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October 31, 2025

Docket Nos.: 52-025
52-026

NL-25-0388
10 CFR 50.90

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555-0001

Southern Nuclear Operating Company
Vogtle Electric Generating Plant Units 3 and 4
Response to Request for Additional Information
License Amendment Requests
to Increase Flexibility in Mode Restraints and
to Revise Shutdown Actions Mode Change Restrictions

Ladies and Gentlemen:

Pursuant to 10 CFR 52.98(c) and in accordance with 10 CFR 50.90, Southern Nuclear Operating Company (SNC) requested two amendments to the combined license (COL) for Vogtle Electric Generating Plant (VEGP) Unit 3 (License Number NPF-91) and Unit 4 (License Number NPF-92). The requested amendments (ML24354A169, L-2024-LLA-0171 and ML25023A275, L-2025-LLA-0011) proposed changes to the COLs Appendix A, Technical Specifications (TS), to increase flexibility in mode restraints and to revise unnecessarily restrictive and potentially conflicting Required Actions that may also restrict mode changes while shutdown, respectively.

Because of the similarity of the reviews, the NRC determined that a combined audit would be appropriate to obtain additional information that potentially supports reviews of both amendment requests. The Enclosure to this letter provides SNC responses to NRC request for additional information addressing the topics determined by the audit to require additional information. The previously submitted regulatory evaluations (including the Significant Hazards Consideration Determinations), environmental considerations and the markups depicting the requested changes are not impacted by the additional information.

SNC expects to implement the proposed amendments within 90 days of issuance.

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

In accordance with 10 CFR 50.91, a copy of this application, with enclosures, is being provided to the designated State of Georgia official.

If you have any questions, please contact Mr. Ryan Joyce at (205) 992-6468.

I declare under penalty of perjury that the foregoing is true and correct.
Executed on the 31st day of October 2025.

Respectfully submitted,

Jamie Coleman

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Jamie M. Coleman
Regulatory Affairs Director

Enclosure Responses to Request for Additional Information

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**Responses to Request for Additional Information
License Amendment Requests
to Increase Flexibility in Mode Restraints and
to Revise Shutdown Actions Mode Change Restrictions**

Request for Additional Information	**Related LAR** ML24354A169, L-2024-LLA-0171 ML25023A275, L-2025-LLA-0011	**Related Audit Items**
1	Increase Flexibility in Mode Restraints	5
2	Increase Flexibility in Mode Restraints	7 (revised)
3	Revise Shutdown Actions Mode Change Restrictions	15
4	Revise Shutdown Actions Mode Change Restrictions	21
5	Revise Shutdown Actions Mode Change Restrictions	23 (revised)
6	Revise Shutdown Actions Mode Change Restrictions	24 (revised)
7	Revise Shutdown Actions Mode Change Restrictions	25 (revised)
8	Revise Shutdown Actions Mode Change Restrictions	26 (revised)
9	Revise Shutdown Actions Mode Change Restrictions	27 (revised)
10	Revise Shutdown Actions Mode Change Restrictions	28 (revised)
11	Revise Shutdown Actions Mode Change Restrictions	31 (revised)
12	Revise Shutdown Actions Mode Change Restrictions	34 (revised)

REQUEST FOR ADDITIONAL INFORMATION (RAI) 1

[Follow up question to the licensee's response to Audit Question 5 on Mode Restraints regarding the qualitative risk assessment consistent with attachments to TSTF-359] (ML24354A169, L-2024-LLA-0171) The TSTF-359 safety evaluation for the Turkey Point license amendment on mode restraints (ML18018A559) states, "[i]n evaluating these submittals, the NRC staff applies the guidance in RG 1.174, Revision 3, 'An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis,' dated January 2018 and in RG 1.177, Revision 1, 'An Approach for Plant-Specific, Risk-Informed Decision-making: Technical Specifications,' dated May 2011." The SER also states, "[b]oth the temporary and cumulative risk of the proposed change is adequately limited. The temporary risk is limited by the exclusion of higher-risk systems and components, and completion time limits contained in TS (Section 3.1.1 of this safety evaluation)."

In addition, the references to and risk insights from the San Onofre LPSD PRA do not necessarily apply to Vogtle 3 & 4, since San Onofre is not an advanced light-water reactor with a passive ECCS. General Design Criterion 34 was met at San Onofre by safety-related pumps that provided the decay heat removal function. In the AP1000 design, GDC 34 is met using the safety-related gravity-driven core cooling system and ADS.

In this context, the qualitative assessment was reviewed, and the staff has the following questions.

a. In revision 10 of the UFSAR, Section 19.59.3, "System Importances for At-Power Core Damage," it states that the protection and safety monitoring system (which actuates the safety-related systems) and the Class 1E DC power system are the most important systems for maintaining the low CDF. This section also states that the risk-significant systems are the safety-related systems. The initial version of NUREG-1793, "Final Safety Evaluation Report Related to Certification of the AP1000 Standard Design," states, "The most important systems for core damage prevention, or equivalently, the systems that are the most "worthy" in achieving the low CDF level assessed in the PRA (i.e., systems with the highest risk achievement worth), are the PMS, the Class 1E dc power, the ADS, IRWST recirculation, IRWST injection, the CMTs, and the accumulators." How have these risk insights been incorporated into evaluation of the proposed LCO 3.0.4.b?

b. In revision 10 of the UFSAR, Section 19.59.5-1, "Summary of Shutdown Level 1 Results," states that the major contributors to risk due a loss of RNS during drained conditions are:

   - Common-cause failure of the RNS pumps to run
   - Common-cause failure of the recirculation line squib valves
   - Common-cause failure of the ADS 4th stage squib valves
   - Common-cause failure of the IRWST injection squib valves
   - Common-cause failure of the strainers in the IRWST Tank (failing the function of the IRWST)
   - Common-cause failure of the recirculation sump strainers (failing the function of recirculation)

   How have these UFSAR risk insights been incorporated for the evaluation of LCO 3.0.4.b?

c. Can LCO 3.0.4.b be used to transition between MODES or other specified conditions in the Applicability if they are already in an applicable MODE for an LCO and do not meet the LCO?

d. Scenario 1: If the answer to question c is yes, then consider a scenario where:

- The Plant is in MODE 5 with RCS pressure boundary open and the reactor has been subcritical for ≥ 28 hrs. LCO 3.4.13 requires three flow paths in ADS stage 4 to be operable. One of three required ADS 4 flow paths is found to be inoperable.

    - Can the operators transition the plant to another specified condition in Applicability such as MODE 5 with the level < 20% using LCO 3.0.4.b? Note that Condition B of LCO 3.4.13 requires restoration of the required flow path within 36 hours for both MODE 5 with the RCS open and for MODE 5 with the level < 20%.

    - Explain from what point in time the Completion Time clock would be started for restoration of the required ADS Stage 4 flow path and tracked.

- LCO 3.4.12 also requires three ADS 4 flow paths to be operable with the plant in MODE 5 with RCS pressure boundary intact and pressurizer level ≥ 20%?

    - Can the operators continue to startup and transition the plant to MODE 5 with RCS pressure boundary intact and pressurizer level ≥ 20% (i.e., enter LCO 3.4.12)?

    - Explain from what point in time the Completion Time clock would be started for restoration of the required ADS Stage 4 flow path and tracked.

- If the 36-hour Completion Time to restore the required ADS 4 flow path is not met, the Vogtle 3 and 4 current TS would require immediately exiting the MODE of Applicability (i.e., Condition D would require “Initiate action to open the RCS pressure boundary”). Based on the Shutdown Actions LAR, LCO 3.4.12 Condition D would require the operator to “Initiate action to restore compliance with the LCO with a Completion Time of Immediately.”

    - How does the Shutdown Actions LAR affect the ability to use LCO 3.0.4.b in this case? TSTF-359 states, “LCO 3.0.4.b should not be used unless there is a reasonable probability of completing restoration such that the requirements of the LCO would be met prior to the expiration of the ACTIONS Completion Times that would require exiting the Applicability.”

- LCO 3.4.11 requires four ADS 4 flow paths to be operable when in MODE 4.

- Can operators transition to MODE 4? Note that the plant would now have two required flow paths inoperable.

- If so, explain from what point in time the Completion Time clock would be started for restoration of the required ADS Stage 4 flow path and tracked.

e. Scenario 2: The Plant is in MODE 5 with one IRWST containment recirculation flow path inoperable and the Boron Concentration is not within limits. Can the plant transition to MODE 4?

   If so, explain from what point in time the Completion Time clock(s) would be started for restoration of the required ADS Stage 4 flow path and tracked.

RAI Response 1 - While true that temporary risk is limited by exclusion of higher-risk systems and components, it is not necessarily true that the temporary risk is unacceptable if Limiting Condition for Operation (LCO) 3.0.4.b is leveraged for a degraded condition involving a partial loss (e.g., one train) of a higher-risk system. Instead of precluding higher risk systems and components by default, the approach put forth is to preclude only higher risk systems and components that are not capable of being adequately assessed by the 10 CFR 50.65(a)(4) procedures and tools. This approach is, in part, justifiable due to enhancements in the quality and scope of the 10 CFR 50.65(a)(4) procedures and tools.

The descriptions in the Updated Final Safety Analysis Report (UFSAR) of systems and components that are major contributors to risk during at-power and shutdown modes are based on loss of the entire system. Common cause failures drove those insights. The fact alone that a system is among the highest risk systems according to Probabilistic Risk Assessment (PRA) does not constitute a justification for its exclusion from use of LCO 3.0.4.b. If the risk impact is quantifiable because the PRA explicitly models the system, the system need not be excluded from use of LCO 3.0.4.b. In the case of shutdown modes, if the reduction in defense-in-depth (DID) is accounted for in the shutdown DID assessment, then the system need not be excluded from use of LCO 3.0.4.b. Note that since the risk can be adequately evaluated, upon applying LCO 3.0.4.b, if the “determination of the acceptability of entering the MODE or other specified condition in the Applicability” concludes that the risk is not acceptable, then the MODE change is not allowed.

For Technical Specification (TS) Actions that represent complete loss of a system which allow LCO 3.0.4.b to be applied, precluding the use of LCO 3.0.4.b is only necessary where the risk is or may be significant and the 10 CFR 50.65(a)(4) procedures and tools are not capable of adequately assessing the impact. Note that LCO 3.0.4.b exclusions were only evaluated for cases where LCO 3.0.4.a did not apply and where LCO 3.0.4.b could be applicable. This judgement was taken into account to streamline the assessment documented in the License Amendment Request (LAR), Attachment 4 (ML24354A169).

RAI Response 1b specific – RAI 1 item b includes a list from the UFSAR of the major contributors to risk due to a loss of Normal Residual Heat Removal (RNS) during drained conditions. The first contributor listed is “common-cause failure of the RNS pumps to run.” The LAR attachment 4 assessment addresses roles of RNS in shutdown safety, but RNS is not discussed in the context of potential LCO 3.0.4.b exclusion because RNS is not covered by TS. The remaining components listed (recirculation line squib valves, Automatic Depressurization System (ADS) stage 4 squib valves, In-containment Refueling Water Storage Tank (IRWST)

injection squib valves, IRWST strainers, and IRWST recirculation sump strainers) are covered by TS and were identified in the LAR attachment 4 assessment of potential LCO 3.0.4.b exclusion as the potentially risk significant components, consistent with the insights from the design certification low power shutdown (LPSD) PRA.

The same/similar PRA insights resulted in the common cause failures listed in UFSAR (Rev. 10) subsection 19.59.5.-1. After identifying the potentially risk significant equipment and listing those, the LAR Attachment 4 assessment then focused on the TS covering drained conditions and requiring operability of those components. Note that LCO 3.0.4.b exclusions were only evaluated for cases where LCO 3.0.4.a did not apply and where LCO 3.0.4.b could be applicable. If only LCO 3.0.4.a would apply to conditions covered by the TS, then the assessment did not evaluate the LCO further. If LCO 3.0.4.b would apply to one or more conditions covered by the LCO, then the assessment evaluated the capability of the 10 CFR 50.65(a)(4) procedures and tools to adequately assess the impact of the inoperability.

RAI Response 1c specific – Yes, LCO 3.0.4.b can be used to transition between MODES or other specified conditions within the Applicability if already in an applicable MODE of an LCO with the LCO not met. This is consistent with the proposed LCO 3.0.4 (see Page E-5 of the LAR (ML24354A169)) which states:

> When an LCO is not met, entry into a MODE or other specified condition in the Applicability shall only be made:
>
> a. When … ACTIONS … permit continued operation … ; or
> b. After performance of a risk assessment … ; or
> c. When an allowance is stated … .

TS usage for LCO 3.0.4 does not differentiate between initial entry into the Applicability or transitioning to another MODE or specified condition within the Applicability. LCO 3.0.4 evaluations apply to each stated Applicability entry.

RAI Response 1d.1a specific – In this scenario, Condition B of LCO 3.4.13 would be entered when the determination is made that one of three required ADS stage 4 flow paths is inoperable.

While in Condition B for the stated inoperability, i.e., with the plant in MODE 5 with RCS pressure boundary open, the plant would also be in the Applicability of MODE 5 with the level < 20% having entered both Applicabilities when transitioning from MODE 6. Thus, the plant would not actually be a transition from one Applicability into the other, and LCO 3.0.4.b would not need to be applied. However, closing the RCS pressure boundary would transition out of MODE 5 with RCS pressure boundary open, and while LCO 3.0.4.b would not need to be applied for leaving an Applicability, the transition from Plant Operating State (POS) IV with the pressure boundary open to POS III with the pressure boundary intact is entering the Applicability for LCO 3.4.12 and is addressed below. (Note that Plant Operating States are defined in the response to RAI 7.)

An assessment of decay heat removal (DHR) and inventory control (IC) depends on which ADS stage 4 paths are not available. IRWST gravity injection credit is dependent on ≥ 2 ADS stage 4 paths with at least one on the non-pressurizer loop.

Before the transition: POS IV, Mode 5 Reactor Coolant System (RCS) Open:

- DHR is yellow (N+1) if the only credited defense is two RNS trains. If ADS 4 paths B and D are available, then DHR is green (N+2) where the credited defense is two RNS trains and IRWST gravity injection.
- IC is orange (N) if the only credited defense is Chemical and Volume Control System (CVS) makeup from the Boric Acid Storage Tank (BAST) (both pumps). If ADS 4 paths B and D are available, then IC is yellow (N+1) where the credited defense is CVS makeup from the BAST (both pumps) and IRWST gravity injection.

After the transition: POS III, Mode 5 RCS intact, RCS level at mid-loop prior to RCS fill:

- DHR is yellow if the only credited defense is two RNS trains. If ADS 4 paths B and D are available, then DHR is green (N+2) where the credited defense is two RNS trains and IRWST gravity injection.
- IC is green (N+2) where the credited defense is CVS makeup from the BAST (both pumps) and two Core Makeup Tanks (CMTs).

RAI Response 1d.1b specific – Consistent with the response to "1d.1a" above, the time at which the determination is made that one of three required ADS stage 4 flow paths is inoperable marks the time for entry into Condition B of LCO 3.4.13. Per TS 1.3, Completion Times, Condition B remains in effect, and the Required Actions apply until the Condition no longer exists (i.e., ADS 4 flow path returned to OPERABLE) or the unit is not within any of the LCO Applicabilities.

RAI Response 1d.2a specific –

Under the proposed change, the plant may also be able to use LCO 3.0.4.b for transitioning to the Applicability of LCO 3.4.12 (MODE 5 with RCS pressure boundary intact and pressurizer level ≥ 20%) with the LCO not met. The same protocols described above would be invoked in accordance with the governing procedures, including a risk assessment, consideration of Risk Management Actions (RMAs), and management approvals as required. Note that the availability of the Passive Residual Heat Removal Heat Exchanger (PRHR Hx) and CMTs in these plant conditions provide additional means of accident mitigation.

Barring other inoperabilities/unavailabilities, the risk assessment would support the mode change. The assessments of DHR and IC depend on which ADS stage 4 paths are not available. IRWST gravity injection credit is dependent on ≥ 2 ADS stage 4 paths with at least one on the non-pressurizer loop.

Before the transition: POS III, Mode 5 RCS intact, RCS below pressurizer (PZR) level 20%:

- DHR is yellow if the only credited defense is two RNS trains. If ADS 4 paths B and D are available, then DHR is green (N+2) where the credited defense is two RNS trains and IRWST gravity injection.
- IC is green (N+2) where the credited defense is CVS makeup from BAST (both pumps) and two CMTs.

After the transition: POS III, Mode 5 RCS intact, RCS at PZR level ≥ 20%

- DHR is green (N+3) where the credited defense is two RNS trains, Feedwater System (FWS) to Steam Generation System (SGS), and PRHR. If ADS 4 paths B

and D are available, then IRWST gravity injection credit produces green (N+4) for DHR.

- IC is green (N+2) where the credited defense is CVS makeup from BAST (both pumps) and two CMTs. If ADS 4 paths B and D are available, then IRWST gravity injection credit produces green (N+3) for IC.

RAI Response 1d.2b specific – The Completion Time for Condition B of LCO 3.4.12 would start upon entry into the LCO's Applicability with one required ADS stage 4 valve inoperable.

RAI Response 1d.3a specific – The proposed associated TS Bases changes include the statement: "Consideration should also be given to the probability of completing restoration such that the requirements of the LCO would be met prior to the expiration of ACTIONS Completion Times that would require exiting the Applicability."

Given the scenario provided, the plant would not transition into the Applicability of LCO 3.4.12 unless there was a reasonable probability of restoring the ADS Stage 4 flow path within the Completion Time of Condition B (72 hours). The Shutdown Action LAR does not affect the ability to use LCO 3.0.4.b in this case. NOTE that TS 3.4.12 Action D would only apply after 72 hours (only then would "immediately" apply).

RAI Response 1d.4a specific – Entering MODE 4 Applicability for TS 3.4.11 would require compliance with LCO 3.0.4.b and consideration of "reasonable probability of restoration." That evaluation would dictate whether the transition could be made. If (as in this example) there are two ADS stage 4 paths inoperable, TS 3.4.11 Action D, which requires plant shutdown would be entered. While the LCO 3.0.4.b risk evaluation could be satisfactory (see discussion in the next paragraph) an expectation that both ADS stage 4 would be restored prior to having to re-enter MODE 5 within the associated Completion Time is an unlikely scenario.

The assessments of DHR and IC use the same decision trees for Mode 5 RCS intact (POS III) and for Mode 4 (POS II). IRWST gravity injection credit is dependent on ≥ 2 ADS stage 4 paths with at least one on the non-pressurizer RCS loop. Even if both inoperable ADS stage 4 paths are on the non-pressurizer loop, resulting in no credit for IRWST gravity injection, the results for DHR and IC are still green. For DHR, the green result is due to two RNS trains available, one FWS pump available, and PRHR available. For IC, the green result is due to availability of CVS makeup from BAST (both pumps) and two CMTs.

RAI Response 1d.4b specific – For TS 3.4.11, as above, per TS 1.3, the Completion Time applies from initial Condition entry; which for this example would be on entry into TS 3.4.11 Actions with ADS stage 4 inoperable (i.e., at entry into MODE 4).

RAI Response 1e specific – There are multiple ways for one IRWST containment recirculation flow path to be inoperable. If it is due to a valve inoperability, then transition to MODE 4 would result in TS 3.5.6, "IRWST- Operating," Condition A entry with a 72-hour Completion Time (or Condition F entry for any other reason) along with Condition D entry for the Boron Concentration not within limits (with an 8-hour Completion Time). As discussed for RAI Response 1d.4a above, while the LCO 3.0.4.b risk evaluation could be satisfactory (see discussion in the paragraph below) an expectation that both ADS stage 4 would be restored prior to having to re-enter MODE 5 within the associated Completion Time is an extremely unlikely scenario.

In all cases, per TS 1.3, the Completion Time applies from initial Condition entry unless otherwise stated (e.g., a "from discovery" Completion Time exception is provided).

For a TS 3.5.6 Condition A entry for one containment recirculation path inoperable and a Condition D entry for IRWST boron concentration not within limits, a potential LCO 3.0.4b risk assessment could conservatively treat the IRWST unavailable, which would produce the following results for decay heat removal and inventory control:

Before the transition: POS III, Mode 5 RCS intact, RCS at PZR level ≥ 20%

- DHR is green – available defense is 2 RNS trains and FWS to SGS.
- IC is green – available defense is CVS makeup from BAST (both pumps) and 2 CMTs.

After the transition: POS II, Mode 4 with RNS cooling, RCS at PZR level ≥ 20%

- DHR is green – available defense is 2 RNS trains and FWS to SGS.
- IC is green – available defense is CVS makeup from BAST (both pumps) and 2 CMTs.

Given the scenario provided, the plant would not transition into the Applicability of LCO 3.5.6 unless there was a reasonable probability of restoring IRWST boron concentration within the associated Completion Time and restoring the inoperable containment recirculation path within the associated Completion Time.

REQUEST FOR ADDITIONAL INFORMATION (RAI) 2

[Revised Audit Question 7] ML24354A169, L-2024-LLA-0171. In the Vogtle 3 & 4 design, general design criterion (GDC) 34 is met in modes 5 and 6 by the automated and passive actuation of the gravity-driven core cooling system combined with actuation of the automatic depressurization system (ADS), which is covered by technical specifications. Per LCO 3.5.7, "IRWST – Shutdown, MODE 5," and LCO 3.5.8, "IRWST – Shutdown, MODE 5," only one injection flow path and one containment recirculation isolation valve need to be operable in modes 5 and 6 for sustained decay heat removal.

a. How is this lack of redundancy considered in the maintenance rule (a)(4) risk evaluations when in modes 5 and 6?

b. It appears to the staff that ADS stage 4 is necessary for gravity injection using the gravity-driven core cooling flow path and the normal residual heat removal system (RNS) gravity injection flow path. Explain how these dependencies do not result in overcounting the licensee's defense-in-depth capability, or explain why there are no dependencies between ADS stage 4 and the gravity-driven core cooling and RNS gravity injection flow paths.

c. The chemical and volume control system (CVCS) is credited as one source of defense-in-depth for the key safety function of inventory control. Is CVCS capable of making up for inventory losses from decay heat during the entire outage?

d. Based on the audit response to New Question 1 (follow-up question to Audit Item #7), due to the shared dependency on ADS stage 4 SNC acknowledges that for a case of less than the full complement of ADS stage 4 paths, overcounting could result. Since the staff's regulatory finding relies on the adequacy of SNC's tools (B-ADM-OPS-11) and Phoenix to accurately manage the risk of maintenance configurations in lieu of Tech. Spec. Action statements, the staff needs a detailed description of the changes to B-ADM-OPS-11 and to Phoenix to prevent over counting. It appears to the staff that ADS stage 4 is necessary for gravity injection using the PXS gravity-driven core cooling flow path and the normal residual heat removal system (RNS) gravity injection flow path when the RCS is vented via stage 2 and 3 of the ADS valves. However, the draft markup to B-ADM-OPS-11 shows that ADS stage 4 is not needed for RNS gravity injection. Given the anticipated pressurizer filling and surge line flooding following RCS boiling, the staff is interested if there is a thermohydraulic analysis that supports ADS stage 4 not being needed for RNS gravity injection, especially post RCS boiling, following a loss or interruption of RNS. If an analysis exists, the staff requests to see the results of such an analysis. Alternatively, the staff requests to see a detailed description of changes to B-ADM-OPS-11 and Phoenix which reflects a RNS gravity dependency on ADS Stage 4.

RAI Response 2a – Each injection flow path and each recirculation flow path (NOTE that the NRC RAI 2 lead-in for containment recirculation incorrectly used "isolation valve" versus "flow path") are provided with parallel squib valves that provide the necessary redundancy as identified in TS 3.5.6 Bases Background – 2nd paragraph.

The TS requirement for one containment recirculation flow path is a fully open containment recirculation motor-operated valve (MOV) and two squib valves operable. Entry into TS 3.5.7 or TS 3.5.8 Condition A may not represent a complete loss of the Passive Core Cooling System (PXS) containment recirculation capability because each TS flow path has two sub-paths. Hence, there are a total of four containment recirculation sub-paths with two sub-paths through an isolation MOV and squib valve (PXS-V117A and V118A or PXS-V117B and V118B) and two

sub-paths through a check valve and squib valve (PXS-V119A and V120A or PXS-V119B and V120B). Recirculation via PXS can succeed via any one of the four containment recirculation sub-paths. If in TS 3.5.7 or TS 3.5.8 Condition A, up to two sub-paths are potentially available through a check valve and squib valve (PXS-V119A and V120A or PXS-V119B and V120B). The described potential paths for containment recirculation are assessed by B-ADM-OPS-011 and the shutdown defense-in-depth tool.

The TS requirement for "one injection flow path" is a fully open isolation MOV and both parallel squib valves operable. For TS 3.5.7 or TS 3.5.8 not met, potential remains for capability of IRWST gravity injection via PXS. Entry into TS 3.5.7 or TS 3.5.8 Condition B does not represent a complete loss of capability for IRWST injection via PXS. Entry into Condition C or E may not represent a complete loss of capability for IRWST injection via PXS, as the other inoperable injection flow path may be capable of injection through the MOV and one squib valve. The described potential paths for IRWST gravity injection via PXS are assessed by procedure B-ADM-OPS-011, "Outage Risk Assessment Monitoring" and the shutdown defense-in-depth tool.

RAI Response 2b – In the shutdown defense-in-depth assessments, dependency of IRWST gravity injection on ADS is as follows:

- Credit for IRWST gravity injection via RNS includes dependency on ADS stages 2 & 3. Currently, the shutdown defense-in-depth tool's logic reflects the assumption that ADS stages 2 & 3 are open as required by TS 3.4.13. As part of the amendment implementation, a revision to B-ADM-OPS-011 and the shutdown defense-in-depth (DID) tool will explicitly add dependency on 3 out of 4 ADS stage 2 & 3 paths.
- Credit for IRWST gravity injection via PXS includes dependency on two or more of the four ADS Stage 4 paths available to open and one open path must be on the non-pressurizer RCS loop.
- RAI response 2d describes forthcoming revisions to B-ADM-OPS-011 and to the shutdown DID software tool adding a dependency on ADS 4 paths for successful IRWST gravity injection via RNS. Also, RAI response 2d explains how overcounting is prevented, given that IRWST gravity injection via RNS and PXS are both dependent on ADS 4 paths.

In emergency operating procedure (EOP)-SDP-2, "Response to Loss of RNS During Shutdown," if RCS refill using CVS makeup is not successful, operators are directed to refill with IRWST injection using RNS pumps (Attachment 1) or with IRWST gravity injection via RNS (Attachment 2). In the shutdown defense-in-depth assessments, no credit is given in mode 5 or 6 for IRWST injection using RNS pumps (assumed unavailable/failed, hence the entry into EOP-SDP-2). In EOP-SDP-2, if RCS level is not adequate following IRWST gravity injection via RNS, the procedure directs actuation of IRWST gravity injection via PXS. Following actuation of IRWST gravity injection via PXS, monitoring is performed (prior to any automatic actuation) to determine if ADS stage 4 valves must be opened to provide additional RCS vent path.

With respect to dependency on ADS and potential overcounting, the shutdown defense-in-depth assessment procedure and tool currently credits for up to two PXS paths of IRWST gravity injection with availability of the required ADS stage 4 paths to open (success potentially requires ADS stage 4 actuation). Due to the shared dependency on ADS stage 4, for a case of less than the full complement of ADS stage 4 paths, overcounting could result; therefore, an amendment implementation revision to B-ADM-OPS-011 and to the shutdown DID software tool will reduce the maximum credit for IRWST gravity injection via PXS to one success path. Additionally, amendment implementation revisions to B-ADM-OPS-011 and to the shutdown DID software

tool will address confirmation of sufficient redundancy in available ADS stage 4 paths and containment recirculation paths to support simultaneous credit of IRWST gravity injection via PXS and RNS.

RAI Response 2c – From 5 hours to 12 hours after shutdown, two CVS pumps may be necessary to provide makeup; after 12 hours, one pump provides adequate makeup. For simplification, the shutdown defense assessment requires both pumps for all plant operating states.

RAI Response 2d – There is a need for ADS stage 4 for RNS gravity injection under some conditions. Therefore, amendment implementation revisions to B-ADM-OPS-011 and to the shutdown defense-in-depth (DID) software tool will add dependency on ADS stage 4 paths. The revision is described in detail below.

The amendment implementation revisions to B-ADM-OPS-011 and the shutdown defense-in-depth (DID) software tool resulting from the audit are as follows:

1. IRWST gravity injection:

    a. A change will limit maximum credit for IRWST gravity injection to one success path (previously two). This change prevents overcounting in the event redundancy does not exist in available ADS stage 4 paths or containment recirculation paths. (B-ADM-OPS-011 and shutdown DID software tool)

        i. In B-ADM-OPS-011, the revision is to be reflected as a change from “2” to “1” in the N column for IRWST gravity injection in both the Decay Heat Removal matrix in Figure 1 and the Inventory Control matrix in Figure 2.

        ii. Additionally, in B-ADM-OPS-011, the revision is to be reflected in a note associated with the Decay Heat Removal matrix in Figure 1 and the Inventory Control matrix in Figure 2. The note will state the following: Conservatively, IRWST gravity injection maximum credit is a single N due to potential for common dependency on ADS stage 4 paths or containment recirculation path.

    b. A change will enhance the description of explicit dependency on ADS stage 4 paths in POS I, II, III, IV, V, and VI. (B-ADM-OPS-011)

        i. In B-ADM-OPS-011, the revision is to be reflected in a note associated with the Decay Heat Removal matrix in Figure 1 and the Inventory Control matrix in Figure 2. The relevant portion of the note will state that IRWST gravity injection requires availability of ADS stage 4, specifically $\geq$ 2 out of 4 paths with $\geq$ 1 path on the non-pressurizer RCS loop in POS I to VI. The note will also state that ADS stage 4 is not required in POS VII.

    c. A change will describe explicit dependency on containment recirculation via at least one path in train A or train B. (B-ADM-OPS-011)

        i. In B-ADM-OPS-011, the revision is to be reflected in a note associated with the Decay Heat Removal matrix in Figure 1 and the Inventory Control matrix in Figure 2. The relevant portion of the note will state that IRWST

gravity injection requires availability of containment recirculation, specifically ≥1 out of 4 paths, and the note will list the possible paths (PXS-V117A and PXS-V118A, PXS-V119A and PXS-V120A, PXS-V117B and PXS-V118B, or PXS-V119B and PXS-V120B).

Note that IRWST gravity injection credit is assessed for decay heat removal and inventory control in POS I, II, III, IV, V, VI, and VII. Note that ADS paths are not required in POS VII because the reactor vessel head and upper internals are removed, which is consistent with TS.

2. RNS gravity injection:

   a. A change will add explicit dependency on ADS stage 2 & 3 paths and ADS stage 4 paths for POS IV. V, and VI. (B-ADM-OPS-011 and shutdown DID software tool)

      i. In B-ADM-OPS-011, the ADS stage 2 & 3 revision is to be reflected in a note associated with the Decay Heat Removal matrix in Figure 1 and the Inventory Control matrix in Figure 2. The relevant portion of the note will state that RNS gravity injection requires availability of ADS stages 2 & 3, specifically ≥3 out of 4 paths in POS IV, V, and VI. The note will also state that ADS stages 2 & 3 are not required in POS VII.

      ii. In B-ADM-OPS-011, the ADS stage 4 revision is to be reflected in a note associated with the Decay Heat Removal matrix in Figure 1 and the Inventory Control matrix in Figure 2. The relevant portion of the note will state that RNS gravity injection requires availability of ADS stage 4, specifically ≥2 out of 4 paths with ≥1 path on the non-pressurizer RCS loop in POS I to VI. The note will also state that ADS stage4 is not required in POS VII.

   b. A change will add explicit dependency on containment recirculation via at least one path in train B. (B-ADM-OPS-011 and shutdown DID software tool)

      In B-ADM-OPS-011, the amendment implementation revision is to be reflected in notes associated with the Decay Heat Removal matrix in Figure 1 and the Inventory Control matrix in Figure 2. The relevant portion of the note will state that RNS gravity injection requires availability of containment recirculation, specifically ≥1 out of 2 B train paths, and the note will list the possible paths (PXS-V117B and PXS-V118B or PXS-V119B and PXS-V120B).

   Note that RNS gravity injection credit is assessed for decay heat removal and inventory control in only POS IV, V, VI, and VII.

3. A change will evaluate available ADS stage 4 paths and containment recirculation paths to provide sufficient redundancy to support simultaneous credit of IRWST gravity injection and RNS gravity injection. (B-ADM-OPS-011 and shutdown DID software tool)

In B-ADM-OPS-011, the amendment implementation revision is to be reflected in a notes associated with the Decay Heat Removal matrix in Figure 1 and the Inventory Control matrix in Figure 2. The relevant additions to the notes will state the following:

a. In a case of three ADS stage 4 paths available with less than two paths on the non-pressurizer RCS loop, the assessment can only credit RNS gravity injection or IRWST gravity injection, not both.

b. In a case of two ADS stage 4 paths available with at least one path on the non-pressurizer RCS loop, the assessment can only credit RNS gravity injection or IRWST gravity injection, not both.

c. In a case of only one available containment recirculation path (zero paths in train A and only one path in train B), the assessment can only credit RNS gravity injection or IRWST gravity injection, not both.

4. The definition of “containment closure” is revised for consistency with NUMARC 91-06 as follows:

   The action to secure primary containment and its associated structures, systems, and components as a FUNCTIONAL barrier to fission product release under existing plant conditions. During shutdown conditions, it is necessary that containment closure is planned and can be achieved. The containment closure key safety function (KSF) includes assessment of the margin available in the time to implement the containment closure plan relative to the RCS time to boil.

REQUEST FOR ADDITIONAL INFORMATION (RAI) 3

[Revised Audit Question 15] ML25023A275, L-2025-LLA-0011. Section 2.3 of the LAR makes an argument to justify the change that may not accurately characterize the options operators would have in the situation with conflicting requirements in required actions. Specifically, the LAR states,

> "When "Immediately" is used as a Completion Time, the Required Action should be pursued without delay and in a controlled manner." Thus, actions taken contrary to this direction would not be allowed, i.e., actions taken to "exit the Applicability" that would necessitate a water level change that conflict with the Required Action.

Technical Specification (TS) Actions only apply when the plant is operating with the applicable mode. This is consistent with 10 CFR 50.36 which specifically requires a licensee to either shut down **or** follow any remedial action permitted by their TS when an LCO is not met. Based on the regulation, shutting down the reactor (or exiting the applicable mode) should always be an option. Vogtle, Units 3 and 4, LCO 3.0.2 states:

> Upon discovery of a failure to meet an LCO, the Required Actions of the associated Conditions shall be met, except as provided in LCO 3.0.5 and 3.0.6.
>
> **If the LCO** is met, or **is no longer applicable** prior to expiration of the specified Completion Time(s), **completion of the Required Action(s) is not required**, unless otherwise stated. [**Emphasis added**]

This is further supported by the Vogtle, Units 3 and 4, Bases for LCO 3.0.2 which state, "**Completing the Required Actions is not required when an LCO** is met, **or is no longer applicable**, unless otherwise stated in the individual Specifications." [**Emphasis added**]

a. Please explain whether the intent of the above statement from Section 3.2 of the LAR is stating that in the example case provided in the LAR, the licensee does not believe that exiting the Applicability is an option or if they believe that any time the plant is in a Condition with a specified immediate action, operators are prevented from exiting the Applicability.

b. If, as stated in the LAR, a Completion Time of "Immediately" prevents operator from taking any other action than the specified Required Action, doesn't the portions of the proposed change to revise the Required Actions to "Initiate action to restore [compliance with the LCO]" with an "Immediately" Completion Time result in the same problem? The only choice would be to restore compliance with the specified LCO. Section 3.0 of the LAR states that exiting the Applicability would be an option with the proposed structure, but exiting the Applicability does not restore compliance. It places the plant in a mode where compliance is not required. The LCO would still not be met. If exiting the Applicability is acceptable with the proposed revision, then why isn't it acceptable with current technical specification requirements. The NRC notes that the licensee is obligated to enter all applicable LCOs concurrently along with Required Actions and Completion Times for each associated LCO Condition.

   For example, LCO 3.5.3, "CMTs - Shutdown, RCS Intact," Action E could be entered in Mode 5 with the RCS intact after failure to restore the inoperable CMT to operable status within 72 hours. In this case, the current requirement is to exit the applicability by venting the RCS. The current action seems appropriate if the IRWST is operable. Under the proposed change, the operator would "E.1 Initiate Action to be in MODE 5," (which would already be complete in this case) "AND E.2 Initiate action to restore required CMT to

> OPERABLE status." The proposed addition of Action E.2 tells the operator to keep trying to restore after they have already been unable to do so for 72 hours. Would the operator (based on the discussion in Section 2.3 of the LAR) be prevented from venting the RCS to exit the Applicability in this case?

RAI Response 3a – The LAR (ML25023A275), Section 2.3 ("Reason for the Proposed Change") [*incorrectly cited in one place in Item 3 as "3.2"*] was attempting to describe an example (i.e., "in some cases") of a situation where complying with a required action would not be consistent with activities supporting a transition between Mode 5 and Mode 6. In order to place and tension, or detension and remove, the reactor vessel head (i.e., transition from Mode 5 to Mode 6, or from Mode 6 to Mode 5), water level must be below the reactor vessel flange. In cases where the Applicability is all of Mode 5 or all of Mode 6 (e.g., TS 3.5.7 or TS 3.5.8, respectively) and the actions require increasing level well above the reactor vessel flange (note that 20% pressurizer level is approximately 23.5 feet above the reactor vessel flange), complying with that action will not be consistent with activities supporting the ability to place and tension, or detension and remove, the reactor vessel head and exit the Applicability of Mode 5 or the Applicability of Mode 6. The activity to place and tension, or the activity to detension and remove, the reactor vessel head (i.e., transition from Mode 5 to Mode 6, or from Mode 6 to Mode 5, which would exit the Applicability) is not considered an action to "shut down the reactor" in accordance with 10 CFR 50.36, and therefore would not provide explicit direction for this situation.

As discussed further in RAI response 3b below, exiting the Applicability would be allowed irrespective of having an "immediately" Completion Time, except when the Required Action with this "immediately" Completion Time is such that it could not be safety accomplished in order to exit the Applicability. The example being discussed for the Mode 5 and/or Mode 6 exit are actions that would not be consistent with activities supporting exiting the Applicability.

RAI Response 3b - The LAR discussions of "Immediately" are not intended to convey that they are preventing any other action. The discussion from LAR Section 2.3 (ML25023A275) ("Reason for the Proposed Change"), as discussed in RAI response 3a above, is addressing the Required Action that is not consistent with safe practices to exit the Applicability. The RAI 3 quote of the LAR discussion as repeated below (with emphasis added):

> "When "Immediately" is used as a Completion Time, **the Required Action should be pursued without delay** and in a controlled manner." Thus, actions taken contrary to ***this direction*** would not be allowed, i.e., actions taken to "exit the Applicability" that would necessitate a water level change that conflict with the Required Action."

The "***this direction***" is referring to "**the Required Action should be pursued without delay**" and not to "Immediately." The Required Action to increase level well above the reactor vessel flange is the "direction" that would not allow maintaining level below the flange if a transition between Modes (i.e., exiting the Applicability) was desired. Any delay in increasing level could be viewed as contrary to the requirement to take immediate action to comply with the TS Required Action.

The RAI continues with an example citing TS 3.5.3, "CMT - Shutdown, RCS Intact," and questions whether the operator "(based on the discussion in LAR Section 2.3)" would be prevented from venting and exiting the Applicability for TS 3.5.3. Note that LAR Section 2.3 presents some of the "reasons for the proposed change" and does not attempt to present the applicable corrective actions or justifications for the requested change. However, as

described in the LAR Section 3.0, Technical Evaluation, “Removing the prescriptive requirement to exit the Applicability does not change the option to exit the Applicability.” If the operators evaluation of the plant status and ongoing activities determine the appropriate course of action to achieve compliance with 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, that requires the nonconformance be “promptly identified and corrected” is to vent the RCS, then that course of action is appropriate.

This RAI also states: “exiting the Applicability does not restore compliance.” In accordance with LCO 3.0.1 and LCO 3.0.2, TS “compliance” is not challenged when the TS LCO is not Applicable. Exiting the Applicability is a well understood means of removing the TS non-compliance with an inoperable condition (i.e., exiting the condition of “failing to meet the LCO”).

REQUEST FOR ADDITIONAL INFORMATION (RAI) 4

[Revised Audit Question 21] ML25023A275, L-2025-LLA-0011. The default actions proposed for revision in the LAR, in some cases, can only be entered after having already failed to restore operability (or compliance with the LCO) for a period of time. The default actions in these cases are proposed to be revised to state “initiate action to” restore operability or compliance with the LCO. Why are the words “initiate action to” necessary? The action to restore would have already been started in response to the previous Required Actions. Why wouldn’t it be more appropriate to state restore operability or compliance with an immediate CT? For instance, LCO 3.5.3 provides at least 8 hours (and as much as 72 hours) to restore the required CMT to operable status prior to entry into Condition E. Condition E cannot be entered without having failed to restore operability in accordance with Required Actions A.1, B.1 and D.1.

As stated in Section 1.3 of the Vogtle, Units 3 and 4, TS, “[w]hen ‘Immediately’ is used as a Completion Time, the Required Action should be pursued without delay and in a controlled manner.” “Initiate action to” makes sense when the default Condition can be entered directly. But if the default Condition can only be entered after having time to restore compliance with the LCO, it’s unclear as to why the words are necessary.

RAI Response 4

The presentation format provided in the LAR for Conditions with a Completion Time of “Immediately” is consistent with the “Writer’s Guide for Plant-Specific Improved Technical Specifications (ML25023A275),” TSTF-GG-05-01, subsection 4.1.6.j, which was only partially quoted in the question. The full Writer’s Guide guidance states:

> It is desired to accomplish an action without delay (given the potential surrounding circumstances), but the time necessary to complete the action may vary widely based on a number of unknowns, it may be inappropriate to require the completion of the action within a specific time. In this case the acceptable presentation is for the Required Action to state "Initiate action to...," and state its Completion Time as "Immediately."

A review identified no occurrence of a formatted Action in the Standard TS NUREGs (NUREG-1430, NUREG-1431, NUREG-1432, NUREG-1433 and NUREG-1434) that provides a presentation of “Restore ... Immediately” (i.e., without the “initiate action to” preceding the restore activity).

Additionally, in the vast majority of the instances where the Actions provide for “Initiate action to restore...” the associated Condition would be entered after having had time to restore compliance with the LCO and efforts to restore would be a natural course of action for failures to meet an LCO. The use of “Initiate action” does not necessarily convey that no prior efforts to restore were being made.

REQUEST FOR ADDITIONAL INFORMATION (RAI) 5

[Revised Audit Question 23] ML25023A275, L-2025-LLA-0011. There are multiple examples in the Vogtle 3 & 4 shutdown actions LAR where a potential conflict is identified with the LCOs for TS 3.6.7, “Containment Penetrations.” Numerous LCOs require the opening of a containment air flow path ≥ 6 inches, the containment equipment hatch, or the containment airlock while LCO 3.6.7 requires the capability of closing the containment prior to steaming (e.g., loss of decay heat removal that would lead to steaming in containment). The staff need to understand what guidance on opening a containment air flow path ≥ 6 inches the operators have during shutdown operations to ensure that there are appropriate restrictions on dominant risk significant configurations and determine if the defense-in-depth assessment can inform any operator action in the absence of a prescriptive LCO action.

a. How does the defense-in-depth assessment performed in accordance with NUMARC 91-06 and B-ADM-OPS-011, “Outage Risk Assessment Monitoring,” evaluate the need to create an opening of a containment air flow path? As part of the response, discuss any potential impacts to the key safety functions, including containment closure.

b. If the defense-in-depth assessment does not evaluate the need to create an opening of a containment air flow path, identify the procedures or guidance that directs operators or informs them of the need to assess opening a containment air flow path, or justify why the defense-in-depth assessment does not evaluate the need to create an opening of a containment air flow path.

RAI Response 5a – As noted in the LAR (ML25023A275) Section 3, Technical Evaluation, “Removing the prescriptive requirement to exit the Applicability does not change the option to exit the Applicability when appropriate and restore compliance.” This is addressed in the procedures.

Procedure 3/4-CNS-OTS-10-004, “Containment Penetration Verification in Modes 5 and 6,” is performed every seven days to verify Containment penetrations are in the required status and documents any open penetrations.

Procedure B-ADM-OPS-011 does not evaluate the need to open a containment vent path. KSF 6, Containment Closure, determines that containment can be closed in time to prevent a fission product release only.

RAI Response 5b – Alarm Response Procedures 3/4-PCS-ARP-001-058, “Low 1 CTMT Press Median,” and 3/4-PCS-ARP-001-059, “Low 2 CTMT Press Median,” provide guidance to operators in the case of low Containment pressure alarms. The Low 1 alarm setpoint is 0.1 psig and the Low 2 setpoint is -0.8 psig (which is also the CTMT Vacuum Relief setpoint).

Procedure 3/4-PCS-ARP-001-058, “Low 1 CTMT Press Median,” directs operators to restore Containment pressure with Containment Purge using normal operating procedures. 3/4-PCS-ARP-001-059, “Low 2 CTMT Press Median,” directs operators to ensure the Containment Vacuum Relief actuates. Both Alarm Response Procedures direct operators to return to any Emergency Operating Procedure in effect as the Emergency Operating Procedure network will ensure Engineered Safety Feature actuations occur.

Per the Bases for TS 3.6.9, Vacuum Relief Valves, the bounding analyses for the Containment Relief function is for loss of AC power combined with low temperature ambient air because of the lack of ability heat Containment via the Containment Cooling and Plant Hot Water Systems or lack of the ability to raise Containment pressure with Containment Purge. In the case of loss of AC power, operators will perform 3/4-AOP-302, “Loss of AC Power to restore power.”

REQUEST FOR ADDITIONAL INFORMATION (RAI) 6

[Revised Audit Question 24] ML25023A275, L-2025-LLA-0011. There are multiple examples within the Vogtle 3 & 4 shutdown actions LAR where it states that events requiring actuation of ADS stage 1, 2, and 3 or ADS stage 4 do not assume a minimum reactor coolant system (RCS) water level. The staff need to understand what guidance on RCS level and plant configuration the operators have during shutdown operations to ensure that there are appropriate restrictions on dominant risk significant configurations and determine if the defense-in-depth assessment can inform any operator action in the absence of a prescriptive LCO action.

a. How does RCS level impact the defense-in-depth assessment performed in accordance with NUMARC 91-06 and B-ADM-OPS-011? As part of the response, discuss any potential impacts to the key safety functions, including inventory control, containment closure, and decay heat removal.

b. How is a 20% pressurizer water level (or any comparable level) in the pressurizer credited in the defense-in-depth assessment performed in accordance with NUMARC 91-06 and B-ADM-OPS-011? As part of the response, discuss any potential impacts to the key safety functions, including inventory control, containment closure, and decay heat removal.

RAI Response 6 - During a shutdown to Mode 5 with the RCS not intact, the required ADS stages 1, 2, and 3 flow paths are opened to meet TS 3.4.13 prior to draining the RCS below narrow range pressurizer level of 20%. Since the RCS level is at or above narrow range pressurizer level of 20% while the RCS is intact (except during vacuum fill as described below), the precise RCS level has no impact on the shutdown defense-in-depth assessment during Mode 5 with the RCS not intact.

During a return to power operation, when in Mode 5 with the RCS not intact, RCS level is drained to mid-loop level for the start of vacuum refill (and SG nozzle dam removal, as applicable). The RCS pressure boundary is then established intact for the start of RCS vacuum refill. For this configuration, RCS level impacts the defense-in-depth assessment of decay heat removal. The PRHR HX and SGS cooling are not credited for decay heat removal until completion of the RCS vacuum refill, which results in an RCS level of approximately 35% narrow range level in the pressurizer. Inventory control is not impacted by RCS level because although there is a period when RCS level is below 16% in the pressurizer (P-12) and automatic CMT actuation is blocked, operators can manually initiate CMT actuation.

RAI Response 6a specific – RCS level impacts the B-ADM-OPS-011 assessment as an input to evaluating Plant Operating States (POS). For example, the transition into POS IV and V is in part defined by RCS level being lowered from the Pressurizer Narrow Range to just below the Reactor Vessel Flange (POS IV) and into the Hot Leg range for Mid-Loop operations (POS V). The POS determines the appropriate flow chart in B-ADM-OPS-011 with which to evaluate each key safety function. For the containment closure function, RCS level is a major input to the time-to-boil calculation with lower levels resulting in shorter time-to-boil. In B-ADM-OPS-011 the containment closure defense-in-depth (DID) is evaluated by the ratio of Containment closure time to the calculated time-to-boil. System response and recovery strategies are impacted by RCS level as follows. Once pressurizer level is < 16% (P-12), this permits manual block of CMT actuation on PZR low-2, and Auxiliary Spray

Purification line isolation (PZR low level) coincident with manual blocking of CMT and auxiliary spray and purification line isolation initiated by PZR level low. P-12 also unblocks hot leg level low-4 - IRWST injection and ADS fourth stage actuation (for mid-loop operation). This will also automatically unblock CVS letdown isolation on hot leg Level Low-2 (for mid-loop). P-12 allows blocking of actuation on lower pressurizer level to allow RCS drain down for mid-loop operations. This swaps the Low-Pressure Safety Injection from CMT level to Hot Leg level. P-12 also permits opening of IRWST isolation valve to RNS suction (RNS-V023) while RNS hot leg suction valves are open to allow gravity backfill to RCS.

RAI Response 6b specific – B-ADM-OPS-011 does not specifically evaluate for 20% pressurizer level. A pressurizer level of 20% and lower impacts the Applicability of multiple Technical Specification functions as event response strategies change from use of PRHR to IRWST injection. B-ADM-OPS-011 evaluates this same change in key safety function strategy by not crediting the PRHR Hx after exiting POS III (Mode 5 RCS Intact). The system design to accomplish this that when lowering RCS level below 20% Pressurizer level the P-12 (16% PZR level) interlock will be reached. The P-12 interlock allow operators to block low Pressurizer level actuations and then to drain to mid-loop without actuation of the CMTs. Inserting the P-12 blocks will also swap the Low-Pressure Safety Injection from CMT level to low Hot Leg Level.

In EOP-SDP-2, “Response to Loss of RNS During Shutdown,” if RCS refill using CVS makeup is not successful, operators are directed to refill with IRWST injection using RNS pumps (EOP-SDP-2, Attachment 1) or with IRWST gravity injection via RNS (EOP-SDP-2, Attachment 2). In the shutdown defense-in-depth assessments, no credit is given in Mode 5 or 6 for IRWST injection using RNS pumps (assumed unavailable/failed, hence the entry into EOP-SDP-2). In EOP-SDP-2, if RCS level is not adequate following IRWST gravity injection via RNS, the procedure directs actuation of IRWST gravity injection via PXS. Following actuation of IRWST gravity injection via PXS, monitoring is performed to determine if ADS stage 4 valves should be manually opened to provide additional RCS vent path prior to reaching the automatic setpoint.

REQUEST FOR ADDITIONAL INFORMATION (RAI) 7

[Revised Audit Question 25] ML25023A275, L-2025-LLA-0011. There are multiple examples within the Vogtle 3 & 4 shutdown actions LAR where it states that once the RCS is vented, the complement of safety systems available to respond to an event is reduced.

How are the RCS vented and RCS pressure boundary intact states credited in the defense-in-depth assessment performed in accordance with NUMARC 91-06 and B-ADM-OPS-011? As part of the response, discuss any potential impacts to the key safety functions).

RAI Response 7 - The “state” is not “credited” but the systems required operable by TS (and therefore credited in the DID assessment) differ if the RCS is not intact. With RCS not intact the CMTs and the PRHR are not required to be operable.

Two examples that are detailed in B-ADM-OPS-011 are provided below.

Decay Heat Removal

- POS I – III – the RCS is intact and for Decay Heat Removal focus on Feedwater, PRHR, RNS (when less than 350F) and IRWST injection.
- POS IV and higher the RCS is Open (vented) – for DHR focus on RNS cooling, RNS gravity injection (when less than P-12) and IRWST gravity injection.

Inventory Control

- POS I-III consider CVS makeup, CMT availability, RNS availability not intact. With RCS not intact the CMTs and the PRHR are not required to take suction from IRWST, and IRWST gravity drain (with successful ADS-4 actuation) be operable.
- POS IV and higher (RCS open) focus on CVS makeup RNS gravity injection (<P-12) and IRWST gravity drain (with successful ADS-4 actuation).

For information, the referenced Plant Operating State (POS) definitions are provided below.

- POS I – Mode 4 with decay heat removal via steam generator cooling, RCS intact, RCS temperature 420°F to 350°F, RCS pressure >400 psig, RCS level at pressurizer midscale
- POS II – MODE 4 with decay heat removal via RNS, RCS intact, RCS temperature 350°F to 200°F, RCS pressure >400 psig, RCS level at pressurizer midscale
- POS III – Mode 5, RCS intact, RCS temperature 200°F to 100°F, RCS pressure <400 psig, RCS level between hot leg midscale and pressurizer full
- POS IV – Mode 5, RCS not intact, RCS temperature ~100°F, RCS pressure at atmospheric, RCS level between ~1 foot below reactor vessel flange and pressurizer

midscale

- POS V – Mode 5 or 6, RCS not intact, RCS temperature ~100°F, RCS pressure at atmospheric, RCS level between hot leg midscale and ~1 foot below reactor vessel flange

- POS VI – Mode 6, RCS not intact, RCS temperature ~100°F, RCS pressure at atmospheric, upper internals installed, RCS level between ~1 foot below reactor vessel flange to refueling cavity full

- POS VII - Mode 6, RCS not intact, reactor vessel head removed and upper internals removed, RCS temperature ~100°F, RCS pressure at atmospheric, RCS level at refueling cavity full

REQUEST FOR ADDITIONAL INFORMATION (RAI) 8

[Revised Audit Question 26] ML25023A275, L-2025-LLA-0011. There are multiple examples within the Vogtle 3 & 4 shutdown actions LAR where it states that the removal of the upper internals would preclude normal outage progression to proceed to mode 5 with the reactor vessel head on, which also precludes establishing an additional fission product barrier. Based on audit responses, the staff agree that plant configurations in mode 6 with the upper internals installed should be evaluated as drained conditions, which have the highest risk, since the RCS inventory may not communicate with the volume in the refueling cavity for decay heat removal.

How is the removal of the upper internals credited in the defense-in-depth assessment performed in accordance with NUMARC 91-06 and B-ADM-OPS-011? As part of the response, discuss any potential impacts to the key safety functions.

RAI Response 8 - Removal of the upper internals is credited in the defense-in-depth assessments as follows:

- Decay heat removal – RCS level and upper internals status impact credit for cooling of the RCS by up to one train of spent fuel pool cooling. POS VII addresses operations with the refueling cavity filled and the upper internals removed. POS VII is the only operating state in which up to one train of spent fuel pool cooling is credited.
- Inventory control – RCS level and upper internals status impact credit for the volume in the refueling cavity. POS VII addresses operations with the refueling cavity filled and the upper internals removed. POS VII is the only operating state that credits refueling cavity volume.
- ADS stage 4 – With the upper internals removed (POS VII), ADS stage 4 is not required for success of either RNS gravity injection or IRWST gravity injection.

REQUEST FOR ADDITIONAL INFORMATION (RAI) 9

[Revised Audit Question 27] ML25023A275, L-2025-LLA-0011. There are multiple examples within the Vogtle 3 & 4 shutdown actions LAR where mode 6 LCO actions to initiate action to establish water level ≥ 23 feet above the top of the reactor vessel flange are eliminated. The staff need to understand what guidance on RCS level and plant configuration the operators have during shutdown operations to ensure that there are appropriate restrictions on dominant risk significant configurations and determine if the defense-in-depth assessment can inform any operator action in the absence of a prescriptive LCO action.

a. How does refueling cavity water level impact the defense-in-depth assessment performed in accordance with NUMARC 91-06 and B-ADM-OPS-011? As part of the response, discuss any potential impacts to the key safety functions including inventory control, containment closure, and decay heat removal.

b. How is a 23 foot level (or any comparable level) in the refueling cavity credited in the defense in depth assessment performed in accordance with NUMARC 91-06 and B-ADM-OPS-011? As part of the response, discuss any potential impacts to the key safety functions, including inventory control, containment closure, and decay heat removal.

RAI Response 9a - For the RCS not intact, RCS level impacts the defense-in-depth assessments performed in accordance with 10 CFR 50.65(a)(4) as follows:

- Containment closure – RCS level is accounted for in the RCS time to boil calculations. The RCS time to boil impacts the assessment of the containment closure key safety function when the RCS is not intact and containment is open. Refer to B-ADM-OPS-011 Figure 6. For the RCS not intact and containment open, the assessment evaluates the ratio of the expected containment closure time to the RCS time to boil.
- Decay heat removal – RCS level and upper internals status impact credit for cooling of the RCS by up to one train of spent fuel pool cooling. POS VII addresses operations with the refueling cavity filled and the upper internals removed. POS VII is the only operating state in which up to one train of spent fuel pool cooling is credited.
- Inventory control – RCS level and upper internals status impact credit for the volume in the refueling cavity. POS VII addresses operations with the refueling cavity filled and the upper internals removed. POS VII is the only operating state that credits refueling cavity volume.

RAI Response 9b - A 23-foot level in the refueling cavity is not specifically credited in the shutdown defense in depth assessment. Refueling cavity level impacts the defense-in-depth assessments as discussed in RAI response 6a.

REQUEST FOR ADDITIONAL INFORMATION (RAI) 10

[Revised Audit Question 28] ML25023A275, L-2025-LLA-0011. On page E-20 of the Vogtle 3 & 4 shutdown actions LAR, the following statement is made with respect to TS 3.3.9, Function 7, "ADS Stage 4 Actuation – Manual Initiation," Actions H & I: "Once the RCS is vented (i.e., the first portion of Required Action H.2) the remaining requirement to establish ≥ 20% pressurizer level is not required to be completed since the Applicability would be exited."

To exit the mode of applicability (mode 5) for this function and action (H.2), operators would need to take the plant to either mode 4 or mode 6. Vented is defined in the Vogtle 3 & 4 TS as a "condition when all required flow paths in ADS stage 1, 2, and 3, or alternative flow path with equivalent area…" Mode 4 and mode 6, as defined in section 1.1 of the Vogtle 3 & 4 TS, do not require the RCS to be vented.

How does the act of taking the RCS to a vented status affect the requirement to establish a level in the pressurizer?

RAI Response 10 – The following paragraph on page E-20 of the Vogtle 3 & 4 shutdown actions LAR (ML25023A275), includes statements that are unnecessary, and are proposed to be deleted as shown.

"Once the RCS is VENTED (i.e., the first portion of Required Action H.2) the remaining requirement to establish ~ 20% pressurizer level is not required to be completed since the Applicability would be exited. As such, removing the requirement to establish level is an administrative change. Without (or prior to) exiting the Applicability, establishing pressurizer water level ~ 20% is well above the level of reactor vessel flange thereby precluding activities necessary to remove the reactor vessel head and proceed to MODE 6. Additionally, since events requiring actuation of ADS valves do not assume a minimum RCS water level, the MODE 5 Required Action H.2 requirement to establish ~ 20% pressurizer level is not necessary to put the plant within the assumptions of the safety analysis. Safe plant operation can be maintained without the requirement to establish a specific water level. Consequently, there is no adverse impact to safe plant operation in eliminating Required Action H.2."

The paragraph is proposed to be revised to remove the beginning sentences, to read as shown.

"Since events requiring actuation of ADS valves do not assume a minimum RCS water level, the MODE 5 Required Action H.2 requirement to establish ~ 20% pressurizer level is not necessary to put the plant within the assumptions of the safety analysis. Safe plant operation can be maintained without the requirement to establish a specific water level. Consequently, there is no adverse impact to safe plant operation in eliminating Required Action H.2."

REQUEST FOR ADDITIONAL INFORMATION (RAI) 11

[Revised Audit Question 31] ML25023A275, L-2025-LLA-0011. As part of the Vogtle 3 & 4 shutdown actions LAR, an elimination of RCS level requirements has been requested as part of proposed changes to TS 3.6.7, “Containment Penetrations.” The proposed changes impact TS 3.6.7 required actions B.1.1 and B.1.2, which are only entered if it is found that a containment penetration cannot be closed prior to steaming in containment and the penetrations cannot be restored in one hour (action A.1). The staff need to understand what guidance on RCS level and plant configuration the operators have during shutdown operations to ensure that there are appropriate restrictions on dominant risk significant configurations and determine if the defense in depth assessment can inform any operator action in the absence of a prescriptive LCO action.

a. An entry into required actions B.1.1 and B.1.2 of TS 3.6.7 represents a loss of the containment closure safety function, which is a significant loss of defense in depth and a loss of a fission product barrier. What guidance and restrictions are there on entering dominant risk significant configurations when there is an inability to maintain containment closure?

b. For a complete loss of the containment closure safety function, how would changes to the time to boil based on changes to RCS level impact the defense-in-depth assessment performed in accordance with NUMARC 91-06 and B-ADM-OPS-011?

c. For a complete loss of containment closure safety function, how would changes to the other key safety functions of the defense-in-depth assessment inform any operator decision on plant configuration in the absence of a prescriptive LCO action?

d. If the defense-in-depth assessment does not inform operator action for a complete loss of the containment closure safety function, are there any procedurally-driven processes or actions that would inform any operator decision on plant configuration in the absence of a prescriptive LCO action?

RAI Response 11 – With regard to the statement “entry into required actions B.1.1 and B.1.2 of TS 3.6.7 represents a loss of the containment closure safety function,” it is noted that those Actions apply when containment closure time exceeds time to boil (i.e., inability to close containment prior to inventory loss that may have adversely impact the safety analysis). Closure “prior to steaming” is a conservative indication of forthcoming inventory loss if containment is not closed. The condition does not necessarily reflect a complete inability to close containment. However, in the extreme, there could be an inability to close containment and the following provides discussion assuming this case.

On approval of the requested amendment, additional procedural administrative controls will be implemented to provide guidance in the event containment closure is not able to be accomplished prior to steaming. The guidance will include consideration of increasing RCS inventory to increase time to boil (and potentially restore compliance with the LCO). Additional guidance may consider possible core offloading to reduce time to boil while continuing efforts to effect containment closure.

Specifically, B-ADM-OPS-011 KSF-6 will be revised to include actions for the operators to increase RCS inventory therefore raising the “Ratio of closure time to RCS boil” in the event an ORANGE or RED path is identified.

The two methods of adding inventory, besides the normal RCS makeup, are the CVS and gravity injection from the IRWST to the RCS via the RNS hot leg suction isolations.

UFSAR Subsection 6.3.3.4.3, Loss of Normal Residual Heat Removal Cooling During Reduced Inventory, identifies that it is normal practice to open the steam generator channel head manway covers to install the hot leg and cold leg nozzle dams during a refueling outage.

REQUEST FOR ADDITIONAL INFORMATION (RAI) 12

[Revised Audit Question 34] ML25023A275, L-2025-LLA-0011. GL 88-17 in conjunction with NUMARC 91-06 were found to reduce risk significantly enough that a proposed rule on shutdown and low-power operations for nuclear power reactors was found to be unnecessary. GL 88-17 has numerous recommendations, particularly with respect to operating in a reduced inventory condition. The staff need to understand what guidance on RCS level and plant configuration the operators have during shutdown operations to ensure that there are appropriate restrictions on dominant risk significant configurations and determine if the recommended actions of GL 88-17 are being implemented at Vogtle 3 & 4.

a. Expeditious action 2 in the Recommended Actions attachment to GL 88-17 recommends that plants “Implement procedures and administration controls that reasonably assure that containment closure will be achieved prior to the time at which a core uncovery could result… These procedures and administrative controls should be active and in use: (a) prior to entering a reduced inventory condition for NSSSs supplied by Combustion Engineering or Westinghouse… and should apply whenever operating in those conditions.” Regarding closure before steaming inside containment, GL 88-17 also states, "The 200 F temperature identified above provides assurance that containment is closed prior to the existence of such conditions.”

   If a complete loss of the containment closure safety function were to occur (such as when LCO 3.6.7 is entered), what guidance is provided to operators to implement the above referenced expeditious action 2 from GL 88-17?

b. Expeditious action 6 in the Recommended Actions attachment to GL 88-17 recommends that “Prior to operating in a reduced inventory condition… provide at least two available or operable means of adding inventory to the RCS that are in addition to pumps that are a part of the normal DHR systems.” NUMARC 91-06 guidance states that “Prior to entering a reduced inventory condition, equipment requirements that provide or support key safety functions should be verified.”

   Is the operability or availability of two means of adding inventory to the RCS verified before entering reduced inventory operation? As part of the response describe how ADS stage 4 is verified prior to entering reduced inventory operation or provide a justification if it is not verified.

c. Expeditious action 7 in the Recommended Actions attachment to GL 88-17 recommends that “Prior to operating in a reduced inventory condition… Implement procedure and administrative controls that reasonably assure that all hot legs are not blocked simultaneously by nozzle dams unless a vent path is provided that is large enough to prevent pressurization of the upper plenum of the reactor vessel.

   What procedures and administrative controls does Vogtle 3 & 4 have to implement 88-17 expeditious action 7?

RAI Response 12 – Operator actions (administrative controls and procedures) are identified in UFSAR Subsection 1.9.5.1.4, Midloop Operation, (last 2 paragraphs) and UFSAR Subsection 5.4.7.2.1, Design Features Addressing Shutdown and Mid-Loop Operations, (last paragraph).

> “Administrative controls require containment closure capability in modes 5 and 6, during reduced inventory operations, and when the upper internals are in place. Containment closure capability is defined as the capability to close the containment prior to core

> uncovery following a loss of the normal decay heat removal system (that is, normal residual heat removal system). The containment design also includes penetrations for temporary cables and hoses needed for shutdown operations. These penetrations are isolated in an emergency.
>
> In addition to these design features, appropriate procedures are defined to guide and direct the operator in the proper conduct of midloop operation and to aid in identifying and correcting abnormal conditions that might occur during shutdown operations."

and

> "Procedures direct the operator in the proper conduct of midloop operation and aid in identifying and correcting abnormal conditions that might occur during shutdown operations."

As noted in RAI response 11, on approval of the requested amendment, additional procedural administrative controls will be implemented to provide guidance in the event containment closure is not able to be accomplished prior to steaming. The guidance will include consideration of increasing RCS inventory to increase time to boil (and potentially restore compliance with the LCO). Additional guidance may consider possible core offloading to reduce time to boil while continuing efforts to effect containment closure.

RAI Response 12a specific - 3/4-EOP-SDF-0, Shutdown Critical Safety Function Status Trees, is entered when the plant is in Mode 5 and 6. EOP-SDF-0 provides entry conditions to procedures 3/4-EOP-SDP-1 through 6. 3/4-EOP-SDP-1, Response to Loss of RCS Inventory during Shutdown, 3/4-EOP-SDP-2, Response to Loss of RNS During Shutdown, and 3/4-EOP-SDP-3 Response to Hight Containment Radiation during Shutdown, have steps to evacuate and establish containment closure per 3/4-CNS-SOP-001.

RAI Response 12b specific - Normal RCS makeup is provided from the CVS. During mid-loop conditions CVS-V091 is closed and makeup is limited to 50 gpm, however if necessary 3/4-EOP-SDP-1 provides guidance to operators to open CVS-V090 to allow for one CVS makeup pump to provide a maximum of 100 gpm, or two CVS makeup pumps for 175 gpm. A second method of providing RCS makeup is gravity injection from the IRWST to the RCS via the RNS hot leg suction isolations, via RNS-V023. This guidance is provided to the operators in 3/4-EOP-SDP-1, Response to Loss of RCS Inventory During Shutdown.

In addition, 3/4-GOP-301-006 and -07 are the mode change check lists for entering mode 6 and core alterations and are completed prior to entering mode 6, and prior to performing core alterations. The following surveillance per TS 3.4.11 OPERABLITY for ADS-4.

- SR 3.4.11.1 (3/4-GEN-OTS-17-002) verifies the MOV in series with each 4th stage ADS valve is OPEN every 12 hours.
- SR 3.4.11.3 (3/4-PMS-OTS-17-156) verifies each stage 4 ADS valve is OPERABLE in accordance with the Inservice testing program.
- SR 3.4.11.5 (3/4-RCS-RCS-17-005) verifies continuity of the circuit from the Protection Logic Cabinets to each stage 4 ADS valve every 24 months.

RAI Response 12c specific - Per the UFSAR subsection 1.9.5.1.4, Midloop Operation, the Automatic depressurization system first, second, and third stage valves, connected to the top of the Pressurizer, are open whenever the core makeup tanks are blocked during shutdown conditions while the reactor vessel upper internals are in place. This provides a vent flow path that, when combined with actuation of the automatic depressurization system fourth stage valves, sufficient steam venting area is provided to reduce reactor coolant system pressure. Actuation of ADS stage 4, either automatically or manually allows the in-containment water storage tank to provide injection flow following a loss of decay heat removal.

3/4-GOP-206, Cold Shutdown to Refueling Mode 5 to Mode 6, directs lowering RCS level when RCS temperature is less than 135F, transitioning to 3/4-GOP-102, Draining the Reactor Coolant System. 3/4-GOP-102 directs opening of ADS stages 1-3 dependent on time the reactor has been subcritical, < 28 hours at least 5 ADS stage 1, 2, and 3 flowpaths are OPEN, with ALL ADS stage 4 flowpaths OPERABLE. If Reactor subcritical time is ≥ 28 hrs then at least 3 ADS stage 1, 2, and 3 flowpaths are OPEN (can only take credit for 1 ADS stage 1 flowpath, with at least 2 ADS stage 2 or 3 flowpaths OPEN, and 3 ADS stage 4 flowpaths OPERABLE. This step also satisfies TS 3.4.13.

When Pressurizer level is less than 16% and P-12 is on, CMT actuation on Low-2 Pressurizer level is blocked. The Hot Leg Level Low-4 Engineered Safety Feature Actuation System Functions (ADS-4 auto actuation, RNS isolation, and Containment Isolation) at 9.7% level is active and required to be OPERABLE.

In 3/4-EOP-SDF-0, Shutdown Critical Safety Function Status Trees, is used for monitoring while in Mode 5 and 6, and 3/4-EOP-SDP-1, Response to Loss of RCS Inventory During Shutdown, is used if RCS level lowers uncontrollably.