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Sent: Wednesday, September 10, 2014 12:47 PM
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Cc: Pascarelli, Robert; ONeal, Daniel; Gennardo, David
Subject: RAIs - Draft
Attachments: 09 10 14 RAI 4 b II .docx

Attached are Draft Requests for Additional Information (RAI) on the Vogtle license amendment request on extending completion times.

Please advise of the time that SNC wishes to discuss these RAIs with the NRC staff.

REQUEST FOR ADDITIONAL INFORMATION
BY THE OFFICE OF NUCLEAR REACTOR REGULATION
SOUTHERN NUCLEAR OPERATING COMPANY, INC.
VOGTLE ELECTRIC GENERATING PLANT, UNITS 1 AND 2

By letter dated September 13, 2012, as supplemented on August 2, 2013 July 3 and July 17, 2014, (Agencywide Documents Access and Management System Accession Nos. ML12258A055, ML13217A072, ML14189A554 and ML14198A574), Southern Nuclear Operating Company (SNC) submitted a license amendment request (LAR) to modify the Vogtle Electric Generating Plant (VEGP) Technical Specification (TS) requirements to permit the use of Risk Informed Completion Times (RICT) in accordance with Nuclear Energy Institute (NEI) 06-09, *Risk Informed Technical Specifications Initiative 4b, Risk-Managed Technical Specifications (RMTS) Guidelines*.¹ The U.S. Nuclear Regulatory Commission (NRC) staff finds that the following additional information is needed.

TS RAI 3.1 (Follow-up to TS Review RAI 3)

Per the licensee response ADAMS Accession No. ML14198A574) to TS Request for Additional Information (RAI) 3, "LCOs 3.5.5, 3.7.3 and 3.8.3 will be removed from the [Southern Nuclear Operating Company (SNC) Vogtle Electric Generating Plant (VEGP)] Risk Informed Completion Time Program. The [License Amendment Request (LAR)] will be revised to reflect these changes."

Please clarify if both Limiting Condition for Operation (LCO) 3.8.3 Condition A and F will be removed or if only LCO 3.8.3 Condition A will be removed.

TS RAI 5.1 (Follow-up to TS Review RAI 5)

The response to TS RAI 5 proposes an addition to TS Administrative Controls, Section 5.5.22. Please clarify whether "loss of functional level [Probabilistic Risk Assessment (PRA)] success criteria" means loss of safety function.

PRA RAI 2.1 (Follow-up to PRA Review RAI 2)

The response to PRA RAI 2 noted a response to RAI 27 for the Vogtle 10 CFR 50.69 application (ADAMS Accession No. ML13184A267). The NRC staff reviewed that response and noted methodologies potentially important for the Vogtle Initiative 4b application.

The methodology for Main Control Room (MCR) abandonment fire scenarios uses a Conditional Core Damage Probability (CCDP) of 1.0 according to the response to RAI 27 for the Vogtle 10 CFR 50.69 application. As such, a CCDP of 1.0 does not result in any delta risk if equipment relied upon for these scenarios are not available.

¹ The NRC staff notes that the updated correct reference is NEI 06-09, Revision 0-A (October 12, 2012, ADAMS Accession No. ML12286A321).

Enclosure

Please explain why this method may be acceptable for the Initiative 4b application, or describe how this observation will be addressed such that the methodology is capable of evaluating the risk of equipment out of service which affects the MCR abandonment fire scenario CCDP in order to include the associated risk in the RICT calculation. Please propose an implementation item which addresses this methodology for the Fire PRA application in the RICT program.

PRA RAI 10.1 (Follow-up to PRA Review RAI 10)

The NRC Safety Evaluation (SE) (ADAMS Accession No. ML071200238) for Topical Report (TR) Nuclear Energy Institute (NEI) 06-09 (ADAMS Accession No. ML12286A321) discusses common cause failures (CCFs), on page 6 it states:

Emergent Failures. During the time when an RICT is in effect and risk is being assessed and managed, it is possible that emergent failures of SSCs may occur, and these must be assessed to determine the impact on the RICT. If a failed component is one of two or more redundant components in separate trains of a system, then there is potential for a common cause failure mechanism. Licensees must continue to assess the remaining redundant components to determine there is reasonable assurance of their continued operability, and this is not changed by implementation of the RMTS. If a licensee concludes that the redundant components remain operable, then these components are functional for purposes of the RICT. However, the licensee is required to consider and implement additional risk management actions (RMAs), due to the potential for increased risks from common cause failure of similar equipment. The staff interprets TR NEI 06-09, Revision 0, as requiring consideration of such RMAs whenever the redundant components are considered to remain operable, but the licensee has not completed the extent of condition evaluations, and additionally, as required by a followup prompt operability determination.

Pages 9 and 10 of the SE state:

TR NEI 06-09, Revision 0, uses both the [core damage frequency (CDF) and Large Early Release Frequency (LERF)] metrics to assess and establish [TS LCO Completion Times (CTs)], which addresses maintaining a balance between core damage prevention and containment failure prevention. Compliance with the guidance of [Regulatory Guide (RG)] 1.174, Revision 1, and RG 1.177 for Δ CDF and Δ LERF is achieved by evaluation using a comprehensive risk analysis, which assesses the configuration-specific risk by including contributions from human errors and common cause failures. The use of extended CTs is restricted to conditions which do not involve a total loss of function, which assures preservation of redundancy and diversity. Both the quantitative risk analysis and the qualitative considerations assure a reasonable balance of defense in depth is maintained to ensure protection of public health and safety, satisfying the second key safety principle of RG 1.177.

RG 1.177, Revision 1, provides guidance on the treatment of CCF for risk-informed TSs on page 15:

The CCF contributions should be modeled so that they can be modified to reflect the condition in which one or more of the components is unavailable. It should be noted, however, that CCF modeling of components is not only dependent on the number of remaining inservice components, but is also dependent on the reason components were removed from service (i.e., whether for preventive or corrective maintenance). For appropriate configuration risk management and control, preventive and corrective maintenance activities need to be considered, and licensees should, therefore, have the ability to address the subtle difference that exists between maintenance activities (see Section A-1.3.2 of Appendix A to this guide for details).

Further guidance is provided in RG 1.177, Revision 1, Appendix A, page A-3:

Contributions from common-cause failures (CCFs) need special attention when calculating the increased risk level R1. If the component is down because of a failure, the common-cause contributions involving the component should be divided by the probability of the component being down because of failure since the component is given to be down. If the component is down because it is being brought down for maintenance, the CCF contributions involving the component should be modified to remove the component and to only include failures of the remaining components (also see Regulatory Position 2.3.1 of Regulatory Guide 1.177).

Additional guidance is given in RG 1.177, Sections A-1.3.2.1 and A-1.3.2.2, regarding the treatment of CCFs for a component failed or in preventive maintenance.

Please address the following two parts with respect to CCF treatment for the RICT program:

- a. The RAI response notes the guidance in NEI 06-09, Section 3.3.6: "For all RICT assessments of planned configuration, the treatment of common cause failure in the quantitative [Configuration Risk Management (CRM)] Tools may be performed by considering only the removal of the planned equipment and not adjusting common cause failure terms."

The NRC staff notes that page 14 of the SE for NEI 06-09 states: "As part of its review and approval of a licensee's application requesting to implement the RMTS, the NRC staff intends to impose a license condition that will explicitly address the scope of the PRA and non-PRA methods approved by the NRC staff for use in the plant-specific RMTS program."

The NRC staff considers that the RMTS PRA method for CCF should be consistent with the RG 1.177 treatment of CCF, as described above. Please provide assurance that

RICT calculations will be consistent with RG 1.177 guidance for CCF treatment.

- b. Secondly, with respect to the response which describes outcomes from an "extent of condition" evaluation, explain how "Outcome 3," which does not consider RMAs, is consistent with NEI 06-09 guidance which appears to apply when the "extent of condition" is incomplete rather than completed with redundant equipment found to be TS-inoperable.

PRA RAI 11.1 (Follow-up to PRA Review RAI 11)

Please expand on the response to Part (b)(ii) regarding inclusion of TS LCO 3.6.2 Containment Air Locks in the RICT program. The response does not clarify if there is no expected impact on CDF (page E1-20), and, why LERF considerations do not exclude the TS LCO 3.6.2 from the RICT program (page E1-32). The response indicates that PRA functionality could result in "a longer RICT for TS inoperable conditions."

For the LERF assessment provided in the LAR Table E1-3, please explain how PRA functionality could result in an increase in the CT if the function cannot be achieved by TS operability considerations. For the containment air lock function, is its function evaluated differently for a PRA functionality determination than for a design basis evaluation?

PRA RAI 13.1 (Follow-up to PRA Review RAI 13)

Since the TS LCOs may require evaluation of success criteria at different levels, documentation of success criteria should support the level needed (e.g., system level, train level, etc.). Review of the response appears to show documentation of system-level success criteria only, and not train-level success criteria, or lower level if necessary, for a RICT program evaluation of success criteria. For example, in response to PRA Review RAI 6, 1 of 3 Auxiliary Feedwater (AFW) pumps provides flow to 2 of 4 steam generators; however, in some applications of the RICT program it may be necessary to know the success criteria of one train of AFW (e.g. turbine-driven AFW) rather than the system-level success criteria.

Please explain whether success criteria at different levels other than the system level are documented for use in RICT program evaluations.

PRA RAI 16.1 (Follow-up PRA Review RAI16)

The response to this RAI considers that, upon calculating a new RICT given the emergent condition, the 1E-5 incremental core damage probability (ICDP) and the 1E-6 incremental large early release probability (ILERP) are applicable and implies that the plant configuration could be maintained until these RICT program limits are reached. NEI 06-09 guidance (page 2-6) notes that the plant shall implement appropriate risk management actions to limit the extent and duration of the high risk configuration. The NRC staff notes the NEI 06-09 guidance is to limit the extent and duration of the condition rather than to remain in the condition until reaching the above limits.

Please clarify whether your RICT program considers returning equipment to service which provides a quantitative measure of risk decrease, as well as RMAs which may not be quantified,

to decrease risk prior to reaching the ICDP/ILERP limits of 1E-5/1E-6 for an emergent plant condition.

PRA RAI 17.1 (Follow-up to PRA Review RAI 17)

- a. The response to the RAI cites a quote from the NRC SE for the requirements of Tier 2; which references NUMARC 93-01 as endorsed by RG 1.182. These references have been updated such that the latest guidance is NUMARC 93-01, Revision 4, as endorsed by RG 1.160.

Please confirm these updated references are applicable for your RICT program Tier 2 requirements.

- b. As described in RG 1.177, Revision 1, on pages 11 and 12:

Tier 2 is an identification of potentially high-risk configurations that could exist if equipment, in addition to that associated with the change, were to be taken out of service simultaneously or other risk-significant operational factors, such as concurrent system or equipment testing, were also involved. The objective of this part of the evaluation is to ensure that appropriate restrictions on dominant risk-significant configurations associated with the change are in place. ...

Once plant equipment is so evaluated, an assessment can be made as whether certain enhancements to the TS or procedures are needed to avoid risk significant plant configurations. In addition, compensatory actions that can mitigate any corresponding increase in risk (e.g., backup equipment, increased surveillance frequency, or upgraded procedures and training) should be identified and evaluated.

- i. The response indicates that the 1E-6/1E-7 ICDP/ILERP RMTS thresholds are the triggers for RMA implementation. Please provide clarification on this response since this appears to be different from the guidance in NEI 06-09 for risk management action times (RMATs) which states on page A-5: "This guidance requires risk management actions to be taken no later than the calculated RMAT."
- ii. Also, discuss the Tier 2 assessment process to accomplish Tier 2 objectives, and discuss the timeline to perform the Tier 2 assessment (e.g., with respect to the TS front stop, the RMA thresholds).

PRA RAI 23: TS 3.7.4 Atmospheric Relief Valves (ARVs)

The RICT program in TS 5.5.22 and NEI 06-09, Revision 0, does not permit voluntary entry into a configuration, which represents a loss of a specified safety function or inoperability of all required [trains] of a system required to be operable. TS Conditions, which represent a loss of specified safety function have been modified by a note stating it is not applicable when the second [train] is intentionally made inoperable. However, TS 3.7.4 Condition B did not add a note stating that it is not applicable when the third ARV line is intentionally made inoperable. Entering TS 3.7.4 Condition B intentionally due to three (or more) inoperable ARVs would not be

allowed by TS Section 5.5.22 or NEI 06-09, Revision 0-A.

Please explain how this will be prevented from occurring or provide a revision that adds the Condition note to TS 3.7.4 Condition B.

PRA RAI 24: Proposed License Changes for TS Administrative Controls Section 5.5.22

The NRC staff's review of the proposed license TS Section 5.5.22 in the LAR could not conclude that it is sufficient for the application. The following should be addressed for the proposed TS Section 5.5.22:

- a. Part c(3) states "Revising the RICT is not required if the plant configuration change would lower plant risk and would result in a longer RICT." Part c(3) should also be updated to recognize that it is necessary to consider any changes in risk management actions when the plant configuration changes even though there is a lower plant risk.
- b. Success criteria must be up-to-date, clearly documented, and reviewed.
- c. PRA functionality does not apply when the cause of inoperability is unknown or if the basis for declaring inoperability is anticipated degradation.

PRA RAI 25: RICT Program Implementation Items

Please provide implementation items to address for the following issues before implementation of the RICT program.

1. The LAR has identified items to be completed before using the RICT program:
 - i. The LAR Table E1.1 in Enclosure 1 to the LAR identifies that the disposition for TS LCO 3.7.5 Condition A will be completed before application of the RICT program.
 - ii. The LAR Table E2.2 in Enclosure 2 identifies F&Os that will be resolved prior to the implementation of the RICT program.
2. Draft plant procedures which are necessary for implementing the RICT program should be completed prior to implementation.
3. Propose an implementation item which updates the Fire PRA model to include guidance in NUREG/CR-7150, "Joint Assessment of Cable Damage and Quantification of Effects from Fire (JACQUE FIRE)," Volume 2, which is supported by a letter from the NRC to NEI, "Supplemental Interim Technical Guidance on Fire-induced Circuit Failure Mode Likelihood Analysis," (ADAMS Accession Nos. ML14086A165 and ML14017A135).

4. The NRC staff considered the use of the term "should" versus "shall" in NEI 06-09 for its importance to the RICT program since it is proposed to be incorporated into the TS Administrative Controls Section 5.5.22. The NRC staff has identified that the following "should" statements should be replaced with "shall." Please propose an implementation item that addresses the use of "shall" in place of "should" for the following NEI 06-09 guidance in the table below.

NEI 06-09: Implementation of "Shall" versus "Should"
<p><u>Page 3-10</u></p> <p>"Since the condition has been judged to warrant declaring a pump inoperable, it should shall not be simultaneously considered PRA functional for the RICT calculations."</p>
<p><u>Page 3-17</u></p> <p>"Should preventive maintenance activities be anticipated to exceed the RMAT thresholds, appropriate RMAs should shall be identified and, as appropriate, implemented before the condition is entered."</p>
<p><u>Page 3-18</u></p> <p>"To accomplish this goal, the impact of RMTS implementation on the baseline risk metrics should shall be periodically assessed and managed as appropriate to ensure there is no undue increase."</p>
<p><u>Page 3-19, 3-20, and 3-21</u></p> <p>"This administrative process for cumulative risk management should shall include a requirement to document specific corrective actions and, if necessary, for ensuring operation remains within Regions II or III of Figures 3 and 4 of NRC Regulatory Guide 1.174 [4]."</p> <p>"The RMTS program implementing procedure should shall clearly describe how cumulative risk tracking and associated "triggers" for self-assessment and corrective action will be implemented within the station-specific RMTS program."</p> <p>"Regardless of the method used, the station must track the risk associated with all entries beyond the front-stop CT. This information should shall be evaluated periodically against the guidance of Regulatory Guide 1.174."</p> <p>"For stations <u>without</u> external events PRAs incorporated into their quantitative CRM Tools, or in cases where the existing external event PRA does not adequately address the situation, the station should shall apply the following criteria to support maintenance activities beyond the front-stop CT:</p> <ol style="list-style-type: none">1. Provide a reasonable technical argument (to be documented prior to the implementation of the associated RICT) that the configuration risk of interest is dominated by internal events, and that external events, including internal fires, are not a significant contributor to configuration risk (i.e., they are not significant relative to a RICT calculation). <p>OR</p> <ol style="list-style-type: none">2. Perform a reasonable bounding analysis of the external events, including internal fires, configuration risk (to be documented prior to the implementation of the associated RICT) and apply this upper bound external events risk contribution along with the internal events risk contribution in calculating the configuration risk and the associated RICT.

OR

3. For limited scope RMTS applications, a licensee may use pre-analyzed external events internal fire analyses to restrict RMA thresholds and identify and implement compensatory risk management actions. For the duration of the configuration of interest, these actions should be supported by analyses and provide a reasonable technical argument (to be documented prior to the implementation of the associated RICT) that external events, including internal fires, are adequately controlled so as to be an insignificant contributor to the incremental configuration risk. Any RMAs credited in this manner shall be proceduralized and appropriate training provided."

Page 3-22

"In addition to a determination of operability on the affected component, the operator ~~should~~ shall make a judgment with regard to whether the operability of similar or redundant components might be affected."

Page 4-3

"In cases where the CRM tool directly performs PRA logic model reduction and/or risk calculations, quality assurance checks of the model and quantification results translation from the underlying approved PRA ~~should~~ shall be performed to validate model translation."

"Training of personnel who apply or review the CRM tool ~~should~~ shall be performed."

Page 4-4

"CRM tools ~~should~~ shall reflect ~~as-built~~, as-operated plant conditions."