

Vogle PEmails

From: Hoellman, Jordan
Sent: Tuesday, October 16, 2018 3:36 PM
To: Sparkman, Wesley A.
Cc: Chamberlain, Amy Christine (ACCHAMBE@southernco.com); Patel, Chandu; Harbuck, Craig; Tjader, Theodore; Le, Hien; Vogtle PEmails
Subject: Draft RAI Related to Vogtle Units 3 and 4 LAR 18-017, TS Changes for Spent Fuel Pool Level - Low 2 and IRWST Wide Range Level - Low Operability
Attachments: Draft RAI No. 1 - LAR 18-017.pdf

Good Afternoon,

Attached is a draft Request for Additional Information (RAI) related to Vogtle Units 3 and 4 LAR 18-017 regarding Technical Specification Changes for Spent Fuel Pool Level – Low 2 and IRWST Wide Range Level – Low Operability.

If you would like to schedule a clarification conference call to discuss this RAI, please let me know by Wednesday, October 24, 2018. If no request for a clarification call is received, this RAI will be issued as final.

Please let me know if you have any questions.

Thank you,
Jordan

Jordan Hoellman

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Request for Additional Information – DRAFT

LAR 18-017, TS Changes for Spent Fuel Pool Level - Low 2 and IRWST Wide Range Level - Low Operability

Issue Date:

Application Title: VEGP Units 3 and 4 - LARs
Operating Company: Southern Nuclear Operating Co.
Docket No. 52-025 and 52-026
Review Section: 16 - Technical Specifications

10 CFR 50.36 sets forth requirements for technical specifications to be included as part of the operating license for a nuclear power facility. In particular, 10 CFR 50.36(b) states, in part, "[T]he technical specifications will be derived from the analyses and evaluation included in the safety analysis report, and amendments thereto." NUREG-2194, "Standard Technical Specifications-Westinghouse Advanced Passive 1000 (AP1000) Plants," Rev. 0, provides NRC guidance on format and content of technical specifications as one acceptable means to meet 10 CFR 50.36 requirements.

In LAR 18-017, "Technical Specification Changes for Spent Fuel Pool Level – Low 2 and In-Containment Refueling Water Storage Tank (IRWST) Wide Range Level – Low Operability," the licensee proposed the following changes to the VEGP Units 3 & 4 plant-specific technical specifications (TS).

- The title of TS Subsection 3.3.14 would be revised as indicated below:

"Engineered Safety Feature Actuation System (ESFAS) Refueling Cavity and Spent Fuel Pool Level Cooling System (SFS) Isolation Instrumentation"

- The LCO 3.3.14 statement would be revised as indicated below:

"Three channels of ESFAS Spent Fuel Pool Level – Low 2 instrumentation The ESFAS Refueling Cavity and SFS Isolation Instrumentation channels for each Function in Table 3.3.14-1 shall be OPERABLE."

In the new Table 3.3.14-1, "Engineered Safety Feature Actuation System Instrumentation," besides a revised Applicability for the Spent Fuel Pool Level - Low 2 Function as described below, a new instrumentation Function would be added for the In-containment Refueling Water Storage Tank (IRWST) Wide Range Level – Low with two channels required to be OPERABLE in MODES 1, 2, 3, and 4.

- The LCO 3.3.14 Applicability for the Spent Fuel Pool Level – Low 2 instrumentation Function would be changed from "MODE 6" to "MODE 6 with refueling cavity and spent fuel pool volumes in communication."

- A new Note is added to the Subsection 3.3.14 Actions Table to accommodate the additional instrumentation Function , as indicated below:

"Separate condition entry is allowed for each Function."

- Subsection 3.3.14 Condition A is revised as indicated below:

"A. One Spent Fuel Pool Level - Low 2 channel inoperable. | A.1 Place channel in trip. | 6 hours"

- Subsection 3.3.14 Condition B is revised as indicated below:

"B. Required Action and associated Completion Time of Condition A *Not Met not met*. OR One or more In-Containment Refueling Water Storage Tank (IRWST) Wide Range Level – Low channels inoperable. OR Two or more Spent Fuel Pool Level - Low 2 channels inoperable. | NOTE Flow paths may be unisolated intermittently under administrative controls. B.1 Isolate the affected flow path(s). | 24 hours AND B.2.1 Isolate the affected flow path(s) by use of at least one closed and deactivated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured. | 7 days OR B.2.2 Verify the affected flow path is isolated. | Once per 7 days"

- New Condition C is added to Subsection 3.3.14 as indicated below:

"C. Required Action and associated Completion Time of Condition B not met. | C.1 Declare the IRWST inoperable. | Immediately"

- New Subsection 3.7.13 is added to address the safety function of the SFS containment penetration flow path isolation in Mode 6 (refueling operations) with refueling cavity and spent fuel pool volumes in communication. Proposed Actions A and B state:

"A. One or more flow paths with one or more SFS containment isolation valves inoperable. | A.1 Isolate the affected flow path. | 24 hours AND A.2.1 Isolate the affected flow path by use of at least one closed and deactivated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured. | 7 days OR A.2.2 Verify the affected flow path is isolated. | Once per 7 days

B. Required Action and associated Completion Time not met. | B.1 Declare the IRWST inoperable. | Immediately"

- New surveillance requirements (SRs) are added to Subsections 3.5.7 and 3.5.8, to verify the SFS containment isolation valves are closed in support of the IRWST minimum required water volume in Mode 5, and the IRWST and refueling cavity minimum required combined water volume in Mode 6 with refueling cavity and spent fuel pool volumes *not* in communication, respectively.

In the LAR, the licensee states:

"UFSAR Subsections 6.3.2.2.3 and 7.3.1.2.21 describe closure of the SFS containment isolation valves on one of two channels of ESFAS IRWST Wide Range Level – Low instrumentation to prevent loss of IRWST water inventory in the event of a leak in the

nonsafety-related, nonseismic SFS when connected to the IRWST. This actuation can be manually blocked while the plant is in MODE 6, below the P-9 (reactor coolant average temperature (T_{avg})) interlock setpoint of less than or equal to 200°F. This allows the SFS to transfer IRWST water inventory to the refueling cavity, and to perform cooling and purification of the refueling cavity. The manual block can also be used during MODE 5 so that, if required, operators can use the SFS to cool, purify, sample, or transfer water to the IRWST when the level is below the IRWST Wide Range Level – Low setpoint. IRWST Wide Range Level – Low is automatically unblocked when T_{avg} is above the P-9 setpoint (i.e., in MODES 1, 2, 3, and 4). The ESFAS IRWST Wide Range Level – Low instrumentation function was added in VEGP Units 3 and 4 License Amendments 100 and 99, respectively (NRC Accession No. ML17284A066).

"The operability of the IRWST Wide Range Level – Low instrumentation function, and the operability of the actuated SFS containment isolation valves, support continued IRWST operability when the SFS is connected to the IRWST in MODES 1, 2, 3, and 4. Without an OPERABLE IRWST Wide Range Level – Low instrumentation function and OPERABLE SFS containment isolation valves in MODES 1, 2, 3, and 4, aligning the SFS to the IRWST would result in declaring the IRWST inoperable [because the IRWST water inventory would be vulnerable to a leak in the SFS system outside containment], and the requirements of TS 3.5.6, "In-containment Refueling Water Storage Tank (IRWST) – Operating," would be applicable for determining the TS Actions required to be followed.

"In addition, without the SFS containment isolation valves being closed in MODE 5 and in MODE 6 with refueling cavity and spent fuel pool volumes not in communication, aligning the SFS to the IRWST would also result in declaring the IRWST inoperable, and the requirements of TS 3.5.7, "In-containment Refueling Water Storage Tank (IRWST) - Shutdown, MODE 5," or TS 3.5.8, "In-containment Refueling Water Storage Tank (IRWST) - Shutdown, MODE 6," would be applicable for determining the TS Actions required to be followed.

"The Refueling Cavity and SFS Isolation on the IRWST Wide Range Level – Low instrumentation function is a support system required by the definition of operability for the IRWST. However, it is desired to have separate TS requirements for this support system, similar to other ESFAS automatic actuation functions. This is desired to provide greater visibility and explicit guidance to the operations staff. To support this, changes are proposed to TS 3.3.14.

"Similarly, explicit operability requirements in the form of explicit Surveillance Requirements (SRs) are proposed for TS 3.5.7 in MODE 5 and TS 3.5.8 in MODE 6 with refueling cavity and spent fuel pool volumes not in communication to support continued IRWST operability. These changes provide clear requirements for the following:

1. Requiring the IRWST Wide Range Level – Low instrumentation function to be OPERABLE in MODES 1, 2, 3, and 4, and
2. Requiring the SFS containment isolation valves to be verified closed, and only opened intermittently under administrative controls, in MODE 5 and in MODE 6 with refueling cavity and spent fuel pool volumes not in communication.

"These changes provide explicit operability requirements while allowing flexibility in the

use of the SFS to cool, purify, sample, or transfer water to and from the IRWST and refueling cavity, while maintaining operability of the IRWST during these times."

Based on the above information, the staff understands that both instrumentation functions listed in TS Subsection 3.3.14 are only used to initiate isolation of the SFS (outside containment) from the refueling cavity and the IRWST (both inside containment) when the SFS is operating to cool and purify water in the refueling cavity or IRWST, or transfer water inventory between them, in the respective specified Modes to support normal plant operations or refueling operations. The licensee is requested to consider the below Sub-questions 1, 2, 3, 4 and 5, which provide suggestions to improve the clarity of the proposed changes to TS Subsections 3.3.14, 3.5.7, 3.5.8 and 3.7.13, and associated Bases; and also to TS Subsection 3.3.16 and associated Bases.

1. The proposed revised title of Subsection 3.3.14 seems imprecise because this LCO just requires operability of the two IRWST Wide Range Level – Low channels in MODES 1, 2, 3, and 4; and the three Spent Fuel Pool Level – Low 2 channels in MODE 6 with the refueling cavity and the spent fuel pool volumes in communication. Both of these ESFAS instrument Functions cause SFS CIVs SFS-PL-V035 (outside), SFS-PL-V034 (inside), and SFS-PL-V038 (outside) to close to prevent a loss of IRWST-refueling cavity water volume should the SFS system develop a leak. In keeping with other Section 3.3 subsections, the title should reflect the containment isolation purpose of the instrumentation functions; the staff suggests, "ESFAS Spent Fuel Pool Cooling System (SFS) Containment Isolation Instrumentation"; also, the LCO 3.3.14 statement should be consistent with the title: "The ESFAS SFS containment isolation instrumentation channels for each Function in Table 3.3.14-1 shall be OPERABLE."

The licensee is requested to make these clarifications.

2. The Subsection 3.3.14 Actions for Function 1, "Spent Fuel Pool Level - Low 2," apply in 'MODE 6 with refueling cavity and spent fuel pool volumes in communication.' The staff understands that this means that SFP level and fuel transfer canal level match the refueling cavity level, which if irradiated fuel is being moved, implies a refueling cavity water level of \geq 23 ft above the top of the reactor vessel flange.

In Condition A ("One Spent Fuel Pool Level – Low 2 channel inoperable."), placing the inoperable channel in trip places the coincidence logic in a 1 out of 2 configuration; but if the channel is still inoperable but not placed in trip within 6 hours, the first condition of Condition B ("Required Action and associated Completion Time of Condition A ~~Not Met~~ not met.") would apply. Assuming this inoperable channel is unable to produce a trip signal, the staff understands that the remaining two channels are in a 2 out of 2 coincidence logic configuration, which means Function 1 could not withstand a single failure of an operable channel, which would prevent generation of an isolation signal to the valves. This constitutes a loss of the automatic SFS containment penetration flow path isolation function, which would require manually closing the supported CIVs or otherwise isolating the two SFS containment penetration flow paths, within a reasonable but relatively short completion time. The staff concludes that performing Required Actions B.1 and B.2 would accomplish this manual isolation.

Assuming Required Action A.1 is met, if one of the remaining two channels become inoperable, the third condition of Condition B ("Two or more Spent Fuel Pool Level – Low 2 channels inoperable.") would apply. Placing the second inoperable channel in bypass is not

an option because then Function 1 could not withstand a single failure of the remaining operable channel, which would prevent generation of an isolation signal to the valves; in addition, placing one of the remaining two channels in trip would generate an isolation signal to the valves. Although this would preserve the combined refueling cavity and IRWST water volumes, it would block direct cooling and filtering of this combined volume using the SFS. Therefore, Action B appropriately does not include placing additional channels in bypass or trip, but as already noted, requires manually closing the supported CIVs or otherwise isolating the two SFS containment penetration flow paths, within a reasonable but relatively short Completion Time of 24 hours. The staff notes that the LAR-18-017 Enclosure 2 markup of Required Actions B.1 and B.2.1 of Subsection 3.3.14 mistakenly deletes the “(s)” from “flow path(s)”; the staff understands that (i) there are just two SFS containment penetration flow paths, and this should be explained in the Bases; and (ii) separate condition entry is not specified for each flow path. Therefore, to be consistent with the guidance of plant-specific TS Example 1.3-4, the “(s)” would need to be retained. However, the staff also notes that since the two SFS isolation instrumentation functions support the coincidence logic in each of the ESF logic divisions that actuate closure of the three SFS CIVs to isolate both SFS containment penetration flow paths, *the licensee is requested to replace the phrase “isolate the affected flow path(s)” with “isolate both SFS containment penetration flow paths” in Required Actions B.1 and B.2.1, and replace “Verify the affected flow path is isolated” with “Verify both SFS containment penetration flow paths are isolated” in Required Action B.2.2.*

In the very unlikely event that a Required Action and associated Completion Time of Condition B is not met, Action C would apply. Since the required water volume of the IRWST and refueling cavity would not be ensured were the SFS to develop a leak, Required Action C.1 conservatively requires declaring the IRWST inoperable, which would immediately lead to entering Subsection 3.5.8, Condition F. *However, since the Applicability of the Spent Fuel Pool Level – Low 2 ESFAS Function can be exited by closing one or both ends of the fuel transfer tube, thereby ceasing “communication” between the water volumes of the spent fuel pool and the refueling cavity, the licensee is requested to consider adding this measure as alternative Required Action C.2. The associated Bases should explain why this action would also (by itself) maintain the required combined water inventory of the refueling cavity and IRWST.* In addition, for the Spent Fuel Pool Level – Low 2 Function, were this alternative action to be taken, proposed SR 3.5.8.3 (“Verify SFS CIVs are closed.”) would apply according to surveillance column Note 2 (“Only required to be met with the refueling cavity and spent fuel pool volumes not in communication.”), but would not be met. With LCO 3.5.8 not met because SR 3.5.8.3 is not met, entry into Action F would also be required. This is the same result as declaring the IRWST inoperable by proposed Required Action C.1 of Subsection 3.3.14. *The licensee is requested to explain whether irradiated fuel movement in containment and irradiated fuel movement in, and transfer to and from, the spent fuel transfer canal and spent fuel pool can continue provided the refueling cavity water level is ≥ 23 ft above the top of the reactor vessel flange (as required by Subsection 3.5.8 Required Action F.1), even though the SFS containment penetration flow paths are not isolated nor capable of being automatically isolated on a Spent Fuel Pool Level – Low 2 Function generated ESF actuation signal to close the three SFS CIVs.*

3. The Subsection 3.7.13 Actions table Note 2 could be stated more clearly by inserting the phrase “containment penetration” so that it says: “2. Separate condition entry is allowed for each SFS **containment penetration** flow path.” In addition, Condition A could be stated more clearly as follows: “A. One or both **penetration** flow paths with one or more SFS

containment isolation valves inoperable.” *The licensee is requested to make these clarifications.*

4. The SFS pump suction line containment penetration flow path has two motor operated automatic containment isolation valves (CIVs). In Modes 1, 2, 3, and 4, Subsection 3.6.3, "Containment Isolation Valves," Action A specifies a Completion Time of 4 hours to isolate this penetration flow path were one of these two SFS CIVs inoperable; and Action B specifies a Completion Time of just 1 hour to isolate this penetration flow path were both of these two SFS CIVs inoperable. *The licensee is requested to justify the Subsection 3.7.13, Required Action A.1 Completion Time of 24 hours to isolate the affected penetration flow path were one or both of these two SFS CIVs inoperable in Mode 6 with the refueling cavity and spent fuel pool water volumes in communication. Address whether two separate Conditions should be specified, one for a single inoperable CIV in one or more flow paths, and another for two inoperable CIVs in one or more flow paths. Does LCO 3.7.13 also require operability of the SFS containment return line check valve (V037)? Were the SFS containment return line motor operated automatic CIV (V038) inoperable, which of the two suggested Conditions would be entered? Would the operability status of V037 make a difference?*

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ITEMS FOR DISCUSSION: The staff seeks a discussion with the licensee concerning the implementation of Subsection 3.7.13 Required Actions A.1 and B.1; note the below discussion items also apply to Subsection 3.3.14 Required Actions B.1 and C.1 for the SFP Level - Low 2 Function.

A. Subsection 3.7.13 Required Action A.1 states, "Isolate the affected flow path. | 24 hours." The staff requests that the licensee clarify how this isolation would be done on the:

SFS pump suction header line penetration flow path Could nonseismically qualified manual valve SFS-PL-V044 (outside) be used? Or must a seismically qualified valve, such as either CIV, SFS-PL-V035 (outside) or SFS-PL-V034 (inside) be used? If isolation is not accomplished by closing SFS-PL-V034, -V035, or -V044, it appears that the following manual valves, which are inside containment, would need to be closed to maintain IRWST and refueling cavity water inventory: V039 (from IRWST); and V032 (from refueling cavity). Are these valves seismically qualified?

SFS IRWST and refueling cavity return line penetration flow path Could nonseismically qualified manual valve SFS-PL-V065 (outside) be used? Or must a seismically qualified valve, such as CIV SFS-PL-V038 (outside) be used? If isolation is not accomplished by closing V065 or V038, can check valve SFS-PL-V037 (inside) be credited, or must manual valve V064 (inside) be used? If isolation is not accomplished by closing V037 or V064, it appears that the following manual valves, which are inside containment, would all need to be closed to maintain IRWST and refueling cavity water inventory: V030 (to refueling cavity); V036 (to IRWST); and V063 or V062 (to IRWST). Figure 9.1-6, Sheet 1, depicts a tank with a pipe connected to the line between V062 and V063; what is this tank's function, as the label is unclear, and DCD, Tier 2, Chapter 9 does not appear to describe it elsewhere.

B. The staff requests the licensee to confirm the following interpretation:

Subsection 3.7.13 Required Action B.1 states, "Declare the In-Containment Refueling Water Storage Tank inoperable. | Immediately." Since proposed Subsection 3.7.13 Applicability is "MODE 6 with refueling cavity and spent fuel pool volumes in communication," the staff understands that this action would result in entering the second statement of Condition F of Subsection 3.5.8, "IRWST – Shutdown, MODE 6." The second Condition F statement says, "LCO not met for reasons other than Condition A, B, C, D, or E." And the unit would have to meet Action F, which states, "F.1 Initiate action to establish water level \geq 23 feet above the top of the reactor vessel flange. | Immediately AND F.2 Suspend positive reactivity additions. | Immediately"

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5. Subsection 3.7.13, SR 3.7.13.1 states:

SR 3.7.13.1 For SFS containment isolation valves required to be OPERABLE, the following SRs are applicable:

SR 3.6.3.4

SR 3.6.3.5

| In accordance with applicable SRs.

Subsection 3.6.3, SR 3.6.3.4 states:

SR 3.6.3.4 Verify the isolation time of each automatic power operated containment isolation valve is within limits.

| In accordance with the Inservice Testing Program

Subsection 3.6.3, SR 3.6.3.5 states:

SR 3.6.3.5 Verify each automatic containment isolation valve that is not locked, sealed or otherwise secured in position, actuates to the isolation position on an actual or simulated actuation signal.

| 24 months

NUREG-2194, STS Subsection 3.3.16, SR 3.3.16.4 states:

SR 3.3.16.4 -----NOTE-----

Only required to be met in MODE 6.

Verify Spent Fuel Pool Cooling System containment
isolation valves actuate to the isolation position on an
actual or simulated actuation signal.

| 24 months

The staff has the following concerns:

a. Since the above two SRs of Subsection 3.6.3 apply in MODES 1, 2, 3, and 4, they do not automatically support the LCO 3.7.13 MODE 6 operability requirement for the two SFS return line CIVs, SFS-PL-V035 (outside) and SFS-PL-V034 (inside), and the one SFS supply line CIV, SFS-PL-V038 (outside); for improved clarity and ease of use, the staff suggests that Subsection 3.7.13 state the two SRs explicitly, as follows:

SR 3.7.13.1 Verify the isolation time of each **SFS** automatic power operated containment isolation valve is within limits.

| In accordance with the Inservice Testing Program

SR 3.7.13.2 Verify each **SFS** automatic containment isolation valve that is not locked, sealed or otherwise secured in position, actuates to the isolation position on an actual or simulated actuation signal.

| 24 months

b. In addition, STS SR 3.3.16.4 may be removed, since the addition of Subsection 3.7.13 and the suggested SR 3.7.13.2 obviate the original need for it in Subsection 3.3.16.

Therefore, the licensee is requested to change (i) proposed Subsection 3.7.13 by replacing the proposed SR 3.7.13.1 and associated Bases with the above explicit SRs and suitable associated Bases; and (ii) existing Subsection 3.3.16 by deleting SR 3.3.16.4 and associated Bases.

The licensee is reminded to update the proposed changes to the Bases that were provided in the LAR-18-017 Enclosure 3 to reflect the disposition and resolution of the above issues, as stated in Sub-questions 1, 2, 3, 4 and 5.