COL Appendix C (and corresponding Tier 1) information are proposed:

- COL Appendix C (and plant-specific Tier 1) Table 2.2.4-1
    - Revise table to add two main feedwater thermal relief valves, SGS-PL-V257A and SGS-PL-V257B and add two startup feedwater thermal relief valves, SGS-PL-V258A and SGS-PL-V258B.
- COL Appendix C (and plant-specific Tier 1) Figure 2.2.4-1 (Sheet 1)
    - Revise figure to add SGS-PL-V257A and SGS-PL-V258A.
- COL Appendix C (and plant-specific Tier 1) Figure 2.2.4-1 (Sheet 2)
    - Revise figure to add SGS-PL-V257B and SGS-PL-V258B.

The following changes to the UFSAR are proposed:

- UFSAR Tables 3.2-3, 3.9-12, 3.9-16, 3.11-1 and 3I.6-3
    - Revise table to add the main feedwater thermal relief valves, SGS-PL-V257A/B, and startup thermal relief valves, SGS-PL-V258A/B.
- UFSAR Figure 10.3.2-1 (Sheets 1 and 2)
    - Revise Sheet 1 to add main feedwater thermal relief valve, SGS-PL-V257A, between the MFIV and MFCV, and add startup feedwater thermal relief valve, SGS-PL-V258A, between the SFIV and startup feedwater check valve.
    - Revise Sheet 2 to add main feedwater thermal relief valve, SGS-PL-V257B, between the MFIV and MFCV, and add startup feedwater thermal relief valve, SGS-PL-V258B, between the SFIV and startup feedwater check valve.
    - Note: Existing components are moved slightly on the figures to accommodate the addition of the valves.
- UFSAR Subsection 10.4.7.2.1
    - Revise to add a description of the thermal relief valves on the main feedwater lines between the control valves and isolation valves to prevent overpressure due to thermal expansion when both isolation and control valves are closed.

- UFSAR Subsection 10.4.7.2.2
    - This section is revised to include a paragraph describing the feedwater thermal relief valves located on the main feedwater lines between the MFIVs and MCIVs and their function to prevent overpressurization.
- UFSAR Subsection 10.4.9.2.1
    - Revise to add a description of the thermal relief valves on the startup feedwater lines between the check valves and isolation valves to prevent overpressure due to thermal expansion when both isolation and control valves are closed.
- UFSAR Subsection 10.4.9.2.2
    - Revise to include a paragraph description of the startup feedwater thermal relief valves located between the check valves and isolation valves and their function to prevent overpressurization.

3. TECHNICAL EVALUATION

As described in UFSAR Subsection 10.4.7, the condensate and feedwater system is composed of components from the condensate system (CDS), main and startup feedwater system (FWS) and steam generator system (SGS). The safety-related portion of the system is required to function following a design basis accident to provide containment and feedwater isolation for the main lines routed into containment. This includes providing steam generator isolation to prevent blowdown of more than one steam generator in the event of a steam line or feed line break. MFIVs provide isolation to terminate main feedwater flow to containment. MFCVs provide backup isolation to their respective containment isolation valves in order to terminate feedwater flow. MFIVs and MFCVs fail closed on loss of actuating fluid and are designed to close automatically on a main feedwater isolation signal, which is an ESF signal. Upon receipt of this signal, the SGS provides redundant isolation of the main feedwater supply to the steam generators during accident conditions that require containment or feedwater isolation. Additionally, a main feedwater check valve is installed downstream of the isolation and control valve to prevent reverse flow from the steam generators whenever feedwater pumps are tripped. The check valve also limits blowdown from the steam generator and provides backup isolation of the steam generators.

As described in UFSAR Subsection 10.4.9, the startup feedwater system supplies feedwater to the steam generators during plant startup, hot standby and shutdown conditions, and during transients in the event of main feedwater system unavailability. The startup feedwater system is composed of components from the FWS and SGS. The safety functions of the startup feedwater system are to provide for containment isolation, steam generator isolation and feedwater isolation following design basis events requiring these actions. SFIVs provide isolation to terminate startup feedwater flow to containment. SFCVs provide backup isolation to their respective containment isolation valves in order to terminate feedwater flow. Both valves are designed to close on a startup feedwater isolation signal, which is an ESF signal. The SGS works with the FWS to limit the amount of feedwater delivered to the steam

generators in order to limit mass and energy release to the containment in the event of a feedwater line or steam line break. Additionally, a check valve is installed between the isolation and control valve to prevent reverse flow through the pump.

The proposed changes described above to add the main feedwater thermal relief valves to the main feedwater lines do not adversely impact the functions of the main feedwater system. The MFIVs and MFCVs are not adversely impacted as the function to isolate the main feedwater lines is not changed. Failure effects and analysis related to these valves are described in UFSAR Table 10.4.7-1 and are not changed by this activity. ESF signals to isolate main feedwater isolation and control valves are not changed. Conclusions for potential accidents evaluated in UFSAR Chapters 6 and 15 which rely upon the isolation and control valves in the main feedwater lines to mitigate consequences of design basis events, including postulated steam line breaks, feedwater line breaks, and steam generator tube ruptures, are not changed by this activity as functions of the isolation and control valves are not changed. Failure of thermal relief valves is not a postulated event and does not require further evaluation as thermal relief valves are considered highly reliable components. This change prevents overpressure conditions from occurring in the main feedwater lines when both MFIVs and MFCVs are closed for isolation and increased ambient temperatures are present.

The proposed changes described above to add the startup feedwater thermal relief valves to the startup feedwater lines do not adversely impact the functions of the startup feedwater system. The SFIVs and SFCVs are not adversely impacted as the function to isolate the startup feedwater lines is not changed. Failure effects and analysis related to these valves are described in UFSAR Table 10.4.9-1 and are not changed by this activity. ESF signals to isolate startup feedwater isolation and control valves are not changed. Conclusions for potential accidents evaluated in UFSAR Chapters 6 and 15 which rely upon the isolation and control valves in the startup feedwater lines to mitigate consequences of design basis events, including postulated steam line breaks, feedwater line breaks, and steam generator tube ruptures, are not changed by this activity as functions of these valves are not changed. Failure of thermal relief valves is not a postulated event and does not require further evaluation as thermal relief valves are considered highly reliable components. This change prevents overpressure conditions from occurring in the startup feedwater lines when both SFIVs and SFCVs are closed for isolation and increased ambient temperatures are present.

Technical Specification (TS) 3.7.3 identifies the main feedwater isolation and control valves must be operable for each steam generator. TS 3.7.7 identifies both startup feedwater isolation and control valves shall be operable. This change to add respective thermal relief valves for main and startup feedwater lines does not adversely impact the technical specification or limiting conditions for operation as functions of the existing feedwater line isolation and control valves are not changed.

Proposed changes to add the main feedwater and startup feedwater thermal relief valves do not involve an interface with any SSC accident initiator or initiating sequence of events related to the accidents evaluated in the UFSAR. The changes to COL Appendix C (and plant-specific Tier 1) and UFSAR design information do not adversely impact safety-related equipment or a fission product barrier. No system or equipment qualification is adversely affected by the proposed changes. The changes do not result in a new failure mode, malfunction or sequence of events that could adversely affect a radioactive material barrier or safety-related equipment.

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

The changes do not adversely impact any functions associated with containing, controlling, channeling, monitoring, or processing radioactive or non-radioactive materials. The types and quantities of expected plant effluents are not changed. No effluent release path is associated with these safe shutdown components. Therefore, neither radioactive nor non-radioactive material effluents are affected by this activity.

Proposed changes to add the main feedwater and startup feedwater thermal relief valves do not adversely impact radiologically controlled zones. Plant radiation zones, radiation controls established to satisfy 10 CFR 20 requirements, and expected amounts and types of radioactive materials are not affected by the proposed changes. Therefore, individual and cumulative radiation exposures are not significantly affected by this change.

Summary

The proposed changes to COL Appendix C (and plant-specific Tier 1) and associated UFSAR design information will not adversely affect safety-related equipment or function, design function, radioactive material barrier or safety analysis.

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 information and corresponding plant-specific Tier 1 information; therefore, this activity requires an amendment to the COL. Accordingly, NRC approval is required prior to making the plant-specific changes in this license amendment request.

10 CFR 52, Appendix D, Section 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. The proposed change to UFSAR (Tier 2) design information involves changes to plant-specific Tier 1 (and corresponding changes to COL Appendix C) Table 2.2.4-1 and Figure 2.2.4-1, and thus requires NRC approval for the Tier 2 and involved Tier 1 departures.

10 CFR 50, Appendix A, “General Design Criteria for Nuclear Power Plants” General Design Criterion (GDC) 16 – *Containment design*. Reactor containment and associated systems shall be provided to establish an essentially leak-tight barrier against the uncontrolled release of radioactivity to the environment and to assure that the containment design conditions important to safety are not exceeded for as long as

postulated accident conditions require. The proposed changes do not adversely impact the containment or containment design as the functions of containment and containment isolation are not changed. The added thermal relief valves prevent overpressurization of the main feedwater system and startup feedwater system when both the isolation and control valves in the lines are closed. Therefore, compliance with GDC 16 is not changed.

10 CFR 50, Appendix A, GDC 54 – *Piping systems penetrating containment*. Piping systems penetrating primary reactor containment shall be provided with leak detection, isolation, and containment capabilities having redundancy, reliability, and performance capabilities which reflect the importance to safety of isolating these piping systems. Such piping systems shall be designed with a capability to test periodically the operability of the isolation valves and associated apparatus and to determine if valve leakage is within acceptable limits. The proposed changes do not adversely impact the main feedwater and startup feedwater piping which penetrates containment to the steam generators. The added thermal relief valves to each line prevent overpressure conditions from occurring in the lines when the feedwater is isolated from containment. Therefore, compliance with GDC 54 is not changed.

10 CFR 50, Appendix A, GDC 57 – *Closed system isolation valves*. 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 containment as practical. A simple check valve may not be used as the automatic isolation valve. The proposed changes do not adversely impact the function of the main feedwater and startup feedwater isolation and control valves when isolation to containment is required. The activity to add thermal relief valves to the feedwater lines between the feedwater isolation and control valves does not prevent isolation from occurring. Therefore, compliance with GDC 57 is not changed.

4.2 Precedent

No precedent is identified.

4.3 Significant Hazards Consideration Determination

The requested change(s) revise the Combined License (COL) Appendix C (and plant-specific Tier 1) information. COL Appendix C (and plant-specific Tier 1) Table 2.2.4-1 and Figure 2.2.4-1 are revised to add a thermal relief valve between the main feedwater isolation and control valves and between the startup feedwater isolation and control valves on each feedwater line. Additionally, the following UFSAR text, tables and figures are also changed by the proposed activity to add the thermal relief valves to the steam generator system (SGS):

- Table 3.2-3
- Table 3.9-12
- Table 3.9-16
- Table 3.11-1
- Table 3I.6-3
- Figure 10.3.2-1 (Sheets 1 and 2)
- Subsection 10.4.7.2.1
- Subsection 10.4.7.2.2
- Subsection 10.4.9.2.1
- Subsection 10.4.9.2.2

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 changes to Combined License (COL) Appendix C (and plant-specific Tier 1) Table 2.2.4-1 and Figure 2.2.4-1, and associated Updated Final Safety Analysis Report (UFSAR) design information do not adversely impact previously evaluated accidents. The addition of the thermal relief valves to the feedwater lines does not adversely impact the ability to isolate the main and startup feedwater lines following a steam or feedwater line break or steam generator tube rupture. The new thermal relief valves are normally closed and required to open to prevent potential overpressure conditions when ambient temperatures increase in the area. Thermal relief valves added into the feedwater lines operate mechanically and are not activated upon a new engineered safety features (ESF) signal in response to design basis accidents. Isolation capabilities of the main and startup feedwater lines are not adversely affected as ESF signals are not changed. The proposed change does not reduce the temperature of feedwater and does not increase feedwater flow during any operational mode as main feedwater and startup feedwater isolation and control valves are not changed by this activity. Failure of thermal relief valves is not a postulated event and does not require further evaluation as thermal relief valves are considered highly reliable components. Performance of overpressure relief supports the safety-related functions of the isolation and control valves in the main and startup feedwater lines when isolation is required.

No safety-related structure, system, component (SSC) or function is adversely affected by this change. The change does not involve an interface with any SSC accident

initiator or initiating sequence of events, and thus, the probabilities of the accidents evaluated in the plant-specific UFSAR are not affected. The proposed changes do not involve a change to the predicted radiological releases due to postulated accident conditions, thus, the consequences of the accidents evaluated in the UFSAR are not affected.

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

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

Response: No

The proposed changes to COL Appendix C (and plant-specific Tier 1) Table 2.2.4-1 and Figure 2.2.4-1, and associated UFSAR design information do not reduce the temperature of feedwater and do not increase feedwater flow during any operational mode such that it would result in a new or different kind of accident from accidents previously evaluated. Conclusions of existing analyses are not changed by this activity as existing feedwater isolation and control valve functions are not changed.

The proposed changes to add thermal relief valves to the main and startup feedwater lines do not adversely affect any safety-related equipment, and do not add any new interfaces to safety-related SSCs that adversely affect safety functions. No system or design function or equipment qualification is adversely affected by these changes as the changes do not modify any SSCs that prevent safety functions from being performed by the existing main feedwater and startup feedwater valves. The changes do not introduce a new failure mode, malfunction or sequence of events that could adversely affect safety or safety-related equipment as feedwater isolation capabilities are not changed. Failure of thermal relief valves is not a postulated event and does not require further evaluation as thermal relief valves are considered highly reliable components. Performance of overpressure relief supports the safety-related functions of the isolation and control valves in the main and startup feedwater lines when isolation is required.

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 COL Appendix C (and plant-specific Tier 1) Table 2.2.4-1 and Figure 2.2.4-1, and associated UFSAR design information add thermal relief valves to the main feedwater and startup feedwater lines. These valves are designed to the same codes and standards as the existing piping to which they are connected, including ASME Code Section III, Class C, seismic Category I. The proposed changes do not

affect any other safety-related equipment or fission product barriers. The requested changes will not affect any design code, function, design analysis, safety analysis input or result, or design/safety margin. No safety analysis or design basis acceptance limit/criterion is challenged or exceeded by the requested changes. There are not any changes to operation of the main feedwater and startup feedwater isolation and control valves when isolation of the lines is required. Operation of the relief valves supports isolation capabilities for the main and feedwater isolation and control valves.

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

This review supports a request to amend licensing basis documents to allow departure from Updated Final Safety Analysis Report (UFSAR) and Combined Licenses (COLs) with regard to Appendix C information (and associated plant-specific Tier 1 information), and Tier 2 information to add main feedwater thermal relief valves into the main feedwater lines to prevent overpressure conditions when both the main feedwater isolation and control valves are closed. Startup feedwater thermal relief valves are also added into the startup feedwater lines to prevent overpressure when both the startup feedwater isolation and control valves are closed. The addition of the thermal relief valves does not adversely impact the function of feedwater isolation and control valves to provide isolation of the main and startup feedwater lines following a design basis accident.

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

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

The proposed changes in the requested amendment revise COL Appendix C (and plant-specific Tier 1) to identify the addition of main feedwater and startup feedwater thermal relief valves to each respective feedwater line in order to prevent overpressure conditions. When both the feedwater isolation and control valves are closed in the main or startup feedwater lines, trapped fluid between the valves may expand and overpressurize the piping. The added relief valves prevent this scenario from occurring.

The changes are unrelated to any aspects of plant construction or operation that would introduce any changes 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, these changes do not diminish the functionality of any design or operational features that are credited with controlling the release of effluents during plant operation. Therefore, it is concluded that the proposed amendment does not involve a significant change in the types or a significant increase in the amounts of any effluents that may be released offsite.

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

The proposed changes in the requested amendment revise COL Appendix C (and plant-specific Tier 1) to identify the addition of main feedwater and startup feedwater thermal relief valves to each respective feedwater line in order to prevent overpressure conditions. The proposed changes do not impact radiation exposure or dose rates. Plant radiation zones, radiation controls established to satisfy 10 CFR 20 requirements, and expected amounts and types of radioactive materials are not affected by the proposed changes. Therefore, it is concluded that 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 the 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), an environmental impact statement or environmental assessment of the proposed amendment is not required.

6. REFERENCES

None.

Southern Nuclear Operating Company

ND-17-0614

Enclosure 2

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Exemption Request:

Addition of Steam Generator System (SGS) Thermal Relief Valves

(LAR-17-012)

(Enclosure 2 consists of 9 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 is Tier 1 Table 2.2.4-1 and Figure 2.2.4-1 (Sheets 1 and 2). The Licensee proposes changes to add main feedwater thermal relief valves, SGS-PL-V257A/B, between the main feedwater isolation and control valves and to add startup feedwater thermal relief valves, SGS-PL-V258A/B, between the startup feedwater isolation and control 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 a departure from generic Tier 1 information to include the aforementioned thermal relief 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.

During the isolation of the main feedwater and startup feedwater lines, a significant ambient temperature increase may occur in the room in which the feedwater isolation and control valves are located (i.e., Main Steam Isolation Valve (MSIV) compartments, rooms 12404 and 12406). As a result, thermal expansion of the trapped volumes of fluid between the isolation and control valves may occur. Significant room heatup can occur in a loss of offsite power (LOOP) event, loss of ac event, or other loss of all heating, ventilation and cooling. Heatup can also occur during more severe events such as steam line or feed line breaks.

The trapped volumes of concern for the main feedwater lines are between the main feedwater isolation valves (MFIVs), SGS-PL-V057A/B, and main feedwater control valves (MFCVs), SGS-PL-V250A/B. The trapped volumes of concern for the startup feedwater lines are between the startup feedwater isolation valves (SFIVs), SGS-PL-V067A/B, and the startup feedwater control valves (SFCVs), SGS-PL-V255A/B. Main feedwater and startup feedwater lines may exhibit an undesirable overpressure condition due to thermal expansion of trapped fluid volumes if ambient temperatures increase in the area. The potential overpressure condition can occur when both the isolation valve and control valve

in either the main or startup feedwater lines are closed following actuation of engineered safety features (ESF) signals for feedwater or containment isolation, and the fluid in the lines is initially below the maximum ambient temperature. This can occur for main feedwater lines during heatup, hot standby and power operation up to 10%. This can occur for startup feedwater lines during operation at greater than 5% power. Overpressure in these lines has the potential to impact the safety functions of containment isolation and steam generator isolation performed by the isolation and control valves. Therefore, four 1"x1" thermal relief valves are added to the main and startup feedwater lines to preclude potential overpressure conditions.

The main feedwater relief valves, SGS-PL-V257A/B, are located off the main feedwater lines. The startup feedwater relief valves, SGS-PL-V258A/B, are located off the startup feedwater lines. These valves are safety-related, Class C, as they are required to mitigate design basis events. The valves perform an active function of changing position to open ("transfer open") in order to prevent overpressure in the line when both the isolation and control valves are closed. The valves also have the safety function to re-close after they open to relieve pressure ("transfer closed") in order to restore the isolation boundary.

Proposed Departures from Tier 1 Information are as follows:

- Tier 1 Table 2.2.4-1:
    - This table is revised to add the main feedwater thermal relief valves, SGS-PL-V257A/B, and startup feedwater thermal relief valves, SGS-PL-V258A/B. These valves retain their pressure boundary integrity at their design pressure. The valves are constructed in accordance with American Society of Mechanical Engineers (ASME) Code Section III requirements and can withstand seismic design basis loads per the seismic Category I qualification. The valves are not remotely-operated as designated with a "No" in the applicable column. The qualification for Class 1E or harsh environment, safety-related display, and control PMS columns are not applicable to the valves as designated by a dashed line, as these are not remotely-operated valves. Loss of motive power position is not applicable to these valves as they are not automatic valves.
- Tier 1 Figure 2.2.4-1 (Sheets 1 and 2):
    - Figure 2.2.4-1 (Sheet 1) is revised to add main feedwater relief valve, SGS-PL-V257A, between valves SGS-PL-V057A and SGS-PL-V250A and to add startup feedwater relief valve, SGS-PL-V258A, between valves SGS-PL-V067A and SGS-PL-V255A.
    - Figure 2.2.4-1 (Sheet 2) is revised to add main feedwater relief valve, SGS-PL-V257B, between valves SGS-PL-V057B and SGS-PL-V250B and to add startup feedwater relief valve, SGS-PL-V258B, between valves SGS-PL-V067B and SGS-PL-V255B.

3.0 TECHNICAL JUSTIFICATION OF ACCEPTABILITY

The proposed changes to add the main feedwater thermal relief valves, SGS-PL-V257A/B, to the main feedwater lines do not adversely impact the functions of the main feedwater system. The MFIVs and MFCVs are not adversely impacted as the function to isolate the main feedwater lines is not changed. Failure effects and analysis related to these valves are described in UFSAR Table 10.4.7-1 and are not changed by this activity. ESF signals to isolate main feedwater isolation and control valves are not changed. Conclusions for potential accidents evaluated in UFSAR Chapters 6 and 15, which rely upon the isolation and control valves in the main feedwater lines to mitigate consequences of design basis events, including postulated steam line breaks, feedwater line breaks, and steam generator tube ruptures, are not changed by this activity as functions of the isolation and control valves are not changed. Failure of thermal relief valves is not a postulated event and does not require further evaluation as thermal relief valves are considered highly reliable components. This change prevents overpressure conditions from occurring in the main feedwater lines when both MFIVs and MFCVs are closed for isolation and increased ambient temperatures are present.

The proposed changes to add the startup feedwater thermal relief valves, SGS-PL-V258A/B, to the startup feedwater lines do not adversely impact the functions of the startup feedwater system. The SFIVs and SFCVs are not adversely impacted as the function to isolate the startup feedwater lines is not changed. Failure effects and analysis related to these valves are described in UFSAR Table 10.4.9-1 and are not changed by this activity. ESF signals to isolate startup feedwater isolation and control valves are not changed. Conclusions for potential accidents evaluated in UFSAR Chapters 6 and 15 which rely upon the isolation and control valves in the startup feedwater lines to mitigate consequences of design basis events, including postulated steam line breaks, feedwater line breaks, and steam generator tube ruptures, are not changed by this activity as functions of these valves are not changed. Failure of thermal relief valves is not a postulated event and does not require further evaluation as thermal relief valves are considered highly reliable components. This change prevents overpressure conditions from occurring in the startup feedwater lines when both SFIVs and SFCVs are closed for isolation and increased ambient temperatures are present.

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. Because the Licensee 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 plant-specific DCD Tier 1 Table 2.2.4-1 and Figure 2.2.4-1 (Sheets 1 and 2) 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 Table 2.2.4-1 and Figure 2.2.4-1 (Sheets 1 and 2) will continue to serve their required purpose.

The addition of the two main feedwater thermal relief valves and two startup feedwater thermal relief valves in Tier 1 Table 2.2.4-1 and Figure 2.2.4-1 (Sheets 1 and 2), does not represent any adverse impact to the design function of main feedwater and startup feedwater isolation and control valves or the systems, structures and components therein and will continue to protect the health and safety of the public in the same manner. Addition of the two main feedwater thermal relief valves and two startup

feedwater thermal relief valves 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 add two main feedwater thermal relief valves and two startup feedwater thermal relief valves.

The proposed addition of the two main feedwater thermal relief valves and two startup feedwater thermal relief valves, discussed in Section 2.0, maintains the required design functions of the thermal relief valves to prevent overpressure in the main feedwater and startup feedwater lines and does not impact the safety functions of containment isolation and steam generator isolation performed by the isolation and control valves. The proposed changes do not affect any function or feature used for the prevention and mitigation of accidents or their safety analyses. No safety-related structure, system, component (SSC) or function is involved. The proposed changes do not 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 support the design function of the main feedwater and startup feedwater isolation and control valves, 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 revises the plant-specific DCD Tier 1 information by adding two main feedwater thermal relief valves and two startup feedwater thermal relief valves, as discussed in Section 2.0. The addition of the two main feedwater thermal relief valves and two startup feedwater thermal relief valves does not change the design

requirements of the main feedwater and startup feedwater isolation and control valves. 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 identified.

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 determination, (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 add two main feedwater thermal relief valves and two startup feedwater thermal relief 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-17-0614

Enclosure 3

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Proposed Changes to the Licensing Basis Documents

(LAR-17-012)

Note:
Added text is shown as bold **Blue Underline**
Deleted text is shown as bold **~~Red Strikethrough~~**
Changes to figures are shown as **Red Bubbles**
******* Indicates omitted exiting text

(Enclosure 3 consists of 13 pages, including this cover page.)

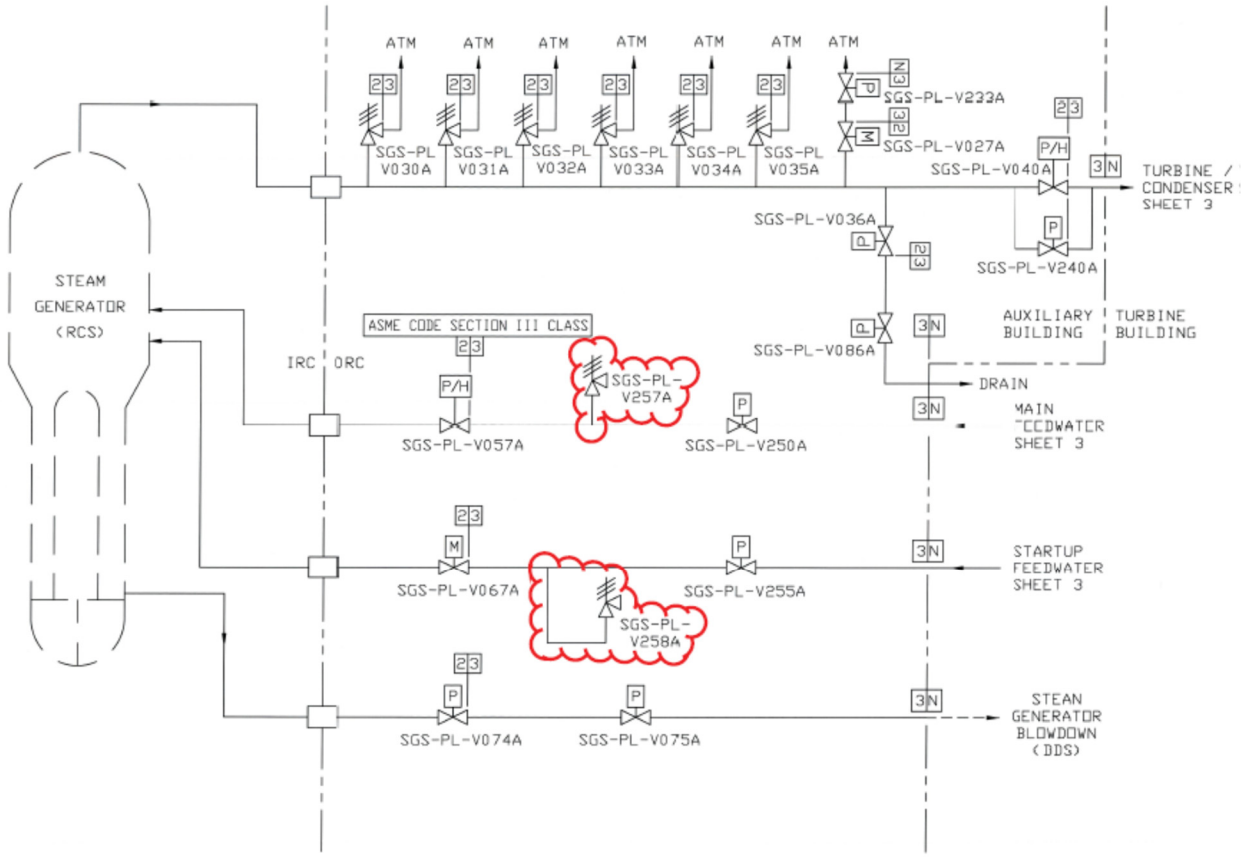
COL Appendix C (and plant-specific Tier 1) Table 2.2.4-1

Revise COL Appendix C (and plant-specific Tier 1) Table 2.2.4-1 as follows:

Equipment Name	Tag No.	ASME Code Section III	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. For Harsh Envir.	Safety-Related Display	Control PMS	Active Function	Loss of Motive Power Position
***	***	***	***	***	***	***	***	***	***
Startup Feedwater Control Valve	SGS-PL-V255B	Yes	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	Closed
Main Feedwater Thermal Relief Valve	SGS-PL-V257A	Yes	Yes	No	- / -	-	-	Transfer Open/ Transfer Closed	-
Main Feedwater Thermal Relief Valve	SGS-PL-V257B	Yes	Yes	No	- / -	-	-	Transfer Open/ Transfer Closed	-
Startup Feedwater Thermal Relief Valve	SGS-PL-V258A	Yes	Yes	No	- / -	-	-	Transfer Open/ Transfer Closed	-
Startup Feedwater Thermal Relief Valve	SGS-PL-V258B	Yes	Yes	No	- / -	-	-	Transfer Open/ Transfer Closed	-
Steam Generator 1 Narrow Range Level Sensor	SGS-001	No	Yes	-	Yes/Yes	Yes	-	-	-
***	***	***	***	***	***	***	***	***	***

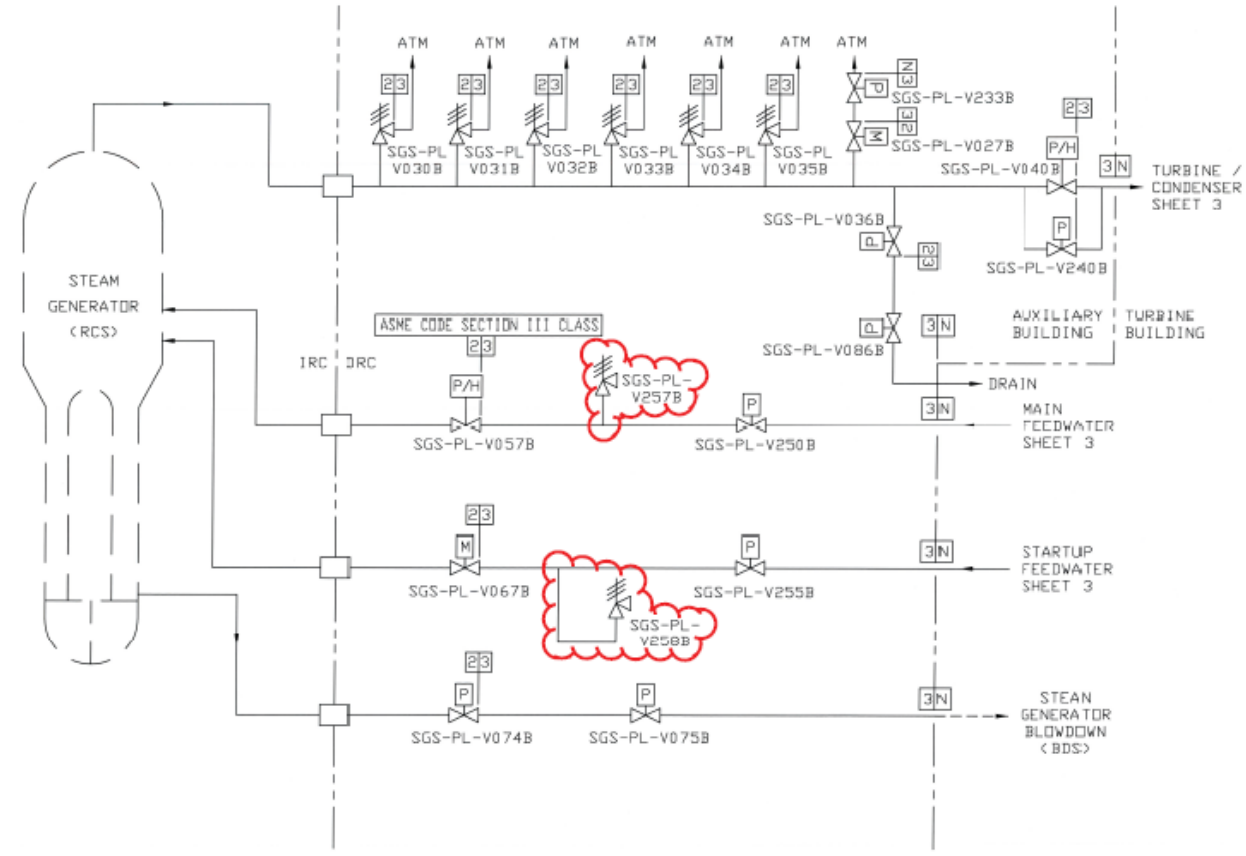
COL Appendix C (and plant-specific Tier 1) Figure 2.2.4-1 (Sheet 1) "Steam Generator System"

Revise COL Appendix C (and plant-specific Tier 1) Figure 2.2.4-1 (Sheet 1) as follows:



COL Appendix C (and plant-specific Tier 1) Figure 2.2.4-1 (Sheet 2) "Steam Generator System"

Revise COL Appendix C (and plant-specific Tier 1) Figure 2.2.4-1 (Sheet 2) as follows:



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

Revise UFSAR Table 3.2-3 as follows:

Tag Number	Description	AP1000 Class	Seismic Category	Principal Construction Code	Comments
Steam Generator System (Continued)					
***	***	***	***	***	***
SGS-PL-V256B	Startup Feedwater Check Valve	C	I	ASME III-3	
SGS-PL-V257A	Main Feedwater Thermal Relief Valve	C	I	ASME III-3	
SGS-PL-V257B	Main Feedwater Thermal Relief Valve	C	I	ASME III-3	
SGS-PL-V258A	Startup Feedwater Thermal Relief Valve	C	I	ASME III-3	
SGS-PL-V258B	Startup Feedwater Thermal Relief Valve	C	I	ASME III-3	
SGS-PY-C01A	Main Steam Line A Penetration	B	I	ASME III, MC	
***	***	***	***	***	***

UFSAR Table 3.9-12 "List of ASME Class 1, 2, and 3 Active Valves"

Revise UFSAR Table 3.9-12 as follows:

Valve	Description	Function [(a)]
Steam Generator System (Cont.)		
***	***	***
SGS-PL-V255B	Startup Feedwater Control	3,4
SGS-PL-V257A	Main Feedwater Thermal Relief Valve	3,4
SGS-PL-V257B	Main Feedwater Thermal Relief Valve	3,4
SGS-PL-V258A	Startup Feedwater Thermal Relief Valve	3,4
SGS-PL-V258B	Startup Feedwater Thermal Relief Valve	3.4
Nuclear Island Nonradioactive Ventilation System		
***	***	***

UFSAR Table 3.9-16 "Valve Inservice Test Requirements"

Revise UFSAR Table 3.9-16 as follows:

Valve Tag Number	Description (1)	Valve/ Actuator Type	Safety Related Missions	Safety Functions (2)	ASME Class/ IST Category	Inservice Testing Type and Frequency	IST Notes
***	***	***	***	***	***	***	***
SGS-PL-V255B	Startup Feedwater Control	Remote AO GLOBE	Maintain Close Transfer Close	Active-to-Failed Remote Position	Class 3 Category B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Quarterly Failsafe Test/Quarterly Operability Test	31
SGS-PL-V257A	Main Feedwater Thermal Relief Valve	Thermal Relief	Maintain Close Transfer Open Transfer Close	Active	Class 3 Category C	Thermal Relief Valve Replacement/10 Years	
SGS-PL-V257B	Main Feedwater Thermal Relief Valve	Thermal Relief	Maintain Close Transfer Open Transfer Close	Active	Class 3 Category C	Thermal Relief Valve Replacement/10 Years	
SGS-PL-V258A	Startup Feedwater Thermal Relief Valve	Thermal Relief	Maintain Close Transfer Open Transfer Close	Active	Class 3 Category C	Thermal Relief Valve Replacement/10 Years	
SGS-PL-V258B	Startup Feedwater Thermal Relief Valve	Thermal Relief	Maintain Close Transfer Open Transfer Close	Active	Class 3 Category C	Thermal Relief Valve Replacement/10 Years	
VBS-PL-V186	MCR Supply Air Isolation Valve	Remote MO Butterfly	Maintain Close Transfer Close	Active Remote Position	Class 3 Category B	Remote Position Indication, Exercise/2 Years Exercise Full Stroke/Quarterly Failsafe Test/Quarterly Operability Test	31
***	***	***	***	***	***	***	***

UFSAR Table 3.11-1 "Environmentally Qualified Electrical and Mechanical Equipment"

Revise UFSAR Table 3.11-1 as follows:

Description	AP1000 Tag No.	Envir. Zone (Note 2)	Function (Note 1)	Operating Time Required (Note 5)	Qualification Program (Note 6)
***	***	***	***	***	***
Startup Feedwater Control Valve	SGS-PL-V255B	5	ESF	5 min	M*
Limit Switch	SGS-PL-V255B-L	5	PAMS	2 wks	E*
Solenoid Valve	SGS-PL-V255B-S	5	ESF	5 min	E*
Main Feedwater Thermal Relief Valve	SGS-PL-V257A	5	ESF	24 hr	M*
Main Feedwater Thermal Relief Valve	SGS-PL-V257B	5	ESF	24 hr	M*
Startup Feedwater Thermal Relief Valve	SGS-PL-V258A	5	ESF	24 hr	M*
Startup Feedwater Thermal Relief Valve	SGS-PL-V258B	5	ESF	24 hr	M*
MCR Isolation Valve	VBS-PL-V186	3	ESF	24 hr	M
Limit Switch	VBS-PL-V186-L	3	PAMS	2 wks	E
Motor Operator	VBS-PL-V186-M	3	ESF	24 hr	E
***	***	***	***	***	***

UFSAR Table 3I.6-3 "List Of AP1000 Safety-Related Electrical and Mechanical Equipment Not High Frequency Sensitive"

Revise UFSAR Table 3I.6-3 as follows:

Description	AP1000 Tag Number	Comment
***	***	***
Startup Feedwater Control Valve	SGS-PL-V255B	2
Main Feedwater Thermal Relief Valve	SGS-PL-V257A	2
Main Feedwater Thermal Relief Valve	SGS-PL-V257B	2
Startup Feedwater Thermal Relief Valve	SGS-PL-V258A	2
Startup Feedwater Thermal Relief Valve	SGS-PL-V258B	2
MCR Isolation Valve	VBS-PL-V186	2
***	***	***

UFSAR Subsection 10.4.7.2.1 "General Description"

Revise the fifth paragraph in UFSAR Subsection 10.4.7.2.1 as follows:

* * *

The condensate polishing system is described in Subsection 10.4.6 and may be in service or bypassed. Each of the two main feedwater lines to the two steam generators contains a feedwater flow element, a main feedwater control valve, a main feedwater isolation valve, and a check valve. A thermal relief valve is included in each main feedwater line between the control valve and isolation valve to prevent overpressure due to thermal expansion when both valves are closed.

* * *

UFSAR Subsection 10.4.7.2.2 "Component Description"

Add information related to the Feedwater Thermal Relief Valves in UFSAR Subsection 10.4.7.2.2 as follows:

* * *

Feedwater Check Valves

Each main feedwater line includes a check valve installed outside containment. During normal and upset conditions, the check valve prevents reverse flow from the steam generator whenever the feedwater pumps are tripped. In addition, the closure of the valves prevents more than one steam generator from blowing down in the event of feedwater pipe rupture. The check valve is designed to limit blowdown from the steam generator and to prevent slam resulting in potentially severe pressure surges due to water hammer. The valves are designed to withstand the closure forces encountered during the normal, upset and faulted conditions. Rapid closure associated with a feedline rupture does not impose unacceptable loads on the steam generator or the steam generator system. The closure of the valves provides for isolation of the steam generators in the event of a feedwater line break to prevent blowdown from both steam generators. The valves are seismic Category I, ASME Code, Section III, Class 2 valves.

Feedwater Thermal Relief Valves

A relief valve is provided to prevent overpressurization of the main feedwater lines between the MFIVs and MFCVs. The relief valve prevents overpressurization that could be caused by thermal expansion of the fluid trapped between the isolation and control valves following an event causing main feedwater isolation.

Plant Main Condenser

For a description of main condenser, refer to Subsection 10.4.1.

* * *

UFSAR Subsection 10.4.9.2.1 "General Description"

Add information to UFSAR Tier 2 Subsection 10.4.9.2.1 as follows:

*** * ***

The startup feedwater header branches into individual lines to the two steam generators. Each individual line contains a startup feedwater control valve, a check valve, and a startup feedwater isolation valve. Startup feedwater flow in each line is controlled by the associated startup feedwater control valve to maintain level in the associated steam generator.

A thermal relief valve is included in each startup feedwater line between the check valve and isolation valve to prevent overpressure between the control valve and isolation valve due to thermal expansion when both valves are closed.

A startup feedwater system failure analysis for safety-related components is presented in Table 10.4.9-1.

UFSAR Subsection 10.4.9.2.2 "Component Description"

Add information related to the Feedwater Thermal Relief Valves to the end of UFSAR Subsection 10.4.9.2.2 as follows:

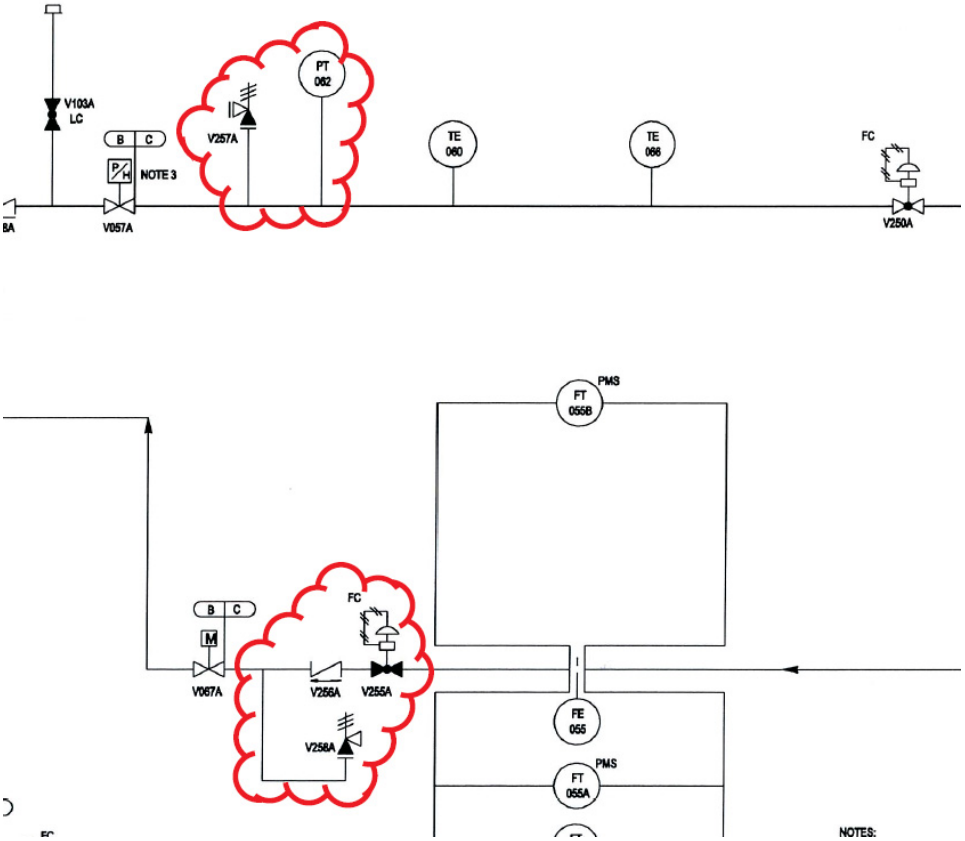
*** * ***

Startup Feedwater Thermal Relief Valves

A relief valve is provided between the startup feedwater check valve and isolation valve to prevent overpressurization of the startup feedwater lines between the startup feedwater isolation valve and startup feedwater control valve. The relief valve prevents overpressurization that could be caused by thermal expansion of the fluid trapped between the isolation and control valves following an event causing startup feedwater isolation.

UFSAR Figure 10.3.2-1 (Sheet 1) "Simplified Main Steam Piping and Instrumentation Diagram (Safety-Related System) (REF) SGS 001"

Revise Figure 10.3.2-1 (Sheet 1), as shown in the excerpt below:



UFSAR Figure 10.3.2-1 (Sheet 2) "Simplified Main Steam Piping and Instrumentation Diagram (Safety-Related System) (REF) SGS 002"

Revise Figure 10.3.2-1 (Sheet 2), as shown in the excerpt below: