Vogtle PEmails

From: Kallan, Paul
Sent: Tuesday, June 06, 2017 2:17 PM
To: Vogtle PEmails
Subject: Draft RAI- LAR 17-012
Attachments: Draft RAI- LAR 17-012.jen(Paul clean copy).docx

Hearing Identifier: Vogtle_COL_Docs_Public
Email Number: 113

Mail Envelope Properties (3da50acd4be64c2797480786d6bf9713)

Subject: Draft RAI- LAR 17-012
Sent Date: 6/6/2017 2:16:51 PM
Received Date: 6/6/2017 2:16:52 PM
From: Kallan, Paul

Created By: Paul.Kallan@nrc.gov

Recipients:
"Vogtle PEmails" <Vogtle.PEmails@nrc.gov>
Tracking Status: None

Post Office: HQPWMSMRS08.nrc.gov

Files	**Size**	**Date & Time**
MESSAGE	3	6/6/2017 2:16:52 PM
Draft RAI- LAR 17-012.jen(Paul clean copy).docx	33001	

Options
Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

The NRC regulations in 10 CFR 50.90 state that whenever a holder of a license desires to amend the license, an application for an amendment must be filed with the Commission fully describing the changes desired, and following as far as applicable, the form prescribed for original applications. The NRC regulations in 10 CFR 52.98(c) state, in part, that if the COL references a certified design, then changes to or departures from information within the scope of the referenced design certification rule are subject to the applicable change procedures in that rule. Section VIII, Processes for Changes and Departures, in 10 CFR Part 52, Appendix D, describes the procedures for changes to Tier 1 and Tier 2 information within the scope of the AP1000 design certification.

In License Amendment Request (LAR) LAR-17-012 dated April 21, 2017, Southern Nuclear Operating Company, the licensee for Vogtle Electric Generating Plant (VEGP) Units 3 and 4, submitted a request for an amendment to Combined License (COL) Numbers NPF-91 and NPF-92, for VEGP Units 3 and 4, respectively. In LAR-17-012, the licensee proposes to depart from approved AP1000 Design Control Document (DCD) Tier 2 information 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). For the plant-specific Tier 1 material departures, the licensee requests an exemption from elements of the design as certified in 10 CFR Part 52, Appendix D. The licensee proposes changes to COL Appendix C (and plant-specific Tier 1) Table 2.2.4-1 and Figure 2.2.4-1 to add two main feedwater thermal relief valves and two startup feedwater thermal relief valves with additional changes to corresponding Tier 2 information in UFSAR Chapters 3 and 10.

In LAR-17-012, the licensee proposes to modify the AP1000 certified design by installing new thermal relief valves with safety-related functions in the main feedwater and startup feedwater systems in VEGP Units 3 and 4. The NRC staff has determined that additional information is necessary to reach a safety finding regarding the proposed modification in LAR-17-012 to the AP1000 certified design for the construction of VEGP Units 3 and 4.

Request for Additional Information

1. Vogtle LAR-17-012, Enclosure 1 (LAR), on page 4 states that the new thermal relief valves are constructed in accordance with ASME *Boiler and Pressure Vessel Code* (BPV 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. Other UFSAR sections also address the design and qualification of safety-related valves. For example, UFSAR Section 3.9.3.2.2, “Valve Operability,” states that prior to installation, qualification of functional capability of active valve assemblies is performed in accordance with the requirements of ASME Standard QME-1-2007, “Qualification of Active Mechanical Equipment Used in Nuclear Power Plants.” In addition, ITAAC 220 in Vogtle COL Appendix C, Section 2.2.4, includes requirements for the design and construction of components listed in Table 2.2.4-1. In accordance with 10 CFR 50.90 and 52.98(c), the NRC staff requests that the licensee describe in LAR-17-012 its plans to design, qualify, and construct the new thermal relief valves in accordance with the provisions in Vogtle COL Appendix C and the UFSAR to provide adequate performance, including sufficient flow capacity.

2. Vogtle LAR-17-012, Enclosure 1 (LAR), on page 5 states that COL Appendix C, Figure 2.2.4-1 (Sheets 1 and 2) will be revised to add the new thermal relief valves in the main feedwater and startup feedwater lines. LAR-17-012, Enclosure 3 (Document Changes) in COL Appendix C, Figure 2.2.4-1 (Sheets 1 and 2) indicates the general location of the new thermal relief valves, but does not specify the location of the startup feedwater check valves in relation to the thermal relief valves. Vogtle LAR-17-012, Enclosure 1 (LAR), on page 7 indicates in discussing UFSAR Figure 10.3.2-1 that the thermal relief valve in the startup feedwater lines will be installed between the isolation valve and check valve, and states that the location of the startup feedwater check valve does not adversely affect the relieving capabilities of the new thermal relief valve as the check valve serves to prevent backflow. COL Appendix C does not provide assurance that the proposed thermal relief valve in the startup feedwater line will be installed downstream of the check valve in that line to allow the pressure upstream of that check valve to be relieved through the thermal relief valve. In accordance with 10 CFR 50.90 and 52.98(c), the NRC staff requests that the licensee modify LAR-17-012 to specify that COL Appendix C, Figure 2.2.4-1 will be revised to indicate the proper location of the thermal relief valve in the startup feedwater line with respect to the check valve in that line. The staff also requests that the licensee confirm that the check valve in the main feedwater line does not impact the planned location of the thermal relief valve in that line.

3. Vogtle LAR-17-012, Enclosure 1 (LAR), on pages 5 and 6 states that the Inservice Testing (IST) provisions in UFSAR Table 3.9-16 specify that the IST type and frequency is listed as thermal relief valve replacement every 10 years. The LAR states that this is consistent with the current Category C requirements for thermal relief valves in the IST program. It should be noted that the NRC accepted the description of the IST program for Vogtle Units 3 and 4 in granting the COL. In accordance with 10 CFR 50.90 and 52.98(c), the NRC staff requests that the licensee describe in LAR-17-012 its basis for categorizing the new thermal relief valves as Category C (rather than Category A/C) as well as the IST provisions and their justification (including the specific ASME OM Code paragraphs) for the new thermal relief valves in the IST program under development for Vogtle Units 3 and 4.

4. Vogtle LAR-17-012, Enclosure 1 (LAR), on page 6 states in discussing UFSAR Table 3.11-1 that the valves are designed to withstand harsh environment conditions and do not contain material that degrades in harsh environments. In accordance with 10 CFR 50.90 and 52.98(c), the NRC staff requests that the licensee clarify the description in LAR-17-012 of the design of the new thermal relief valves regarding whether they contain any non-metallic material.

5. Vogtle LAR-17-012, Enclosure 1 (LAR), on page 10 (and other locations in the LAR and Exemption Request) states that the failure of the thermal relief valves is not a postulated event and does not require further evaluation as thermal relief valves are considered highly reliable components. In addition, Vogtle LAR-17-012, Enclosure 1 (LAR), on pages 10 and 11 states that (1) 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; (2) the proposed changes do not allow a new fission product release path; (3) the changes do not adversely impact any functions associated with containing, controlling, channeling, monitoring, or processing radioactive or non-radioactive materials; and (4) the proposed changes do not adversely impact

radiologically controlled zones. Similar statements are made in Vogtle LAR-17-012, Enclosure 2 (Exemption Request). Operating and testing experience has revealed that relief valves are highly reliable, but remain susceptible to potential failure. See, for example, NUREG/CR-7037 (March 2011), "Industry Performance of Relief Valves at U.S. Commercial Nuclear Power Plants through 2007." In accordance with 10 CFR 50.90 and 52.98(c), the NRC staff requests that the licensee describe in LAR-17-012 the potential consequences of the new thermal relief valves failing to open or failing to reclose following their operation. In addition, the staff requests that the licensee discuss in LAR-17-012 the release path for the new thermal relief valves based on the statements in LAR-17-012.

6. Vogtle LAR-17-012, Enclosure 2 (Exemption Request) on page 3 states that the new thermal relief valves have safety functions to "transfer open" to prevent overpressure and to "transfer closed" to restore the isolation boundary. LAR-17-012, Enclosure 1 (LAR) on page 4 also states that the new thermal relief valves have safety function to "maintain closed" when isolation is required and temperature conditions do not produce overpressure. In accordance with 10 CFR 50.90 and 52.98(c), the NRC staff requests that the licensee clarify in LAR-17-012 the safety functions of the new thermal relief valves and provide consistency between the different enclosures.

7. Vogtle LAR-17-012, Enclosure 2 (Exemption Request) on page 7 states that no safety-related structure, system, component (SSC) or function is involved. In LAR-17-012, the licensee proposes to install safety-related thermal relief valves in the main feedwater and startup feedwater lines between safety-related valves. In accordance with 10 CFR 50.90 and 52.98(c), the NRC staff requests that the licensee clarify in LAR-17-012 its statement that no safety-related SSC or function is involved.

8. In LAR-17-012, the licensee identifies that, under certain conditions, the potential exists, during the isolation of the main feedwater and startup feedwater lines, for thermal expansion of the trapped volumes of fluid between the isolation and control valves to occur. 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, respectively. To resolve this problem the licensee has proposed adding safety-related thermal relief valves to the main and startup feedwater lines to preclude potential overpressure conditions.

LAR-17-012 gives a general description of why the design change is being proposed and how the change will prevent the occurrence of overpressure in the piping section of concern. However the LAR only provides limited information concerning the overpressure expected to be produced by thermal expansion of the fluid in the piping, the operation of the proposed thermal relief valves, their capacities and the capability they have to perform their design/safety function in support of assuring steam generator and containment isolation as described in the Vogtle units 3 and 4 UFSAR.

On page 4 of Vogtle LAR-17-012, Enclosure 1, the licensee states that 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. They also state that this can occur:

- for the main feedwater during heatup, hot standby and power operation up to 10 percent power, and

- for the startup feedwater during operation at greater than 5 percent power.

In order to complete its review, the staff request the following information be provided:

a. During heatup, hot standby, and low power operation the main feedwater would normally be expected to be at a temperature significantly higher than the main steam isolation valve (MSIV compartment ambient room temperature. Preheating of the feedwater by the auxiliary steam system during startup would result in a feedwater temperature of over 200 °F, and during hot standby the feedwater temperature would also be expected to remain well above ambient room temperature. Explain why the main feedwater line is susceptible to overpressure due to rise in the ambient room temperature associated with loss of heating, ventilation and air conditioning (HVAC) when the peak room temperature should remain well below the temperature of the water in the main feedwater line.

b. Provide a discussion on the overpressure that will be produced in the isolated sections of the feedwater and startup feedwater line due to thermal expansion of the fluids in those sections of the line. Include information on expected changes in ambient room temperature, and changes in fluids temperature and the resultant pressure in the piping sections for which relief valves are being proposed to provide thermal overpressure protection.

c. Provide design performance information for the proposed thermal relief valves including sizing considerations, capacity, leakage, setpoints, etc.

d. Discuss where the discharge for the relief valves will be routed and the resulting impact, if any, on the environmental conditions in or near the discharge location.

e. The proposed thermal relief valves are located in the MSIV compartment which is identified as break exclusion zone; thus high energy line breaks (HELBs) for the feedwater or startup feedwater lines are not postulated. What impact would leakage from the thermal relief valves, or a break in the line containing the thermal relief valves, have on the conditions in the environmental zone? Will the existing zone environmental profiles continue to be bounding for the MSIV compartments?