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

Vogtle Electric Generating Plant – Units 1 & 2
Response to Request for Additional Information Regarding
End State Revision from Hot Shutdown to Cold Shutdown

Ladies and Gentlemen:

By application dated July 9, 2019 (Agencywide Documents Access and Management System Accession No. ML19190A309), Southern Nuclear Operating Company (SNC) submitted a license amendment request (LAR) to revise the Technical Specifications (TSs) for Vogtle Electric Generating Plant, Units 1 and 2.

The proposed change would revise the actions of TS 3.7.7, "Component Cooling Water (CCW) System," TS 3.7.8, "Nuclear Service Cooling Water (NSCW) System," TS 3.8.1, "AC Sources – Operating," TS 3.8.4, "DC Sources – Operating," TS 3.8.7, "Inverters – Operating," and TS 3.8.9, "Distribution Systems – Operating."

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the application and has determined that additional information is needed to complete its review. Enclosure 1 provides the SNC response to the NRC staff request for additional information (RAI) in support of the NRC review of the subject LAR. In support of the RAI response, Enclosures 2 and 3 provide revised TS markup and clean-typed pages, respectively, and Enclosure 4 provides revised TS bases pages for information only. The revised pages provided in Enclosures 2, 3, and 4 correspond to pages in the original LAR affected by the RAI response and supplant the respective pages in the original LAR enclosures. In addition, the change associated with TS 3.7.7 (CCW System), including associated TS markup and clean-typed pages and TS bases markup pages, is being withdrawn from the original LAR as a result of the RAI response.

The conclusions of the No Significant Hazards Consideration and Environmental Consideration contained in the original LAR have been reviewed and are unaffected by this RAI response.

This letter contains no NRC commitments. If you have any questions, please contact Jamie Coleman at 205.992.6611.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 17th day of October 2019.

Respectfully submitted,

C. A. Gayheart
Director, Regulatory Affairs
Southern Nuclear Operating Company

CAG/RMJ

Enclosures:
1. SNC Response to NRC Request for Additional Information
2. Revised TS Marked-up Pages
3. Revised TS Clean-typed Pages
4. Revised TS Bases Pages (Information only)

cc: Regional Administrator, Region II
NRR Project Manager – Vogtle 1 & 2
Senior Resident Inspector – Vogtle 1 & 2
State of Georgia Environmental Protection Division
RType: CVC7000

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Enclosure 1

SNC Response to NRC Request for Additional Information

REQUEST FOR ADDITIONAL INFORMATION

Southern Nuclear Operating Company (SNC, the licensee) proposed to add new Condition D to both Technical Specification (TS) 3.7.7, "Component Cooling Water (CCW) System" and TS 3.7.8, "Nuclear Service Cooling Water (NSCW) System." Condition D would be entered within one hour after both CCW (or NSCW) trains are inoperable and probabilistic risks assessment (PRA) non-functional, or within the risk-informed completion time (RICT) if at least one train is PRA functional while both trains are TS inoperable. In the event both CCW (or NSCW) trains are declared TS inoperable and PRA nonfunctional, Condition D would direct the plant to be attain MODE 5 within 36 hours without the required support systems [i.e., CCW (or NSCW)] available to support this plant progression.

As stated in Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 36(c)(2)(i), when a limiting condition for operations (LCO) of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the TS until the LCO can be met. The intent of this requirement is to place the plant in a safe and attainable state until the LCO supporting continued normal operation is satisfied.

Improved Standard Technical Specifications (ISTS) of NUREG-1431 for TS 3.7.7 and TS 3.7.8 provide no direction with respect to two inoperable trains of CCW or SWS. Thus, the provisions of TS 3.0.3 would apply for two inoperable trains of CCW or SWS, which specifies a shutdown and cooldown to cold shutdown conditions. However, the Bases of VEGP TS 3.0.3 state that exceptions are provided to the actions of LCO 3.0.3 where requiring a unit shutdown/cooldown would not provide appropriate remedial measures.

TSTF-432, Revision 1 "Change in Technical Specifications End States (WCAP-16294)" Section 1.0 "Description" reads in part:

> The risk of the transition from MODE 1 to MODE 4 or MODE 5 depends on the equipment that is operable. For example, the transition from MODE 4 to MODE 5 can introduce additional risk since it is required to realign the unit from steam generator cooling to residual heat removal, or shutdown cooling. During this realignment, there is an increased potential for loss of shutdown cooling and loss of inventory events, which is reflected in the plant risk calculated using Probabilistic Risk Assessment (PRA). In addition, decay heat removal following a loss of offsite power event in MODE 5 is dependent on Emergency [alternating current] AC power, whereas, in MODE 4, the turbine-driven auxiliary feedwater pump is available without relying on Emergency AC power. Therefore, transitioning to MODE 5 may not always be the appropriate end state from a risk perspective.

The NRC staff recognizes that the above conclusion was intended to apply where only one of two trains was not restored to operable status with the completion time. However, the assessment is valid in other conditions where equipment essential to support maintenance of a cold shutdown condition is not suitably reliable.

Given that Condition D of proposed TS 3.7.7, and TS 3.7.8 specify a cold shutdown end state that might be unattainable given the entry condition, either provide justification that reliable equipment would be available to reach that end state or propose an alternate end state, consistent with the intent of 10 CFR 50.36(c)(2)(i) and the Bases of VEGP TS 3.0.3. If attaining the specified end state requires use of equipment in a manner different than that described in

the safety analysis report, provide appropriate additional descriptions of the equipment and manner of use.

SNC RESPONSE

With both trains of either the CCW or NSCW systems inoperable, the residual heat removal (RHR) system may be incapable of supporting the decay heat removal function when transitioning to Mode 5. With the RHR system incapable of supporting decay heat removal, no other practical means for conducting a cooldown to Mode 5 exists. In such a condition, it is preferred that the unit not cooldown to Mode 5 conditions, but rather remain in Mode 4 where reactor coolant system (RCS) cooling capability can be maintained by steaming the steam generators (SGs).

Per LCO 3.0.6, when a supported system LCO is not met solely due to a support system LCO not being met, the conditions and required actions associated with the supported system are not required to be entered. However, if a loss of safety function exists per the safety function determination program (Specification 5.5.15), the appropriate conditions and required actions of the LCO in which the loss of safety function exists are required to be entered.

The supported emergency core cooling system (ECCS) LCOs affected by two inoperable CCW trains in Modes 1 2, 3, and 4 are LCO 3.5.2 and LCO 3.5.3 due to the inability of the RHR system to provide ECCS long term cooling. The actions of neither TS 3.5.2, "ECCS – Operating," or TS 3.5.3, "ECCS – Shutdown," require cooldown to Mode 5 when both RHR subsystems are inoperable.

The decay heat removal function of the RHR system is not required in Mode 1, 2, or 3. The supported decay heat removal LCO affected by two inoperable CCW trains in Mode 4 is LCO 3.4.6, due to the inability for the RHR system to provide the decay heat removal function. The actions of TS 3.4.6, "RCS Loops – MODE 4," do not require Mode 5 entry unless both RCS loops are inoperable concurrent with one or more RHR loops inoperable. As a result, a cooldown to Mode 5 is not currently required when two CCW trains are inoperable as long as one RCS loop is operable (i.e., an operable reactor coolant pump and an operable SG, including a means to provide feedwater and remove the decay heat). Based on this, SNC is hereby withdrawing the proposed change to TS 3.7.7 as requested in the July 9, 2019 license amendment request (Agencywide Documents Access and Management System Accession No. ML19190A309) restoring the current end state of Mode 4 when two trains of CCW are not restored to operable status within the required completion time.

The NSCW system supports multiple systems whose TS actions require Mode 5 entry when both trains of NSCW are inoperable. As a result, SNC is proposing a Note to Required Action B.1 (proposed Required Action C.1) to the TS 3.7.8 condition for two trains inoperable. This proposed note, in effect, results in an alternate end state of Mode 4 until the NSCW system is capable of supporting the decay heat removal function of one RHR loop. It is conceptually similar to the note in Condition E of TS 3.7.5, "Auxiliary Feedwater (AFW) System." The proposed Note will state:

> "LCO 3.0.3 and all other LCO Required Actions requiring entry into MODE 5 are suspended until the NSCW System is capable of supporting the decay heat removal function of one RHR loop."

In addition, an action to be in Mode 4 in 12 hours is added to proposed Condition D of TS 3.7.8 (Insert 3.7.8-1). The 12 hour completion time to reach Mode 4 is consistent with the time to reach Mode 4 in current Required Action C.2 (proposed Required Action B.2) of TS 3.7.8. The 12 hour completion time is also consistent with other required actions to be in Mode 4 (e.g., TS 3.4.5, Required Action B.1 and TS 3.5.2, Required Action B.2).

TS 3.4.7, "RCS Loops – MODE 5, Loops Filled," provides the requirements for the decay heat removal function of an RHR loop in Mode 5 with the RCS loops filled, and ensures an operable RHR pump is capable of providing forced flow to an operable RHR heat exchanger. With both trains of the NSCW inoperable, the RHR pumps may be incapable of removing the required decay heat load via the RHR heat exchangers. When applying the proposed Note, the LCO 3.0.3 requirement and all other TS action requirements to enter Mode 5 are suspended due to the impracticality of Mode 5 entry in this configuration. Because the NSCW system is not required to be operable in Mode 5, the proposed note does not suspend entry into Mode 5 until the NSCW system is restored to operable status, but rather, suspends the cooldown to Mode 5 conditions until the NSCW system is restored as necessary to support the decay heat removal function of at least one RHR subsystem.

Additionally, the proposed Note does not obviate the current Mode 4 requirement to restore an RHR subsystem to operable status while in this condition. If both trains of the NCSW system were inoperable, the LCO requirements for TS 3.5.3 may not be met. Condition A of TS 3.5.3 would require immediate initiation of action to restore an ECCS RHR subsystem to operable status, which would necessitate restoring an NSCW subsystem as necessary to support the ECCS function.

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Enclosure 2

Revised TS Marked-up Pages

Insert 3.7.8-2

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~B.~~ C ----------NOTES---------- 1. Not applicable when second NSCW train intentionally made inoperable. 2. The following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h. ---------- Two NSCW trains inoperable.	~~B.1~~ C Restore NSCW trains to OPERABLE status.	1 hour OR In accordance with the Risk Informed Completion Time Program
~~C.~~ B Required Action and associated Completion Time of Condition A ~~or B~~ not met.	~~C.1~~ Be in MODE 3.	6 hours
	AND B	
	~~C.2~~ ----------NOTE---------- LCO 3.0.4.a is not applicable when entering MODE 4. ---------- Be in MODE 4.	12 hours

Insert 3.7.8-1

Insert 3.7.8-1

D.	Required Action and associated Completion Time of Condition C not met.	D.1	Be in MODE 3.	6 hours
		AND		
		D.2	Be in MODE 4.	12 hours
		AND		
		D.3	Be in MODE 5.	36 hours

Insert 3.7.8-2

----------NOTE----------
LCO 3.0.3 and all other LCO Required Actions requiring entry into MODE 5 are suspended until the NSCW System is capable of supporting the decay heat removal function of one RHR loop.

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Enclosure 3

Revised TS Clean-typed Pages

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	----------NOTE---------- LCO 3.0.4.a is not applicable when entering MODE 4. ---------- Be in MODE 4.	12 hours
C. ----------NOTES---------- 1. Not applicable when second NSCW train intentionally made inoperable. 2. The following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h. ---------- Two NSCW trains inoperable.	C.1	----------NOTE---------- LCO 3.0.3 and all other LCO Required Actions requiring entry into MODE 5 are suspended until the NSCW System is capable of supporting the decay heat removal function of one RHR loop. ---------- Restore NSCW trains to OPERABLE status.	1 hour OR In accordance with the Risk Informed Completion Time Program
D. Required Action and associated Completion Time of Condition C not met.	D.1	Be in MODE 3.	6 hours
	AND		
	D.2	Be in MODE 4.	12 hours
	AND		
	D.3	Be in MODE 5.	36 hours

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Enclosure 4

Revised TS Bases Pages (Information only)

Bases Insert 1

D.1 and D.2

If the Required Actions of Condition C cannot be completed within the required Completion Times, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours, to MODE 4 within 12 hours, and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

Bases Insert 2

I.1 and I.2

If the Required Action of Condition H cannot be completed within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

Bases Insert 3

F.1 and F.2

If the Required Actions of Condition E cannot be completed within the required Completion Times, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

Bases Insert 4

Required Action C.1 is modified by a Note stating that LCO 3.0.3 and all other LCO Required Actions requiring entry into MODE 5 are suspended until the NSCW System is capable of supporting the decay heat removal function of one RHR loop. LCO 3.4.7, "RCS Loops – MODE 5, Loops Filled," provides requirements for the decay heat removal function in MODE 5 with the RCS loops filled. With both trains of the NSCW System inoperable, the RHR pumps may be incapable of removing the required decay heat load via the RHR heat exchangers. In this condition, no other practical means for conducting a cooldown to MODE 5 exists. It is therefore preferred that the unit not cooldown to MODE 5 conditions, but rather remain in MODE 4 where RCS cooling capability can be maintained by steaming the steam generators. Because the NSCW System is not required to be OPERABLE in MODE 5, the Note does not suspend entry into MODE 5 until the NSCW System is restored to OPERABLE status. The Note suspends the cooldown to MODE 5 conditions until the NSCW System is restored as necessary to support the decay heat removal function of at least one RHR subsystem.

BASES (continued)

ACTIONS

A.1

If one NSCW System train is inoperable, action must be taken to restore the train to OPERABLE status within 72 hours. In this Condition, the remaining OPERABLE NSCW System train is adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE NSCW System train could result in loss of NSCW System function. Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program. Required Action A.1 is modified by two Notes. The first Note indicates that the applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources — Operating," should be entered if an inoperable NSCW System train results in an inoperable emergency diesel generator. The second Note indicates that the applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops — MODE 4," should be entered if an inoperable NSCW System train results in an inoperable decay heat removal train. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components. The 72 hour Completion Time is based on the redundant capabilities afforded by the OPERABLE train, and the low probability of a DBA occurring during this time period.

C → ~~B~~.1

With both trains of NSCW inoperable, the NSCW system may be incapable of providing an adequate heat sink for safety related components during design basis accident and transients. Consequently, one hour is provided to restore the NSCW trains to OPERABLE status. Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.

The CONDITION is modified by two Notes. The first Note states it is not applicable when the second NSCW train is intentionally made inoperable. This Required Action is not intended for voluntary removal of redundant systems or components from service. The Required Action is intended only when the second NSCW train is found inoperable with one train already inoperable, or if two NSCW trains are found inoperable at the same time. The second Note indicates the parts of Section 5.5.22, "Risk Informed Completion Time Program", which are applicable to this LCO Condition. The Risk Informed Completion Time for this LCO Condition can be no longer than 24 hours (Ref. 5).

Bases Insert 4 →

(continued)