Vogtle PEmails

From: Rankin, Jennivine
Sent: Wednesday, August 28, 2019 2:57 PM
To: Vogtle PEmails
Subject: FW: RE: Draft LAR 80 for Aug 29 PreSubmittal Meeting
Attachments: ND-19-0000 LAR-19-009 20190814 for PSM.pdf

For use at Aug 29th pre-submittal meeting.

From: Grant, Eddie <X2EDGRAN@SOUTHERNCO.COM>
Sent: Thursday, August 15, 2019 11:07 AM
To: Patel, Chandu <Chandu.Patel@nrc.gov>
Cc: Chamberlain, Amy Christine <ACCHAMBE@southernco.com>; Arafeh, Yasmeen N. <YNARAFEH@southernco.com>
Subject: [External_Sender] RE: Draft LAR 80 for Aug 29 PreSubmittal Meeting

Chandu,

My apologies, please use this version with Draft watermark and Presubmittal meeting header.

Thanks,
Eddie R. Grant
SNC - AP1000 Licensing
Eddie.Grant@EXCELServices.com
Cell/office - 850.598.9801
Msg: 8505989801@txt.att.net

From: Grant, Eddie
Sent: Thursday, August 15, 2019 9:43 AM
To: Patel, Chandu (Chandu.Patel@nrc.gov) <Chandu.Patel@nrc.gov>
Cc: Chamberlain, Amy Christine <ACCHAMBE@southernco.com>; Arafeh, Yasmeen N. <YNARAFEH@southernco.com>
Subject: Draft LAR 80 for Aug 29 PreSubmittal Meeting

Chandu,

Attached for your use and distribution is the draft version of the enclosures for SNC's letter requesting a License Amendment and Exemption related to "**Automatic Depressurization System (ADS) & Core Makeup Tank (CMT) Design Parameters (LAR-19-009)**."

Please confirm the Staff availability to review this document and discuss any feedback during the public pre-submittal meeting on **August 29, 2019**.

This document does not contain any material proposed to be withheld from distribution to the Public.

Thanks,
Eddie R. Grant
SNC - AP1000 Licensing

Hearing Identifier: Vogtle_COL_Docs_Public
Email Number: 475

Mail Envelope Properties (BY5PR09MB4376369D5C527375FDDC25ED98A30)

Subject: FW: RE: Draft LAR 80 for Aug 29 PreSubmittal Meeting
Sent Date: 8/28/2019 2:57:22 PM
Received Date: 8/28/2019 2:57:29 PM
From: Rankin, Jennivine

Created By: Jennivine.Rankin@nrc.gov

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

Post Office: BY5PR09MB4376.namprd09.prod.outlook.com

Files	Size	Date & Time
MESSAGE	2182	8/28/2019 2:57:29 PM
ND-19-0000 LAR-19-009 20190814 for PSM.pdf	1278532	

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

Southern Nuclear Operating Company

ND-19-0000

Enclosure 1

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Request for License Amendment Regarding

Automatic Depressurization System (ADS) & Core Makeup Tank (CMT) Design Parameters

(LAR-19-009)

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

ND-19-0000
Enclosure 1
Request for License Amendment Regarding Automatic Depressurization System (ADS) and Core Makeup Tank (CMT) Design Parameters (LAR-19-009)

Table of Contents

ND-19-0000
Enclosure 1
Request for License Amendment Regarding Automatic Depressurization System (ADS) and Core Makeup Tank (CMT) Design Parameters (LAR-19-009)

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

1. SUMMARY DESCRIPTION

The proposed changes would revise the COL and licensing basis documents to reflect revised automatic depressurization system (ADS) and core makeup tank (CMT) design parameters.

The requested amendment requires a departure from the Updated Final Safety Analysis Report (UFSAR) Tier 2 information that involves a change to the plant-specific Tier 1 (and associated COL Appendix C) information in Table 2.1.2-4 identifying a) the maximum stroke times for the ADS Stages 1, 2 and 3 valves, and b) the minimum effective flow areas for the ADS Stages 2 and 3 valves.

The requested amendment also requires a departure from the UFSAR Tier 2 information that involves a change to the COL Appendix A information in Technical Specification (TS) 3.5.2 and TS 3.5.3 identifying the required CMT minimum volume.

This enclosure requests approval of the license amendment necessary to implement these changes as shown in Enclosure 3. Proposed changes to the TS Bases are provided in Enclosure 4 for information only. The discussions of changes to the plant-specific Tier 1 information are also understood to impact the corresponding COL Appendix C information.

The changes summarized above, other approved input changes, and other changes that were determined to not require prior NRC approval will be incorporated into the analyses, descriptions, and results provided in the UFSAR following NRC approval of the above changes in accordance with applicable processes. Since the other related changes to the UFSAR do not involve additional changes to Tier 1, Tier 2* or TS, the consolidated update of the analyses, the descriptions, and the results provided in the UFSAR does not require NRC approval prior to implementation.

2. DETAILED DESCRIPTION

Licensing Basis Background

UFSAR Subsection 15.0.1.3 identifies small break loss-of-coolant-accidents (SBLOCAs) resulting from a spectrum of postulated piping breaks within the reactor coolant pressure boundary as Condition III category postulated accidents. Condition III events are faults that may occur infrequently during the life of the plant. They may result in the failure of only a small fraction of the fuel rods. The release of radioactivity is not sufficient to interrupt or restrict public use of those areas beyond the exclusion area boundary, in accordance with the guidelines of 10 CFR 50.34. By definition, a Condition III event alone does not generate a Condition IV event or result in a consequential loss of function of the reactor coolant system (RCS) or containment barriers.

A SBLOCA is defined as a rupture of the RCS pressure boundary with a total cross-sectional area less than 1.0 ft^2 in which the normally operating charging system flow is not sufficient to sustain pressurizer level and pressure. The acceptance criteria for the loss of coolant accident (LOCA) are summarized in 10 CFR 50.46 as follows:

- The calculated maximum fuel element cladding temperature shall not exceed 2200 °F
- Localized cladding oxidation shall not exceed 17 percent of the total cladding thickness before oxidation
- The amount of hydrogen generated from fuel element cladding reacting chemically with water or steam shall not exceed 1 percent of the total amount if all metal cladding were to react
- The core remains amenable to cooling for any calculated change in core geometry
- The core temperature is maintained at a low value, and decay heat is removed for the extended period of time required by the long-lived radioactivity remaining in the core

These criteria are established to provide significant margin in emergency core cooling system (ECCS) performance following a LOCA.

The AP1000 safety-related systems are designed to provide adequate cooling of the reactor indefinitely. The purpose of the long-term cooling analysis is to demonstrate that the passive systems provide adequate ECCS performance during the in-containment refueling water storage tank (IRWST) injection/containment recirculation time scale, post-LOCA.

The first, second, and third stage ADS control valves and isolation valves are included as part of the pressurizer safety and relief valve module and are connected to nozzles on top of the pressurizer. The second and third stage ADS control valves are four 8-inch normally closed, dc powered, motor-operated globe valves (two for each stage) arranged in four lines in series with four normally closed, dc powered, motor-operated gate isolation valves. The first, second, and third stage ADS control valves and isolation valves actuate at discrete CMT levels, as either tank's level decreases during injection or from spilling out of a broken injection line. The second and third stage ADS control valves and isolation valves actuate based upon a timed delay after actuation of the preceding stage. This opening sequence provides a controlled depressurization of the RCS. The valve opening sequence prevents simultaneous opening of more than one stage, to allow sequential opening of the valves. The second and third stage ADS control valves are designed to open relatively slowly. During the actuation of each stage, the isolation valve is sequenced open before the control valve. Therefore, there is some time delay between stage actuation and control valve actuation.

The fourth stage ADS squib valves connect to the hot leg of each reactor coolant loop. The fourth stage ADS squib valves are four 14-inch squib valves arranged in four lines in series with four normally open, dc powered, motor-operated gate isolation valves. The fourth stage ADS squib valves are interlocked so that they cannot be opened until RCS pressure has been substantially reduced.

As described in VEGP Units 3 and 4 COL Appendix C Table 2.1.2-4, the design commitment for Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) Item 8.d is that the RCS provides automatic depressurization during design basis events. ITAAC No. 2.1.02.8d.iv requires type tests and analysis to determine the minimum effective flow area through each first, second, and third stage ADS control valve, with the minimum effective flow area through each second and third stage ADS control valve verified to be ≥ 19 in^2. Additionally, the ITAAC No. 2.1.02.11a.ii requires that testing be performed to demonstrate that Stage 1, 2, and 3 ADS valves open within the required response time, with the maximum open time for ADS Stage 1 control valves verified to be ≤ 40 seconds and the maximum open time for ADS Stage 2 and 3 control valves verified to be ≤ 100 seconds.

During controlled depressurization via the ADS, the accumulators and CMTs maintain RCS inventory. Once the RCS depressurizes, injection from the IRWST maintains long-term core cooling. For continued injection from the IRWST, the RCS must remain depressurized. Design maximum resistance values for the IRWST delivery lines are used to model this condition conservatively.

As described in UFSAR Subsection 15.6.5.4B.2.1, the NOTRUMP computer code is used in the analysis of small breaks in the RCS. In NOTRUMP, the RCS is nodalized into volumes interconnected by flow paths. The transient behavior of the system is determined from the governing conservation equations of mass, energy, and momentum applied throughout the system. A steady-state input deck is set up to comply, where appropriate, with the standard AP1000 SBLOCA evaluation model methodology. One of the major features of the modeling is based on ADS actuation signals generated on low CMT levels and the ADS timer delays. Active single failures of the passive safeguards systems are considered. The limiting failure is one out of the four fourth stage ADS squib valves failing to open on demand, the failure that most severely affects depressurization capability. The safety design approach is to depressurize the RCS to the containment pressure in an orderly fashion such that the large reservoir of water stored in the IRWST is available for core cooling. The mass inventory plots provided for the breaks show the minimum inventory condition generally occurs at the start of the IRWST injection. Penalizing the depressurization is the most conservative approach in postulating the single failure for such breaks.

As described in UFSAR Subsection 15.6.5.4B.3.1, the SBLOCA safety design approach is to provide for a controlled depressurization of the primary system if the break cannot be terminated, or if the nonsafety-related charging system is postulated to be lost or cannot maintain acceptable plant conditions. The CMT level activates primary system depressurization. The CMT provides makeup to help compensate for the postulated break in the RCS. As the CMT level drops, the first through fourth stages of the ADS valves are ramped open in sequence. The RCS depressurizes due to the break and opening of the ADS valves, while subcooled water from the CMTs and accumulators enters the reactor vessel downcomer to maintain system inventory and keep the core covered. Design basis maximum values of PXS resistances are applied to obtain a conservative prediction of system behavior during the SBLOCA events.

As described in UFSAR Table 14.3-2, the first, second, and third stage ADS control valve and fourth stage ADS squib valve design features assumed in the SBLOCA analysis are provided in UFSAR Table 15.6.5-10.

Reason for the Change

The safety-related 4-inch, motor-operated, ADS Stage 1 control valves (RCS-PL-V001A/B) have a safety-related function to open, and these globe valves are oriented such that flow is over the seats. It was identified that these valves may not meet design specification requirements at elevated design temperatures.

This change activity proposes to update the effective flow area and the maximum stroke times of the ADS Stage 2 and Stage 3 control valves based on the expected operating conditions. The effective flow area on valve datasheets was not correctly calculated for all flow conditions. These values are necessary inputs to ITAAC and safety analysis.

The COL Appendix A TS Surveillance Requirement (SR) 3.5.2.2 requires that the borated water volume in each CMT is at least 2487 ft^3. Based on as-built dimensions for the limiting CMT for VEGP Units 3 and 4, the tank level associated with this volume correlates to approximately 99% of the wide-range level instrumentation span. Thus, satisfying SR 3.5.2.2 would require that instrument uncertainty be less than 1% of span, such that an indicated level of 100% cannot be less than 99% true tank level. However, based on uncertainty calculations, achieving this level of accuracy is not practical. Therefore, a change to the TS is required. Note that this change is also proposed to Vogtle Unit 4 to maintain consistency within the TS.

Description of the Activity

(included with the Technical Evaluation)

Licensing Basis Change Descriptions:

COL Appendix C (and corresponding plant-specific Tier 1) Table 2.1.2-4, RCS ITAAC:

- Revise ITAAC No. 2.1.02.8d.iv acceptance criterion iv) for ADS Stage 2 & 3 control valves minimum effective flow area
- Revise ITAAC No. 2.1.02.11a.ii acceptance criterion 11.b.iii) for ADS Stage 1 control valves maximum opening time
- Revise ITAAC No. 2.1.02.11a.iia acceptance criterion 11.b.iii) for ADS Stage 2 & 3 control valves maximum opening time

UFSAR Table 14.3-2, Sheet 17 of 17, Design Basis Accident Analysis:

- Revise value for ADS Stage 2 & 3 control valves minimum effective flow area
- Revise value for ADS Stage 1 control valves maximum opening time
- Revise value for ADS Stage 2 & 3 control valves maximum opening time

UFSAR Table 15.6.5-10, ADS Parameters Used in Small-Break LOCA Analysis:

- Revise value for ADS Stage 2 & 3 control valves minimum effective flow area
- Revise value for ADS Stage 1 control valves maximum opening time
- Revise value for ADS Stage 2 & 3 control valves maximum opening time

COL Appendix A, TS 3.5.2, CMTs – Operating, to remove a duplicative SR (SR 3.5.2.2) verifying sufficient CMT borated water volume. Renumbering of the subsequent SRs is reflected in TS 3.5.2, TS 3.5.3, and TS 3.3.20.

COL Appendix A, TS 3.5.3, CMTs – Shutdown, RCS Intact, to include a revised SR for borated water volume for MODE 5 with the RCS not VENTED.

Corresponding TS Bases changes will also be made to reflect the above changes. Related editorial revisions to TS Bases are also included. The markups showing these changes are provided for information only in Enclosure 4 and will be implemented following NRC approval of this LAR in accordance with the TS 5.5.6, TS Bases Control Program.

3. TECHNICAL EVALUATION

ADS Stage 1 Valves

The safety-related, 4-inch, motor-operated, ADS Stage 1 control valves (RCS-PL-V001A/B) have a safety-related function to open, and these globe valves are oriented such that flow is over the seats. It was identified that these valves may not meet design specification requirements at elevated design temperatures. Under design basis accident conditions, the motors may stall and thus not meet the maximum valve opening time requirement expected in the licensing basis.

To address this concern, this change activity proposes to change the RCS-PL-V001A/B ADS Stage 1 control valves maximum open time from 40 seconds to 48 seconds to resolve concerns of not meeting the design specification requirements at elevated design temperatures. The 8-second increase in maximum opening time was evaluated as part of the valve setup program to determine the impact on the capability of the motor actuator. The AP1000 valve setup program includes temperature effects on determining the motor actuator capability.

Changes to limit switch setting are also utilized to indicate valve “open” between 85%-90% of valve stem travel and to shut off the motor approximately +3% after the “open” indication signal. The range is provided for ease of valve setup, and the motor shutoff signal is sent +3% after the “open” indication signal confirms that the valve has reached the fully open position. It was determined that the valve travel to reach full effective flow is less than the full physical stroke capability of the valve. The limit switch was set to limit the valve travel to meet full open effective flow area requirement since additional valve travel would not result in any increase in flow. The valve supplier is required to adjust the limit switch setting to limit the valve travel to when full effective choke flow area was reached. Based on the test results, the stem lift to reach the full effective choke flow area was determined to be less than the full stoke length capability of the valve. Indicate of “open” between 85%-90% of stem travel is appropriate, because the flow coefficient (C_v) of the valve reaches a limit and remains constant from roughly 80%-100% of stem travel.

ASME QME-1 qualification testing does not require effective flow area vs. valve travel type testing and is, therefore, not affected by this change activity. However, since effective flow area vs. valve travel is an important design input for nuclear safety analysis, validation of the flow area is performed as validation of this plant performance parameter; not as functional qualification of the valve. As a result of the changes proposed as part of this change activity, the valves continue to be capable of performing their design function.

The normally closed ADS gate valves (RCS-PL-011A/B) are required to open before the normally closed ADS control (globe) valves. During ADS testing, the gate valve opening time requirements identified on the valve data sheets were met; thus, no changes were necessary to the gate valves.

This change activity proposes to change with the stroke time value modeled in the VEGP Units 3 and 4 UFSAR Chapter 15 SBLOCA accident analysis as 48 seconds (see proposed revision to UFSAR Table 15.6.5-10). This change involves a change to ITAAC for RCS-PL-V001A/B described in VEGP Units 3 and 4 COL Appendix C Table 2.1.2-4 (and the corresponding table of the plant-specific Tier 1 information). Additional changes to the current licensing basis with respect to this change activity include UFSAR Tables 14.3-2 and 15.6.5-10. A conforming change will also be made to TS Bases 3.4.11.

ADS Stage 2 and 3 Valves

The effective flow area calculated for the ADS Stage 2 and Stage 3 control valves was not appropriately calculated for anticipated flow conditions. Specifically, calculations of the effective flow area were based on liquid service (i.e., where the density of the liquid does not change as the pressure decreases from the relieving pressure to the total backpressure). However, these valves are installed in the steam space of the pressurizer and will open under either subcooled liquid (which flashes to a two-phase mixture) or saturated steam (compressible flow). This value is necessary input to safety analysis and are reflected in the ITAAC acceptance criteria.

Because the current C_v and effective flow areas are based on incompressible flow, new testing has been performed to determine the effective flow area with compressible flow. This testing was performed in accordance to ISA standard ANSI/ISA-75.02.01-2008 for compressible flow. Specifically, choked flow characteristic testing was performed to validate the effective choked flow area versus valve stem position utilizing compressed air, in accordance with the guidelines of ANSI/ISA-75.02.01-2008. The test results included any testing uncertainties and manufacturing tolerances that may affect the physical flow area. As such, this change activity proposes to update the effective flow area for the ADS Stage 2 and Stage 3 control valves based on this new test data.

Test data from the choked flow area testing performed for the 8-inch ADS Stage 2 and Stage 3 control valves shows an effective flow area of ~18.5 in^2 at 100% of the valve stroke, which is below the current minimum effective flow area of 19 in^2. As such, this change activity proposes to reduce the minimum valve effective flow area from 19 in^2 to 16 in^2. The updated minimum effective flow area of 16 in^2 is based on the effective flow area at an intermediate stroke length. The limit switch settings are adjusted to limit the valve travel to the point at which the full effective flow area is reached. It was confirmed that the valve travel to reach full effective flow is less than the full physical stroke capability of the valve. Limiting the valve travel to match reaching full effective flow area enabled the valve supplier to achieve slower opening characteristics thus reducing the hydrodynamic loading impact that valve opening may have on downstream piping and components.

ASME QME-1 qualification testing does not require effective flow area versus valve travel type testing and is, therefore, not affected by this change activity. However, since effective flow area versus valve travel is an important design input for nuclear safety analysis, validation of the flow area is performed as validation of this plant performance parameter; not as functional qualification of the valve. As a result of the changes proposed as part of this change activity, the valves continue to be capable of performing their design function.

In addition to the flow area changes, the maximum stroke times are also proposed for update. The proposed maximum time is increased from 100 seconds to 120 seconds. The minimum stroke time is the cycle time from full close to full open under ideal voltage conditions. The increase in maximum stroke time provides an additional benefit for depressurization. The 20-second increase in maximum opening time was evaluated as part of the valve setup program to determine the impact on the capability of the motor actuator. The AP1000 valve setup program includes temperature effects on determining the motor actuator capability.

This change activity does not impact the ADS Stage 1 valves, only the Stage 2 and Stage 3 control valves (RCS-PL-V002A/B and RCS-PL-V003A/B). Flow testing was performed for the ADS Stage 1 control valves and confirms that the current effective flow areas are bounding and appropriate.

The C_v curve was reviewed for the 8-inch valves and determined that there is no impact on the calculated line resistance for the ADS Stage 1, Stage 2, or Stage 3 lines and the increase in stroke time does not result in any changes to the ADS valve opening sequence or in additional loads on the batteries.

The normally closed ADS gate valves are required to open before the normally closed ADS control (globe) valves. During ADS testing, the gate valve opening time requirements identified on the valve data sheets were met; thus, no changes were necessary to the gate valves.

The second and third stage ADS control valves are important in the SBLOCA safety analysis to allow the RCS to depressurize sufficiently for ADS Stage 4 actuation and subsequent IRWST injection. The SBLOCA analyses model a minimum ADS flow area along with a maximum stroke time. The changes proposed reduce the ADS effective flow area from 19 in^2 to 16 in^2 and also increase the maximum stroke time from 100 seconds to 120 seconds. The valve area change will decrease the flow rate through the ADS Stage 2 and Stage 3 control valves and cause a slight reduction in the rate of depressurization. Increasing the valve opening time of the ADS Stage 2 and Stage 3 control valves will cause the valves to discharge less at a given time while opening. The changes combined will cause a reduction in the overall venting capability of the ADS 1-3 system. The effects of this change activity are accounted for in the updated SBLOCA analysis.

The non-LOCA inadvertent ADS/RCS depressurization analysis presented in UFSAR Subsection 15.6.1 is limited by a larger effective flow area (maximum valve area) and a minimum stroke time. No further justification for non-LOCA analysis impacts is necessary with respect to this change activity.

The LBLOCA and LOCA containment analyses do not explicitly model the ADS Stage 2 and Stage 3 control valves and thus this change has no impact on these analyses.

Changes to the current licensing basis with respect to this change activity include Vogtle Units 3 and 4 COL Appendix C Table 2.1.2-4, ITAAC Numbers 2.1.02.08d.iv and 2.1.02.11a.ii, and UFSAR Tables 14.3-2 and 15.6.5-10. A conforming change will also be made to TS Bases 3.4.11.

CMT Volume

The Vogtle Units 3 and 4 COL Appendix A TS SR 3.5.2.2 requires CMT volume to be greater than or equal to 2487 ft^3 for both CMTs OPERABLE when in MODES 1, 2, and 3, and in MODE 4 with the RCS not being cooled by the normal residual heat removal system (RNS) (TS 3.5.2) and for one CMT OPERABLE when in MODE 4 with RCS cooling provided by RNS and in MODE 5 with the RCS not VENTED (TS 3.5.3).

A method for confirming this requirement is through the use of the wide range (WR) level instrumentation. Due to the configuration of the CMT WR level tap locations, and instrument uncertainty considerations, the full CMT height cannot be measured. The Vogtle Unit 3 CMTs were fabricated close to the minimum volume and additional deviations to the location of nozzles used have reduced the measurable range, which precludes confirmation of measuring ≥ 2487 ft^3 of borated water volume with the existing WR level instrumentation. Thus, the only way to verify the CMT contains the necessary water volume is with the high-point sensors which are used to verify compliance with existing TS SR 3.5.2.4. However, the WR level measurement is the only credible means of confirming CMT level during MODE 5 with the RCS

not VENTED (for TS 3.5.3). While this configuration is specific to Vogtle Unit 3, this change is also proposed to Vogtle Unit 4 to maintain consistency within the TS.

This change activity proposes to delete TS SR 3.5.2.2 for the verification of borated water volume in each CMT ≥ 2487 ft^3. This is acceptable as the verification of the requisite borated water volume in MODES 1 through 3 and MODE 4 with RCS not being cooled by RNS is inherently accomplished by the performance of existing TS SR 3.5.2.4 (proposed to be renumbered to TS SR 3.5.3.3) for verifying the volume of noncondensible gases in each CMT inlet line has not caused the high-point water level to drop below the sensor. This level is above the CMT level corresponding to 2487 ft^3 assumed in the safety analysis for CMT injected volume. Verifying this volume above the limit for noncondensible gases ensures ≥ 2487 ft^3 borated water volume in the CMT. Therefore, the existing TS SR 3.5.2.2 borated water volume verification is redundant to existing TS SR 3.5.2.4 and should be deleted. Editorial consistency changes to renumber the existing TS SRs 3.5.2.3 through 3.5.2.8 are necessitated as a result of the deletion of TS SR 3.5.2.2. These editorial renumbering changes are nontechnical in nature.

Additionally, this change activity proposes to change the required CMT TS volume to ≥ 2450 ft^3 for TS 3.5.3 only during MODE 5 with the RCS not VENTED and retaining the minimum volume of 2487 ft^3 for all other MODES of applicable operation in TS 3.5.2 and TS 3.5.3. Specifically, this change proposes to delete the performance of existing TS SR 3.5.2.2 from TS SR 3.5.3.1 as well as proposes the addition of a new TS SR; SR 3.5.3.3 (only required to be met in MODE 5 with the RCS not VENTED). New TS SR 3.5.3.3 is created to verify the borated water volume in the CMT required to be OPERABLE when in MODE 5 with the RCS not VENTED is greater than or equal to 2450 ft^3.

This proposed change is acceptable as the high point gas vent alarm can be used to confirm the Loss of RNS analysis required CMT level in MODE 4 with RCS cooling provided by RNS (i.e., 2487 cu. ft.); this volume verification is inherently accomplished for TS 3.5.3 during MODE 4 with RCS cooling provided by RNS via performance of TS SR 3.5.3.2. This proposed change is further acceptable because the CMT WR level instrumentation can be used to confirm the Loss of RNS analysis required CMT level of ≥ 2450 ft^3 in MODE 5 (RCS not VENTED). Thus, the CMT can be confirmed to be full using a combination of WR level and high-point vent alarm during the TS applicable MODES.

The SBLOCA analysis is performed with a CMT volume of 2487 ft^3 consistent with TS 3.5.2 and is not impacted by this proposed change activity. The Loss of RNS analysis is performed with a CMT volume of 2450 ft^3 consistent with the proposed updates to TS 3.5.3. The results of the Loss of RNS analysis in UFSAR Appendix 19E confirm the acceptability of the CMT TS 3.5.3 volume during MODE 4 with RCS being cooled by RNS and in MODE 5 with RCS not VENTED. Therefore, the proposed new TS SR 3.5.3.3 that requires a volume of ≥ 2450 ft^3 when in MODE 5 with the RCS not VENTED is acceptable.

Associated updates to the Vogtle Units 3 and 4 Bases for TS 3.3.20, TS 3.5.2, and TS 3.5.3, including removal of an unnecessary second definition of RNS in SR 3.5.3.2, are also identified. This change activity also identifies editorial updates to TS Bases 3.4.13 and 3.5.7 to change language from “vacuum refill” to “vacuum fill” for consistency with other licensing basis documents. These changes are non-technical in nature and are purely editorial.

Additional Impact Evaluation

The proposed changes do not adversely affect or require any change to the AP1000 probabilistic risk assessment (PRA) presented in UFSAR Chapter 19, including the Fire PRA, insights and results (e.g., core damage frequency and large release frequency). The proposed changes do not result in any changes to the failures currently included in the PRA model, and no new postulated failures are required in the PRA model. Therefore, there are no changes required to initiating event frequencies and system logic models of the PRA. The existing PRA risk significance investment protection determination for the system is not affected.

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

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

The proposed changes do not adversely affect any safety-related equipment, design code limit, safety-related function, safety-related design analysis, safety analysis input or result, or design or safety margin. No safety analysis or design basis acceptance limit or criterion would be challenged or exceeded. The proposed changes do not revise any aspects of the plant that could have an adverse effect on safety or security, including the site emergency plan.

There are no radiation zone changes or radiological access control changes required because of these proposed changes. The physical design and operation of the system, as described in the UFSAR, is not changed, and thus there are no changes required to the radiation protection design features described in UFSAR Section 12.3.

The proposed changes do not affect the containment, control, channeling, monitoring, processing or releasing of radioactive and non-radioactive materials. The proposed changes do not adversely affect the containment or control of radioactive and non-radioactive materials inside containment, and do not adversely affect the containment boundary.

The proposed changes do not adversely affect the design functions of any SSC to prevent the unmonitored release of airborne radioactivity to the atmosphere or adjacent plant areas. Therefore, no effluent release path is affected by these changes. In addition, the types and quantities of expected effluents are not changed by the proposed changes. Therefore, radioactive or non-radioactive material effluents are not affected by these changes.

4. REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

10 CFR 52.98 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 A Technical Specifications and COL Appendix C ITAAC; therefore, this activity requires a proposed amendment to the COL.

10 CFR Part 52, Appendix D, Section VIII.B.5.a allows an applicant or licensee who references this appendix to depart from Tier 2 information, without prior NRC approval, unless the proposed departure involves a change to or departure from Tier 1 information, Tier 2* information, or the Technical Specifications, or requires a license amendment under paragraphs B.5.b or B.5.c of the section. This activity involves changes to the COL Appendix A Technical Specifications and to plant-specific Tier 1 information, and thus requires prior NRC approval prior to making the UFSAR Tier 2 changes identified in this license amendment request.

10 CFR Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants," General Design Criterion (GDC) 10, *Reactor design*. The reactor core and associated coolant, control, and protection systems shall be designed with appropriate margin to assure that specified acceptable fuel design limits are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences. The changes to the a) the maximum stroke times for the ADS Stages 1, 2 and 3 control valves, b) the minimum effective flow areas for the ADS Stages 2 and 3 control valves, and c) the CMT minimum volume continue to provide appropriate margin to assure that specified acceptable fuel design limits are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences. Therefore, compliance with GDC 10 is maintained.

10 CFR Part 50, Appendix A, GDC 29, *Protection against anticipated operational occurrences*. The protection and reactivity control systems shall be designed to assure an extremely high probability of accomplishing their safety functions in the event of anticipated operational occurrences. The proposed changes do not adversely affect the capability of the protection and reactivity control systems to perform their safety functions in the event of anticipated operational occurrences. Therefore, compliance with GDC 29 is not changed.

10 CFR Part 50, Appendix A, GDC 35, *Emergency Core Cooling*. A system to provide abundant emergency core cooling shall be provided. The system safety function shall be to transfer heat from the reactor core following any loss of reactor coolant at a rate such that (1) fuel and clad damage that could interfere with continued effective core cooling is prevented and (2) clad metal-water reaction is limited to negligible amounts. Suitable redundancy in components and features, and suitable interconnections, leak detection, isolation, and containment capabilities shall be provided to assure that for onsite electric power system operation (assuming offsite power is not available) and for offsite electric power system operation (assuming onsite power is not available) the system safety function can be accomplished, assuming a single failure. The changes continue to show compliance with the requirements in 10 CFR 50.46, and thus, the requirements of GDC 35 are met.

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

4.2 Precedent

No precedent is identified.

4.3 Significant Hazards Consideration

Southern Nuclear Operating Company (SNC) is requesting an amendment to Combined License (COL) Nos. NPF-91 and NPF-92 for Vogtle Electric Generating Plant (VEGP) Units 3 and 4, respectively. The proposed changes would revise the Updated Final Safety Analysis Report (UFSAR) Tier 2 information, which involves a change to the Technical Specifications in COL Appendix A, and to COL Appendix C and corresponding plant-specific Tier 1 information to reflect revisions in the automatic depressurization system (ADS) and core makeup tank (CMT) design parameters of a) the maximum stroke times for the ADS Stages 1, 2 and 3 control valves, b) the minimum effective flow areas for the ADS Stages 2 and 3 control valves, and c) the CMT minimum volume.

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

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

Response: No.

The proposed revisions to the ADS and CMT design parameters have been found to continue to provide the required functional capability of the safety systems for previously evaluated accidents and anticipated operational occurrences. The ADS and CMT design parameters are not an initiator of any accident analyzed in the UFSAR, nor do the changes involve an interface with any structure, system or component (SSC) accident initiator or initiating sequence of events, and thus, the probabilities of the accidents evaluated in the UFSAR are not affected. The proposed changes do not involve a change to any mitigation sequence or the predicted radiological releases due to postulated accident conditions, thus, the consequences of the accidents evaluated in the UFSAR are not affected.

The UFSAR describes the analyses of various design basis transients and accidents to demonstrate compliance of the design with the acceptance criteria for these events. The acceptance criteria for the various events are based on meeting the relevant regulations, general design criteria, and the Standard Review Plan, and are a function of the anticipated frequency of occurrence of the event and potential radiological consequences to the public. The revised accident analyses maintain their plant conditions, and thus their frequency designation and consequence level as previously evaluated.

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 revisions to the ADS and CMT design parameters have been found to continue to provide the required functional capability of the safety systems for previously evaluated accidents and anticipated operational

occurrences. The proposed revisions to the ADS and CMT design parameters do not change the function of the related systems, and thus, the changes do not introduce a new failure mode, malfunction or sequence of events that could adversely affect safety or safety-related equipment.

Therefore, the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

Response: No.

The proposed revisions to the ADS and CMT design parameters have been found to continue to provide the required functional capability of the safety systems for previously evaluated accidents and anticipated operational occurrences. The proposed revisions to the ADS and CMT design parameters does not change the function of the related systems nor significantly affect the margins provided by the systems. No safety analysis or design basis acceptance limit/criterion is challenged or exceeded by the requested changes.

Therefore, the proposed amendment does not involve a significant reduction in a margin of safety.

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

4.4 Conclusions

Based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission’s regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public. Therefore, it is concluded that the requested amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of “no significant hazards consideration” is justified.

5. ENVIRONMENTAL CONSIDERATIONS

The proposed changes would revise the Updated Final Safety Analysis Report (UFSAR) Tier 2 information, which involves a change to the Technical Specifications in Combined License (COL) Appendix A, and to COL Appendix C and corresponding plant-specific Tier 1 information to reflect revisions in the automatic depressurization system (ADS) design parameters of a) the maximum stroke times for the ADS Stages 1, 2 and 3 control valves, b) the minimum effective flow areas for the ADS Stages 2 and 3 control valves, and c) the core makeup tank minimum volume. This review supports a request to amend the COL to allow a departure from the UFSAR incorporated plant-specific design control document information.

A review has determined that the proposed changes require an amendment to the COL. However, a review of the anticipated construction and operational effects of the requested

amendment has determined that the requested amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9), in that:

(i) There is no significant hazards consideration.

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

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

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

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

The proposed change in the requested amendment does not adversely affect the shielding capability of, or adversely alter any walls, floors, or other structures that provide shielding. Plant radiation zones and controls under 10 CFR 20 preclude a significant increase in occupational radiation exposure. Therefore, the proposed amendment does not involve a significant increase in individual or cumulative occupational radiation exposure.

Based on the above review of the proposed amendment, it has been determined that anticipated construction and operational effects of the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in 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), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment and proposed exemption.

6. REFERENCES

None.

Southern Nuclear Operating Company

ND-19-0000

Enclosure 2

Vogtle Electric Generating Plant Units 3 and 4

Exemption Request:

Automatic Depressurization System (ADS) & Core Makeup Tank (CMT) Design Parameters

(LAR-19-009)

(This Enclosure consists of 11 pages, including this cover page**)**

1.0 Purpose

Southern Nuclear Operating Company (the Licensee) requests a permanent exemption from the provisions of 10 CFR Part 52, Appendix D, Section III.B, *Design Certification Rule for the AP1000 Design, Scope and Contents*, to allow a departure from elements of the certification information in Tier 1 of the generic AP1000 Design Control Document (DCD). The regulation, 10 CFR Part 52, Appendix D, Section III.B, requires an applicant or licensee referencing Appendix D to 10 CFR Part 52 to incorporate by reference and comply with the requirements of Appendix D, including certified information in DCD Tier 1. The Tier 1 information for which a plant-specific departure and exemption is being requested includes changes to reflect revisions in the ADS design parameters of a) the maximum stroke times for the ADS Stages 1, 2 and 3 control valves, and b) the minimum effective flow areas for the ADS Stages 2 and 3 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 Part 52, Appendix D, Section VIII.A.4 to allow departures from generic Tier 1 information due to proposed clarifications to Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) related Table 2.1.2-4 for the identified ADS 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.

The current licensing basis Updated Final Safety Analysis Report (UFSAR) Chapter 15 accident analyses as prescribed in NUREG-0800 and Regulatory Guide 1.70 describe the analyses of various design basis accidents to demonstrate compliance of the AP1000 plant design with the acceptance criteria for these events. The acceptance criteria for the various events are based on relevant regulations and general design criteria (GDC) 10 and 15 and Title 10, Section 50.46 of the Code of Federal Regulations (10 CFR 50.46) and are a function of the anticipated frequency of occurrence of the event and potential radiological consequence.

UFSAR Subsection 15.0.1.3 identifies small break loss-of-coolant-accidents (SBLOCAs) resulting from a spectrum of postulated piping breaks within the reactor coolant pressure boundary as Condition III category postulated accidents. Condition III events are faults that may occur infrequently during the life of the plant. They may result in the failure of only a small fraction of the fuel rods. The release of radioactivity is not sufficient to interrupt or restrict public use of those areas beyond the exclusion area boundary, in accordance with the guidelines of 10 CFR 50.34. By definition, a Condition III event alone does not generate a Condition IV event or result in a consequential loss of function of the reactor coolant system (RCS) or containment barriers.

A SBLOCA is defined as a rupture of the RCS pressure boundary with a total cross-sectional area less than 1.0 ft^2 in which the normally operating charging system flow is not sufficient to sustain pressurizer level and pressure. Acceptance criteria are

established to provide significant margin in emergency core cooling system (ECCS) performance following a loss of coolant accident (LOCA).

The AP1000 safety-related systems are designed to provide adequate cooling of the reactor indefinitely. The purpose of the long-term cooling analysis is to demonstrate that the passive systems provide adequate ECCS performance during the in-containment refueling water storage tank (IRWST) injection/containment recirculation time scale, post-LOCA.

The first, second, and third stage ADS control valves and isolation valves are included as part of the pressurizer safety and relief valve module and are connected to nozzles on top of the pressurizer. The second and third stage ADS control valves are four 8-inch normally closed, dc powered, motor-operated globe valves (two for each stage) arranged in four lines in series with four normally closed, dc powered, motor-operated gate isolation valves. The first, second, and third stage ADS control valves and isolation valves actuate at discrete CMT levels, as either tank's level decreases during injection or from spilling out of a broken injection line. The second and third stage ADS control valves and isolation valves actuate based upon a timed delay after actuation of the preceding stage. This opening sequence provides a controlled depressurization of the RCS. The valve opening sequence prevents simultaneous opening of more than one stage, to allow sequential opening of the valves. The second and third stage ADS control valves are designed to open relatively slowly. During the actuation of each stage, the isolation valve is sequenced open before the control valve. Therefore, there is some time delay between stage actuation and control valve actuation.

The fourth stage ADS squib valves connect to the hot leg of each reactor coolant loop. The fourth stage ADS squib valves are four 14-inch squib valves arranged in four lines in series with four normally open, dc powered, motor-operated gate isolation valves. The fourth stage ADS squib valves are interlocked so that they cannot be opened until RCS pressure has been substantially reduced.

As described in the VEGP plant-specific Tier 1 Table 2.1.2-4, the design commitment for ITAAC Item 8.d is that the RCS provides automatic depressurization during design basis events. ITAAC Item 8.d.iv requires type tests and analysis to determine the minimum effective flow area through each first, second, and third stage ADS control valve, with the minimum effective flow area through each second and third stage ADS control valve verified to be ≥ 19 in^2. Additionally, the ITAAC Item 11.b.iii requires that testing be performed to demonstrate that Stage 1, 2, and 3 ADS valves open within the required response time, with the maximum open time for ADS Stage 1 control valves verified to be ≤ 40 seconds and the maximum open time for ADS Stage 2 and 3 control valves verified to be ≤ 100 seconds.

During controlled depressurization via the ADS, the accumulators and CMTs maintain RCS inventory. Once the RCS depressurizes, injection from the IRWST maintains long-term core cooling. For continued injection from the IRWST, the RCS must remain depressurized. Design maximum resistance values for the IRWST delivery lines are used to model this condition conservatively.

As described in UFSAR Subsection 15.6.5.4B.2.1, the NOTRUMP computer code is used in the analysis of small breaks in the RCS. In NOTRUMP, the RCS is nodalized into volumes interconnected by flow paths. The transient behavior of the system is

determined from the governing conservation equations of mass, energy, and momentum applied throughout the system. A steady-state input deck is set up to comply, where appropriate, with the standard AP1000 SBLOCA evaluation model methodology. One of the major features of the modeling is based on ADS actuation signals generated on low CMT levels and the ADS timer delays. Active single failures of the passive safeguards systems are considered. The limiting failure is one out of the four fourth stage ADS squib valves failing to open on demand, the failure that most severely affects depressurization capability. The safety design approach is to depressurize the RCS to the containment pressure in an orderly fashion such that the large reservoir of water stored in the IRWST is available for core cooling. The mass inventory plots provided for the breaks show the minimum inventory condition generally occurs at the start of the IRWST injection. Penalizing the depressurization is the most conservative approach in postulating the single failure for such breaks.

As described in UFSAR Subsection 15.6.5.4B.3.1, the SBLOCA safety design approach is to provide for a controlled depressurization of the primary system if the break cannot be terminated, or if the nonsafety-related charging system is postulated to be lost or cannot maintain acceptable plant conditions. The CMT level activates primary system depressurization. The CMT provides makeup to help compensate for the postulated break in the RCS. As the CMT level drops, the first through fourth stages of the ADS valves are ramped open in sequence. The RCS depressurizes due to the break and opening of the ADS valves, while subcooled water from the CMTs and accumulators enters the reactor vessel downcomer to maintain system inventory and keep the core covered. Design basis maximum values of PXS resistances are applied to obtain a conservative prediction of system behavior during the SBLOCA events.

As described in UFSAR Table 14.3-2, the first, second, and third stage ADS control valve and fourth stage ADS squib valve design features assumed in the SBLOCA analysis are provided in UFSAR Table 15.6.5-10.

3.0 Technical Justification of Acceptability

The changes described in this exemption request would revise the plant-specific Tier 1 information in Table 2.1.2-4 to reflect revisions in the design parameters of a) the maximum stroke times for the automatic depressurization system (ADS) Stages 1, 2 and 3 control valves, and b) the minimum effective flow areas for the ADS Stages 2 and 3 control valves. Related consistency revisions in the safety analysis information are proposed in the accompanying license amendment request (Enclosure 1 of this letter).

ADS Stage 1 Valves

The safety-related, 4-inch, motor-operated, ADS Stage 1 control valves (RCS-PL-V001A/B) have a safety-related function to open, and these globe valves are oriented such that flow is over the seats. It was identified that these valves may not meet design specification requirements at elevated design temperatures. Under design basis accident conditions, the motors may stall and thus not meet the maximum valve opening time requirement expected in the licensing basis.

To address this concern, this change activity proposes to change the RCS-PL-V001A/B ADS Stage 1 control valves maximum open/close time from 40 seconds to 48 seconds to resolve concerns of not meeting the design specification requirements at elevated design temperatures. The 8-second increase in maximum opening time was evaluated as part of the valve setup program to determine the impact on the capability of the motor actuator. The AP1000 valve setup program includes temperature effects on determining the motor actuator capability.

The changes to limit switch setting are proposed to indicate valve "open" between 85%-90% of valve stem travel and to shut off the motor approximately +3% after the "open" indication signal. The range is provided for ease of valve setup, and the motor shutoff signal is sent +3% after the "open" indication signal in order to ensure that the valve has reached the fully open position. It was determined that the valve travel to reach full effective flow is less than the full physical stroke capability of the valve. The limit switch was set to limit the valve travel to meet full open effective flow area requirement since additional valve travel would not result in any increase in flow. The valve supplier is required to adjust the limit switch setting to limit the valve travel to when full effective choke flow area was reached. Based on the test results, the stem lift to reach the full effective choke flow area was determined to be less than the full stoke length capability of the valve. It is acceptable to indicate "open" between 85%-90% of stem travel because the flow coefficient (C_v) of the valve reaches a limit and remains constant from roughly 80%-100% of stem travel.

ASME QME-1 qualification testing does not require effective flow area vs. valve travel type testing and is, therefore, not affected by this change activity. However, since effective flow area vs. valve travel is an important design input for nuclear safety analysis, validation of the flow area is performed as validation of this plant performance parameter; not as functional qualification of the valve. As a result of the changes proposed as part of this change activity, the valves continue to be capable of performing their design function.

The normally closed ADS gate valves are required to open before the normally closed ADS control (globe) valves. During ADS testing, the gate valve opening time requirements identified on the valve data sheets were met; thus, no changes were necessary to the gate valves.

This change activity proposes to change ITAAC for RCS-PL-V001A/B described in the plant-specific Tier 1 Table 2.1.2-4. This change is consistent with the updated stroke time value modeled in the VEGP Units 3 and 4 UFSAR Chapter 15 SBLOCA accident analysis as 48 seconds.

Conforming changes to the current licensing basis (with respect to this change activity) include UFSAR Tables 14.3-2 and 15.6.5-10. A conforming change will also be made to TS Bases 3.4.11.

<u>ADS Stage 2 and 3 Valves</u>

The effective flow area calculated for the ADS Stage 2 and Stage 3 control valves was not appropriately calculated for anticipated flow conditions. Specifically, calculations of the effective flow area were based on liquid service (i.e., where the density of the liquid does not change as the pressure decreases from the relieving pressure to the total

backpressure). However, these valves are installed in the steam space of the pressurizer and will open under either subcooled liquid (which flashes to a two-phase mixture) or saturated steam (compressible flow). This value is necessary input to safety analysis and are reflected in the ITAAC acceptance criteria.

Because the current C_v and effective flow areas are based on incompressible flow, new testing has been performed to determine the effective flow area with compressible flow. This testing was performed in accordance to ISA standard ANSI/ISA-75.02.01-2008 for compressible flow. Specifically, choked flow characteristic testing was performed to validate the effective choked flow area versus valve stem position utilizing compressed air, in accordance with the guidelines of ANSI/ISA-75.02.01-2008. The test results included any testing uncertainties and manufacturing tolerances that may affect the physical flow area. As such, this change activity proposes to update the effective flow area for the ADS Stage 2 and Stage 3 control valves based on this new test data.

Test data from the choked flow area testing performed for the 8-inch ADS Stage 2 and Stage 3 control valves shows an effective flow area of ~18.5 in^2 at 100% of the valve stroke, which is below the current minimum effective flow area of 19 in^2. As such, this change activity proposes to reduce the minimum valve effective flow area from 19 in^2 to 16 in^2. The updated minimum effective flow area of 16 in^2 is based on the effective flow area at an intermediate stroke length. The limit switch settings are adjusted to limit the valve travel to the point at which the full effective flow area is reached. It was confirmed that the valve travel to reach full effective flow is less than the full physical stroke capability of the valve. Limiting the valve travel to match reaching full effective flow area enabled the valve supplier to select slower opening characteristics thus reducing the hydrodynamic loading impact that valve opening may have on downstream piping and components.

ASME QME-1 qualification testing does not require effective flow area versus valve travel type testing and is, therefore, not affected by this change activity. However, since effective flow area versus valve travel is an important design input for nuclear safety analysis, validation of the flow area is performed as validation of this plant performance parameter; not as functional qualification of the valve. As a result of the changes proposed as part of this change activity, the valves continue to be capable of performing their design function.

In addition to the flow area changes, the maximum stroke times are also proposed for update. The proposed maximum time is increased from 100 seconds to 120 seconds. The minimum stroke time is the cycle time from full close to full open under ideal voltage conditions. The increase in maximum stroke time allows for a larger effective flow area, which provides a benefit for depressurization. The 20-second increase in maximum opening time was evaluated as part of the valve setup program to determine the impact on the capability of the motor actuator. The AP1000 valve setup program includes temperature effects on determining the motor actuator capability.

This change activity does not impact the ADS Stage 1 valves, only the Stage 2 and Stage 3 control valves (RCS-PL-V002A/B and RCS-PL-V003A/B). Flow testing was performed for the ADS Stage 1 control valves and confirms that the current effective flow areas are bounding and appropriate.

The C_v curve was reviewed for the 8-inch valves and determined that there is no impact on the calculated line resistance for the ADS Stage 1, Stage 2, or Stage 3 lines and the increase in stroke time does not result in any changes to the ADS valve opening sequence or in additional loads on the batteries.

The normally closed ADS gate valves are required to open before the normally closed ADS control (globe) valves. During ADS testing, the gate valve opening time requirements identified on the valve data sheets were met; thus, no changes were necessary to the gate valves.

The second and third stage ADS control valves are important in the SBLOCA safety analysis to allow the RCS to depressurize sufficiently for ADS Stage 4 actuation and subsequent IRWST injection. The SBLOCA analyses model a minimum ADS flow area along with a maximum stroke time. The changes proposed reduce the ADS effective flow area from 19 in^2 to 16 in^2 and also increase the maximum stroke time from 100 seconds to 120 seconds. The valve area change will decrease the flow rate through the ADS Stage 2 and Stage 3 control valves and cause a slight reduction in the rate of depressurization. Increasing the valve opening time of the ADS Stage 2 and Stage 3 control valves will cause the valves to discharge less at a given time while opening. The changes combined will cause a reduction in the overall venting capability of the ADS 1-3 system. The effects of this change activity are accounted for in the updated SBLOCA analysis.

The non-LOCA inadvertent ADS/RCS depressurization analysis presented in UFSAR Subsection 15.6.1 is limited by a larger effective flow area (maximum valve area) and a minimum stroke time. No further justification for non-LOCA analysis impacts is necessary with respect to this change activity.

The LBLOCA and LOCA containment analyses do not explicitly model the ADS Stage 2 and Stage 3 control valves and thus this change has no impact on these analyses.

Changes to the current licensing basis with respect to this change activity include Vogtle plant-specific Tier 1 Table 2.1.2-4, ITAAC Items 08.d.iv and 11b.iii, along with conforming changes to UFSAR Tables 14.3-2 and 15.6.5-10. A conforming change will also be made to TS Bases 3.4.11.

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

4.0 Justification of Exemption

10 CFR Part 52, Appendix D, Section VIII.A.4 and 10 CFR 52.63(b)(1) govern the issuance of exemptions from elements of the certified design information for AP1000 nuclear power plants. Since SNC has identified changes to the Tier 1 information as discussed in Enclosure 1 of the accompanying License Amendment Request, an exemption from the certified design information in Tier 1 is needed.

10 CFR Part 52, Appendix D, and 10 CFR 50.12, §52.7, and §52.63 state that the NRC may grant exemptions from the requirements of the regulations provided six conditions are met: 1) the exemption is authorized by law [§50.12(a)(1)]; 2) the exemption will not present an undue risk to the health and safety of the public [§50.12(a)(1)]; 3) the

exemption is consistent with the common defense and security [§50.12(a)(1)]; 4) special circumstances are present [§50.12(a)(2)]; 5) the special circumstances outweigh any decrease in safety that may result from the reduction in standardization caused by the exemption [§52.63(b)(1)]; and 6) the design change will not result in a significant decrease in the level of safety [Part 52, App. D, VIII.A.4].

The requested exemption satisfies the criteria for granting specific exemptions, as described below.

1. This exemption is authorized by law

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

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

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

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

The proposed changes do not represent any adverse impact to the design function of the systems, structures and components (SSCs) and the SSCs will continue to protect the health and safety of the public in the same manner. The changes do not introduce any new industrial, chemical, or radiological hazards that would represent a public health or safety risk, nor do they modify or remove any design or operational controls or safeguards intended to mitigate any existing on-site hazards. Furthermore, the proposed change would not allow for a new fission product release path, result in a new fission product barrier failure mode, or create a new sequence of events that would result in fuel cladding failures. Accordingly, this change does not present an undue risk from any existing or proposed equipment or systems.

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

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

The requested exemption from the requirements of 10 CFR 52, Appendix D, Section III.B would allow the licensee to depart from elements of the plant-specific Tier 1 design information. The proposed exemption does not alter the design, function, or operation of any structures or plant equipment that is necessary to maintain a safe and secure status

of the plant. The proposed exemption has no impact on plant security or safeguards procedures.

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

4. Special circumstances are present

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

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

The changes continue to show compliance with the requirements in 10 CFR 50.46. The proposed changes do not significantly affect any function or feature used for the prevention or mitigation of accidents or their safety analyses. The proposed changes neither involve nor interface with any SSC accident initiator or initiating sequence of events related to the accidents evaluated, and therefore, do not have an adverse effect on any SSC's design function. Accordingly, this exemption from the certification information will enable the Licensee to safely construct and operate the AP1000 facility consistent with the design certified by the NRC in 10 CFR 52, Appendix D.

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

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

Based on the nature of the changes to the plant-specific Tier 1 information and the understanding that these changes have been determined to not significantly impact the design function of the related SSCs, it is expected that this exemption may be requested by other AP1000 licensees and applicants. However, a review of the reduction in standardization resulting from the departure from the standard DCD determined that even if other AP1000 licensees and applicants do not request this same departure, the special circumstances will continue to outweigh any decrease in safety from the reduction in standardization because the key design functions of the structures associated with this request will continue to be maintained. Furthermore, the justification

provided in the license amendment request and this exemption request and the associated mark-ups demonstrate that there is a limited change from the standard information provided in the generic AP1000 DCD, which is offset by the special circumstances identified above.

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

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

The exemption impacts the plant-specific Tier 1 information by revising the design parameters of a) the maximum stroke times for the ADS Stages 1, 2 and 3 control valves, and b) the minimum effective flow areas for the ADS Stages 2 and 3 control valves. The revised stroke times and effective flow areas have been evaluated to continue to demonstrate compliance with the requirements in 10 CFR 50.46, and thus do not impact the design requirements of the related SSCs. Because the SSC functions continue to be met, there is no reduction in the level of safety.

5.0 Risk Assessment

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

6.0 Precedent Exemptions

None

7.0 Environmental Consideration

The Licensee requests a departure from elements of the certified information in Tier 1 of the generic AP1000 DCD. The Licensee has determined that the proposed departure would require a permanent exemption from the requirements of 10 CFR Part 52, Appendix D, Section III.B, *Design Certification Rule for the AP1000 Design, Scope and Contents,* with respect to installation or use of facility components located within the restricted area, as defined in 10 CFR Part 20, or which changes an inspection or a surveillance requirement; however, the Licensee evaluation of the proposed exemption has determined that the proposed exemption meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9).

Based on the above review of the proposed exemption, the Licensee has determined that the proposed activity does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in the 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 are to Tier 1 design parameters of a) the maximum stroke times for the ADS Stages 1, 2 and 3 control valves, and b) the minimum effective flow areas for the ADS Stages 2 and 3 control valves. The revised stroke times and effective flow areas have been evaluated to continue to show compliance with the requirements in 10 CFR 50.46. 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-19-0000

Enclosure 3

Vogtle Electric Generating Plant Units 3 and 4

Proposed Changes to Licensing Basis Documents

(LAR-19-009)

Insertions Denoted by underlined Blue text and Deletions by ~~Red Strikethrough~~
Relocated or duplicated text is identified in Green
Omitted text is identified by three asterisks (* * *)

(This Enclosure consists of 6 pages, including this cover page)

Revise plant-specific Tier 1 Table 2.1.2-4, and corresponding COL Appendix C Table 2.1.2-4, as shown below, for ITAAC 2.1.02.8d.iv, Acceptance Criterion 8.d) iv) and ITAAC 2.1.02.11a.ii, Acceptance Criterion 11.b) iii).

Table 2.1.2-4
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
—	—	—
8.d) The RCS provides automatic depressurization during design basis events.	iv) Type tests and analysis will be performed to determine the effective flow area through each stage 1,2,3 ADS valve.	iv) A report exists and concludes that the effective flow area through each stage 1 ADS valve ≥ 4.6 in^2 and each stage 2,3 ADS valve is ≥ 16 ~~19~~ in^2
—	—	—
11.b) The valves identified in Table 2.1.2-1 as having PMS control perform an active safety function after receiving a signal from the PMS.	iii) Testing will be performed to demonstrate that remotely operated RCS valves RCS-V001A/B, V002A/B, V003A/B, V011A/B, V012A/B, V013A/B open within the required response times.	iii) These valves open within the following times after receipt of an actuation signal: ~~V001A/B ≤ 40 sec~~ V001A/B ≤ 48 sec ~~V002A/B, V003A/B ≤100 sec~~ V002A/B, V003A/B ≤120 sec V011A/B ≤ 30 sec V012A/B, V013A/B ≤ 60 sec
—	—	—

Revise COL Appendix A, Technical Specification 3.5.2, Surveillance Requirements, as shown below.

3.5.2 Core Makeup Tanks (CMTs) – Operating

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	* * *	* * *
~~SR 3.5.2.2~~	~~Verify the borated water volume in each CMT is ≥2487 cu. ft.~~	~~7 days~~
SR 3.5.2.~~3~~2	* * *	* * *
SR 3.5.2.~~4~~3	* * *	* * *
SR 3.5.2.~~5~~4	* * *	* * *
SR 3.5.2.~~6~~5	* * *	* * *
SR 3.5.2.~~7~~6	* * *	* * *
SR 3.5.2.~~8~~7	* * *	* * *

Revise COL Appendix A, Technical Specification 3.3.20, Surveillance Requirements, as shown below.

3.3.20 ADS and IRWST Injection Blocking Device

SURVEILLANCE REQUIREMENTS

* * *

SURVEILLANCE		FREQUENCY
SR 3.3.20.1	* * *	* * *
SR 3.3.20.2	* * *	* * *
SR 3.3.20.3	* * *	* * *
SR 3.3.20.4	* * *	* * *
SR 3.3.20.5	* * *	* * *
SR 3.3.20.6	* * *	* * *
SR 3.3.20.7	The following SRs of Specification 3.5.2, "Core Makeup Tanks (CMTs) – Operating" are applicable for each CMT: SR 3.5.2.~~3~~2 SR 3.5.2.~~6~~5 SR 3.5.2.~~7~~6	In accordance with applicable SRs

Revise COL Appendix A, Technical Specification 3.5.3, Surveillance Requirements, as shown below.

3.5.3 Core Makeup Tanks (CMTs) – Shutdown, Reactor Coolant System (RCS) Intact

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.5.3.1	For the CMT required to be OPERABLE, the following SRs are applicable: SR 3.5.2.1 ~~SR 3.5.2.2~~ SR 3.5.2.~~3~~2 SR 3.5.2.~~5~~4 SR 3.5.2.~~6~~5 SR 3.5.2.~~7~~6 SR 3.5.2.~~8~~7	In accordance with applicable SRs
SR 3.5.3.2	---------- -**NOTE**- Only required to be met in MODE 4 with RCS cooling provided by the ~~Normal Residual Heat Removal System (~~RNS~~)~~. ---------- For the CMT required to be OPERABLE, the following SR is applicable: SR 3.5.2.~~4~~3	In accordance with applicable SRs
SR 3.5.3.3	---------- -NOTE- Only required to be met in MODE 5 with the RCS not VENTED. ---------- For the CMT required to be OPERABLE, verify the borated water volume is ≥ 2450 cu. ft.	7 days

ND-19-0000
Enclosure 3
Proposed Changes to Licensing Basis Documents (LAR-19-009)

Revise UFSAR Section 14.3, Table 14.3-2, Sheet 17 of 17, Design Basis Accident Analysis, as shown below.

Reference	Design Feature	Value
Section 15.5.2.1	* * *	
Table 15.6.5-10	ADS Valve Minimum Effective Flow Areas (in^2) – ADS Stage 1 Control Valve – ADS Stage 2 Control Valve – ADS Stage 3 Control Valve – ADS Stage 4A Valve – ADS Stage 4B Valve	 ≥ 4.6 ≥ 16 ~~19~~ ≥ 16 ~~19~~ ≥ 66 ≥ 66
Table 15.6.5-10	ADS Valve Opening Times (sec) – ADS Stage 1 Control Valve – ADS Stage 1 Isolation Valve – ADS Stage 2 Control Valve – ADS Stage 2 Isolation Valve – ADS Stage 3 Control Valve – ADS Stage 3 Isolation Valve	 ≤ 48 ~~40~~ ≤ 30 ≤ 120 ~~100~~ ≤ 60 ≤ 120 ~~100~~ ≤ 60
Section 18.8.3.2	* * *	
* * *	* * *	

Revise UFSAR Section 15.6, Table 15.6.5-10, ADS Parameters Used in Small-Break LOCA Analyses, as shown below.

Table 15.6.5-10

ADS Parameters Used in Small-Break LOCA Analyses

Actuation Signal (percentage of core makeup tank level)		**Actuation Time** (seconds)	**ADS Valve Minimum Effective Flow Area (for each path, in^2)**	**Maximum Valve Flow Area (for each path, in^2)**	**Number of Paths**	**Valve Opening Time (seconds)**
Stage 1 — Control Low-3	67.5	32 after CMT-Low-3	4.6(3)	7(3)	2 out of 2	≤ 48 ~~40~~
Stage 2 — Control		48 after Stage 1	~~19~~ 16(3)	26(3)	2 out of 2	≤ 120 ~~100~~
Stage 3 — Control		120 after Stage 2	~~19~~ 16(3)	26(3)	2 out of 2	≤ 120 ~~100~~
Stage 4A	20	128 after Stage 3(1)	66	NA	1 out of 2	≤ 4(2)
Stage 4B		60 after Stage 4A	66	NA	2 out of 2	≤ 4(2)

* * *

Southern Nuclear Operating Company

ND-19-0000

Enclosure 4

Vogtle Electric Generating Plant Units 3 and 4

Conforming Changes to Technical Specification Bases

(For Information Only)

(LAR-19-009)

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(This Enclosure consists of 6 pages, including this cover page)

Technical Specification Bases B 3.4.11, BACKGROUND, seventh paragraph, is revised as shown below.

* * *

ADS stages 1, 2 and 3 valves are designed to open relatively slowly, from approximately ~~40~~ 48 seconds for the first stage valves, to approximately ~~100~~ 120 seconds for the second and third stage valves.

* * *

Technical Specification Bases B 3.3.20, SURVEILLANCE REQUIREMENTS, is revised as shown below.

SR 3.3.20.7

SR 3.3.20.7 requires performance of LCO 3.5.2 Surveillances associated with ensuring CMTs are capable of injecting to the RCS. CMT injection supports OPERABILITY of the ADS and IRWST Injection Blocking Devices for automatic unblocking. If one or both CMTs are inoperable for injection, all four divisions of ADS and IRWST Injection Blocking Devices are inoperable. Therefore, SRs 3.5.2.~~3~~2, 3.5.2.~~6~~5, and 3.5.2.~~7~~6 are required to be met. See the corresponding Bases for LCO 3.5.2 for a discussion of each Surveillance and its Frequency.

Technical Specification Bases B 3.5.2, SURVEILLANCE REQUIREMENTS, is revised as shown below.

SR 3.5.2.1 ~~and SR 3.5.2.2~~

Verification every 24 hours ~~and 7 days~~ that the temperature ~~and the volume, respectively,~~ of the borated water in each CMT is within limits ensures that when a CMT is needed to inject water into the RCS, the injected water temperature ~~and volume~~ will be within the limits assumed in the accident analysis. The 24 hour Frequency is adequate, based on the fact that no mechanism exists to rapidly change the temperature of a large tank of water such as a CMT. ~~These parameters are~~ This parameter is normally monitored in the control room by indication and alarms. Also, there are provisions for monitoring the temperature of the inlet and outlet lines to detect in-leakage which may affect the CMT water temperature.

SR 3.5.2.~~3~~2

* * *

SR 3.5.2.~~4~~3

Verification that excessive amounts of noncondensible gases have not
* * *
containment entry for venting the gas.

This level is well above the CMT level corresponding to 2487 cu. ft. assumed in the safety analysis for CMT injected volume. Verifying noncondensible gas volume within the limit confirms ≥ 2487 cu. ft. of borated water volume in the CMT.

The 24 hour Frequency is based on the expected low rate of gas accumulation and the availability of control room indication.

SR 3.5.2.~~5~~4

* * *

SR 3.5.2.~~6~~5

* * *

SR 3.5.2.~~7~~6

* * *

SR 3.5.2.~~8~~7

* * *

Technical Specification Bases B 3.5.3, APPLICABLE SAFETY ANALYSES, is revised as shown below.

* * *

Since no loss of coolant accidents (LOCAs) are postulated within the applicability of this LCO ~~during MODES 5 and 6~~, the possibility of a break in the direct vessel injection line is not considered. * * *

Technical Specification Bases B 3.5.3, ACTIONS, is revised as shown below.

* * *

D.1

With the required CMT inoperable for reasons other than Condition A, B, or C operation of the CMT may not be available. Action must be taken to restore the inoperable CMT to OPERABLE status within 8 hours. ~~LOCAs are not postulated during the MODEs when this LCO is applicable. The only safety function is to provide LEAKAGE makeup in case normal RCS makeup is unavailable.~~ The 8 hour Completion Time is based on the availability of injection from the IRWST to provide RCS makeup. The ability of the IRWST to provide RCS injection is demonstrated by analysis performed to show that IRWST injection together with ADS venting provides adequate core cooling. Such analysis was performed for the loss of RNS cooling during midloop operations. The analysis was performed in support of the AP1000 PRA (Ref. 2).

Technical Specification Bases B 3.5.3, SURVEILLANCE REQUIREMENTS, is revised as shown below.

SR 3.5.3.1

The LCO 3.5.2 Surveillance Requirements (SRs 3.5.2.1 through 3.5.2.~~8~~7, except SR 3.5.2.~~4~~3) are applicable to the CMT required to be OPERABLE. The Frequencies associated with each specified SR are applicable. Refer to the corresponding Bases for LCO 3.5.2 for a discussion of each SR.

SR 3.5.3.2

The LCO 3.5.2 SR 3.5.2.~~4~~3 is applicable to the CMT required to be OPERABLE in MODE 4, with RCS cooling provided by the ~~Normal Residual Heat Removal System (~~RNS~~)~~. It is not required to be met in MODE 5, with the RCS not VENTED, because a noncondensible gas volume in the CMT inlet line does not affect its draindown capability. The ~~f~~Frequency associated with the specified SR is applicable. Refer to the corresponding Bases for LCO 3.5.2 for a discussion of this SR.

SR 3.5.3.3

Verification every 7 days that the volume of the borated water is ≥ 2450 cu. ft. for the CMT required to be OPERABLE in MODE 5 with the RCS not VENTED verifies that when the OPERABLE CMT is needed to inject water into the RCS, the injected water volume will be within the limits assumed in the analyzed event. This parameter is normally monitored in the control room by indication and alarm. The 7 day Frequency is adequate, based on the fact that no mechanism exists which will drain water below the top nozzle of the CMT.

Technical Specification Bases B 3.4.13, LCO, is revised as shown below.

* * *

The LCO is modified by a Note that allows required flow paths in ADS stage 1, 2, and 3 to be closed for two operational evolutions, provided their OPERABILITY meets LCO 3.4.12, ADS - Shutdown, RCS Intact. The first is to facilitate vacuum ~~re~~fill operations until a pressurizer water level ≥ 20% is established, and the second is to facilitate compliance during transitions between LCO 3.4.12 and LCO 3.4.13.

Technical Specification Bases B 3.5.7, LCO, is revised as shown below.

* * *

Note that during vacuum ~~re~~fill operations, a vapor void may form in the high point vent lines, causing the water level to drop below the high point water level sensor. Noncondensible gas accumulation will not increase to a volume that could potentially challenge the OPERABILITY of the passive safety injection flow.