August 8, 2017

Mr. James J. Hutto
Regulatory Affairs Director
Southern Nuclear Operating Company, Inc.
Post Office Box 1295, Bin 038
Birmingham, AL 35201-1295

SUBJECT: VOGTLE ELECTRIC GENERATING PLANT, UNITS 1 AND 2 – ISSUANCE OF AMENDMENTS REGARDING IMPLEMENTATION OF TOPICAL REPORT NUCLEAR ENERGY INSTITUTE NEI 06-09, “RISK-INFORMED TECHNICAL SPECIFICATIONS INITIATIVE 4B, RISK-MANAGED TECHNICAL SPECIFICATION (RMTS) GUIDELINES,” REVISION 0-A (CAC NOS. ME9555 AND ME9556)

Dear Mr. Hutto:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment Nos. 188 and 171 to Renewed Facility Operating License Nos. NPF-68 and NPF-81, respectively, for the Vogtle Electric Generating Plant, Units 1 and 2, in response to your letter dated September 13, 2012, as supplemented by letters dated August 2, 2013; July 3, July 17, November 11, and December 12, 2014; March 16 and May 5, 2015; February 17, April 18, and July 13, 2016; and March 13, April 14, May 4, and June 2, 2017.

The amendments modify the Technical Specifications (TS) to permit use of Risk-Informed Completion Times (RICTs) in accordance with Topical Report Nuclear Energy Institute (NEI) 06-09, “Risk-Informed Technical Specification Initiative 4b, Risk-Managed Technical Specifications (RMTS) Guidelines,” Revision 0-A. For selected TS action statements, the associated completion time would be replaced with a reference to a licensee-controlled document. The required completion times in the licensee-controlled documents will be managed in accordance with the licensee’s RICT Program.
A copy of the related Safety Evaluation is also enclosed. A Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

G. Edward Miller, Project Manager
Special Projects and Process Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-424 and 50-425

Enclosures:
1. Amendment No. 188 to NPF-68
2. Amendment No. 171 to NPF-81
3. Safety Evaluation

cc: Listserv
SOUTHERN NUCLEAR OPERATING COMPANY, INC.

GEORGIA POWER COMPANY

OGLETHORPE POWER CORPORATION

MUNICIPAL ELECTRIC AUTHORITY OF GEORGIA

CITY OF DALTON, GEORGIA

DOCKET NO. 50-424

VOGTLE ELECTRIC GENERATING PLANT, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 188
Renewed License No. NPF-68

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:

A. The application for amendment to the Vogtle Electric Generating Plant, Unit 1 (the facility) Renewed Facility Operating License No. NPF-68 filed by the Southern Nuclear Operating Company, Inc. (the licensee), acting for itself, Georgia Power Company, Oglethorpe Power Corporation, Municipal Electric Authority of Georgia, and City of Dalton, Georgia (the owners), dated September 13, 2012, as supplemented by letters dated August 2, 2013; July 3, July 17, November 11, and December 12, 2014; March 16 and May 5, 2015; February 17, April 18, and July 13, 2016; and March 13, April 14, May 4, and June 2, 2017, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations as set forth in 10 CFR Chapter I;

B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;

D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is hereby amended by changes to the Operating License, Technical Specifications, and Appendix D, "Additional Conditions," as indicated in the attachment to this license amendment, and Paragraphs 2.C.(2) and 2.C.(11) of Renewed Facility Operating License No. NPF-68 are hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 188 and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. Southern Nuclear shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

(11) Additional Conditions

The Additional Conditions contained in Appendix D, as revised through Amendment No. 188 are hereby incorporated into this license. Southern Nuclear shall operate the facility in accordance with the Additional Conditions.

3. This license amendment is effective as of its date of issuance and shall be implemented within 120 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to Renewed Facility Operating License, Technical Specifications, and Appendix D

Date of Issuance: August 8, 2017
1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:

A. The application for amendment to the Vogtle Electric Generating Plant, Unit 2 (the facility) Renewed Facility Operating License No. NPF-81 filed by the Southern Nuclear Operating Company, Inc. (the licensee), acting for itself, Georgia Power Company Oglethorpe Power Corporation, Municipal Electric Authority of Georgia, and City of Dalton, Georgia (the owners), dated September 13, 2012, as supplemented by letters dated August 2, 2013; July 3, July 17, November 11, and December 12, 2014; March 16 and May 5, 2015; February 17, April 18, and July 13, 2016; and March 13, April 14, May 4, and June 2, 2017, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission’s rules and regulations as set forth in 10 CFR Chapter I;

B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission’s regulations set forth in 10 CFR Chapter I;

D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission’s regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is hereby amended by changes to the Operating License, Technical Specifications, and Appendix D, “Additional Conditions,” as indicated in the attachment to this license amendment, and Paragraphs 2.C.(2) and 2.C.(5) of Renewed Facility Operating License No. NPF-81 are hereby amended to read as follows:

(2) **Technical Specifications and Environmental Protection Plan**

The Technical Specifications contained in Appendix A, as revised through Amendment No. 171 and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. Southern Nuclear shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

(5) **Additional Conditions**

The Additional Conditions contained in Appendix D, as revised through Amendment No. 171 are hereby incorporated into this license. Southern Nuclear shall operate the facility in accordance with the Additional Conditions.

3. This license amendment is effective as of its date of issuance and shall be implemented within 120 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

[Signature]

Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to Renewed Facility Operating License, Technical Specifications, and Appendix D

Date of Issuance: August 8, 2017
ATTACHMENT TO LICENSE AMENDMENT NOS. 188 AND 171

VOGTLE ELECTRIC GENERATING PLANT, UNITS 1 AND 2

RENEWED FACILITY OPERATING LICENSE NOS. NPF-68 AND NPF-81

DOCKET NOS. 50-424 AND 50-425

Replace the following pages of the Renewed Facility Operating Licenses, Appendix A, Technical Specifications, and Appendix D, Additional Conditions. The revised pages are identified by amendment number and contain marginal lines indicating areas of change.

**Renewed Facility Operating License No. NPF-68**

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**Renewed Facility Operating License No. NPF-81**

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Appendix D, Renewed Facility Operating License No. NPF-68

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Appendix D, Renewed Facility Operating License No. NPF-81

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(1) **Maximum Power Level**

Southern Nuclear is authorized to operate the facility at reactor core power levels not in excess of 3625.6 megawatts thermal (100 percent power) in accordance with the conditions specified herein.

(2) **Technical Specifications and Environmental Protection Plan**

The Technical Specifications contained in Appendix A, as revised through Amendment No. 188, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. Southern Nuclear shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

(3) Southern Nuclear Operating Company shall be capable of establishing containment hydrogen monitoring within 90 minutes of initiating safety injection following a loss of coolant accident.

(4) Deleted

(5) Deleted

(6) Deleted

(7) Deleted

(8) Deleted

(9) Deleted

(10) **Mitigation Strategy License Condition**

The licensee shall develop and maintain strategies for addressing large fires and explosions and that include the following key areas:

(a) Fire fighting response strategy with the following elements:
   1. Pre-defined coordinated fire response strategy and guidance
   2. Assessment of mutual aid fire fighting assets
   3. Designated staging areas for equipment and materials
   4. Command and control
   5. Training and response personnel

(b) Operations to mitigate fuel damage considering the following:
   1. Protection and use of personnel assets
   2. Communications
   3. Minimizing fire spread
   4. Procedures for Implementing integrated fire response strategy
   5. Identification of readily-available pre-staged equipment
   6. Training on integrated fire response strategy

Renewed Operating License NPF-68
Amendment No. 188
7. Spent fuel pool mitigation measures

(c) Actions to minimize release to include consideration of:
   1. Water spray scrubbing
   2. Dose to onsite responders

(11) Additional Conditions

The Additional Conditions contained in Appendix D, as revised through Amendment No. 188, are hereby incorporated into this license. Southern Nuclear shall operate the facility in accordance with the Additional Conditions.

D. The facility requires exemptions from certain requirements of 10 CFR Part 50 and 10 CFR Part 70. These include (a) an exemption from the requirements of 10 CFR 70.24 for two criticality monitors around the fuel storage area, and (b) an exemption from the requirements of Paragraph III.D.2(b)(ii) of Appendix J of 10 CFR 50, the testing of containment air locks at times when containment integrity is not required. The special circumstances regarding exemption b are identified in Section 6.2.6 of SSER 5.

An exemption was previously granted pursuant to 10 CFR 70.24. The exemption was granted with NRC materials license No. SNM-1967, issued August 21, 1986, and relieved GPC from the requirement of having a criticality alarm system. GPC and Southern Nuclear are hereby exempted from the criticality alarm system provision of 10 CFR 70.24 so far as this section applies to the storage of fuel assemblies held under this license.

These exemptions are authorized by law, will not present an undue risk to the public health and safety, and are consistent with the common defense and security. The exemptions in items b and c above are granted pursuant to 10 CFR 50.12. With these exemptions, the facility will operate, to the extent authorized herein, in conformity with the application, as amended, the provisions of the Act, and the rules and regulations of the Commission.

E. Southern Nuclear shall fully implement and maintain in effect all provisions of the Commission-approved physical security, training and qualification, and safeguards contingency plans including amendments made pursuant to provisions of the Miscellaneous Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822) and to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The plan, which contains Safeguards Information protected under 10 CFR 73.21, is entitled: "Southern Nuclear Operating Company Security Plan, Training and Qualification Plan, and Safeguards Contingency Plan," with revisions submitted through May 15, 2006.

Southern Nuclear shall fully implement and maintain in effect all provisions of the Commission-approved cyber security plan (CSP), including changes made pursuant to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The Southern Nuclear CSP was approved by License Amendment No. 162, as supplemented by a change approved by License Amendment No. 175.

F. GPC shall comply with the antitrust conditions delineated in Appendix C to this license.

Renewed Operating License No. NPF-68
Amendment No. 188
Georgia Power Company, Oglethorpe Power Corporation, Municipal Electric Authority of Georgia, and City of Dalton, Georgia, pursuant to the Act and 10 CFR Part 50, to possess but not operate the facility at the designated location in Burke County, Georgia, in accordance with the procedures and limitations set forth in this license;

Southern Nuclear, pursuant to the Act and 10 CFR Part 70, to receive, possess, and use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, as described in the Final Safety Analysis Report, as supplemented and amended;

Southern Nuclear, pursuant to the Act and 10 CFR Parts 30, 40, and 70 to receive, possess, and use at any time any byproduct, source and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;

Southern Nuclear, pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess, and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components;

Southern Nuclear, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproduct and special nuclear materials as my be produced by the operation of the facility authorized herein.

This license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter 1 and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect, and is subject to the additional conditions specified or incorporated below.

(1) Maximum Power Level
Southern Nuclear is authorized to operate the facility at reactor core power levels not in excess of 3625.6 megawatts thermal (100 percent power) in accordance with the conditions specified herein.

(2) Technical Specifications and Environmental Protection Plan
The Technical Specifications contained in Appendix A, as revised through Amendment No. 171 and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. Southern Nuclear shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

The Surveillance requirements (SRs) contained in the Appendix A Technical Specifications and listed below are not required to be performed immediately upon implementation of Amendment No. 74. The SRs listed below shall be
successfully demonstrated prior to the time and condition specified below for each:

a) DELETED

b) DELETED

c) SR 3.8.1.20 shall be successfully demonstrated at the first regularly scheduled performance after implementation of this license amendment.

(3) Southern Nuclear Operating Company shall be capable of establishing containment hydrogen monitoring within 90 minutes of initiating safety injection following a loss of coolant accident.

(4) **Mitigation Strategy License Condition**

The licensee shall develop and maintain strategies for addressing large fires and explosions and that include the following key areas:

(a) Fire fighting response strategy with the following elements:
   1. Pre-defined coordinated fire response strategy and guidance
   2. Assessment of mutual aid fire fighting assets
   3. Designated staging areas for equipment and materials
   4. Command and control
   5. Training of response personnel

(b) Operations to mitigate fuel damage considering the following:
   1. Protection and use of personnel assets
   2. Communications
   3. Minimizing fire spread
   4. Procedures for implementing integrated fire response strategy
   5. Identification of readily-available pre-staged equipment
   6. Training on integrated fire response strategy
   7. Spent fuel pool mitigation measures

(c) Actions to minimize release to include consideration of:
   1. Water spray scrubbing
   2. Dose to onsite responders

(5) **Additional Conditions**

The Additional Conditions contained in Appendix D, as revised through Amendment No. 171, are hereby incorporated into this license. Southern Nuclear shall operate the facility in accordance with the Additional Conditions.

D. The facility requires exemptions from certain requirements of 10 CFR Part 50 and 10 CFR Part 70. These include (a) an exemption from the requirements of 10 CFR 70.24 for two criticality monitors around the fuel storage area, and (b) an exemption from the requirements of Paragraph III.D.2(b)(ii) of Appendix J of 10 CFR 50, the testing of containment air locks at times when containment integrity is not required. The special circumstances regarding exemption b are identified in Section 6.2.6 of SSER 8.

Renewed Operating License NPF-81
Amendment No. 171
1.3 Completion Times

EXAMPLES

EXAMPLE 1.3-7  (continued)

If after Condition A is entered, Required Action A.1 is not met within either the initial 1 hour or any subsequent 8-hour interval from the previous performance (plus the extension allowed by SR 3.0.2), Condition B is entered. The Completion Time clock for Condition A does not stop after Condition B is entered, but continues from the time Condition A was initially entered. If Required Action A.1 is met after Condition B is entered, Condition B is exited and operation may continue in accordance with Condition A, provided the Completion Time for Required Action A.2 has not expired.
### EXAMPLES (continued)

#### EXAMPLE 1.3-8

**ACTIONS**

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<th>CONDITION</th>
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<th>COMPLETION TIME</th>
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<tr>
<td>A. One subsystem inoperable.</td>
<td>A.1 Restore subsystem to OPERABLE status.</td>
<td>7 days OR In accordance with the Risk Informed Completion Time Program</td>
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| B. ---NOTES---  
1. Not applicable when second subsystem 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.  
| B.1 Restore subsystems to OPERABLE status. | 1 hour OR In accordance with the Risk Informed Completion Time Program |
| C. Required Action and associated Completion Time not met. | C.1 Be in MODE 3. AND C.2 Be in MODE 5. | 6 hours AND 36 hours |

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Two subsystems inoperable.

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Vogtle Units 1 and 2  
1.3-14  
Amendment No.188 (Unit 1)  
Amendment No.171 (Unit 2)
EXAMPLE 1.3-8 (continued)

When a subsystem is declared inoperable, Condition A is entered. The 7 day Completion Time may be applied as discussed in Example 1.3-2. However, the licensee may elect to apply the Risk Informed Completion Time Program which permits calculation of a Risk Informed Completion Time (RICT) that may be used to complete the Required Action beyond the 7 day Completion Time. The RICT cannot exceed 30 days. After the 7 day Completion Time has expired, the subsystem must be restored to OPERABLE status within the RICT or Condition C must also be entered.

If a second subsystem is declared inoperable, Condition B may also be entered. The Condition is modified by two Notes. The first note states it is not applicable if the second subsystem is intentionally made inoperable. The second note provides restrictions applicable to these “loss of function” Conditions. The Required Actions of Condition B are not intended for voluntary removal of redundant subsystems from service. The Required Action is only applicable if one subsystem is inoperable for any reason and the second subsystem is found to be inoperable, or if both subsystems are found to be inoperable at the same time. If Condition B is applicable, at least one subsystem must be restored to OPERABLE status within 1 hour or Condition C must also be entered. The licensee may be able to apply a RICT or to extend the Completion Time beyond 1 hour, but not longer than 24 hours, if the requirements of the Risk Informed Completion Time Program are met. If two subsystems are inoperable and Condition B is not applicable (i.e., the second subsystem was intentionally made inoperable), LCO 3.0.3 is entered as there is no applicable Condition.

The Risk Informed Completion Time Program requires recalculation of the RICT to reflect changing plant conditions. For planned changes, the revised RICT must be determined prior to implementation of the change in configuration. For emergent conditions, the revised RICT must be determined within the time limits of the Required Action Completion Time (i.e., not the RICT) or 12 hours after the plant configuration change, whichever is less.

If the 7 day Completion Time clock of Condition A or the 1 hour Completion Time clock of Condition B have expired and subsequent changes in plant condition result in exiting the applicability of the Risk Informed Completion Time Program without restoring the inoperable subsystem to OPERABLE status, Condition C is also entered and the Completion Time clocks for Required Actions C.1 and C.2 start.

(continued)
1.3 Completion Times

EXAMPLES

EXAMPLE 1.3-8  (continued)

If the RICT expires or is recalculated to be less than the elapsed time since the Condition was entered and the inoperable subsystem has not been restored to OPERABLE Status, Condition C is also entered and the Completion Time clocks for Required Actions C.1 and C.2 start. If the inoperable subsystems are restored to OPERABLE status after Condition C is entered, Conditions A, B, and C are exited, and therefore, the Required Actions of Condition C may be terminated.

IMMEDIATE COMPLETION TIME

When "Immediately" is used as a Completion Time, the Required Action should be pursued without delay and in a controlled manner.
3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.10 Pressurizer Safety Valves

LCO 3.4.10 Three pressurizer safety valves shall be OPERABLE with lift settings ≥ 2410 psig and ≤ 2510 psig.

APPLICABILITY: MODES 1, 2, and 3.
MODE 4 with all RCS cold leg temperatures > the COPS arming temperature specified in the PTLR.

-----------------------------------------NOTE----------------------------------------------
The lift settings are not required to be within the LCO limits during MODE 3 and MODE 4 with all RCS cold leg temperatures > the COPS arming temperature specified in the PTLR for the purpose of setting the pressurizer safety valves under ambient (hot) conditions. This exception is allowed for 54 hours following entry into MODE 3 provided a preliminary cold setting was made prior to heatup.

-----------------------------------------ACTIONS------------------------------------------

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.---------NOTES---------</td>
<td>A.1</td>
<td>15 minutes</td>
</tr>
<tr>
<td>1. Not applicable when pressurizer safety valve intentionally made inoperable.</td>
<td>Restore valve to OPERABLE status.</td>
<td>OR</td>
</tr>
<tr>
<td>2. The following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.</td>
<td>In accordance with the Risk Informed Completion Time Program</td>
<td></td>
</tr>
</tbody>
</table>

One pressurizer safety valve inoperable.

(continued)

Vogtle Units 1 and 2

Amendment No.188 (Unit 1)
Amendment No.171 (Unit 2)
### ACTIONS (continued)

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
</table>
| B. Required Action and associated Completion Time not met. | **AND** B.1 Be in MODE 3.  
Or  
Two or more pressurizer safety valves inoperable. | 6 hours |
|  | B.2 Be in MODE 4 with any RCS cold leg temperature ≤ the COPS arming temperature specified in the PTLR. | 12 hours |

### SURVEILLANCE REQUIREMENTS

<table>
<thead>
<tr>
<th>SURVEILLANCE</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR 3.4.10.1</td>
<td>Verify each pressurizer safety valve is OPERABLE in accordance with the INSERVICE TESTING PROGRAM. Following testing, lift settings shall be within ±1%.</td>
</tr>
</tbody>
</table>
3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.11 Pressurizer Power Operated Relief Valves (PORVs)

LCO 3.4.11 Each PORV and associated block valve shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

Separate Condition entry is allowed for each PORV and each block valve.

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. One or more PORVs inoperable and capable of being manually cycled.</td>
<td>A.1 Close and maintain power to associated block valve.</td>
<td>1 hour</td>
</tr>
<tr>
<td>B. One PORV inoperable and not capable of being manually cycled.</td>
<td>B.1 Close associated block valve.</td>
<td>1 hour</td>
</tr>
<tr>
<td></td>
<td>AND</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B.2 Remove power from associated block valve.</td>
<td>1 hour</td>
</tr>
<tr>
<td></td>
<td>AND</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B.3 Restore PORV to OPERABLE status.</td>
<td>72 hours</td>
</tr>
<tr>
<td></td>
<td>OR</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>In accordance with the Risk Informed Completion Time Program</td>
</tr>
</tbody>
</table>

(continued)
## ACTIONS (continued)

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. One block valve inoperable.</td>
<td>C.1 Place associated PORV in manual control.</td>
<td>1 hour</td>
</tr>
<tr>
<td>AND</td>
<td>C.2 Restore block valve to OPERABLE status.</td>
<td>72 hours</td>
</tr>
<tr>
<td>D. Required Action and associated Completion Time of Condition A, B, or C not met.</td>
<td>D.1 Be in MODE 3.</td>
<td>6 hours</td>
</tr>
<tr>
<td>AND</td>
<td>D.2 Be in MODE 4.</td>
<td>12 hours</td>
</tr>
<tr>
<td>E. Two PORVs inoperable and not capable of being manually cycled.</td>
<td>E.1 Close associated block valves.</td>
<td>1 hour</td>
</tr>
<tr>
<td>AND</td>
<td>E.2 Remove power from associated block valves.</td>
<td>1 hour</td>
</tr>
<tr>
<td>AND</td>
<td>E.3 Be in MODE 3.</td>
<td>6 hours</td>
</tr>
<tr>
<td>AND</td>
<td>E.4 Be in MODE 4.</td>
<td>12 hours</td>
</tr>
</tbody>
</table>

Vogtle Units 1 and 2

3.4.11-2

Amendment No.188 (Unit 1)
Amendment No.171 (Unit 2)
### ACTIONS (continued)

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>F.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Not applicable when second block valve intentionally made inoperable.</td>
<td>F.1 Restore one block valve to OPERABLE status.</td>
<td>2 hours OR In accordance with the Risk Informed Completion time Program</td>
</tr>
<tr>
<td>2. The following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two block valves inoperable.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G. Required Action and associated Completion Time of Condition F not met.</td>
<td>G.1 Be in MODE 3.</td>
<td>6 hours</td>
</tr>
<tr>
<td>G.2 Be in MODE 4.</td>
<td></td>
<td>12 hours</td>
</tr>
</tbody>
</table>

Vogtle Units 1 and 2

Amendment No.188 (Unit 1)
Amendment No.171 (Unit 2)
### Surveillance Requirements

<table>
<thead>
<tr>
<th>Surveillance</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR 3.4.11.1</td>
<td>In accordance with the Surveillance Frequency Control Program</td>
</tr>
<tr>
<td></td>
<td>1. Not required to be performed with block valve closed in accordance with the Required Actions of this LCO.</td>
</tr>
<tr>
<td></td>
<td>2. Only required to be performed in MODES 1 and 2.</td>
</tr>
<tr>
<td></td>
<td>Perform a complete cycle of each block valve.</td>
</tr>
<tr>
<td>SR 3.4.11.2</td>
<td>In accordance with the Surveillance Frequency Control Program</td>
</tr>
<tr>
<td></td>
<td>Only required to be performed in MODES 1 and 2.</td>
</tr>
<tr>
<td></td>
<td>Perform a complete cycle of each PORV.</td>
</tr>
</tbody>
</table>

Vogtle Units 1 and 2

Amendment No.188 (Unit 1)
Amendment No.171 (Unit 2)
### 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

#### 3.5.1 Accumulators

**LCO 3.5.1** Four ECCS accumulators shall be OPERABLE.

**APPLICABILITY:** MODES 1 and 2, MODE 3 with pressurizer pressure > 1000 psig.

**ACTIONS**

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. One accumulator inoperable due to boron concentration not within limits.</td>
<td>A.1 Restore boron concentration to within limits.</td>
<td>72 hours</td>
</tr>
<tr>
<td>B. One accumulator inoperable for reasons other than Condition A.</td>
<td>B.1 Restore accumulator to OPERABLE status.</td>
<td>24 hours</td>
</tr>
<tr>
<td>C. ----------NOTES----------</td>
<td>C.1 Restore accumulators to OPERABLE status.</td>
<td>1 hour, OR In accordance with the Risk Informed Completion Time Program</td>
</tr>
</tbody>
</table>

1. Not applicable when two or more accumulators are 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 or more accumulators inoperable for reasons other than boron concentration not within limits.

(continued)
<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>D. Required Action and associated Completion Time of Condition A, B, or C not met.</td>
<td>D.1 Be in MODE 3. AND D.2 Reduce pressurizer pressure to ≤ 1000 psig.</td>
<td>6 hours 12 hours</td>
</tr>
</tbody>
</table>

**SURVEILLANCE REQUIREMENTS**

<table>
<thead>
<tr>
<th>SURVEILLANCE</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR 3.5.1.1</td>
<td>Verify each accumulator isolation valve is fully open. In accordance with the Surveillance Frequency Control Program</td>
</tr>
<tr>
<td>SR 3.5.1.2</td>
<td>Verify borated water volume in each accumulator is ≥ 6555 gallons and ≤ 6909 gallons. In accordance with the Surveillance Frequency Control Program</td>
</tr>
<tr>
<td>SR 3.5.1.3</td>
<td>Verify nitrogen cover pressure in each accumulator is ≥ 617 psig and ≤ 678 psig. In accordance with the Surveillance Frequency Control Program</td>
</tr>
</tbody>
</table>

Vogtle Units 1 and 2 3.5.1-2 Amendment No.188 (Unit 1) Amendment No.171 (Unit 2)
### SURVEILLANCE REQUIREMENTS (continued)

<table>
<thead>
<tr>
<th>SURVEILLANCE</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR 3.5.1.4</td>
<td>In accordance with the Surveillance Frequency Control Program AND For each affected accumulator, once within 6 hours after each solution volume increase of ≥ 67 gallons, that is not the result of addition from the refueling water storage tank</td>
</tr>
<tr>
<td>SR 3.5.1.5</td>
<td>In accordance with the Surveillance Frequency Control Program</td>
</tr>
</tbody>
</table>

Vogtle Units 1 and 2

Amendment No.188 (Unit 1) Amendment No.171 (Unit 2)
3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.2 ECCS - Operating

LCO 3.5.2 Two ECCS trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

--- NOTE ---

In MODE 3, either residual heat removal pump to cold legs injection flow path may be isolated by closing the isolation valve to perform pressure isolation valve testing per SR 3.4.14.1.

---

<table>
<thead>
<tr>
<th>ACTIONS</th>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>One or more trains inoperable. AND At least 100% of the ECCS flow equivalent to a single OPERABLE ECCS train available.</td>
<td>A.1 Restore train(s) to OPERABLE status.</td>
<td>72 hours OR In accordance with the Risk Informed Completion Time Program</td>
</tr>
<tr>
<td>B.</td>
<td>Required Action and associated Completion Time not met.</td>
<td>B.1 Be in MODE 3. AND B.2 Be in MODE 4.</td>
<td>6 hours 12 hours</td>
</tr>
</tbody>
</table>

Vogtle Units 1 and 2 3.5.2-1 Amendment No. 188 (Unit 1) Amendment No. 171 (Unit 2)
3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.4 Refueling Water Storage Tank (RWST)

LCO 3.5.4 The RWST shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

**ACTIONS**

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. RWST boron concentration not within limits. OR RWST borated water temperature not within limits.</td>
<td>A.1 Restore RWST to OPERABLE status.</td>
<td>8 hours</td>
</tr>
<tr>
<td>B. One sludge mixing pump isolation valve inoperable.</td>
<td>B.1 Restore the valve to OPERABLE status.</td>
<td>24 hours OR In accordance with the Risk Informed Completion Time Program</td>
</tr>
</tbody>
</table>

(continued)
## ACTIONS (continued)

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Two sludge mixing pump isolation valves inoperable.</td>
<td>C.1 Restore one valve to OPERABLE status.</td>
<td>24 hours</td>
</tr>
<tr>
<td>D. Required Action and associated Completion Time of Condition B or C not met.</td>
<td>D.1 Isolate the sludge mixing system.</td>
<td>6 hours</td>
</tr>
<tr>
<td>E. -----------NOTES----------</td>
<td>E.1 Restore RWST to OPERABLE status.</td>
<td>1 hour</td>
</tr>
</tbody>
</table>

1. Not applicable when the RWST is 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.

---

RWST inoperable for reasons other than Condition A, B, or C.

---

Vogtle Units 1 and 2 3.5.4-2

Amendment No.188 (Unit 1)
Amendment No.171 (Unit 2)
## ACTIONS (continued)

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>F. Required Action and associated Completion Time of Condition A or E not met.</td>
<td>F.1 Be in MODE 3. AND F.2 <strong>---NOTE---</strong> LCO 3.0.4.a is not applicable when entering MODE 4. <strong>---NOTE---</strong> Be in MODE 4.</td>
<td>6 hours 12 hours</td>
</tr>
</tbody>
</table>

## SURVEILLANCE REQUIREMENTS

<table>
<thead>
<tr>
<th>SURVEILLANCE</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR 3.5.4.1</td>
<td>Only required to be performed when ambient air temperature is &lt; 40°F. Verify RWST borated water temperature is ( \geq 44^\circ F ) and ( \leq 116^\circ F ). In accordance with the Surveillance Frequency Control Program.</td>
</tr>
<tr>
<td>SR 3.5.4.2</td>
<td>Verify RWST borated water volume is ( \geq 686,000 ) gallons. In accordance with the Surveillance Frequency Control Program.</td>
</tr>
</tbody>
</table>

Vogtle Units 1 and 2 3.5.4-3 Amendment No.188 (Unit 1) Amendment No.171 (Unit 2)
<table>
<thead>
<tr>
<th>SURVEILLANCE REQUIREMENTS (continued)</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SR 3.5.4.3</strong> Verify RWST boron concentration is $\geq$ 2400 ppm and $\leq$ 2600 ppm.</td>
<td>In accordance with the Surveillance Frequency Control Program</td>
</tr>
<tr>
<td><strong>SR 3.5.4.4</strong> Verify each sludge mixing pump isolation valve automatically closes on an actual or simulated RWST Low-Level signal.</td>
<td>In accordance with the Surveillance Frequency Control Program</td>
</tr>
</tbody>
</table>

Vogtle Units 1 and 2

3.5.4-4

Amendment No.188 (Unit 1)
Amendment No.171 (Unit 2)
<table>
<thead>
<tr>
<th>ACTION</th>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.</td>
<td>One or more containment air locks inoperable for reasons other than Condition A or B.</td>
<td>C.1 Initiate action to evaluate overall containment leakage rate per LCO 3.6.1. AND C.2 Verify a door is closed in the affected air lock. AND C.3 Restore air lock to OPERABLE status.</td>
<td>Immediately OR 1 hour or 24 hours or In accordance with the Risk Informed Completion Time Program</td>
</tr>
<tr>
<td>D.</td>
<td>Required Action and associated Completion Time not met.</td>
<td>D.1 Be in MODE 3. AND D.2 Be in MODE 5.</td>
<td>6 hours or 36 hours</td>
</tr>
</tbody>
</table>
3.6 CONTAINMENT SYSTEMS

3.6.3 Containment Isolation Valves

LCO 3.6.3 Each containment isolation valve shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

NOTES

1. Penetration flow path(s) (except for 24 inch purge valves) may be unisolated intermittently under administrative controls.

2. Separate Condition entry is allowed for each penetration flow path.

3. Enter applicable Conditions and Required Actions for systems made inoperable by containment isolation valves.

4. Enter applicable Conditions and Required Actions of LCO 3.6.1, "Containment," when isolation valve leakage results in exceeding the overall containment leakage rate acceptance criteria.

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. One or more penetration flow paths with one containment isolation valve inoperable except for purge valve leakage not within limit.</td>
<td>A.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured.</td>
<td>4 hours</td>
</tr>
</tbody>
</table>

AND

OR

In accordance with the Risk Informed Completion Time Program

(continued)

Vogtle Units 1 and 2 3.6.3-1 Amendment No.188 (Unit 1)
Amendment No.171 (Unit 2)
### ACTIONS

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
</table>
| A. (continued) | A.2 ————NOTE———
Isolation devices in high radiation areas may be verified by use of administrative means. ————NOTE———
Verify the affected penetration flow path is isolated. | Once per 31 days for isolation devices outside containment AND
Prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days for isolation devices inside containment |

#### B. ————NOTES———

1. Not applicable when the second containment isolation valve is 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.

One or more penetration flow paths with two containment isolation valves inoperable except for purge valve leakage not within limit.

**Vogtle Units 1 and 2**

3.6.3-2

Amendment No.188 (Unit 1)
Amendment No.171 (Unit 2)
### ACTIONS (continued)

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Not applicable when the second containment purge valve is intentionally made inoperable.</td>
<td><strong>C.1</strong> Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange.</td>
<td>24 hours OR In accordance with the Risk Informed Completion Time Program</td>
</tr>
<tr>
<td>2. The following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.</td>
<td><strong>C.2</strong> Isolation devices in high radiation areas may be verified by use of administrative means.</td>
<td>Verify the affected penetration flow path is isolated. Once per 31 days for isolation devices outside containment AND Prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days for isolation devices inside containment</td>
</tr>
</tbody>
</table>

---

One or more penetration flow paths with one or more containment purge valves not within purge valve leakage limits.
3.6 CONTAINMENT SYSTEMS

3.6.6 Containment Spray and Cooling Systems

LCO 3.6.6 Two containment spray trains and two containment cooling trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. One containment spray train inoperable.</td>
<td>A.1 Restore containment spray train to OPERABLE status.</td>
<td>72 hours OR In accordance with the Risk Informed Completion Time Program</td>
</tr>
<tr>
<td>B. One containment cooling train inoperable.</td>
<td>B.1 Restore containment cooling train to OPERABLE status.</td>
<td>72 hours OR In accordance with the Risk Informed Completion Time Program</td>
</tr>
<tr>
<td>C. Required Action and associated Completion Time of Condition A or B not met.</td>
<td>C.1 Be in MODE 3. AND C.2 Be in MODE 4.</td>
<td>6 hours 12 hours</td>
</tr>
</tbody>
</table>

---

Vogtle Units 1 and 2 3.6.6-1 Amendment No.188 (Unit 1) Amendment No.171 (Unit 2)
### 3.7 PLANT SYSTEMS

#### 3.7.2 Main Steam Isolation Valves (MSIVs)

**LCO 3.7.2**

Two MSIV systems per steam line shall be OPERABLE.

**APPLICABILITY:**

MODE 1, MODES 2 and 3 except when one MSIV system in each steam line is closed.

**ACTIONS**

---

**NOTE**

Separate Condition entry is allowed for each steam line.

---

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. One or more steam line with one MSIV system inoperable in MODE 1.</td>
<td>A.1 Restore MSIV to OPERABLE status.</td>
<td>72 hours OR In accordance with the Risk Informed Completion Time Program</td>
</tr>
<tr>
<td>B. <strong>NOTES</strong></td>
<td>B.1 Restore one MSIV system to OPERABLE status in affected steam line.</td>
<td>4 hours OR In accordance with the Risk Informed Completion Time Program</td>
</tr>
</tbody>
</table>

---

1. Not applicable when the second MSIV in one steam line is 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.

---

One or more steam lines with two MSIV systems inoperable in MODE 1.

---

(continued)

**Vogtle Units 1 and 2**

3.7.2-1 Amendment No. 188 (Unit 1)

Amendment No. 171 (Unit 2)
### ACTIONS (continued)

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.</td>
<td>C.1 Be in MODE 2.</td>
<td>6 hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D.</td>
<td>D.1 Verify one MSIV system closed in affected steam line.</td>
<td>7 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AND</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Once per 7 days thereafter.</td>
</tr>
<tr>
<td>E.</td>
<td>E.1 Verify one MSIV system closed in affected steam line.</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AND</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Once per 7 days thereafter.</td>
</tr>
<tr>
<td>F.</td>
<td>F.1 Be in MODE 3.</td>
<td>6 hours</td>
</tr>
<tr>
<td></td>
<td>F.2 Be in MODE 4.</td>
<td>12 hours</td>
</tr>
</tbody>
</table>

### SURVEILLANCE REQUIREMENTS

<table>
<thead>
<tr>
<th>SURVEILLANCE</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR 3.7.2.1</td>
<td>In accordance with the INSERVICE TESTING PROGRAM</td>
</tr>
<tr>
<td></td>
<td>Only required to be performed in MODES 1 and 2.</td>
</tr>
<tr>
<td></td>
<td>Verify closure time of each MSIV system is ≤ 5 seconds on an actual or simulated actuation signal.</td>
</tr>
</tbody>
</table>

Vogtle Units 1 and 2

Amendment No.188(Unit 1)
Amendment No.171(Unit 2)
3.7 PLANT SYSTEMS

3.7.4 Atmospheric Relief Valves (ARVs)

LCO 3.7.4 Three ARV lines shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3

<table>
<thead>
<tr>
<th>CONDITIONS</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. One required ARV line inoperable.</td>
<td>A.1 Restore required ARV line to OPERABLE status.</td>
<td>30 days</td>
</tr>
<tr>
<td>B. -----NOTES-----</td>
<td>B.1 Restore at least two ARV lines to OPERABLE status.</td>
<td>24 hours</td>
</tr>
<tr>
<td>1. Not applicable when the second required ARV line is intentionally made inoperable.</td>
<td>OR</td>
<td>In accordance with the Risk Informed Completion Time Program</td>
</tr>
<tr>
<td>2. The following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two or more required ARV lines inoperable.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Required Action and associated Completion Time not met.</td>
<td>C.1 Be in MODE 3.</td>
<td>6 hours</td>
</tr>
<tr>
<td></td>
<td>AND</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C.2 Be in MODE 4</td>
<td>18 hours</td>
</tr>
</tbody>
</table>

Vogtle Units 1 and 2

Amendment No. 188 (Unit 1)
Amendment No. 171 (Unit 2)
3.7 PLANT SYSTEMS

3.7.5 Auxiliary Feedwater (AFW) System

LCO 3.7.5 Three AFW trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. One steam supply to turbine driven AFW pump inoperable.</td>
<td>A.1 Restore affected equipment to OPERABLE status.</td>
<td>7 days OR In accordance with the Risk Informed Completion Time Program</td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---NOTE----- Only applicable if MODE 2 has not been entered following refueling.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One turbine driven AFW pump inoperable in MODE 3 following refueling.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(continued)

Vogtle Units 1 and 2

3.7.5-1 Amendment No.188 (Unit 1) Amendment No.171 (Unit 2)
### ACTIONS (continued)

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. One AFW train inoperable for reasons other than Condition A.</td>
<td>B.1 Restore AFW train to OPERABLE status.</td>
<td>72 hours OR In accordance with the Risk Informed Completion Time Program</td>
</tr>
<tr>
<td>C.</td>
<td>C.1 Restore AFW trains to OPERABLE status.</td>
<td>1 hour OR In accordance with the Risk Informed Completion Time Program</td>
</tr>
<tr>
<td>C. NOTES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Not applicable when second AFW train intentionally made inoperable.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. The following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two AFW trains inoperable.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Required Action and associated Completion Time for Condition A, B, or C not met.</td>
<td>D.1 Be in MODE 3. AND D.2 Be in MODE 4.</td>
<td>6 hours OR 12 hours</td>
</tr>
</tbody>
</table>

Vogtle Units 1 and 2

3.7.5-2 Amendment No. 188 (Unit 1) Amendment No. 171 (Unit 2)
### ACTIONS (continued)

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. Three AFW trains inoperable.</td>
<td>E.1 ---------------NOTE------------- LCO 3.0.3 and all other LCO Required Actions requiring MODE changes are suspended until one AFW train is restored to OPERABLE status. Initiate action to restore one AFW train to OPERABLE status.</td>
<td>Immediately</td>
</tr>
</tbody>
</table>

### SURVEILLANCE REQUIREMENTS

<table>
<thead>
<tr>
<th>SURVEILLANCE</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>---------------NOTE----------------------------- AFW train(s) may be considered OPERABLE during alignment and operation for steam generator level control, if it is capable of being manually realigned to the AFW mode of operation. Verify each AFW manual, power operated, and automatic valve in each water flow path, and in both steam supply flow paths to the steam turbine driven pump, that is not locked, sealed, or otherwise secured in position, is in the correct position.</td>
<td>In accordance with the Surveillance Frequency Control Program</td>
</tr>
</tbody>
</table>
### SURVEILLANCE REQUIREMENTS (continued)

<table>
<thead>
<tr>
<th>SURVEILLANCE</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SR 3.7.5.2</strong></td>
<td><strong>NOTE</strong></td>
</tr>
<tr>
<td>Not required to be performed for the turbine driven AFW pump until 24 hours after ≥ 900 psig in the steam generator.</td>
<td>In accordance with the Surveillance Frequency Control Program</td>
</tr>
<tr>
<td>Verify the developed head of each AFW pump at the flow test point is greater than or equal to the required developed head.</td>
<td></td>
</tr>
</tbody>
</table>

| **SR 3.7.5.3** | **NOTE** |
| AFW train(s) may be considered OPERABLE during alignment and operation for steam generator level control, if it is capable of being manually realigned to the AFW mode of operation. | In accordance with the Surveillance Frequency Control Program |
| Verify each AFW automatic valve that is not locked, sealed, or otherwise secured in position actuates to the correct position on an actual or simulated actuation signal. | |

(continued)
<table>
<thead>
<tr>
<th>SURVEILLANCE REQUIREMENTS (continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SURVEILLANCE</strong></td>
</tr>
<tr>
<td><strong>SR 3.7.5.4</strong></td>
</tr>
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<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td><strong>SR 3.7.5.5</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>SR 3.7.5.6</strong></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Vogtle Units 1 and 2 3.7.5-5 Amendment No.188 (Unit 1) Amendment No.171 (Unit 2)
### 3.7 PLANT SYSTEMS

#### 3.7.7 Component Cooling Water (CCW) System

**LCO 3.7.7** Two CCW trains shall be OPERABLE.

**APPLICABILITY:** MODES 1, 2, 3, and 4.

**ACTIONS**

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. One CCW train inoperable.</td>
<td>A.1 <strong>NOTE</strong> Enter applicable Conditions and Required Actions of LCO 3.4.6, &quot;RCS Loops - MODE 4,&quot; for residual heat removal loops made inoperable by CCW.</td>
<td>72 hours OR In accordance with the Risk Informed Completion Time Program</td>
</tr>
<tr>
<td></td>
<td>Restore CCW train to OPERABLE status.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. <strong>NOTES</strong></th>
<th>B.1 Restore CCW trains to OPERABLE status.</th>
<th>1 hour OR In accordance with the Risk Informed Completion Time Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Not applicable when second CCW train intentionally made inoperable.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. The following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two CCW trains inoperable.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(continued)
### ACTIONS (continued)

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Required Action and associated Completion Time of Condition A or B not met.</td>
<td>C.1 Be in MODE 3.</td>
<td>6 hours</td>
</tr>
<tr>
<td></td>
<td>AND C.2 ------------NOTE-------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LCO 3.0.4.a is not applicable when entering MODE 4.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Be in MODE 4.</td>
<td>12 hours</td>
</tr>
</tbody>
</table>

### SURVEILLANCE REQUIREMENTS

<table>
<thead>
<tr>
<th>SURVEILLANCE</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR 3.7.7.1</td>
<td>-------------------------------NOTE-------------------------------</td>
</tr>
<tr>
<td></td>
<td>Isolation of CCW flow to individual components does not render the CCW System inoperable.</td>
</tr>
<tr>
<td></td>
<td>Verify each CCW manual, power operated, and automatic valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.</td>
</tr>
<tr>
<td>SR 3.7.7.2</td>
<td>Verify each CCW pump starts automatically on an actual or simulated actuation signal.</td>
</tr>
</tbody>
</table>

Vogtle Units 1 and 2 3.7.7-2 Amendment No.188 (Unit 1) Amendment No.171 (Unit 2)
3.7 PLANT SYSTEMS

3.7.8 Nuclear Service Cooling Water (NSCW) System

LCO 3.7.8 Two NSCW trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. One NSCW train inoperable.</td>
<td>1. Enter applicable Conditions and Required Actions of LCO 3.8.1, &quot;AC Sources - Operating,&quot; for emergency diesel generator made inoperable by NSCW system.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Enter applicable Conditions and Required Actions of LCO 3.4.6, &quot;RCS Loops - MODE 4,&quot; for residual heat removal loops made inoperable by NSCW system.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A.1 Restore NSCW system to OPERABLE status.</td>
<td>72 hours</td>
</tr>
</tbody>
</table>

OR

In accordance with the Risk Informed Completion Time Program

Vogtle Units 1 and 2 3.7.8-1 Amendment No.188 (Unit 1) Amendment No.171 (Unit 2)
### ACTIONS (continued)

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. NOTES</td>
<td>B.1 Restore NSCW trains to OPERABLE status.</td>
<td>1 hour OR In accordance with the Risk Informed Completion Time Program</td>
</tr>
<tr>
<td>1. Not applicable when second NSCW train intentionally made inoperable.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. The following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two NSCW trains inoperable.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Required Action and associated Completion Time of Condition A or B not met.</td>
<td>C.1 Be in MODE 3.</td>
<td>6 hours</td>
</tr>
<tr>
<td>AND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C.2 LCO 3.0.4.a is not applicable when entering MODE 4.</td>
<td></td>
<td>12 hours</td>
</tr>
<tr>
<td></td>
<td>Be in MODE 4.</td>
<td></td>
</tr>
<tr>
<td>SURVEILLANCE REQUIREMENTS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SURVEILLANCE</strong></td>
<td><strong>FREQUENCY</strong></td>
<td></td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------------------------------------</td>
<td></td>
</tr>
<tr>
<td>SR 3.7.8.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>_________________________</td>
<td>NOTE</td>
<td></td>
</tr>
<tr>
<td>Isolation of NSCW system flow to individual components does not render the NSCW system inoperable.</td>
<td>In accordance with the Surveillance Frequency Control Program</td>
<td></td>
</tr>
<tr>
<td>Verify each NSCW system manual, power operated, and automatic valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SR 3.7.8.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verify each NSCW system automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.</td>
<td>In accordance with the Surveillance Frequency Control Program</td>
<td></td>
</tr>
<tr>
<td>SR 3.7.8.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verify each NSCW system pump starts automatically on an actual or simulated actuation signal.</td>
<td>In accordance with the Surveillance Frequency Control Program</td>
<td></td>
</tr>
</tbody>
</table>

Vogtle Units 1 and 2

3.7.8-3

Amendment No.188 (Unit 1)

Amendment No.171 (Unit 2)
3.7 PLANT SYSTEMS

3.7.9 Ultimate Heat Sink (UHS)

LCO 3.7.9 The UHS shall be OPERABLE. The fans/spray cells shall be as specified in Figure 3.7.9-1.

APPLICABILITY: MODES 1, 2, 3, and 4.

### ACTIONS

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. One or more Nuclear Service Cooling Water (NSCW) basins with water temperature and/or water level not within limits.</td>
<td>A.1 Restore water temperature(s) and water level(s) to within limits.</td>
<td>72 hours</td>
</tr>
<tr>
<td>B. One NSCW cooling tower with one required fan/spray cell inoperable when operating in four fan/spray cell required region of Figure 3.7.9-1.</td>
<td>B.1 Restore fan to OPERABLE status.</td>
<td>7 days OR In accordance with the Risk Informed Completion Time Program</td>
</tr>
<tr>
<td>C. One NSCW cooling tower with one or more required fans/spray cells inoperable for reasons other than Condition B.</td>
<td>C.1 Restore fan(s)/spray cell(s) to OPERABLE status.</td>
<td>72 hours OR In accordance with the Risk Informed Completion Time Program</td>
</tr>
</tbody>
</table>

Vogtle Units 1 and 2 3.7.9-1 Amendment No. 188 (Unit 1) Amendment No. 171 (Unit 2)
3.7 PLANT SYSTEMS

3.7.14 Engineered Safety Features (ESF) Room Cooler and Safety Related Chiller System

LCO 3.7.14 Two ESF Room Cooler and Safety-Related Chiller trains shall be OPERABLE.

NOTE: One Safety-Related Chiller train may be removed from service for ≤ 2 hours under administrative controls for surveillance testing of the other Safety-Related Chiller train.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. One ESF room cooler and safety-related chiller train inoperable.</td>
<td>A.1 Restore the ESF room cooler and safety-related chiller train to OPERABLE status.</td>
<td>72 hours OR In accordance with the Risk Informed Completion Time Program</td>
</tr>
</tbody>
</table>

(continued)

Vogtle Units 1 and 2

3.7.14-1 Amendment No. 188 (Unit 1)

Amendment No.171 (Unit 2)
<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. -------NOTES--------</td>
<td>B.1 Restore one ESF room cooler and safety-related chiller train to OPERABLE status.</td>
<td>1 hour OR In accordance with the Risk Informed Completion Time Program</td>
</tr>
<tr>
<td>1. Not applicable when two ESF room cooler and safety-related chiller trains intentionally made inoperable.</td>
<td>Two ESF room cooler and safety-related chiller trains inoperable.</td>
<td></td>
</tr>
<tr>
<td>2. The following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h. However, for the purposes of compliance with part f, the ESF room doors may be opened to maintain acceptable temperatures within the room.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Required Action and Completion Time of Condition A or B not met.</td>
<td>C.1 Be in MODE 3.</td>
<td>6 hours AND C.2 Be in MODE 5.</td>
</tr>
</tbody>
</table>
## SURVEILLANCE REQUIREMENTS

<table>
<thead>
<tr>
<th>SURVEILLANCE</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SR 3.7.14.1</strong> Verify each ESF room cooler and safety-related chiller system</td>
<td>In accordance with the Surveillance Frequency Control Program</td>
</tr>
<tr>
<td>manual, power-operated and automatic valve servicing safety-related equipment that is not locked, sealed, or otherwise secured in position, is in the correct position.</td>
<td></td>
</tr>
<tr>
<td><strong>SR 3.7.14.2</strong> Verify each ESF room cooler and safety-related chiller system</td>
<td>In accordance with the Surveillance Frequency Control Program</td>
</tr>
<tr>
<td>automatic valve servicing safety-related equipment that is not locked, sealed, or otherwise secured in position actuates to the correct position on an actual or simulated actuation signal.</td>
<td></td>
</tr>
<tr>
<td><strong>SR 3.7.14.3</strong> Verify each ESF room cooler fan and safety-related chiller system</td>
<td>In accordance with the Surveillance Frequency Control Program</td>
</tr>
<tr>
<td>(pump and chiller) start automatically on an actual or simulated actuation signal.</td>
<td></td>
</tr>
</tbody>
</table>

Vogtle Units 1 and 2

3.7.14-3

Amendment No. 188 (Unit 1)

Amendment No. 171 (Unit 2)
<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. (continued)</td>
<td>A.2 Declare required feature(s) with no offsite power available inoperable when its redundant required feature(s) is inoperable. AND A.3 Restore required offsite circuit to OPERABLE status.</td>
<td>24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required feature(s) 72 hours OR In accordance with the Risk Informed Completion Time Program</td>
</tr>
</tbody>
</table>

(continued)
### ACTIONS (continued)

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. One DG inoperable.</td>
<td><strong>B.1</strong> Perform SR 3.8.1.1 for the required offsite circuit(s).</td>
<td><strong>1 hour</strong> AND <strong>Once per 8 hours thereafter</strong></td>
</tr>
<tr>
<td></td>
<td><strong>AND</strong> Declare required feature(s) supported by the inoperable DG inoperable when its required redundant feature(s) is inoperable.</td>
<td><strong>4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>AND</strong> <strong>B.3.1</strong> Determine OPERABLE DG is not inoperable due to common cause failure.</td>
<td><strong>24 hours</strong></td>
</tr>
<tr>
<td></td>
<td><strong>OR</strong> <strong>B.3.2</strong> Perform SR 3.8.1.2 for OPERABLE DG.</td>
<td><strong>24 hours</strong></td>
</tr>
<tr>
<td></td>
<td><strong>AND</strong></td>
<td>(continued)</td>
</tr>
</tbody>
</table>
### ACTIONS

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. (continued)</td>
<td>B.4 Restore DG to OPERABLE status.</td>
<td>72 hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OR In accordance with the Risk Informed Completion Time Program</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Two required offsite circuits inoperable.</td>
<td>C.1 Declare required feature(s) inoperable when its redundant feature(s) is inoperable.</td>
<td>12 hours from discovery of Condition C concurrent with inoperability of redundant required features</td>
</tr>
<tr>
<td></td>
<td>AND</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C.2 Restore one required offsite circuit to OPERABLE status</td>
<td>24 hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OR In accordance with the Risk Informed Completion Time Program</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. One required offsite circuit inoperable.</td>
<td>---NOTE--- Enter applicable Conditions and Required Actions of LCO 3.8.9, &quot;Distribution Systems - Operating,&quot; when Condition D is entered with no AC power source to one or more trains.</td>
<td></td>
</tr>
<tr>
<td>AND</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>One DG inoperable.</td>
<td>(continued)</td>
</tr>
</tbody>
</table>

Vogtle Units 1 and 2

3.8.1-4

Amendment No.188 (Unit 1)
Amendment No.171 (Unit 2)
<table>
<thead>
<tr>
<th>ACTIONS</th>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>D. (continued)</td>
<td>D.1 Restore required offsite circuit to OPERABLE status.</td>
<td>12 hours OR In accordance with the Risk Informed Completion Time Program</td>
</tr>
<tr>
<td></td>
<td></td>
<td>D.2 Restore DG to OPERABLE status.</td>
<td>12 hours OR In accordance with the Risk Informed Completion Time Program</td>
</tr>
<tr>
<td></td>
<td>E. NOTES</td>
<td>E.1 Restore one DG to OPERABLE status.</td>
<td>2 hours OR In accordance with the Risk Informed Completion Time Program</td>
</tr>
</tbody>
</table>

1. Not applicable when second DG 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 DGs inoperable.

(continued)
<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>F.</td>
<td>F.1 Restore automatic load sequencer to OPERABLE status.</td>
<td>12 hours</td>
</tr>
<tr>
<td></td>
<td><strong>OR</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>In accordance with the Risk Informed Completion Time Program</td>
<td></td>
</tr>
<tr>
<td>G.</td>
<td>G.1 Restore required inoperable AC sources to OPERABLE status.</td>
<td>1 hour</td>
</tr>
<tr>
<td></td>
<td><strong>OR</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>In accordance with the Risk Informed Completion Time Program</td>
<td></td>
</tr>
<tr>
<td>H.</td>
<td>H.1 Be in MODE 3.</td>
<td>6 hours</td>
</tr>
<tr>
<td></td>
<td><strong>AND</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>H.2 --------------NOTE--------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LCO 3.0.4.a is not applicable when entering MODE 4.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>--------------</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Be in MODE 4.</td>
<td>12 hours</td>
</tr>
</tbody>
</table>

---

**NOTES**

1. Not applicable when three or more required AC sources 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.

---

**AC Sources - Operating 3.8.1**

Vogtle Units 1 and 2 3.8.1-6 Amendment No.188 (Unit 1) Amendment No.171 (Unit 2)
3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources – Operating

LCO 3.8.4 Four class 1E 125 V DC electrical power sources shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

**ACTIONS**

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. One DC electrical power source inoperable due to inoperable battery A or B.</td>
<td>NOTE: Enter applicable Conditions and Required Actions of LCO 3.8.1, &quot;AC Sources – Operating,&quot; for emergency diesel generator made inoperable by inoperable battery A or B.</td>
<td>24 hours</td>
</tr>
<tr>
<td>A.1</td>
<td>Restore DC electrical power source to OPERABLE status.</td>
<td>OR</td>
</tr>
<tr>
<td></td>
<td>In accordance with the Risk Informed Completion Time Program</td>
<td></td>
</tr>
</tbody>
</table>

(continued)
### ACTIONS (continued)

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. One DC electrical power source inoperable due to inoperable battery C or D.</td>
<td>B.1 Verify SAT available</td>
<td>1 hour</td>
</tr>
<tr>
<td></td>
<td>AND</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B.2 Restore DC electrical power source to OPERABLE status.</td>
<td>24 hours</td>
</tr>
<tr>
<td></td>
<td>AND</td>
<td></td>
</tr>
<tr>
<td>C. One DC electrical power source inoperable for reasons other than Condition A or B.</td>
<td>C.1 Restore DC electrical power source to OPERABLE status.</td>
<td>2 hours</td>
</tr>
<tr>
<td></td>
<td>OR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>In accordance with the Risk Informed Completion Time Program</td>
<td></td>
</tr>
<tr>
<td>D. ------NOTES------</td>
<td>D.1 Restore at least one DC electrical power source to OPERABLE status.</td>
<td>1 hour</td>
</tr>
<tr>
<td>1. Not applicable when second DC electrical power source intentionally made inoperable.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. The following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two DC electrical power sources inoperable.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Vogtle Units 1 and 2**

3.8.4-2

Amendment No.188(Unit 1)

Amendment No.171(Unit 2)
### ACTIONS (continued)

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. Required Action and Associated Completion Time of Condition A, B, C, or D not met.</td>
<td><strong>E.1</strong> Be in MODE 3.</td>
<td>6 hours</td>
</tr>
<tr>
<td><strong>AND</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>E.2</strong></td>
<td>----------NOTE----------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LCO 3.0.4.a is not applicable when entering MODE 4.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Be in MODE 4.</td>
<td>12 hours</td>
</tr>
</tbody>
</table>

### SURVEILLANCE REQUIREMENTS

<table>
<thead>
<tr>
<th>SURVEILLANCE</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR 3.8.4.1</td>
<td>In accordance with the Surveillance Frequency Control Program</td>
</tr>
<tr>
<td>Verify battery terminal voltage is greater than or equal to the minimum established float voltage.</td>
<td></td>
</tr>
</tbody>
</table>

(continued)
### SURVEILLANCE REQUIREMENTS (continued)

<table>
<thead>
<tr>
<th>SURVEILLANCE</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR 3.8.4.2</td>
<td>In accordance with the Surveillance Frequency Control Program</td>
</tr>
</tbody>
</table>

Verify the battery charger supplies:
- ≥ 400 amps for System A and B
- ≥ 300 amps for System C, and
- ≥ 200 amps for System D

at greater than or equal to the minimum established float voltage for ≥ 8 hours for Systems A and B and ≥ 3 hours for Systems C and D.

**OR**

Verify each battery charger can recharge the battery to the fully charged state within 12 hours while supplying the largest combined demands of the various continuous steady state loads, after a battery discharge to the bounding design basis event discharge state.

<table>
<thead>
<tr>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The modified performance discharge test in SR 3.8.6.6 may be performed in lieu of the service test in SR 3.8.4.3.</td>
</tr>
<tr>
<td>2. This Surveillance shall not be performed in MODE 1, 2, 3, or 4. However, credit may be taken for unplanned events that satisfy this SR.</td>
</tr>
</tbody>
</table>

Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.

**In accordance with the Surveillance Frequency Control Program**
3.8 ELECTRICAL POWER SYSTEMS

3.8.7 Inverters – Operating

LCO 3.8.7 The required Class 1E 120 V inverters shall be OPERABLE.

NOTE: Two inverters may be disconnected from their associated DC bus for ≤ 24 hours to perform an equalizing charge on their associated common battery, provided:

a. The associated AC vital bus(es) are energized from their Class 1E regulating transformers; and

b. All other AC vital buses are energized from their associated OPERABLE inverters.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. One required inverter inoperable.</td>
<td>Enter applicable conditions and required actions of LCO 3.8.9 &quot;Distribution Systems - Operating&quot; with any vital bus deenergized.</td>
<td>24 hours</td>
</tr>
<tr>
<td>A.1 Restore inverter to OPERABLE status.</td>
<td>OR In accordance with the Risk Informed Completion Time Program</td>
<td></td>
</tr>
</tbody>
</table>

(continued)
## ACTIONS

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. -----------NOTES----------</td>
<td>B.1 Restore required inverters to OPERABLE status.</td>
<td>1 hour</td>
</tr>
<tr>
<td>1. Not applicable when two or more inverters intentionally made inoperable.</td>
<td></td>
<td>OR</td>
</tr>
<tr>
<td>2. The following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.</td>
<td></td>
<td>In accordance with the Risk Informed Completion Time Program</td>
</tr>
<tr>
<td>Two or more required inverters inoperable.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Required Action and associated Completion Time not met.</td>
<td>C.1 Be in MODE 3.</td>
<td>6 hours</td>
</tr>
<tr>
<td>AND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C.2 -----------NOTE-----------</td>
<td>LCO 3.0.4.a is not applicable when entering MODE 4.</td>
<td></td>
</tr>
<tr>
<td>Be in MODE 4.</td>
<td></td>
<td>12 hours</td>
</tr>
</tbody>
</table>

## SURVEILLANCE REQUIREMENTS

<table>
<thead>
<tr>
<th>SURVEILLANCE</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sr 3.8.7.1</td>
<td>In accordance with the Surveillance Frequency Control Program</td>
</tr>
<tr>
<td>Verify correct inverter voltage and alignment to required AC vital buses.</td>
<td></td>
</tr>
</tbody>
</table>

Vogtle Units 1 and 2

3.8.7-2

Amendment No. 188 (Unit 1)
Amendment No. 171 (Unit 2)
3.8 ELECTRICAL POWER SYSTEMS

3.8.9 Distribution Systems – Operating

LCO 3.8.9 The required AC, DC, and AC vital bus electrical power distribution subsystems shall be OPERABLE.

--------------------------------------------NOTE--------------------------------------
The redundant emergency buses of 4160 V switchgear 1/2AAO2 and 1/2BAO3 may be manually connected within the unit by tie breakers in order to allow transfer of preferred offsite power sources provided SR 3.8.1.1 is successfully performed within 12 hours prior to the interconnection. The interconnection shall be implemented without adversely impacting the ability to simultaneously sequence both trains of LOCA loads.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. One or more AC electrical power distribution subsystems inoperable.</td>
<td>A.1 Restore AC electrical power distribution subsystems to OPERABLE status.</td>
<td>8 hours OR In accordance with the Risk Informed Completion Time Program</td>
</tr>
<tr>
<td>B. One or more AC vital bus electrical power distribution subsystems inoperable.</td>
<td>B.1 Restore AC vital bus electrical power distribution subsystems to OPERABLE status.</td>
<td>2 hours OR In accordance with the Risk Informed Completion Time Program</td>
</tr>
</tbody>
</table>

(continued)
## ACTIONS (continued)

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. One or more DC electrical power distribution subsystems inoperable.</td>
<td>C.1 Restore DC electrical power distribution subsystems to OPERABLE status.</td>
<td>2 hours OR</td>
</tr>
<tr>
<td></td>
<td>In accordance with the Risk Informed Completion Time Program</td>
<td></td>
</tr>
<tr>
<td>D. -----------NOTES---------- D.1 Restore electrical power distribution subsystems to OPERABLE status to restore safety function.</td>
<td>1 hour OR In accordance with the Risk Informed Completion Time Program</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Two or more electrical power distribution subsystems inoperable that result in a loss of safety function.</td>
<td></td>
</tr>
<tr>
<td>E. Required Action and associated Completion Time not met.</td>
<td>E.1 Be in MODE 3.</td>
<td>6 hours AND</td>
</tr>
<tr>
<td></td>
<td>E.2 -----------NOTE---------- LCO 3.0.4.a is not applicable when entering MODE 4.</td>
<td>12 hours</td>
</tr>
<tr>
<td></td>
<td>Be in MODE 4.</td>
<td></td>
</tr>
</tbody>
</table>
### SURVEILLANCE REQUIREMENTS

<table>
<thead>
<tr>
<th>SURVEILLANCE</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR 3.8.9.1</td>
<td>In accordance with the Surveillance Frequency Control Program</td>
</tr>
</tbody>
</table>

Verify correct breaker alignments and voltage to required AC, DC, and AC vital bus electrical power distribution subsystems.
5.5 Programs and Manuals

5.5.20 Control Room Envelope Habitability Program (continued)

f. The provisions of SR 3.0.2 are applicable to the Frequencies for assessing CRE habitability, determining CRE unfiltered inleakage, and measuring CRE pressure and assessing the CRE boundary as required by paragraphs c and d, respectively.

5.5.21 Surveillance Frequency Control Program

This program provides controls for Surveillance Frequencies. The program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met.

a. The Surveillance Frequency Control Program shall contain a list of Frequencies of those Surveillance Requirements for which the Frequency is controlled by the program.

b. Changes to the Frequencies listed in the Surveillance Frequency Control Program shall be made in accordance with NEI 04-10, "Risk-Informed Method for Control of Surveillance Frequencies," Revision 1.

c. The provisions of Surveillance Requirements 3.0.2 and 3.0.3 are applicable to the Frequencies established in the Surveillance Frequency Control Program.

5.5.22 Risk Informed Completion Time Program

This program provides controls to calculate a Risk Informed Completion Time (RICT) and must be implemented in accordance with NEI-06-09, Revision 0-A, "Risk-Managed Technical Specifications (RMTS) Guidelines." The program shall include the following:

a. The RICT may not exceed 30 days.

b. A RICT may only be utilized in MODE 1 and 2.

c. When a RICT is being used, any plant configuration change within the scope of the Configuration Risk Management Program must be considered for the effect on the RICT.

1. For planned changes, the revised RICT must be determined prior to implementation of the change in configuration.
5.5 Programs and Manuals

5.5.22 Risk Informed Completion Time Program (continued)

2. For emergent conditions, the revised RICT must be determined within the time limits of the Required Action Completion Time (i.e., not the RICT) or 12 hours after the plant configuration change, whichever is less.

3. Revising the RICT is not required if the plant configuration change would lower plant risk and would result in a longer RICT.

d. Use of a RICT is not permitted for 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.

e. Use of a RICT is permitted for emergent conditions which represent a loss of a specified safety function, or inoperability of all required trains of a system required to be OPERABLE, if one of more of the trains are considered "PRA Functional" as defined in Section 2.3.1 of NEI 06-09. The RICT for these loss of function conditions may not exceed 24 hours.

f. Use of a RICT is permitted for emergent conditions which represent a loss of a specified safety function or inoperability of all required trains of a system required to be OPERABLE if one or more trains are considered "PRA Functional" as defined in Section 2.3.1 of NEI 06-09. However, the following additional constraints shall be applied to the criteria for "PRA Functional".

1. Any SSCs credited in the PRA Functionality determination shall be the same SSCs relied upon to perform the specified Technical Specifications safety function.

2. Design basis success criteria parameters shall be met for all design basis accident scenarios for establishing PRA Functionality during a Technical Specifications loss of function condition where a RICT is applied.

g. Upon entering a RICT for an emergent condition, the potential for a common cause (CC) failure must be addressed.

If there is a high degree of confidence, based on the evidence collected, that there is no CC failure mechanism that could affect the redundant components, the RICT calculation may use nominal CC factor probability.

If a high degree of confidence cannot be established that there is no CC failure that could affect the redundant components, the RICT shall account for the increased possibility of CC failure. Accounting for the increased possibility of CC failure shall be accomplished by one of two methods. If one of the two methods listed below is not used, the Technical Specifications Front Stop shall not be exceeded.
5.5 Programs and Manuals

5.5.22 Risk Informed Completion Time Program

g. (continued)

1. The RICT calculation shall be adjusted to numerically account for the increased possibility of CC failure, in accordance with RG 1.177, as specified in Section A-1.3.2.1 of Appendix A of the RG. Specifically, when a component fails, the CC failure probability for the remaining redundant components shall be increased to represent the conditional failure probability due to CC failure of these components, in order to account for the possibility the first failure was caused by a CC mechanism.

OR

2. Prior to exceeding the front stop, RMAs not already credited in the RICT calculation shall be implemented. These RMAs shall target the success of the redundant and/or diverse structures, systems, or components (SSC) of the failed SSC and, if possible, reduce the frequency of initiating events which call upon the function(s) performed by the failed SSC. Documentation of RMAs shall be available for NRC review.

h. A RICT entry is not permitted, or a RICT entry made shall be exited, for any condition involving a TS loss of function if a PRA Functionality determination that reflects the plant configuration concludes that the LCO cannot be restored without placing the TS inoperable trains in an alignment which results in a loss of functional level PRA success criteria.
<table>
<thead>
<tr>
<th>Amendment Number</th>
<th>Additional Condition</th>
<th>Implementation Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>188</td>
<td>Southern Nuclear Operating Company (SNC) is approved to implement the Risk Informed Completion Time Program as specified in the license amendment request submittals dated September 13, 2012, August 2, 2013, July 17, 2014, November 11, 2014, December 12, 2014, March 16, 2015, May 5, 2015, February 17, 2016, April 18, 2016, July 13, 2016, March 13, 2017, April 14, 2017, May 4, 2017, and June 2, 2017. The licensee shall implement the items listed in Enclosure 1, Implementation items of SNC letter NL-15-0381 dated March 16, 2015 prior to the implementation of the Risk Informed Completion Time Program. The risk assessment approach and methods, shall be acceptable to the NRC, be based on the as-built, as-operated, and maintained plant, and reflect the operating experience of the plant as specified in RG 1.200. Methods to assess the risk from extending the completion times must be PRA methods accepted as part of this license amendment, or other methods approved by the NRC for generic use. If the licensee wishes to change its methods, and the change is outside the bounds of this license condition, the licensee will seek prior NRC approval, via a license amendment.</td>
<td>As stated in the Additional Condition.</td>
</tr>
<tr>
<td>Amendment Number</td>
<td>Additional Condition</td>
<td>Implementation Date</td>
</tr>
<tr>
<td>------------------</td>
<td>----------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>155</td>
<td>Southern Nuclear Operating Company (SNC) is approved to implement 10 CFR 50.69 using the processes for categorization of Risk-Informed Safety Class (RISC)-1, RISC-2, RISC-3, and RISC-4 structures, systems, and components (SSCs) specified in the licensee amendment request submittals dated August 31, 2012, May 17, 2013, July 2, 2013, September 13, 2013, May 2, 2014, July 22, 2014 and August 11, 2014. The licensee shall implement the items listed in enclosure 1, Implementation items of SNC letter NL-14-0960, dated July 22, 2014, prior to categorizing systems under the process. NRC prior approval, under 10 CFR 50.90, is required for a change to a categorization process that is outside the bounds specified above (e.g., change from a seismic margins approach to a seismic probabilistic risk assessment approach.)</td>
<td>As stated in the Additional Condition</td>
</tr>
<tr>
<td>171</td>
<td>Southern Nuclear Operating Company (SNC) is approved to implement the Risk Informed Completion Time Program as specified in the license amendment request submittals dated September 13, 2012, August 2, 2013, July 17, 2014, November 11, 2014, December 12, 2014, March 16, 2015, May 5, 2015, February 17, 2016, April 18, 2016, July 13, 2016, March 13, 2017, April 14, 2017, May 4, 2017, and June 2, 2017. The licensee shall implement the items listed in Enclosure 1, Implementation items of SNC letter NL-15-0381 dated March 16, 2015 prior to the implementation of the Risk Informed Completion Time Program. The risk assessment approach and methods, shall be acceptable to the NRC, be based on the as-built, as-operated, and maintained plant, and reflect the operating experience of the plant as specified in RG 1.200. Methods to assess the risk from extending the completion times must be PRA methods accepted as part of this license amendment, or other methods approved by the NRC for generic use. If the licensee wishes to change its methods, and the change is outside the bounds of this license condition, the licensee will seek prior NRC approval, via a license amendment.</td>
<td>As stated in the Additional Condition</td>
</tr>
</tbody>
</table>
SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

AMENDMENT NO. 188 TO RENEWED FACILITY OPERATING LICENSE NPF-68 AND

AMENDMENT NO. 171 TO RENEWED FACILITY OPERATING LICENSE NPF-81

SOUTHERN NUCLEAR OPERATING COMPANY, INC.

VOGTLE ELECTRIC GENERATING PLANT, UNITS 1 AND 2

DOCKET NOS. 50-424 AND 50-425

1.0 INTRODUCTION

By letter dated September 13, 2012 (Reference 1), as supplemented by letters dated August 2, 2013 (Reference 2); July 3 (Reference 3), July 17 (Reference 4), November 11 (Reference 5), and December 12, 2014 (Reference 6); March 16 (Reference 7) and May 5, 2015 (Reference 8); February 17 (Reference 9), April 18 (Reference 10), and July 13, 2016 (Reference 11); and March 13 (Reference 12), April 14 (Reference 13), May 4 (Reference 14), and June 2, 2017 (Reference 15), Southern Nuclear Operating Company, Inc. (SNC, the licensee), proposed changes to the Technical Specifications (TSs) for the Vogtle Electric Generating Plant, Units 1 and 2 (VEGP or Vogtle). The licensee requested the proposed changes to the TSs in accordance with Section 50.90 of Title 10 of the Code of Federal Regulations (10 CFR). The supplemental letters dated March 16 and May 5, 2015; February 17, April 18, and July 13, 2016; and March 13, April 14, May 4, and June 2, 2017, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the U.S. Nuclear Regulatory Commission (NRC) staff's original proposed no significant hazards consideration determination as published in the Federal Register on March 17, 2015 (80 FR 13913). By letter dated October 15, 2010 (Reference 16), in response to SNC's letter dated July 14, 2010 (Reference 17), the NRC staff granted pilot status for the review of this license amendment request (LAR).

During its review of the LAR, the NRC staff submitted requests for additional information (RAIs) to the licensee on May 16, 2013 (Reference 18), May 14, 2014 (Reference 19), June 9, 2014 (Reference 20), June 25, 2014 (Reference 21), October 14, 2014 (Reference 22), December 17, 2015 (Reference 23), June 15, 2016 (Reference 24), January 24, 2017 (Reference 25), February 3, 2017 (Reference 26), February 24, 2017 (Reference 27), and March 7, 2017 (Reference 28).

The proposed amendment would modify TS requirements to permit the use of Risk-Informed Completion Times (RICTs) in accordance with Topical Report Nuclear Energy Institute (NEI) 06-09, Revision 0-A (NEI 06-09 0-A), Risk-Informed Technical Specifications Initiative 4b, Risk-Managed Technical Specifications (RMTS) Guidelines (Reference 29). NEI developed the guidance in NEI 06-09 0-A as a methodology to evaluate and extend TS Limiting Condition for Operation (LCO) Required Action Completion Times (CTs). The NRC staff's safety evaluation (SE), dated May 17, 2007 (Reference 30), found NEI 06-09 to be acceptable after incorporating
the NRC staff positions, limitations, and conditions into the report and issuing NEI 06-09 0-A. According to the NRC staff’s SE, NEI 06-09 0-A would be acceptable for referencing by licensees proposing to amend their TSs to implement RMTS to the extent specified and under the limitations in the topical report and its associated SE. The licensee is not proposing adoption of Technical Specification Task Force (TSTF) Change Traveler TSTF-505, “Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b.” In its submittals, the licensee compared its proposed TS changes to those contained in TSTF-505 and identified variations (Reference 31). The proposed modification to the TSs for VEGP, Units 1 and 2, would add Section 5.5.22, “Risk Informed Completion Time Program,” TS Section 5, “Administrative Controls”; add Example 1.3-8 to TS Section 1, “Use and Application”; and modify selected Required Action CTs to permit extending the CTs, provided that risk is assessed and managed as described in NEI 06-09 0-A. The TS CTs and Bases are also revised to cite the RICT Program. The NRC staff evaluated the acceptability of the LAR, and provided limitations and conditions in Section 4.0 of this SE.

1.1 Description of Risk-Informed Completion Times in Technical Specifications

The TSs contain LCOs, which are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When an LCO is not met, the licensee must shut down the reactor or follow any remedial or required action (e.g., testing, maintenance, or repair activity) permitted by the TSs until the condition can be met. The ACTIONS associated with an LCO contain conditions that typically describe the ways in which the requirements of the LCO can fail to be met. Specified with each stated condition are required action(s) and CTs. The CTs are referred to as the “front stops” in the context of this SE.

On May 17, 2007 (Reference 30), the NRC staff approved the NEI topical report NEI 06-09 0-A, “Risk-Informed Technical Specifications Initiative 4B, Risk-Managed Technical Specifications (RMTS) Guidelines” (Reference 29). After incorporating the NRC staff positions, limitations, and conditions into the report, NEI 06-09 0-A provides a methodology for modifying selected required actions to provide an optional RICT. The NEI 06-09 0-A topical report provides a methodology for extending existing CTs and thereby delay exiting the operational mode of applicability or taking remedial actions if risk is assessed and managed within the limits and programmatic requirements established by a RICT program that meets the guidelines in NEI 06-09 0-A.

In the Federal Register on March 15, 2012 (77 FR 15399), the NRC announced the availability of TSTF-505, Revision 1 (TSTF-505). The TSTF-505 traveler provides guidance for requesting license amendments to adopt RICTs in accordance with NEI 06-09 0-A if the licensee assesses and manages risk in accordance with a RICT program. The traveler also proposes new conditions, required actions, and CTs to address conditions not currently addressed in TSs (i.e., introduced new CTs not clearly within the scope of NEI 06-09 0-A). By letter dated November 15, 2016 (Reference 32), the NRC staff informed the Technical Specifications Task Force of its decision to suspend NRC approval of TSTF-505, Revision 1, because of concerns identified during the review of plant-specific LARs for adoption of the Traveler. The staff’s letter also stated that the NRC would continue reviewing applications already received and site-specific proposals to address the staff’s concerns.

1.2 Description of TS Changes

The licensee’s LAR for VEGP, Units 1 and 2, requested approval to add a RICT Program to the Administrative Controls of the TS, add new conditions and associated actions in some TSs, and
modify selected CTs to permit extending the CTs, provided risk is assessed and managed as described in NEI 06-09 0-A. The licensee's application for the changes proposed to use the risk-informed TS Initiative 4b methodology, NEI 06-09 0-A, and included documentation regarding the technical adequacy of the probabilistic risk assessment (PRA) models for the RICT Program, consistent with the requirements of Regulatory Guide 1.200, Revision 2, “An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities,” March 2009 (Reference 33).

The following sections group the proposed changes by type and discuss their application to individual TSs.

1.2.1 Addition of Use and Application Example

The licensee has proposed to add the following example to the TSs as Example 1.3-2:

<table>
<thead>
<tr>
<th>ACTIONS</th>
<th>CONDITION</th>
<th>REQUIRED ACTION</th>
<th>COMPLETION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>One subsystem inoperable.</td>
<td>A.1 Restore subsystem to OPERABLE status.</td>
<td>7 days OR In accordance with the Risk Informed Completion Time Program</td>
</tr>
<tr>
<td>B.</td>
<td>NOTES</td>
<td>B.1 Restore subsystems to OPERABLE status.</td>
<td>1 hour OR In accordance with the Risk Informed Completion Time Program</td>
</tr>
<tr>
<td>1. Not applicable when second subsystem intentionally made inoperable.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. The following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two subsystems inoperable.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| C. | Required Action and associated Completion Time not met. | C.1 Be in MODE 3. | 6 hours
| | | C.2 Be in MODE 5. | 36 hours |

When a subsystem is declared inoperable, Condition A is entered. The 7 day Completion Time may be applied as discussed in Example 1.3-2. However, the licensee may elect to apply the Risk Informed Completion Time Program which
permits calculation of a Risk Informed Completion Time (RICT) that may be used to complete the Required Action beyond the 7 day Completion Time. The RICT cannot exceed 30 days. After the 7 day Completion Time has expired, the subsystem must be restored to OPERABLE status within the RICT or Condition C must also be entered.

If a second subsystem is declared inoperable, Condition B may also be entered. The Condition is modified by two Notes. The first note states it is not applicable if the second subsystem is intentionally made inoperable. The second note provides restrictions applicable to these “loss of function” Conditions. The Required Actions of Condition B are not intended for voluntary removal of redundant subsystems from service. The Required Action is only applicable if one subsystem is inoperable for any reason and the second subsystem is found to be inoperable, or if both subsystems are found to be inoperable at the same time. If Condition B is applicable, at least one subsystem must be restored to OPERABLE status within 1 hour or Condition C must also be entered. The licensee may be able to apply a RICT or to extend the Completion Time beyond 1 hour, but not longer than 24 hours, if the requirements of the Risk Informed Completion Time Program are met. If two subsystems are inoperable and Condition B is not applicable (i.e., the second subsystem was intentionally made inoperable), LCO 3.0.3 is entered as there is no applicable Condition.

The Risk Informed Completion Time Program requires recalculation of the RICT to reflect changing plant conditions. For planned changes, the revised RICT must be determined prior to implementation of the change in configuration. For emergent conditions, the revised RICT must be determined within the time limits of the Required Action Completion Time (i.e., not the RICT) or 12 hours after the plant configuration change, whichever is less.

If the 7 day Completion Time clock of Condition A or the 1 hour Completion Time clock of Condition B have expired and subsequent changes in plant condition result in exiting the applicability of the Risk Informed Completion Time Program without restoring the inoperable subsystem to OPERABLE status, Condition C is also entered and the Completion Time clocks for Required Actions C.1 and C.2 start.

If the RICT expires or is recalculated to be less than the elapsed time since the Condition was entered and the inoperable subsystem has not been restored to OPERABLE status, Condition C is also entered and the Completion Time clocks for Required Actions C.1 and C.2 start. If the inoperable subsystems are restored to OPERABLE status after Condition C is entered, Conditions A, B, and C are exited, and therefore, the required actions of Condition C may be terminated.
1.2.2 TS 5.5.22, Risk Informed Completion Time Program

In the supplement dated May 4, 2017, SNC proposed revised language for TS 5.5.22. This proposed revised language is reflected in this SE.

Technical Specification 5.5.22, which describes the RICT Program, would be added to the TS and reads as follows:

Risk Informed Completion Time Program

This program provides controls to calculate a Risk Informed Completion Time (RICT) and must be implemented in accordance with NEI 06-09, Revision 0-A, “Risk-Managed Technical Specifications (RMTS) Guidelines.” The program shall include the following:

a. The RICT may not exceed 30 days.

b. A RICT may only be utilized in MODE 1 and 2.

c. When a RICT is being used, any plant configuration change within the scope of the Configuration Risk Management Program must be considered for the effect on the RICT.

1. For planned changes, the revised RICT must be determined prior to implementation of the change in configuration.

2. For emergent conditions, the revised RICT must be determined within the time limits of the Required Action Completion Time (i.e., not the RICT) or 12 hours after the plant configuration change, whichever is less.

3. Revising the RICT is not required if the plant configuration change would lower plant risk and would result in a longer RICT.

d. Use of a RICT is not permitted for 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.

e. Use of a RICT is permitted for emergent conditions which represent a loss of a specified safety function, or inoperability of all required trains of a system required to be OPERABLE, if one or more of the trains are considered “PRA Functional” as defined in Section 2.3.1 of NEI 06-09. The RICT for these loss of function conditions may not exceed 24 hours.

f. Use of a RICT is permitted for emergent conditions which represent a loss of a specified safety function or inoperability of all required trains of a system required to be OPERABLE if one or
more trains are considered "PRA Functional" as defined in Section 2.3.1 of NEI 06-09 0-A. However, the following additional constraints shall be applied to the criteria for "PRA Functional"

1. Any SSCs credited in the PRA Functionality determination shall be the same SSCs relied upon to perform the specified Technical Specifications safety function.
2. Design basis success criteria parameters shall be met for all design basis accident scenarios for establishing PRA Functionality during a Technical Specifications loss of function condition where a RICT is applied.

Upon entering a RICT for an emergent condition, the potential for a common cause (CC) failure must be assessed. If there is a high degree of confidence, based on the evidence collected, that there is no CC failure mechanism that could affect the redundant components, the RICT calculation may use nominal CC factor probability.

If a high degree of confidence cannot be established that there is no CC failure that could affect the redundant components, the RICT shall account for the increased possibility of CC failure. Accounting for the increased possibility of CC failure shall be accomplished by one of two methods. If one of the two methods listed below is not used, the Technical Specification Front Stop shall not be exceeded.

1. The RICT calculation shall be adjusted to numerically account for the increased possibility of CC failure, in accordance with RG 1.177, as specified in Section A-1.3.2.1 of Appendix A of the RG. Specifically, when a component fails, the CC failure probability for the remaining redundant components shall be increased to represent the conditional failure probability due to CC failure of these components, in order to account for the possibility the first failure was caused by a CC mechanism.

OR

2. Prior to exceeding the front stop, RMAs not already credited in the RICT calculation shall be implemented. These RMAs shall target the success of redundant and/or diverse structures, systems or components (SSCs) of the failed SSC and, if possible, reduce the frequency of initiating events which call upon the function(s) performed by the failed SSC. Documentation of RMAs shall be available for NRC review.
h. A RICT entry is not permitted, or a RICT entry made shall be exited, for any condition involving a TS loss of function if a PRA Functionality determination that reflects the plant configuration concludes that the LCO cannot be restored without placing the TS inoperable trains in an alignment which results in a loss of functional level PRA success criteria.

Conditions f.1 and f.2 add constraints to the PRA Functional definition in Section 2.3.1 of NEI 06-09 0-A. The constraints bring in design basis considerations from the NRC staff SE Condition 2 to ensure that the design basis success criteria continue to be met. Where there are differences between the PRA and the design basis success criteria for the values of, for example, flow rates and timing, the RICT will be calculated based on the PRA success criteria but the capability of the remaining SSC to meet the design basis success criteria will continue to be met per TS 5.5.22.f.

By letter dated July 17, 2014, in response to an NRC staff RAI (Reference 4), SNC clarified that the NRC-approved version NEI 06-09 0-A, October 2012, will be the reference in TS 5.5.22.

1.2.3 Application of the RICT Program to Existing LCOs and Conditions

The individual LCOs for which the RICT Program will apply are listed below. There are three major categories of changes to the LCOs:

1) The option of calculating a RICT is being added for the listed required actions.

2) For conditions involving loss of function, the condition is modified by Notes prohibiting voluntary entry and clarifying the applicable TS 5.5.22 criteria.

3) In some cases, additional changes are made to accommodate incorporation of the RICT Program. For example, the required actions are modified to require restoration of equipment to operable status, where noted. These changes are noted in Section 1.2.4 of this SE.

LCO 3.4.10, Pressurizer Safety Valves

- Required Action A.1
  - The option of calculating a RICT is applied to the action to Restore valve to OPERABLE status
  - The condition is modified by notes stating that it is not applicable when pressurizer safety valve intentionally made inoperable; and that the following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.

LCO 3.4.11, Pressurizer Power Operated Relief Valves (PORVs)

- Required Action B.3
  - The option of calculating a RICT is applied to the action to restore PORV to OPERABLE status.
Required Action C.2
- The option of calculating a RICT is applied to the action to Restore block valve to OPERABLE status.

Required Action F.1
- The option of calculating a RICT is applied to the action to Restore one block valve to OPERABLE status.
- The condition is modified by notes stating that it is not applicable when second block valve intentionally made inoperable; and that the following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.

LCO 3.5.2 Emergency Core Cooling System (ECCS) - Operating

Required Action A.1
- The option of calculating a RICT is applied to the action to Restore train(s) to OPERABLE status.

LCO 3.5.4, Refueling Water Storage Tank (RWST)

Required Action B.1
- The Condition is divided into two conditions for one and two valves inoperable.
- For one valve inoperable, the option of calculating a RICT is applied to the action to Restore the valve to OPERABLE status.
- The new Condition C is applicable when two sludge mixing pump isolation valves are inoperable. New Required Action C.1 requires restoring one valve to OPERABLE status within 24 hours. The option of calculating a RICT is not applicable to this Required Action.
- Existing Condition C is renumbered as Condition D and revised to be applicable when the Required Action and associated Completion Time of Condition B or C is not met.

Required Action D.1 (renumbered as E.1)
- The option of calculating a RICT is applied to the action to Restore RWST to OPERABLE status (Condition D is renumbered as Condition E and is revised to state: RWST inoperable for reasons other than Condition A, B, or C).
- The condition is modified by notes stating that it is not applicable when the RWST intentionally made inoperable; and that the following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.
- Existing Condition E is renumbered as Condition F and is revised to be applicable when the Required Action and associated Completion Time of Condition A or E is not met. Required Actions E.1 and E.2 are renumbered as F.1 and F.2.
LCO 3.6.2, Containment Air Locks

- Required Action C.3
  - The option of calculating a RICT is applied to the action to Restore air lock to OPERABLE status.

LCO 3.6.3, Containment Isolation Valves

- Required Action A.1
  - The option of calculating a RICT is applied to the action to Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured.

- Required Action B.1
  - The condition is modified by notes stating that it is not applicable when the second containment isolation valve is intentionally made inoperable; and that the following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.

- Required Action C.1
  - The condition is modified by notes stating that it is not applicable when the second containment purge valve is intentionally made inoperable; and that the following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.

LCO 3.6.6, Containment Spray and Cooling Systems

- Required Action A.1
  - The option of calculating a RICT is applied to the action to Restore containment spray train to OPERABLE status.

- Required Action B.1
  - The option of calculating a RICT is applied to the action to Restore containment cooling train to OPERABLE status.

LCO 3.7.2, Main Steam Isolation Valves (MSIVs)

- Required Action A.1
  - The option of calculating a RICT is applied to the action to Restore MSIV to OPERABLE status.

- Required Action B.1
  - The option of calculating a RICT is applied to the action to Restore one MSIV system to OPERABLE status in affected steam line.
The condition is modified by notes stating that it is not applicable when the second MSIV in one steam line is intentionally made inoperable; and that the following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.

LCO 3.7.4, Atmospheric Relief Valves (ARVs)

- Required Action B.1
  - The option of calculating a RICT is applied to the action to Restore at least two ARV lines to OPERABLE status.
  - The condition is modified by notes stating that it is not applicable when the second required ARV line is intentionally made inoperable; and that the following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.

LCO 3.7.5, Auxiliary Feedwater (AFW) System

- Required Action A.1
  - The option of calculating a RICT is applied to the action to Restore affected equipment to OPERABLE status.
- Required Action B.1
  - The option of calculating a RICT is applied to the action to Restore AFW train to OPERABLE status.

LCO 3.7.7, Component Cooling Water (CCW) System

- Required Action A.1
  - The option of calculating a RICT is applied to the action to Restore CCW train to OPERABLE status.

LCO 3.7.8, Nuclear Service Cooling Water (NSCW) System

- Required Action A.1
  - The option of calculating a RICT is applied to the action to Restore NSCW system to OPERABLE status.

LCO 3.7.9, Ultimate Heat Sink (UHS)

- Required Action B.1
  - The option of calculating a RICT is applied to the action to Restore fan to OPERABLE status.
- Required Action C.1
  - The option of calculating a RICT is applied to the action to Restore fan(s)/spray cell(s) to OPERABLE status.
LCO 3.7.14, Engineered Safety Features (ESF) Room Cooler and Safety Related Chiller System

- Required Action A.1
  - The option of calculating a RICT is applied to the action to Restore the ESF room cooler and safety-related chiller train to OPERABLE status.

LCO 3.8.1, AC [Alternating Current] Sources - Operating

Note: See Section 1.2.5 of this SE for a detailed description of changes to this LCO.

- Required Action A.3
  - The option of calculating a RICT is applied to the action to Restore required offsite circuit to OPERABLE status.

- Required Action B.6 (renumbered as Required Action B.4)
  - The option of calculating a RICT is applied to the action to Restore DG [Diesel Generator] to OPERABLE status.

- Required Action D.2 (renumbered as C.2)
  - The option of calculating a RICT is applied to the action to Restore one required offsite circuit to OPERABLE status.

- Required Action E.1 (renumbered as D.1)
  - The option of calculating a RICT is applied to the action to Restore required offsite circuit to OPERABLE status.

- Required Action E.2 (renumbered as D.2)
  - The option of calculating a RICT is applied to the action to Restore DG to OPERABLE status.

- Required Action F.1 (renumbered as E.1)
  - The option of calculating a RICT is applied to the action to Restore one DG to OPERABLE status.
  - The condition is modified by notes stating that it is not applicable when second DG intentionally made inoperable; and that the following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.

- Required Action G.1 (renumbered as F.1)
  - The option of calculating a RICT is applied to the action to Restore automatic load sequencer to OPERABLE status.

LCO 3.8.4, DC [Direct Current] Sources – Operating

- Required Action A.1
  - The option of calculating a RICT is applied to the action to Restore DC electrical power source to OPERABLE status.

- Required Action B.2
  - The option of calculating a RICT is applied to the action to Restore DC electrical power source to OPERABLE status.

- Required Action C.1
  - The option of calculating a RICT is applied to the action to Restore DC electrical power source to OPERABLE status.
LCO 3.8.7, Inverters – Operating

- Required Action A.1
  o The option of calculating a RICT is applied to the action to Restore inverter to OPERABLE status.

LCO 3.8.9, Distribution Systems – Operating

- Required Action A.1
  o The option of calculating a RICT is applied to the action to Restore AC electrical power distribution subsystems to OPERABLE status.
- Required Action B.1
  o The option of calculating a RICT is applied to the action to Restore AC vital bus electrical power distribution subsystems to OPERABLE status.
- Required Action C.1
  o The option of calculating a RICT is applied to the action to Restore DC electrical power distribution subsystems to OPERABLE status.

The proposed changes to TS 3.7.9 reflect the issuance of Amendment Nos. 170 and 152 for Vogtle, Units 1 and 2, respectively, on September 18, 2013 (Reference 34). These changes were identified in the licensee’s supplement dated July 17, 2014. These TSs would retain the existing CTs and allow the option of calculating a RICT. The maximum RICT that may be applied is specified in TS 5.5.22.

1.2.4 Application of the RICT Program to New Conditions

The licensee has also proposed to establish new conditions and required actions which permit application of a RICT when all trains are inoperable. Under the existing TS, such configurations would typically result in applicability of LCO 3.0.3 which requires an orderly reactor shutdown to a safe condition. The licensee has proposed addition of new conditions and required actions which allow up to 1 hour to determine a RICT in accordance with the RICT Program, or require a reactor shutdown. Therefore, the new proposed required actions are consistent with the existing actions of LCO 3.0.3, if a RICT is not used. In accordance with NEI 06-09 0-A, the use of a RICT when all trains of a TS system are inoperable is restricted to conditions in which at least one train of the TS system retains PRA functionality and the configuration risk management program (CRMP) can discern which TS functions are available and which are failed due to the inoperability.

The NRC staff’s SE for NEI 06-09 0-A dated May 17, 2007 (Reference 30), provides guidance on application of a RICT when all trains are inoperable. In this situation, if at least one train remains PRA Functional, as described in NEI 06-09 0-A, a RICT may be applied. The May 17, 2007, SE did, however, indicate that application of a RICT was not appropriate for voluntary entry into a condition with all trains inoperable. The SE indicated that the TS safety function should retain the capability to meet its design basis analysis requirements even though all trains are inoperable. Section 4.0 of the SE, “Limitations and Conditions,” adds that the licensee should justify that the scope of the PRA model, including applicable success criteria such as number of SSCs required, flowrate, etc., are consistent with the licensing basis assumptions (e.g., 10 CFR 50.46 Emergency Core Cooling System (ECCS) flowrates) for each of the TS requirements, or an appropriate disposition or programmatic restriction will be provided. Instead
of providing justification for using PRA success criteria that differ from the design basis, SNC added several programmatic restrictions to its definition of PRA Functional to ensure that the design basis success criteria can be fulfilled when the determination is made that at least one train remains PRA Functional. Additionally, TS 5.5.22.e limits the associated RICT under these conditions to a backstop of 24 hours instead of 30 days. These restrictions are discussed in Section 3.1 of this SE.

The following is a list of those TS sections to which the licensee has proposed addition of a new action and associated changes support the addition including allowance of inoperability of each component as long as PRA functionality is maintained:

**LCO 3.5.1, Accumulators**

- New Condition C is added: Two or more accumulators inoperable for reasons other than boron concentration not within limits. The condition is modified by notes stating that it is not applicable when two or more accumulators are intentionally made inoperable; and that the following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.
- The option of calculating a RICT is applied to the action to new Required Action C.1: Restore accumulators to OPERABLE status.
- Existing Condition C is renumbered as Condition D and modified to be applicable if the Required Action and Completion Time of Conditions A, B, or C are not met.

**LCO 3.7.5, Auxiliary Feedwater (AFW) System**

- New Condition C is added: Two AFW trains inoperable. The condition is modified by notes stating that it is not applicable when second AFW train intentionally made inoperable; and that the following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.
- The option of calculating a RICT is applied to the action to new Required Action C.1: Restore AFW trains to OPERABLE status.
- ACTIONS Table is renumbered to accommodate new Condition C.

**LCO 3.7.7, Component Cooling Water (CCW) System**

- New Condition B is added: Two CCW trains inoperable. The condition is modified by notes stating that it is not applicable when second CCW train intentionally made inoperable; and that the following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.
- The option of calculating a RICT is applied to the action to new Required Action B.1: Restore CCW trains to OPERABLE status.
- ACTIONS Table is renumbered to accommodate new Condition B.

**LCO 3.7.8, Nuclear Service Cooling Water (NSCW) System**

- New Condition B is added: Two NSCW trains inoperable. The condition is modified by notes stating that it is not applicable when second NSCW
train intentionally made inoperable; and that the following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.

- The option of calculating a RICT is applied to the action to new Required Action B.1: Restore NSCW trains to OPERABLE status.
- ACTIONS Table is revised to accommodate new Condition B.

**LCO 3.7.14, Engineered Safety Features (ESF) Room Cooler and Safety Related Chiller System**

- New Condition B is added: Two ESF room cooler and safety-related chiller trains inoperable. The condition is modified by notes stating that it is not applicable when second ESF room cooler and safety related chiller trains intentionally made inoperable; that the following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h; and that for the purposes of compliance with part f, the ESF room doors may be opened to maintain acceptable temperatures within the room.
- The option of calculating a RICT is applied to the action to new Required Action B.1: Restore one ESF room cooler and safety-related chiller train to OPERABLE status.
- ACTIONS Table is revised to accommodate new Condition B and C.

**LCO 3.8.1, AC Sources – Operating**

Section 2.1.5 of this SE contains a complete discussion of the changes to the LCO 3.8.1 ACTIONS Table.

- New Condition G is added: Three or more required AC sources inoperable. The condition is modified by notes stating that it is not applicable when three or more AC sources intentionally made inoperable; and that the following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.
- The option of calculating a RICT is applied to the action to new Required Action G.1: Restore required inoperable AC sources to OPERABLE status.
- ACTIONS Table is revised to accommodate new Condition G.

**LCO 3.8.4, DC Sources – Operating**

- New Condition D is added: Two DC electrical power sources inoperable. The condition is modified by notes stating that it is not applicable when second DC electrical power source intentionally made inoperable; and that the following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.
- The option of calculating a RICT is applied to the action to new Required Action D.1: Restore at least one DC electrical power source to OPERABLE status.
- ACTIONS Table is revised to accommodate new Condition D.
LCO 3.8.7, Inverters – Operating

- New Condition B is added: Two or more required inverters inoperable. The condition is modified by notes stating that it is not applicable when two or more inverters intentionally made inoperable; and that the following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.
- The option of calculating a RICT is applied to the action to new Required Action B.1: Restore required inverters to OPERABLE status.
- ACTIONS Table is revised to accommodate new Condition B.

LCO 3.8.9, Distribution Systems – Operating

- New Condition D is added: Two or more electrical power distribution subsystems inoperable that result in a loss of safety function. The condition is modified by notes stating that it is not applicable when two or more electrical power subsystems intentionally made inoperable; and that the following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.
- The option of calculating a RICT is applied to the action to new Required Action D.1: Restore electrical power distribution subsystems to OPERABLE status to restore safety function.
- ACTIONS Table is revised to accommodate new Condition D.

1.2.5 Revision of LCO 3.8.1, Alternating Current (AC) Sources – Operating

By letter dated February 17, 2016, in response to NRC staff RAIs, SNC proposed changes to TS 3.8.1, "AC Sources – Operating" for Vogtle (Reference 9). The current Vogtle TSs contain two Completion Times for restoring the DG to operable status. One completion time (14 days) is for when the combustion turbine generator (CTG) is available and the other (72 hours) is for when the CTG is not available. In addition to implementing a RICT program, the changes described below eliminate the 14 day Completion Time to conform the TSs the structure of the RICT Program, as described in NEI 06-09 0-A. Specifically, the proposed changes are:

1. Condition A is applicable when one required offsite circuit is inoperable.
   Required Action A.3 requires restoration of the required offsite circuit to OPERABLE status
   Current Completion Time is 72 hours.
   Proposed Completion Time is 72 hours or in accordance with the Risk Informed Completion Time Program.

2. Condition B is applicable when one DG is inoperable.
   Required Action B.2 requires verifying the standby auxiliary transformer (SAT) is available within 1 hour and once per 12 hours thereafter.
The proposed change is to delete Required Action B.2, and renumber the remaining required actions and references to required actions accordingly.

Required Action B.5.1 requires verifying an enhanced black-start CTG is functional by verifying the CTG and the black-start diesel generator starts and achieves steady state voltage and frequency within 72 hours or within 72 hours prior to entry into Condition B.

As an alternative to Required Action B.5.1, Required Action B.5.2 requires starting and running at least one CTG while in Condition B within 72 hours or prior to entry into Condition B for preplanned maintenance.

Required Actions B.5.1 and B.5.2 are modified by a note which states Required Action B.5.1 is only applicable if the combined reliability of the enhanced black-start combustion turbine generators (CTG) and the black-start diesel generator is ≥ 95%. Otherwise, Required Action B.5.2 applies.

The proposed change is to delete Required Actions B.5.1 and B.5.2 and the associated note.

The remaining Required Action associated with Condition B would be retained as Required Action B.4. The Completion Time for this Required Action is being changed from “From 14 days from discovery of failure to meet LCO” to “72 hours or in accordance with the Risk Informed Completion Time Program.”

3. Condition C is deleted. It is no longer needed because the required actions it references are being deleted.

4. The Completion Time for the following conditions is modified to allow the option of using a RICT. As an editorial change, the conditions and required actions are renumbered.

- Condition D (renumbered as Condition C) is applicable when two required offsite circuits are inoperable.
- Condition E (renumbered as Condition D) is applicable when one required offsite circuit is inoperable and one DG is inoperable.
- Condition F (renumbered as Condition E) is applicable when two DGs are inoperable. The condition is modified by notes stating that it is not applicable when second DG intentionally made inoperable; and that the following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.
- Condition G (renumbered as Condition F) is applicable when one automatic load sequencer is inoperable.

5. As described in Section 1.2.4 of this Safety Evaluation, a new Condition G is proposed to be added. Condition G would be applicable when three or more required AC sources are inoperable. The condition is modified by NOTES stating that it is not applicable when three or more AC sources are intentionally made inoperable; and that the following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.
The proposed Required Action is to restore required inoperable AC sources to operable status, with a proposed Completion Time of 1 hour or in accordance with the RICT Program.

The proposed Condition G would replace and modify existing Condition I.

Condition H is the default condition, which becomes applicable when the required actions and Completion Times for the other conditions are not met. As an editorial change, Condition H is modified to reflect the changes in Conditions A through G.

1.2.6 Editorial Change to LCO 3.5.2, ECCS - Operating

The licensee also proposed to delete a Note applicable to LCO 3.5.2 Condition A that modifies the CT by stating "A one-time only change of the Completion Time to 7 days is permitted for the 1A RHR pump motor replacement during Vogtle Unit 1, Cycle 19. The increased Completion Time is applicable only to the 1A RHR pump." This note is no longer applicable and deleting it is an editorial change.

2.0 REGULATORY EVALUATION

2.1 Applicable Regulations

The regulation under 10 CFR 50.36(c)(2) requires that TSs contain LCOs which are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When an LCO of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the TSs until the condition can be met. Typically, the TSs require restoration of equipment in a timeframe commensurate with its safety significance, along with other engineering considerations.

The regulation under 10 CFR 50.36(c)(5) states that administrative controls are the provisions relating to organization and management, procedures, recordkeeping, review and audit, and reporting necessary to assure operation of the facility in a safe manner.

The regulation under 10 CFR 50.57(a)(2) requires that the facility will operate in conformity with the application as amended, the provisions of the Act, and the rules and regulations of the Commission.

The regulation under 10 CFR 50.57(a)(5) requires that the issuance of the license will not be inimical to the common defense and security or to the health and safety of the public.

Section 10 CFR 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants" (i.e., the Maintenance Rule), requires licensees to monitor the performance or condition of SSCs against licensee established goals in a manner sufficient to provide reasonable assurance that these SSCs are capable of fulfilling their intended functions. Paragraph 50.65(a)(4) requires the assessment and management of the increase in risk that may result from a proposed maintenance activity.

As part of evaluating defense-in-depth, the NRC staff utilized 10 CFR Part 50, Appendix A, General Design Criterion (GDC) 17, "Electric power systems." This GDC provides, in part, that
an onsite electric power system and an offsite electric power system shall be provided to permit functioning of structures, systems, and components important to safety. The safety function for each system (assuming the other system is not functioning) shall be to provide sufficient capacity and capability to assure that (1) specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded as a result of anticipated operational occurrences and (2) the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents. Section 3.1.2 of the Vogtle Updated Final Safety Analysis Report (UFSAR) incorporates this criterion into the Vogtle licensing basis.

Although GDC 18, "Inspection and testing of electric power systems," is generally applicable to electrical power systems, the design and maintenance of the electrical power system equipment are not being changed by the proposed extension of the CTs and only the CTs in the TSs are being changed, therefore the proposed changes do not affect compliance with GDC 18, as incorporated into the plant licensing basis through the UFSAR. The review addressed by this SE is only within the requirements of GDC 17 with respect to defense-in-depth (e.g., availability/capacity/capability of the electrical power systems).

2.2 Commission Policy

In the "Final Policy Statement: Technical Specifications Improvements for Nuclear Power Reactors," published in the Federal Register (58 FR 39132; July 22, 1993), the NRC addressed the use of Probabilistic Safety Analysis (PSA, currently referred to as Probabilistic Risk Assessment or PRA) in Standard Technical Specifications. In this 1993 publication, the Commission wrote, in part:

The Commission believes that it would be inappropriate at this time to allow requirements which meet one or more of the first three criteria [of 10 CFR 50.361] to be deleted from Technical Specifications based solely on PSA (Criterion 4). However, if the results of PSA indicate that Technical Specifications can be relaxed or removed, a deterministic review will be performed.

The Commission Policy in this regard is consistent with its Policy Statement on "Safety Goals for the Operation of Nuclear Power Plants," 51 FR 30028, published on August 21, 1986. The Policy Statement on Safety Goals states in part, "* * * probabilistic results should also be reasonably balanced and supported through use of deterministic arguments. In this way, judgments can be made * * * about the degree of confidence to be given these [probabilistic]2 estimates and assumptions. This is a key part of the process for determining the degree of regulatory conservatism that may be warranted for particular decisions. This defense-in-depth approach is expected to continue to ensure the protection of public health and safety."

The Commission will continue to use PSA, consistent with its policy on Safety Goals, as a tool in evaluating specific line-item improvements to Technical Specifications, new requirements, and industry proposals for risk-based Technical Specification changes.

1 This clarification is not part of the original policy statement.
2 The Federal Register Notice 58 FR 39135 (Alteration in Original) explains the brackets.
Approximately 2 years later, the NRC provided additional detail concerning the use of PRA in the “Final Policy Statement: Use of Probabilistic Risk Assessment Methods in Nuclear Regulatory Activities,” published in the Federal Register (60 FR 42622; August 16, 1995). In this publication, the Commission wrote, in part:

The Commission believes that an overall policy on the use of PRA methods in nuclear regulatory activities should be established so that the many potential applications of PRA can be implemented in a consistent and predictable manner that would promote regulatory stability and efficiency. In addition, the Commission believes that the use of PRA technology in NRC regulatory activities should be increased to the extent supported by the state-of-the-art in PRA methods and data and in a manner that complements the NRC’s deterministic approach....

PRA addresses a broad spectrum of initiating events by assessing the event frequency. Mitigating system reliability is then assessed, including the potential for multiple and common cause failures. The treatment therefore goes beyond the single failure requirements in the deterministic approach. The probabilistic approach to regulation is, therefore, considered an extension and enhancement of traditional regulation by considering risk in a more coherent and complete manner....

Therefore, the Commission believes that an overall policy on the use of PRA in nuclear regulatory activities should be established so that the many potential applications of PRA can be implemented in a consistent and predictable manner that promotes regulatory stability and efficiency. This policy statement sets forth the Commission’s intention to encourage the use of PRA and to expand the scope of PRA applications in all nuclear regulatory matters to the extent supported by the state-of-the-art in terms of methods and data....

Therefore, the Commission adopts the following policy statement regarding the expanded NRC use of PRA:

(1) The use of PRA technology should be increased in all regulatory matters to the extent supported by the state-of-the-art in PRA methods and data and in a manner that complements the NRC’s deterministic approach and supports the NRC’s traditional defense-in-depth philosophy.

(2) PRA and associated analyses (e.g., sensitivity studies, uncertainty analyses, and importance measures) should be used in regulatory matters, where practical within the bounds of the state-of-the-art, to reduce unnecessary conservatism associated with current regulatory requirements, regulatory guides, license commitments, and staff practices. Where appropriate, PRA should be used to support the proposal for additional regulatory requirements in accordance with 10 CFR 50.109 (Backfit Rule). Appropriate procedures for including PRA in the process for changing regulatory requirements should be developed and followed. It is, of course, understood that the intent of this policy is that existing rules and regulations shall be complied with unless these rules and regulations are revised.
(3) PRA evaluations in support of regulatory decisions should be as realistic as practicable and appropriate supporting data should be publicly available for review.

(4) The Commission's safety goals for nuclear power plants and subsidiary numerical objectives are to be used with appropriate consideration of uncertainties in making regulatory judgments on the need for proposing and backfitting new generic requirements on nuclear power plant licensees.

2.3 Regulatory Guidance

Regulatory Guide (RG) 1.174, Revision 2, “An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis,” May 2011 (Reference 35), describes an acceptable risk-informed approach for assessing the nature and impact of proposed permanent licensing basis changes by considering engineering issues and applying risk insights. This regulatory guide also provides risk acceptance guidelines for evaluating the results of such evaluations.

Revision 1 of RG 1.177, “An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications,” May 2011 (Reference 36), describes an acceptable risk-informed approach specifically for assessing proposed TS changes. This regulatory guide identifies a three-tiered approach for a licensee's evaluation of the risk associated with a proposed TS completion time change, as follows.

- Tier 1 assesses the risk impact of the proposed change in accordance with acceptance guidelines consistent with the Commission's Safety Goal Policy Statement, as documented in RG 1.174 and RG 1.177. The first tier assesses the impact on plant risk as expressed by on the change in core damage frequency (ΔCDF) and change in large early release frequency (ΔLERF). It also evaluates plant risk while equipment covered by the proposed CT is out-of-service, as represented by incremental conditional core damage probability (ICCDP) and incremental conditional large early release probability (ICLERP). Tier 1 also addresses PRA quality, including the technical adequacy of the licensee's plant-specific PRA for the subject application. Cumulative risk of the proposed TS change is considered with uncertainty/sensitivity analysis with respect to the assumptions related to the proposed TS change.

- Tier 2 identifies and evaluates any potential risk-significant plant equipment outage configurations that could result if equipment, in addition to that associated with the proposed license amendment, is removed from service simultaneously, or if other risk-significant operational factors, such as concurrent system or equipment testing, are also involved. The purpose of this evaluation is to ensure that there are appropriate restrictions in place such that risk-significant plant equipment outage configurations will not occur when equipment associated with the proposed CT is implemented.

- Tier 3 addresses the licensee's configuration risk management program (CRMP) to ensure that adequate programs and procedures are in place for identifying risk-significant plant configurations resulting from maintenance or other operational activities and appropriate compensatory measures are taken to avoid risk-significant configurations that may not have been considered when the Tier 2
evaluation was performed. Compared with Tier 2, Tier 3 provides additional coverage to ensure risk-significant plant equipment outage configurations are identified in a timely manner and that the risk impact of out-of-service equipment is appropriately evaluated prior to performing any maintenance activity over extended periods of plant operation. Tier 3 guidance can be satisfied by the Maintenance Rule, which requires a licensee to assess and manage the increase in risk that may result from activities such as surveillance testing and corrective and preventive maintenance, subject to the guidance provided in RG 1.177, Section 2.3.7.1 and the adequacy of the licensee's program and PRA model for this application. The CRMP ensures that equipment removed from service prior to or during the proposed extended CT will be appropriately assessed from a risk perspective.

Regulatory Guide 1.200, Revision 2, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," March 2009 (Reference 33), describes an acceptable approach for determining whether the quality of the PRA, in total or the parts that are used to support an application, is sufficient to provide confidence in the results, such that the PRA can be used in regulatory decision making for light-water reactors. This regulatory guide provides guidance for assessing the technical adequacy of a PRA. Revision 2 of RG 1.200, endorses, with clarifications and qualifications, the use of the American Society of Mechanical Engineers (ASME)/American Nuclear Society (ANS) Standard, RA-Sa-2009, "Addenda to ASME RA-S-2008 Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications" (i.e., the PRA Standard)" (Reference 37).

General guidance for evaluating the technical basis for proposed risk-informed changes is provided in NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR [Light-Water Reactor] Edition" (SRP) Chapter 19, Section 19.2, "Review of Risk Information Used to Support Permanent Plant Specific Changes to the Licensing Basis: General Guidance" (Reference 38). Guidance on evaluating PRA technical adequacy is provided in the SRP, Chapter 19, Section 19.1, Revision 3, "Determining the Technical Adequacy of Probabilistic Risk Assessment for Risk-Informed License Amendment Requests after Initial Fuel Load" (Reference 39). More specific guidance related to risk-informed TS changes is provided in SRP, Section 16.1, Revision 1, "Risk-Informed Decision Making: Technical Specifications" (Reference 40), which includes changes to TS completion times as part of risk-informed decision making. Section 19.2 of the SRP references the same criteria as RG 1.177, Revision 1, and RG 1.174, Revision 2, and states that a risk-informed application should be evaluated to ensure that the proposed changes meet the following key principles:

1. The proposed change meets the current regulations unless it is explicitly related to a requested exemption;
2. The proposed change is consistent with the defense-in-depth philosophy;
3. The proposed change maintains sufficient safety margins;
4. When proposed changes result in an increase in core damage frequency or risk, the increases should be small and consistent with the intent of the Commission's Safety Goal Policy Statement; and
5. The impact of the proposed change should be monitored using performance measurement strategies.

The licensee's September 13, 2012, LAR proposed to amend its TSs in accordance with NEI 06-09 0-A. The LAR proposed new conditions, required actions, and CTs to address conditions not currently addressed in TSs consistent with TSTF-505. The LAR stated that although the proposed amendment is consistent with TSTF-505, SNC is not proposing adoption of TSTF-505 with this LAR. This LAR is a site-specific application. The NRC staff reviewed the LAR against NEI 06-09 0-A, including the NRC staff positions, limitations, and conditions, in the staff's May 17, 2007, SE approving NEI 06-09 0-A.

Defense-in-depth is an approach to designing and operating nuclear facilities that prevents and mitigates accidents that release radiation or hazardous materials. The key is creating multiple independent and redundant layers of defense to compensate for potential human and mechanical failures so that no single layer, no matter how robust, is exclusively relied upon. Defense-in-depth includes the use of access controls, physical barriers, redundant and diverse key safety functions, and emergency response measures.

3.0 TECHNICAL EVALUATION

Most TS LCOs identify one or more conditions for which the LCO may not be met, to permit a licensee to perform required testing, maintenance, or repair activities. Each condition has an associated required action for restoration of the LCO or for other actions, each with some fixed time interval, referred to as the CT, which identifies the time interval permitted to complete the required action. Upon expiration of the CT, the licensee is required to shut down the reactor or follow the remedial action(s) stated in the TS. The RICT Program provides the necessary administrative controls to permit extension of CTs and thereby delay reactor shutdown or remedial actions, if risk is assessed and managed within specified limits and programmatic requirements.

The licensee's LAR for VEGP, Units 1 and 2, requested approval to add a RICT Program to the Administrative Controls of TS, add new conditions and associated required actions in some TSs, and modify selected CTs to permit extending the CTs, provided risk is assessed and managed as described in the NEI 06-09 0-A. The licensee's application for the changes proposed to use the risk-informed TS Initiative 4b methodology, NEI 06-09 0-A, included documentation regarding the technical adequacy of the PRA models for the RICT Program, consistent with the requirements of RG 1.200. The licensee's application and proposed program relied on the methodology and framework described in NEI 06-09 and did not clearly incorporate the substantive limitations discussed in the NRC staff's SE dated May 17, 2007 (Reference 30), into the proposed program.

For example, NEI 06-09 defines PRA Functional completely in terms of the safety function modelled in the PRA and impact on PRA success criteria. The NRC staff's SE limited the minimum remaining available success criteria to be consistent with the licensing basis assumptions (e.g., 10 CFR 50.46 flowrates). In addition, the NRC staff's SE states, in part, that "[a] RICT can only apply to (restorative) TS Required Actions that are not Mode changes or unit shutdown (e.g., TS 3.0.3 actions and CTs)." The two NRC staff SE limitations are related insofar as loss of capability to provide licensing basis success criteria often results in a Mode change required action. In contrast, but consistent with TSTF-505, SNC originally proposed to only require that the PRA success criteria be met in order to declare an LCO "PRA Functional" and to apply the RICT calculated from the PRA as the CT. The licensee's TS 5.5.22.f.2 limits
declaring a train PRA Functional to situations where there is a loss of operability and potentially some reduced capability, but the design basis success criteria continue to be met. When there is a loss of operability for all required trains, but continued capability to achieve the design basis success criteria, TS 5.5.22.e further limits the maximum RICT (i.e., the backstop) in these LCOs to 24 hours instead of 30 days. The acceptability of these restrictions is discussed Section 3.1 of this SE.

3.1 Review of PRA Methodology for Using RICTs

Regulatory Guide 1.177, Revision 1, identifies five key safety principles to be applied to risk-informed changes to the TSs. Each of these principles are address in NEI 06-09 0-A. The NRC staff’s evaluation of the licensee’s proposed use of RICTs against these key safety principles is discussed as follows.

3.1.1 Key Principle 1: Compliance with Current Regulations

As stated in 10 CFR 50.36(c)(2), “[l]imiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a limiting condition for operation of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the technical specifications until the condition can be met.” Generally, LCOs are established to preserve the single failure criterion for systems relied upon in the safety analysis report. The single failure criterion is a general design objective that is used to evaluate system designs to ensure that a single failure does not result in a loss of the capability of the system to perform its safety function or functions. Generic Letter 80-30, “Clarification of the Term ‘Operable’ As It Applies to Single Failure Criterion for Safety Systems Required by TS,” dated April 10, 1980 (Reference 41), states, in part, that:

By and large, the single failure criterion is preserved by specifying Limiting Conditions for Operation (LCOs) that require all redundant components of safety related systems to be OPERABLE. When the required redundancy is not maintained, either due to equipment failure or maintenance outage, action is required, within a specific time, to change the operating mode of the plant to place it in a safe condition. The specified time to take action, usually called the equipment out-of-service time [termed Completion Time in the Standard Technical Specifications], is a temporary relaxation of the single failure criterion, which, consistent with overall system reliability considerations, provides a limited time to fix equipment or otherwise make it OPERABLE.

When the necessary redundancy is not maintained (e.g., one train of a two-train system is inoperable), the TSs permit a limited period of time to restore the inoperable train to OPERABLE status and/or take other remedial measures. If these actions are not completed within the CT, the TSs normally require that the plant exit the mode of applicability for the LCO. With one train of a two-train system inoperable, the TS safety function is accomplished by the remaining OPERABLE train. In the current TSs, the CT is specified as a fixed time period (termed the “front stop”). The addition of the option to determine the CT in accordance with the RICT Program would allow an evaluation to determine a configuration-specific CT. The evaluation would be done in accordance with the methodology prescribed in NEI 06-09 0-A and TS 5.5.22. The RICT is limited to a maximum of 30 days (termed the “back stop”), provided there is no loss of function. The CTs in the current TSs were established using experiential data, risk insights, and engineering judgement. The RICT Program provides the necessary administrative controls to permit extension of CTs and thereby delay reactor shutdown or remedial actions, if risk is
assessed and managed appropriately within specified limits and programmatic requirements. The specified safety function or performance levels of TS-required SSCs are unchanged.

In the existing TSs, when both trains of a two-train system are inoperable, the TSs normally require an orderly shutdown to place the unit in a mode in which the LCO is not applicable. This configuration is termed a loss of TS safety function. The proposed TS changes permit the application of a RICT when multiple trains are inoperable. In accordance with NEI 06-09, the use of a RICT when all required trains of a TS system are inoperable is restricted to conditions in which at least one train of the TS system retains PRA functionality and the CRMP can discern which TS functions are available and which are failed due to the inoperability. There are additional constraints imposed on the use of a RICT for these conditions. The maximum RICT (backstop) may not exceed 24 hours. Voluntary entry into these configurations is prohibited. In addition,

1. Any SSCs credited in the PRA Functionality determination shall be the same SSCs relied upon to perform the Technical Specifications safety function.

2. Design basis success criteria parameters shall be met for all design basis accident scenarios for establishing PRA Functionality during a Technical Specifications loss of function condition where a RICT is applied.

When a shutdown is required because an LCO or its associated required actions are not met during power operations, the TSs typically permit 6 or 7 hours to complete a shutdown. This provides sufficient time to prepare for an orderly shutdown. The RICT program provides a methodology to extend this period of time provided risk is assessed and managed, and the design basis success criteria parameters are satisfied for all design-basis accident scenarios.

With the incorporation of the RICT Program, the required performance levels of equipment specified in LCOs are not changed. The remedial actions and the required CT for the remedial actions are modified. Requirements to shut down the reactor are retained, but are modified to provide additional time if risk is appropriately assessed and managed.

Section 3.1.2 of this SE provides an evaluation of the defense-in-depth and safety margin considerations associated with the RICT Program. For the reasons described in that SE section and for the reasons described above, the NRC staff concludes that the requirements of 10 CFR 50.36 are still satisfied. The constraints proposed also ensure that as a minimum, design basis success parameter values will be met any time a RICT is exercised. In turn, this ensures that the plant will be operated in accordance with the design (i.e., the application as amended) and is safe. Therefore, the requirements of 10 CFR 50.57(a)(2) and 10 CFR 50.57(a)(6) are met.

Therefore, the NRC staff finds that the proposed changes meet the first key safety principle of RG 1.174, Revision 2 and RG 1.177, Revision 1.

3.1.2 Key Principle 2: Evaluation of Defense-in-Depth

Consistency with the defense-in-depth philosophy is maintained if: a reasonable balance is preserved among avoidance of core damage, avoidance of containment failure, and consequence mitigation; overreliance on programmatic activities as compensatory measures is avoided; system redundancy, independence, and diversity are maintained commensurate with
The expected frequency and consequences of challenges to the system (e.g., there are no risk outliers); defenses against potential common cause failures are maintained and the potential for the introduction of new common cause failure mechanisms is assessed; independence of physical barriers is not degraded; defenses against human errors are maintained; and the intent of the plants' design criteria is maintained.

The licensee is not proposing any changes to the design of the plant or to any operating parameter, nor is proposing any changes to the design basis in the proposed changes to the TSs.

When one or more trains in a system become inoperable, either from a failure or from a voluntary action, an LCO will not be met, and the appropriate TS conditions must be identified and entered. Technical specification conditions that are entered when an LCO cannot be met result in a temporary reduction in defense-in-depth because less equipment is available to fulfill the safety function. The specified TS required actions must be completed and the train(s) returned to operable within the prescribed CTs or a plant shutdown is required. As discussed in NEI 06-09 0-A, the risk managed technical specifications (RMTS) allows some prescribed CTs to be extended with RICTs, which are calculated based on risk impact.

When PRA Functional and a RICT are applied to a TS LCO with sufficient trains remaining operable to fulfill the TS safety function, the operability of these remaining train(s) limits the magnitude of any reduction in defense-in-depth to a reduction that has been previously evaluated when the prescribed CT was approved. The effect of the proposed changes will be that the RICT Program will allow CTs to vary up to a 30-day backstop based on the risk significance of the given plant configuration, and therefore, when sufficient trains remain operable to fulfill the TS safety function, only the impact of extending the CT on defense-in-depth needs evaluation.

The RICT Program uses both CDF and LERF to assess and establish RICTs, which addresses maintaining a balance between core damage prevention and containment failure prevention. The risk estimate used to extend the CT in the RICT Program reflects observed component performance and the expected frequency and consequences of challenges to the system modeled in the PRA, which address maintaining system redundancy, independence, and diversity, commensurate with the expected frequency and consequences of challenges to the system. Implementation of the RICT Program permits the operator to use the plant PRA to identify other equipment that has the greatest effect on the risk of the existing configuration which provides defenses against human errors associated with inadvertently taking actions that would increase risk. With this information, the operator can manage the out-of-service duration and determine the consequences of removing additional equipment from service.

When the RICT is applied to a TS condition with sufficient trains remaining operable to fulfill the TS safety function, application of the RICT extends the time that the plant operates with the reduced but previously accepted level of defense-in-depth while managing the instantaneous and cumulative risk impact of extending the CT. An important element of defense-in-depth is that defenses against potential common cause failures are maintained and the potential for the introduction of new common cause failure mechanisms is assessed. As discussed in the PRA Modelling, Section 3.1.4.1.3 of this SE, the potential for redundant trains to be affected from a common cause is included quantitatively in the RICT calculation, or qualitatively in risk management actions (RMAs) targeted toward ensuring that any potential common cause failure will not cause a failure of the remaining redundant and/or diverse SSC fulfilling the affected TS function. Thus, defense-in-depth is maintained during this extension when the RMTS program
is applied to a TS LCO condition with sufficient trains remaining operable to fulfill the TS safety function.

After entry into a TS LCO condition, an emergent failure or an additional degraded or non-conforming condition may be discovered in other SSC(s) that results in all trains of equipment being declared inoperable. For emergent conditions, NEI 06-09 0-A states that a RICT may be applied when all trains of equipment required by the TS LCO would be inoperable, provided one or more of the trains are considered PRA Functional. When the RICT is applied to a TS condition with all trains of equipment being declared inoperable, application of PRA Functional instead of the design basis functional capabilities may reduce the capability to fulfill the TS safety function beyond that previously approved in the LCO. Therefore, the additional reduction in defense-in-depth needs to be evaluated based on the reduction in the number or capability of SSCs that remain available to satisfy the design basis functions.

Some SSCs are explicitly included in the TSs while others are included by the TS definition of OPERABLE. When determining operability of the SSCs included in the TS, the SSCs identified in the TSs and all SSCs relied on to support the TS safety function must be capable of performing their support functions. The SE in NEI 06-09 0-A included a limitation and condition (#2 in Section 4.0) requiring that appropriate disposition or programmatic restriction be provided by the licensee if the PRA success criteria, such as number of SSCs required, flowrate, etc., are not consistent with licensing basis assumptions.

Table E1-1, “Revised TS Condition and PRA Functions,” in the LAR (Reference 1), only compared train level success criteria information for SSCs explicitly included in each TS and did not provide any comparison between PRA and design basis success criteria parameter values. Table E1-1 did not provide information regarding the capability of support system SSCs that might be modelled in the PRA and contribute to PRA Functional and how that capability compares to the design basis support system SSCs’ capability being replaced by the PRA SSCs.

By letter dated February 17, 2016 (Reference 9), in response to an NRC staff RAI regarding any PRA Functional definition that relied on SSCs other than the SSCs relied on in the TS, the licensee stated that “SSCs credited in the PRA Functionality determination are the same SSCs relied upon to perform the specified Technical Specifications safety function.” Additionally, by letter dated May 4, 2017 (Reference 14), SNC proposed to add the following constraints to the TS Administrative Controls TS Section 5.5.22.f:

1. Any SSCs credited in the PRA Functionality determination shall be the same SSCs relied upon to perform the specified Technical Specifications safety function.

2. Design basis success criteria parameters shall be met for all design basis accident scenarios for establishing PRA Functionality, during a Technical Specifications Loss of Function Condition, where a RICT is applied.

The TS 5.5.22.f.1 condition on PRA functionality would not permit crediting SSCs not credited in the TS safety functional operability determination as PRA Functional. Providing this condition ensures there is no unanalyzed reduction in system redundancy, independence, and diversity because the SSCs designed to fulfill all design basis functions should be available and capable of providing the design basis success criteria parameters.
The TS 5.5.22.f.2 condition is primarily related to safety margins and is discussed in Section 3.1.3 of this SE. However, the condition also supports the conclusion that the defense-in-depth philosophy is maintained because the intent of the design basis includes having the capability to successfully mitigate all design-basis accident scenarios.

In its June 2, 2017, letter, SNC modified the application of TS 5.5.22.f for TS LCO 3.7.14, “Two ESF Room Cooler and Safety-Related Chiller trains shall be OPERABLE.” The licensee added a note to Condition B, “Two ESF room coolers” inoperable to provide for ESF room doors to be opened to maintain acceptable temperatures within the rooms. Therefore, SSCs other than the TS SSC (i.e., doors instead of coolers) are credited and the design basis success criteria parameters values will not be met (i.e., 150 degrees Fahrenheit (°F) will be reached instead of 104 °F). The reduction of defense-in-depth caused by the inoperability of the coolers is considered acceptable because the cooling through open doors is a passive reliable function, and the action to open the doors is a simple operator action that is included in the procedures and operators receive training on the requirement. The change in success criteria parameter values is discussed in this SE in Section 3.1.3, “Key Principle 3: Evaluation of Safety Margins.” The NRC staff's review is limited to opening doors for the purpose of room cooling and did not address, or approve, the impact of open doors on any other function(s) performed by the door.

Revision 2 of RG 1.174 indicates that licensees should avoid over-reliance on programmatic activities as compensatory measures. The NEI 06-09 0-A topical report addresses potential RMAs by stating, in generic terms, that RMAs may include, but are not limited to the following:

1. Reduce the duration of risk sensitive activities.
2. Remove risk sensitive activities from the planned work scope.
3. Reschedule work activities to avoid high-risk sensitive equipment outages or maintenance states that result in high-risk plant configurations.
4. Accelerate the restoration of out-of-service equipment.
5. Determine and establish the safest plant configuration.

When PRA Functional and a RICT are applied to a TS condition with sufficient trains remaining operable to fulfill the TS safety function, there are often a number of NRC-approved surveillance requirements\(^3\) that must be undertaken to ensure that the minimum operability requirements continue to be met. The RICT program requires that additional compensatory measures be initiated when the PRA-calculated risk management action time (RMAT) is exceeded, or for pre-planned maintenance activities for which the RMAT is expected to be exceeded. The RMAs shall be implemented at the earliest appropriate time (i.e., as soon as possible, but no later than the RMAT). When the TS function remains operable in an existing LCO condition, the reduction in defense-in-depth has already been evaluated and accepted for a limited period of time during the current CT. During the extended CT, quantitative risk analysis, qualitative considerations, and the additional RMAs provide additional confidence that the intent of the plant’s design basis is maintained.

\(^3\) Per 10 CFR 50.36, surveillance requirements are “requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met.”
After entry into a TS condition, an emergent failure or an additional degraded or non-conforming condition may be discovered in the redundant SSC(s), resulting in all required trains of equipment being declared inoperable. As stated in this SE, TS loss of function (TS LOF) conditions are those TS conditions with insufficient TS operable equipment to meet the specified safety function of the system. For these conditions, NEI 06-09 0-A allows inoperable equipment to be either: 1) declared PRA Functional and apply a RICT if certain conditions are met; or 2) be declared PRA non-functional, in which case the plant is considered to be in a “total loss of TS specified safety function” and requires exiting the RICT and entering the associated TS required actions. Voluntary entry into these conditions is not permitted, as stated in TS 5.5.22. The discussion below evaluates defense-in-depth for TS LOF conditions.

When TS LOF occurs, the licensee must determine if the equipment can be considered PRA Functional including a determination that the plant configuration can fulfill its design basis functions, develop RMAs, and estimate a RICT. The guidance in NEI 06-09 0-A directs that a RICT assessment shall be performed within the shorter of 12 hours or the most limiting front-stop CT after a configuration change that affects the RICT has occurred. If the emergent condition is loss of TS operability, a 1-hour front-stop such as for entry into TS LCO 3.0.3 is common. Therefore, the PRA Functionality assessment and RMA development must be done in a short time. Defense-in-depth is maintained by avoiding over-reliance on programmatic activities, however, determination that PRA Functionality is available and development of the associated RICT is a challenging programmatic activity because of:

- The short time available to determine PRA Functionality including the evaluation that either no common cause failure exists, or that any common cause failure mechanism that might exist does not fail the design basis functions;
- The complexity of the determination of PRA Functionality because of the different combinations of available, available but degraded, and unavailable SSCs;
- The number of different plant configurations that could arise indicating an almost certain lack of a documented engineering evaluation that the available equipment as configured is capable of satisfying the design basis success criteria over an indefinite or extended time;
- The complexity of ensuring that all external design basis hazards within the design basis can continue to be mitigated;
- The complexity of developing appropriate surveillance and alignment activities to provide assurance that the available SSCs will fulfill their design basis functions when required;
- The complexity of determining that the remaining SSCs are capable of fulfilling all the design basis requirements (including those not modelled in the PRA); and

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4 As discussed in SE Section 3.1.3, “Key Principle 3: Evaluation of Safety Margins,” the NRC staff has determined that PRA Functional must be able to satisfy the design basis success criteria parameters or additional justification is need. The licensee has added the constraint to its TSs that PRA Functional must be able to satisfy the design basis success criteria parameters.
• The uncertainty associated with the functional capability of the remaining population of SSCs to fulfill the design basis success criteria parameter requirements with all trains inoperable.

The NRC staff’s approval of extending the CT for up to 30 days is based on maintaining the philosophy of defense-in-depth, adequate safety margins, and on the capability of reflecting the as-operated plant to calculate the RICT. The NRC staff concludes, however, that the issues listed above indicate that the proposal to determine PRA Functional and associated activities when all trains of equipment being declared inoperable for any combination of available and degraded SSCs could result in over-reliance on programmatic activities. Overreliance on programmatic activities could be prohibited or the effect of an uncertain reduction in defense-in-depth could be minimized by authorizing a short exposure time (i.e., a shorter maximum RICT). In addition, operation with a reduced number of components may reduce the defense against common cause errors and implementation of the RMAs will increase the reliance on human actions reducing the defense against human errors respectively, therefore further reducing defense-in-depth. This reduction in defense against common cause failures and human errors also supports limiting the time PRA Functional can replace TS operable to a short duration.

To address this concern, in requests for additional information (RAIs), the NRC staff asked SNC how it would account for:

1. The rapidly developed FRA functionality determination and associated RMAs which must ensure that the functionality is sufficient and available,
2. The possibility that the facility could experience a transient or accident challenge that would require the functional capability, and
3. Additional emergent failures throughout the plant that could degrade or fail thereby further degrading the capability of the plant to respond to transient or accident conditions.

In its RAI response dated March 13, 2017 (Reference 12), SNC proposed a 24-hour instead of a 30-day backstop to be applied for TS LOF conditions. A 24-hour backstop upon loss of operability is consistent with the maximum acceptable CT in TSTF-426, “Revise or Add Actions to Preclude Entry into LCO 3.0.3: RITSTF [Risk-Informed TSTF] Initiatives 6b & 6c ADAMS (Reference 66).” The TSTF-426 traveler supports extending the time before shutdown upon loss of TS operability from 1 hour up to a maximum of 24 hours based on an in-depth evaluation on the impact of the loss of operability on the design basis and the development of additional, pre-identified defense-in-depth RMA measures included in the TSs. The NEI 06-09 0-A topical report requires RMAs to be developed under certain conditions, but the approach does not require a defense-in-depth evaluation. The NRC staff finds that the determination that the design basis success criteria can still be met (which is not required by TSTF-426) and the requirement to develop RMAs assures sufficient remaining capability and only a small, acceptable increase in risk for the limited time the CT can be extended with all trains inoperable.

Therefore, the NRC staff finds the licensee’s proposed use of a 24-hour backstop for TS inoperable but PRA Functional, when applied together with the conditions that 1) the same SSCs relied on in the LCO be available, and 2) the design basis function success parameters can still be achieved, acceptable for meeting Key Principle 2: Proposed change is consistent with defense-in-depth philosophy.
3.1.2.1 Evaluation of Electrical Power System Defense-in-Depth and Safety Margins

According to the VEGP UFSAR, the plant is designed such that the safety functions are maintained assuming a single failure within the electrical power system. By incorporating an electrical power supply perspective, this concept is further reflected in a number of principal design criteria for VEGP. Single failure requirements are typically suspended for the time that a plant is not meeting an LCO (i.e., in an ACTION statement). This section considers the plant configurations, from a defense-in-depth perspective.

Defense-in-depth is an approach to designing and operating nuclear facilities that prevents and mitigates accidents that release radiation or hazardous materials. The key is creating multiple independent and redundant layers of defense to compensate for potential human and mechanical failures so that no single layer, no matter how robust, is exclusively relied upon. Defense-in-depth includes the use of access controls, physical barriers, redundant and diverse key safety functions, and emergency response measures.

The licensee's alternating current (AC) electrical power distribution system sources consist of the offsite power sources (preferred power sources, normal and alternate(s)), and the onsite standby power sources (train A and train B diesel generators (DGs)). The onsite Class 1E AC Distribution System is divided into redundant load groups (trains) so that the loss of any one group does not prevent the minimum safety functions from being performed. Each train has connections to two offsite power sources and a single DG. Offsite power is supplied to the unit switchyard from the transmission network by seven transmission lines. From the switchyard, two electrically and physically separated circuits provide AC power, normally through step down reserve auxiliary transformers (RATs), to the 4.16 kiloVolt (kV) engineered safety features (ESF) buses. In addition to the two offsite circuits described above, the 13.8 kV standby auxiliary transformer (SAT) provides an additional qualified offsite source.

The load sequencer(s) is an essential support system to the onsite Class 1E AC distribution system. The sequencers are required to provide the system response to both a safety injection signal and a loss of or degraded ESF bus voltage signal. Therefore, loss of an ESF bus sequencer affects every major ESF system in the train. Following a trip of offsite power, in response to the undervoltage signal, a sequencer strips non-essential loads from the ESF bus. When the DG is tied to the ESF bus, loads are then sequentially connected to its respective ESF bus by the automatic load sequencer. The automatic sequencing logic controls the permissive and starting signals to motor breakers to prevent overloading the DG.

The Class 1E direct current (DC) electrical power distribution system sources consist of four 125 VDC systems (identified A, B, C, and D) per unit. Each system has a 59-cell lead calcium battery, switchgear (electrically operated drawout circuit breakers), two redundant battery chargers, and 125 VDC distribution panels (molded case circuit breakers). There is no capability to connect the DC systems between themselves, between Unit 1 and Unit 2 systems, or between the safety features systems and the nonsafety features systems. During normal operation, the 125 VDC load is powered from the battery chargers with the batteries floating on the system. In case of loss of normal power to the battery chargers, the DC load is automatically powered from the batteries.

There are six Class 1E inverters that supply the six vital AC distribution panels. Each inverter is connected independently to one distribution panel. Each inverter/distribution panel is associated with one of four instrumentation and control power supply channels. Channels I and
II have two inverters and distribution panels each; Channels III and IV have only one inverter and distribution panel each. Channels I and III are associated with train A, and Channels II and IV are associated with train B. The six Class 1E inverters provide the preferred source of 120 VAC, 60 Hertz power for the reactor protection system, the engineered safety feature actuation system, nuclear steam supply system control and instrumentation, post-accident monitoring system, and safety-related radiation monitoring system. The power for the Channel I, II, III, and IV inverters is from the Class 1E 125 VDC train A, B, C, and D station batteries, respectively, or their associated chargers when the batteries are on float. The station batteries ensure continued operation of instrumentation systems in the event of a station blackout. Each distribution panel may be connected to a backup source of Class 1E 120 VAC power. The backup 120 VAC power is derived from the train A and B vital 480 VAC distribution system via 480-120 V Class 1E regulating transformers that are qualified as isolation devices.

The AC (4.16 kVAC and 480 VAC systems), DC (125 VDC system), and AC vital bus (120 VAC system) electrical power distribution systems are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that the fuel, reactor coolant system, and containment design limits are not exceeded. The onsite Class 1E AC electrical power distribution systems are divided by train into two redundant and independent AC electrical power distribution subsystems. The DC and AC vital buses are divided into four channels of distribution, two channels of which are associated with each train. The AC electrical power subsystem for each train consists of a primary ESF 4.16 kV bus and secondary 480 and 120 V buses, distribution panels, motor control centers, and load centers. Each 4.16 kV ESF bus has at least one separate and independent offsite source of power as well as a dedicated DG source. Each 4.16 kV ESF bus is normally connected to a preferred offsite source. A transfer to the alternate offsite source can be made manually. If all offsite sources are unavailable, the onsite emergency DG supplies power to the 4.16 kV ESF bus. Control power for the 4.16 kV breakers is supplied from the Class 1E batteries. The secondary AC electrical power distribution system for each train includes the safety-related load centers, motor control centers, and distribution panels. The 120 VAC vital buses are arranged in two load groups per train and are normally powered from the inverters. The alternate power supply for the vital buses are Class 1E regulating transformers powered from the same train as the associated inverter. Each regulating transformer is powered from a Class 1E AC bus. There are four independent 125 VDC electrical power distribution subsystems (two for each train).

The NRC staff evaluation of the proposed changes considered a number of potential plant conditions allowed by the new TSs and considered what redundant or diverse means were available assist the licensee in responding to various plant conditions. In these evaluations, the NRC staff examined the safety significance of different plant conditions resulting both shorter and longer completion times. The plant conditions evaluated are discussed in more detail below.

3.1.2.1.1 Non-TS LOF Conditions

This section covers entry into TS conditions where there is no TS LOF condition (e.g., one or more redundant trains remain operable to meet the safety function of the system).

3.1.2.1.1 TS 3.8.1 Condition A - One Required Offsite Circuit Inoperable

The licensee has requested to use the RICT Program to extend the existing CT of 72 hours for this condition. The proposed CT to restore the required offsite circuit to operable status is
72 hours or in accordance with the RICT. The high estimate for the calculated RICT for this condition (as provided in Enclosure 1 of the LAR dated September 13, 2012) is 171.71 days. However, as established in the proposed language in the TS Chapter 5, “Administrative Controls,” TS Section 5.5.22, “Risk Informed Completion Time Program,” a RICT may not exceed 30 days. Therefore, the licensee may have up to 30 days to restore the required offsite circuit to operable status.

Assuming that Condition A (one required offsite circuit inoperable) is the only applicable Condition in TS 3.8.1 for the plant configuration, the associated loads will be powered by the remaining offsite power circuit (via its associated Reserve Auxiliary Transformer (RAT)). Additionally, the 13.8 kV SAT provides an additional qualified offsite source.

In addition to the TS required actions, the RICT Program requires the licensee to employ RMAs at the earliest time possible, but no later than the calculated RMAT. Section 3.1.2 of this SE provides further discussion of the RMAs and RMAT. In Enclosure 10 of the September 13, 2012, LAR (Reference 1), the licensee described its procedure to develop and implement RMAs. By letter dated April 14, 2017 (Reference 13), the licensee provided examples of RMAs that are considered during an offsite circuit RICT to provide additional assurance of adequate defense-in-depth:

1. Limit the potential for a loss of offsite power by terminating all activities in the low voltage and high voltage switchyard.

2. Notify the Power Control Center to defer any planned activities with the potential to generate a grid disturbance.

3. Maintain availability of offsite power to/from RAT ‘A’, maintain Operability of both DGs, and maintain Operability of 4160 V safety buses.

4. Evaluate weather predictions and take appropriate actions to mitigate potential impacts of severe weather.

5. Consider staging a portable generator per procedure NMP-OS-019-361, which would accelerate connection to a 4160 VAC bus in the event of a station blackout.

As stated in Table E1.1 of the LAR dated September 13, 2012, the design success criteria for this condition is one of two circuits available. Therefore, upon the loss of one offsite power circuit, the plant is capable to transmit power from the transmission system to the onsite Class 1E ESF buses via the remaining offsite power circuit via the RAT with an additional source of offsite power via the SAT. Since the remaining credited offsite power circuit and the additional offsite power circuit (available via the SAT) could power the safety-related loads and still shut down the plant safely, the NRC staff finds that there is reasonable assurance of defense-in-depth upon declaring one offsite circuit inoperable.

With respect to safety margins, the safety margins present in the remaining equipment will not be affected because the RICT Program does not affect the loss of one of the offsite circuits since the use of the RICT Program does not affect the design of the plant. (See Section 3.1.3 of this SE for the general safety margin discussion.)
3.1.2.1.1.2 TS 3.8.1 Condition B - One DG Inoperable

3.1.2.1.2.1 Revision of the Front-Stop Completion Time

The license proposed to revise the associated CT to restore the DG to operable from 14 days to 72 hours. This change is addressed in Section 3.2.5 of this SE.

3.1.2.1.2.2 Insertion of a Risk-Informed Completion Time

The existing completion time for this condition is 72 hours or 14 days, if the licensee verifies reliability of the combustion turbine generators (CTGs). To align with the RICT program, the proposed completion time to restore the DG to operable status is 72 hours or in accordance with the RICT. The licensee has proposed to eliminate the allowance for a longer completion time by verifying the CTGs. The high estimate for the calculated RICT for this condition (as provided in Enclosure 1 of the LAR dated September 13, 2012) is 176.94 days. However, as established in the proposed language in the TS Chapter 5, "Administrative Controls," TS Section 5.5.22, "Risk Informed Completion Time Program," a RICT may not exceed 30 days. Therefore, the licensee may have up to 30 days to restore the DG to operable status.

Assuming that Condition B (one DG inoperable) is the only applicable condition in TS 3.8.1 for the plant configuration, the associated loads will be powered by either of the two offsite power circuits. As stated in Table E1.1 of the LAR dated September 13, 2012, the design success criteria for this condition is one of two DG trains operable. Each unit has two redundant 4.16 kV Class 1E trains, and, for each unit, one train is adequate to satisfy minimum ESF demand caused by a loss-of-coolant accident and a simultaneous loss of preferred power supply. Therefore, in the event of a loss of offsite power while having one DG inoperable, the other 4.16 kV train can safely shut down the plant.

In addition to the TS required actions, the RICT Program requires the licensee to employ RMAs at the earliest time possible, but no later than the calculated RMAT. Section 3.1.2 of this SE provides further discussion of the RMAs and RMAT. In the LAR, Enclosure 10, the licensee described its procedure to develop and implement RMAs. In its letter dated April 14, 2017, the licensee provided examples of RMAs that are considered during a DG RICT to ensure adequate defense-in-depth:

1. The condition of the offsite power supply, switchyard, and the grid is evaluated prior to entering a RICT, and RMAs as identified below are implemented, particularly during times of high grid stress conditions, such as during high demand conditions.

2. Deferral of switchyard maintenance, such as deferral of discretionary maintenance on the main, auxiliary, or startup transformers associated with the unit.

3. Deferral of maintenance that affects the reliability of the trains associated with the operable DGs.

4. Deferral of planned maintenance activities on station blackout mitigating systems, and treating those systems as protected equipment.
(5) Contacting the dispatcher on a periodic basis to provide information on the DG status and the power needs of the facility.

Since the redundant DG or the two credited offsite transmission lines could power the safety-related loads and still shut down the plant safely, the NRC staff finds that there is reasonable assurance of defense-in-depth upon declaring one DG inoperable.

With respect to safety margins, the safety margins in the remaining equipment will not be affected by the loss of the inoperable DG since the use of the RICT Program does not affect the design of the plant (See Section 3.1.3 of this SE for the evaluation of safety margins).

3.1.2.1.1.3 TS 3.8.1 Condition C - Required Actions B.2, B.5.1, or B.5.2 and Associated Completion Times Not Met

The licensee proposed to delete this condition. This change is addressed in Section 3.2.5 of this SE.

3.1.2.1.1.4 TS 3.8.1 Condition D - Two Required Offsite Circuits Inoperable

The licensee has requested to use the RICT Program to extend the existing CT of 24 hours for this condition. The proposed CT to restore the two required offsite circuits to operable status is 24 hours or in accordance with the RICT. The high estimate for the calculated RICT for this condition (as provided in Enclosure 1 of the LAR dated September 13, 2012) is 171.71 days. However, as established in the proposed language in the TS Chapter 5, "Administrative Controls," TS Section 5.5.22, "Risk Informed Completion Time Program," a RICT may not exceed 30 days. Therefore, the licensee may have up to 30 days to restore the two required offsite circuits to operable status.

Assuming that Condition C (two required offsite circuits inoperable) is the only applicable condition in TS 3.8.1 for the plant configuration, the loads will be powered by the two Class 1E DGs. Additionally, the 13.8 kV SAT provides an additional qualified offsite source. As stated in Table E1.1 of the LAR dated September 13, 2012, the design success criteria for this condition is one of two circuits available. Therefore, upon the loss of both offsite power circuits, the plant is capable of providing power to the Class 1E buses via the DG with an additional layer of defense-in-depth provided by the offsite power via the SAT.

Section 3.1.2 of this SE provides further discussion of RMAs and RMAT. In the LAR, Enclosure 10, the licensee described its procedure to develop and implement RMAs. In the supplement to the LAR dated April 14, 2017 (Reference 13), the licensee provided examples of RMAs that are considered during a two required offsite circuits RICT to provide additional assurance of adequate defense-in-depth:

(1) Limit the potential for a loss of offsite power by terminating all activities in the low voltage and high voltage switchyard.

(2) Notify the Power Control Center to defer any planned activities with the potential to generate a grid disturbance.

(3) Maintain availability of offsite power to/from RAT 'A', maintain Operability of both DGs, and maintain Operability of 4160 V safety buses.
(4) Evaluate weather predictions and take appropriate actions to mitigate potential impacts of severe weather.

(5) Consider staging a portable generator per procedure NMP-OS-019-361, which would accelerate connection to a 4160 VAC bus in the event of a station blackout.

Since the remaining sources, the DGs and the offsite power circuits available via the SAT, could provide power to the safety-related loads and still shut down the plant safely, the staff finds that there is reasonable assurance of defense-in-depth upon declaring two offsite circuits inoperable.

With respect to safety margins, the safety margins present in the remaining equipment will not be affected by the loss of the two credited offsite power circuits because the RICT Program does not affect the design of the plant (See Section 3.1.3 of this SE for the evaluation of safety margins).

3.1.2.1.1.5 TS 3.8.1 Condition E - One Required Offsite Circuit Inoperable and One DG Inoperable

The licensee has requested to use the RICT Program to extend the existing CT of 12 hours for this condition. The proposed CT to restore either the inoperable required offsite circuit or the inoperable DG is 12 hours or in accordance with the RICT. The high estimate for the calculated RICT for this condition (as provided in Enclosure 1 of the LAR dated September 13, 2012) is 176.94 days. However, as established in the proposed language in the TS Chapter 5, "Administrative Controls," TS Section 5.5.22, "Risk Informed Completion Time Program," a RICT may not exceed 30 days. Therefore, the licensee may have up to 30 days to restore either the inoperable required offsite circuit or the inoperable DG to operable status.

Assuming no other inoperable equipment under TS 3.8.1 but one required offsite circuit inoperable and one DG inoperable, the loads will be powered by the remaining required offsite circuit and the remaining DG. Additionally, the 13.8 kV SAT provides an additional qualified offsite source. As stated in Table E1.1 of the LAR dated September 13, 2012, the design success criteria for this condition is one of two circuits, and one of two DG trains operable. Therefore, upon the loss of one required offsite circuit and one DG inoperable, the plant is capable of providing power to the Class 1E buses via the remaining required offsite power circuit and the remaining DG with an additional layer of defense-in-depth provided by the offsite power via the SAT.

Section 3.1.2 of this SE provides further discussion of RMAs and RMAT. In the LAR, Enclosure 10, the licensee described its procedure to develop and implement RMAs. By letter dated April 14, 2017 (Reference 13), the licensee provided examples of RMAs that are considered during a required offsite circuit and DG RICT to provide additional assurance of adequate defense-in-depth:

(1) Deferral of switchyard maintenance, such as deferral of discretionary maintenance on the main, auxiliary, or startup transformers associated with the unit.

(2) Notify the Power Control Center to defer any planned activities with the potential to generate a grid disturbance.
(3) Maintain availability of offsite power to/from RAT ‘A’, maintain Operability of both DGs, and maintain Operability of 4160 V safety buses.

(4) Evaluate weather predictions and take appropriate actions to mitigate potential impacts of severe weather.

(5) Consider staging a portable generator per procedure NMP-OS-019-361, which would accelerate connection to a 4160 VAC bus in the event of a station blackout.

(6) The condition of the offsite power supply, switchyard, and the grid is evaluated prior to entering a RICT, and RMAs as identified below are implemented, particularly during times of high grid stress conditions, such as during high demand conditions.

(7) Deferral of maintenance that affects the reliability of the trains associated with the operable DGs.

(8) Deferral of planned maintenance activities on station blackout mitigating systems, and treating those systems as protected equipment.

(9) Contacting the dispatcher on a periodic basis to provide information on the DG status and the power needs of the facility.

Since the remaining sources, the DG and the required offsite power circuit, as well as the offsite power available via the SAT, are available to provide power to the safety-related loads and still shut down the plant safely, the NRC staff finds that there is reasonable assurance of defense-in-depth upon declaring one required offsite circuit inoperable and one DG inoperable.

With respect to safety margins, the safety margins present in the remaining equipment will not be affected by the loss of a DG and a required offsite power circuit since the use of the RICT Program does not affect the design of the plant (See Section 3.1.3 of this SE for the evaluation of safety margins).

3.1.2.1.1.6 TS 3.8.1 Condition G – One Automatic Load Sequencer Inoperative

The licensee has requested to use the RICT Program to extend the existing CT of 12 hours for this condition. The proposed CT to restore the inoperative automatic load sequencer is 12 hours or in accordance with the RICT. The high estimate for the calculated RICT for this condition (as provided in Enclosure 1 of the LAR dated September 13, 2012) is 4.62 days. This estimate is based on a snapshot of the current plant configuration. Therefore, the estimate for the calculated RICT may change, but may not exceed 30 days to restore an inoperative automatic load sequencer to operable status. As established in the proposed language in the TS Chapter 5, “Administrative Controls,” TS Section 5.5.22, “Risk Informed Completion Time Program,” a RICT may not exceed 30 days.

Assuming that Condition G (one automatic load sequencer inoperative) is the only applicable condition in TS 3.8.1 for the plant configuration and if the plant experiences a loss of offsite power or safety injection, operators could manually perform the functions of the load sequencer by employing various existing procedures to locally emergency-start the DG, manually tie the
bus, and manually load the bus. As stated in Table E1.1 of the LAR dated September 13, 2012, the design success criteria for this condition is one of two sequencers operable (there is one sequencer for each Class 1E train). Therefore, upon the loss of one load sequencer, the plant is capable of providing load shedding, and load sequencing via the remaining load sequencer or by manually performing the functions of the inoperable load sequencer.

Section 3.1.2 of this SE provides further discussion of RMAs and RMAT. In the LAR, Enclosure 10, the licensee described its procedure to develop and implement RMAs. By letter dated April 14, 2017 (Reference 13), the licensee provided examples of RMAs that are considered during RICT for load sequencer 'A' to provide additional assurance of adequate defense-in-depth:

1. Limit the potential for a loss of offsite power by terminating all activities in the low voltage and high voltage switchyard.

2. Notify the Power Control Center to defer any planned activities with the potential to generate a grid disturbance.

3. Establish 24/7 staffing and response teams to ensure prompt restoration to operability of sequencer 'A'.

4. Perform a beginning of shift brief that focuses on actions operators will take in response to a loss of offsite power or safety injection. Include review of local emergency start of DG 'A' per procedure 13145-1, manual tie to bus 1AA02 per procedure 13427-1, and manual bus loading.

5. Maintain operability and availability of redundant and diverse electrical systems by performing the following actions:
   a. Establish protection of the following SSCs against inadvertent operation or contact that may impede the SSC from fulfilling its design function: RAT 'A,' RAT 'B,' DG 'A,' DG 'B,' sequencer 'B,' bus 1AA02, and bus 1BA03, and
   b. Terminate any in-progress testing or maintenance activities with the potential to impact the aforementioned SSCs, and
   c. Defer any scheduled testing or maintenance activities with the potential to impact the aforementioned SSCs.

6. Maintain/establish operability/availability of additional important mitigating SSCs. Identify risk-significant SSCs, either from a pre-plan or by real-time use of CRMP importance reports. Perform the following actions:
   a. Terminate any in-progress testing or maintenance activities with the potential to impact the availability of important in-service SSCs, and
   b. Defer any scheduled testing or maintenance activities with the potential to impact important in-service SSCs, and
   c. Promptly return to service any important out-of-service SSCs.
Since the plant is capable of providing load shedding, and load sequencing via the remaining load sequencer or by manually performing the functions of the load sequencer, the NRC staff finds that there is reasonable assurance of defense-in-depth upon declaring one load sequencer inoperable.

With respect to safety margins, the safety margins present in the remaining equipment will not be affected by the loss of a load sequencer since the use of the RICT Program does not affect the design of the plant (See Section 3.1.3 of this SE for the evaluation of safety margins).

3.1.2.1.7 TS 3.8.4 Condition A – One DC Electrical Power Source Inoperable Due to Inoperable Battery A or B

The licensee has requested to use the RICT Program to extend the existing CT of 24 hours for this condition. The proposed CT to restore the battery to operable status is 24 hours or in accordance with the RICT. The high estimate for the calculated RICT for this condition (as provided in Enclosure 1 of the LAR dated September 13, 2012) is 10.74 days. This estimate is based on a snapshot of the current plant configuration. Therefore, the estimate for the calculated RICT may change, but may not exceed 30 days to restore an inoperable battery to operable status. As established in the proposed language in the TS Chapter 5, “Administrative Controls,” TS Section 5.5.22, “Risk Informed Completion Time Program,” a RICT may not exceed 30 days. The NRC staff's evaluation of the deterministic portion of the proposed changes to TS 3.8.4 Condition A is included below.

Assuming that Condition A (one DC electrical power source inoperable due to inoperable battery A or B) is the only applicable condition in TS 3.8.4 for the plant configuration, the associated DC bus is being supplied by the operable battery charger. The function of batteries A and B is to ensure availability of required emergency diesel generator starting power to shut down the reactor and maintain it in a safe condition after an operational occurrence or design-basis accident. Battery A is necessary for DG A to start and for generator field flashing, and similarly, battery B is necessary for DG B to start and for generator field flashing. With either battery A or B inoperable, the associated DC bus is being supplied by the operable battery charger; the chargers are normally powered by a safety-related AC bus. Additionally, there are two redundant battery chargers per source. Each battery charger is sized to supply the continuous (long-term) demand on its associated DC system while providing sufficient power to replace 110 percent of the equivalent ampere-hours removed from the battery during a design basis battery discharge cycle within a 12-hour period after charger input power is restored.

As stated in Table E1.1 of the supplement to the LAR dated April 14, 2017 (Reference 13), the design success criteria for this condition is one Class 1E battery in each train. Therefore, upon the loss of battery A or B, the plant will be capable of ensuring availability of power to the associated DC bus by the operable battery charger, and in the event of a loss of the AC bus supporting the battery charger, the remaining battery will support the remaining DG since A and B are redundant subsystems.

In addition to the TS required actions, the RICT Program requires the licensee to employ RMAs at the earliest time possible, but no later than the calculated RMAT. Section 3.1.2 of this SE provides further discussion of RMAs and RMAT. In the LAR, Enclosure 10, the licensee described its procedure to develop and implement RMAs. In its letter dated April 14, 2017
(Reference 13), the licensee provided examples of RMAs that are considered during a battery RICT to ensure adequate defense-in-depth:

1. Limit the immediate discharge of the affected battery, if possible.
2. Recharge the affected battery to float voltage conditions using a spare battery charger, if possible.
3. Evaluate the remaining battery capacity and protect its ability to perform its safety function.
4. Periodically verify battery float voltage is equal to or greater than the minimum required float voltage for remaining batteries.

The plant will be capable of ensuring availability of power to the associated DC bus by the operable battery charger, and in the event of a loss of the AC bus supporting the battery charger, the remaining battery will support the remaining DG since A and B are redundant subsystems. Therefore, the NRC staff finds that there is reasonable assurance of defense-in-depth upon declaring batteries A or B is inoperable.

With respect to safety margins, the safety margins present in the remaining equipment will not be affected by the loss of a battery A or B since the use of the RICT Program does not affect the design of the plant (See Section 3.1.3 of this SE for the evaluation of safety margins).

3.1.2.1.1.8 TS 3.8.4 Condition B – One DC Electrical Power Source Inoperable Due to Inoperable Battery C or D

The licensee has requested to use the RICT Program to extend the existing CT of 24 hours for this condition. The proposed CT to restore the battery to operable status is 24 hours or in accordance with the RICT. The high estimate for the calculated RICT for this condition (as provided in Enclosure 1 of the LAR dated September 13, 2012) is 176.94 days. However, as established in the proposed language in the TS Chapter 5, “Administrative Controls,” TS Section 5.5.22, “Risk Informed Completion Time Program,” a RICT may not exceed 30 days. Therefore, the licensee may have up to 30 days to restore the inoperable battery to operable status.

Assuming that Condition B (one DC electrical power source inoperable due to inoperable battery C or D) is the only applicable condition in TS 3.8.4 for the plant configuration, the associated DC bus is being supplied by the operable battery charger. The function of batteries C and D is to ensure availability of required breaker control power and instrumentation to shut down the reactor and maintain it in a safe condition after an operational occurrence or design-basis accident. Battery C and D are required for breaker control power, instrumentation, residual heat removal suction isolation valve inverters, and other functions. With either battery C or D inoperable, the associated DC bus is being supplied by the operable battery charger; the chargers are normally powered by a safety-related AC bus. Additionally, there are two redundant battery chargers per subsystem; each battery charger is sized to supply the continuous (long-term) demand on its associated DC system while providing sufficient power to replace 110 percent of the equivalent ampere-hours removed from the battery during a design basis battery discharge cycle within a 12-hour period after charger input power is restored.
As stated in Table E1.1 of the supplement to the LAR dated April 14, 2017 (Reference 13), the design success criteria for this condition is one Class 1E battery in each train.

In addition to the TS required actions, the RICT Program requires the licensee to employ RMAs at the earliest time possible, but no later than the calculated RMAT. Section 3.1.2 of this SE provides further discussion of RMAs and RMAT. In the LAR, Enclosure 10, the licensee described its procedure to develop and implement RMAs. In its letter dated April 14, 2017 (Reference 13), the licensee provided examples of RMAs that are considered during a battery RICT to ensure adequate defense-in-depth:

1. Limit the immediate discharge of the affected battery, if possible.
2. Recharge the affected battery to float voltage conditions using a spare battery charger, if possible.
3. Evaluate the remaining battery capacity and protect its ability to perform its safety function.
4. Periodically verify battery float voltage is equal to or greater than the minimum required float voltage for remaining batteries.

As stated in Table E1.1 of the supplement to the LAR dated April 14, 2017 (Reference 13), the design success criteria for this condition is one Class 1E battery in each train. Therefore, upon the loss of battery C or D, the plant will be capable of ensuring availability of power to the associated DC bus by the operable battery charger, and in the event of a loss of the AC bus supporting the battery charger, the remaining battery will support its associated remaining loads. Thus, the NRC staff finds that there is reasonable assurance of defense-in-depth upon declaring battery C or D is inoperable.

With respect to safety margins, the safety margins present in the remaining equipment will not be affected by the loss of battery C or D since the use of the RICT Program does not affect the design of the plant (See Section 3.1.3 of this SE for the evaluation of safety margins).

3.1.2.1.1.9 TS 3.8.4 Condition C – One DC Electrical Power Source Inoperable for Reasons Other Than Condition A or B

The licensee has requested to use the RICT Program to extend the existing CT of 2 hours for this condition. The proposed CT to restore the inoperable DC electrical power source to operable status is 2 hours or in accordance with the RICT. A DC electrical power source consists of one battery, one switchgear, two chargers, control equipment, and cabling and distribution panels. Examples for Condition C include an inoperable battery charger, or inoperable battery charger and associated inoperable battery. The high estimate for the calculated RICT for this condition (as provided in Enclosure 1 of the LAR dated September 13, 2012) is 176.94 days. However, as established in the proposed language in the TS Chapter 5, “Administrative Controls,” TS Section 5.5.22, “Risk Informed Completion Time Program,” a RICT may not exceed 30 days. Therefore, the licensee may have up to 30 days to restore the inoperable DC electrical power source to operable status. The NRC staff’s evaluation of the deterministic portion of the proposed changes to TS 3.8.4 Condition C is included below.

Assuming there is no other inoperable equipment under TS 3.8.4, the remaining DC electrical power sources have the capacity to support a safe shutdown and to mitigate an accident
condition. The function of DC electrical power sources is to ensure availability of required power to shut down the reactor and maintain it in a safe condition after an operational occurrence or design-basis accident. With one DC electrical power source in train A or B inoperable, the other DC train is required to be operable. If the battery charger is inoperable, the redundant battery charger will provide power to the associated loads. If the battery charger and its associated battery is inoperable, the redundant battery charger will provide power to the associated loads. If all the components associated with the inoperable DC electrical power source are inoperable, the DC electrical power source in the operable train is required to be operable. Additionally, power to the AC loads downstream from the inverters can be alternatively powered by the regulating transformer, and DC loads residing in the 125 VDC bus can be powered via a temporary modification (e.g., connected to a spare charger on another DC bus), or connection to a FLEX diesel.

It is important to note that in the case where both chargers associated with subsystem A are inoperable and if no power is established from a battery charger, temporary modification, or portable equipment, then battery 1AD1B will deplete and 125 VDC bus 1AD1B will be lost. This will cause main steam isolation valve closure and main feedwater isolation valve closure, resulting in a reactor trip. Therefore, these conditions would not prevent safe shutdown of the reactor.

In addition to the TS required actions, the RICT Program requires the licensee to employ RMAs at the earliest time possible, but no later than the calculated RMAT. Section 3.1.2 of this SE provides further discussion of RMAs and RMAT. In the supplement to the LAR dated April 14, 2017 (Reference 13), the licensee provided examples of RMAs that are considered during a loss of a DC train RICT to ensure adequate defense-in-depth:

1. Limit the potential for a loss of offsite power by terminating all activities in the low voltage and high voltage switchyard.
2. Establish 24/7 staffing and response teams to ensure prompt restoration of operability of the chargers.
3. Work to establish alternate power to the 125 V DC bus by temporary modification or by implementation of FLEX procedures.
4. Maintain Operability and availability of redundant and diverse electrical systems.
5. Maintain/establish Operability/availability of important mitigating SSCs.
6. Evaluate weather predictions and take appropriate actions to mitigate potential impacts of severe weather.

As stated in Table E1.1 of the supplement to the LAR dated April 14, 2017 (Reference 13), the design success criteria for this condition is one of two DC trains. Therefore, upon the loss of a DC train, the plant will be capable of ensuring availability of power to the associated AC and DC buses by the operable DC train, with additional means of powering the loads associated with the inoperable train via temporary modification or connection to a FLEX diesel. Thus, the NRC staff finds that there is reasonable assurance of defense-in-depth upon declaring one DC electrical power source inoperable for reasons other than Condition A or B.
With respect to safety margins, the safety margins present in the remaining equipment will not be affected by the loss of a DC electrical power source since the use of the RICT Program does not affect the design of the plant (See Section 3.1.3 of this SE for the evaluation of safety margins).

3.1.2.1.1.10 TS 3.8.7 Condition A – One Required Inverter Inoperable

The licensee has requested to use the RICT Program to extend the existing CT of 24 hours for this condition. The proposed CT to restore the inverter to operable status is 24 hours or in accordance with the RICT. The high estimate for the calculated RICT for this condition (as provided in Enclosure 1 of the LAR dated September 12, 2013) is 162.13 days. However, as established in the proposed language in the TS Chapter 5, “Administrative Controls,” TS Section 5.5.22, “Risk Informed Completion Time Program,” a RICT may not exceed 30 days. Therefore, the licensee may have up to 30 days to restore the inverter to operable status.

Assuming that Condition A (one required inverter inoperable) is the only applicable condition in TS 3.8.7 for the plant configuration, its associated AC vital bus becomes inoperable until it is manually re-energized from its Class 1E regulating transformer. The function of inverters is to provide necessary power to reactor protection system and engineered safety feature actuation system. With one inverter inoperable, the other inverter channel(s) in the alternate train is required to be operable.

As stated in Table E1.1 of the supplement to the LAR dated April 14, 2017 (Reference 13), the design success criteria for this condition is one of two inverters in each train. Therefore, upon the loss of an inverter, the vital AC bus can be supplied from the inverter backup supply (480/120 VAC regulating transformer) associated with the same load group by repositioning the distribution panel input breakers. Additionally, the inverter(s) located in the redundant subsystem in the alternate train will supply loads that are capable of performing the same function as the inoperable inverter associated loads.

In addition to the TS required actions, the RICT Program requires the licensee to employ RMAs at the earliest time possible, but no later than the calculated RMAT. Section 3.1.2 of this SE provides further discussion of RMAs and RMAT. In a supplement to the LAR dated April 14, 2017 (Reference 13), the licensee provided examples of RMAs that are considered during an inverter RICT to ensure adequate defense-in-depth:

1. Limit the potential for a loss of offsite power by terminating all activities in the low voltage and high voltage switchyard.

2. Maintain operability and availability of DC electrical systems in the subsystem within the same train and the redundant subsystem in the other train (e.g., if the inverter in subsystem A is inoperable, maintain operability in subsystems B and C), associated 480 V bus, and associated regulating transformer.

3. Maintain/establish operability/availability of important mitigating SSCs.

4. Establish 24/7 staffing and response teams to ensure prompt restoration of operability of inoperable inverter.

5. Evaluate weather predictions and take appropriate actions to mitigate potential impacts of severe weather.
Since the vital AC bus can be supplied from the inverter backup supply (480/120 VAC regulating transformer) or the inverter(s) located in the redundant subsystem in the alternate train, the NRC staff finds that there is reasonable assurance of defense-in-depth upon declaring an inverter inoperable.

With respect to safety margins, the safety margins present in the remaining equipment will not be affected by the loss of an inverter since the use of the RICT Program does not affect the design of the plant (See Section 3.1.3 of this SE for the evaluation of safety margins).

3.1.2.1.1.11 TS 3.8.9 Condition A – One or More AC Electrical Power Distribution Subsystems Inoperable

The licensee has requested to use the RICT Program to extend the existing CT of 8 hours for this condition. The proposed CT to restore one or more AC electrical power distribution subsystems to operable status is 8 hours or in accordance with the RICT. One or more AC electrical power distribution subsystems refers to the inoperability of any component(s) in either train A or B that would not result in a loss of function. An AC electrical power distribution subsystem is comprised of a 4.16 kV ESF switchgear, secondary 480 V switchgear, distribution panels, load centers, and motor control centers. The high estimate for the calculated RICT for this condition (as provided in Enclosure 1 of the LAR dated September 13, 2012) is 176.94 days. However, as established in the proposed language in the TS Chapter 5, “Administrative Controls,” TS Section 5.5.22, “Risk Informed Completion Time Program,” a RICT may not exceed 30 days. Therefore, the licensee may have up to 30 days to restore the one or more AC electrical power distribution subsystems to operable status.

The function of the AC electrical power distribution subsystems is to provide necessary power to ESF systems. Assuming that Condition A (one or more AC electrical power distribution subsystems inoperable) is the only applicable Condition in TS 3.8.9 for the plant configuration, the redundant AC electrical power distribution subsystem located in the alternate train has the capacity to provide necessary power to ESF systems. Additionally, temporary modifications providing power to safety-related loads fed from the inoperable bus can be established.

In addition to the TS required actions, the RICT Program requires the licensee to employ RMAs at the earliest time possible, but no later than the calculated RMAT. Section 3.1.2 of this SE provides further discussion of RMAs and RMAT. In a supplement to the LAR dated April 14, 2017 (Reference 13), the licensee provided examples of RMAs that are considered during an AC subsystems RICT to ensure adequate defense-in-depth:

(1) Terminate any in-progress maintenance/testing activities and defer any scheduled maintenance/testing activities with the potential to cause loss of 4160 V AC bus. Also, avoid unnecessary switching (i.e. breaker manipulations) on ‘B’ train AC and DC electrical systems.

(2) Establish 24/7 staffing and response teams to ensure prompt restoration of operability of inoperable AC bus.

(3) If power cannot be readily restored through the inoperable AC bus, work to establish temporary modifications providing power to important loads fed from the inoperable bus.
(4) Maintain operability and availability of inoperable subsystem's remaining electrical SSCs, as well as the other subsystems' electrical SSCs.

As stated in Table E1.1 of the LAR dated September 12, 2013, the design success criteria for this condition is one of two AC subsystems. Therefore, upon the loss of an AC electrical power distribution subsystems, the redundant AC subsystem in the alternate train will be capable of providing necessary power to ESF systems. Thus, the NRC staff finds that there is reasonable assurance of defense-in-depth upon declaring one or more AC electrical power distribution subsystems inoperable.

With respect to safety margins, the safety margins present in the remaining equipment will not be affected by the loss of an AC subsystems since the use of the RICT Program does not affect the design of the plant (See Section 3.1.3 of this SE for the evaluation of safety margins).

3.1.2.1.1.12 TS 3.8.9 Condition B – One or More AC Vital Bus Electrical Power Distribution Subsystems Inoperable

The licensee has requested to use the RICT Program to extend the existing CT of 2 hours for this condition. The proposed CT to restore the one or more AC vital bus electrical power distribution subsystems to operable status is 2 hours or in accordance with the RICT. One or more AC vital bus electrical power distribution subsystem refers to the inoperability of any component(s) in either train A or B that would not result in a loss of function. The high estimate for the calculated RICT for this condition (as provided in Enclosure 1 of the LAR dated September 13, 2012) is 176.94 days. However, as established in the proposed language in the TS Chapter 5, “Administrative Controls,” TS Section 5.5.22, “Risk Informed Completion Time Program,” a RICT may not exceed 30 days. Therefore, the licensee may have up to 30 days to restore the one or more AC vital bus electrical power distribution subsystems to operable status.

The function of the AC vital bus electrical power distribution subsystems is to provide necessary power to ESF systems. Assuming that Condition B (one or more AC vital bus electrical power distribution subsystems inoperable) is the only applicable condition in TS 3.8.9 for the plant configuration, the redundant vital AC vital bus electrical power distribution subsystem located in the alternate train has the capacity to provide necessary power to ESF systems.

In addition to the TS required actions, the RICT Program requires the licensee to employ RMAs at the earliest time possible, but no later than the calculated RMAT. Section 3.1.2 of this SE provides further discussion of RMAs and RMAT. In a supplement to the LAR dated April 14, 2017 (Reference 13), the licensee provided examples of RMAs that are considered during an AC vital subsystem RICT to ensure adequate defense-in-depth:

(1) Limit the potential for a loss of offsite power by terminating all activities in the low voltage and high voltage switchyard.

(2) Maintain operability and availability of inoperable subsystem’s remaining electrical SSCs, as well as the other subsystems’ electrical SSCs.

(3) Maintain/establish Operability/availability of important mitigating SSCs.

(4) Establish 24/7 staffing and response teams to ensure prompt restoration of operability of inoperable SSC.
(5) Evaluate weather predictions and take appropriate actions to mitigate potential impacts of severe weather.

As stated in Table E1.1 of the supplement to the LAR dated April 14, 2017 (Reference 13), the design success criteria for this condition is one of two vital AC subsystems. Therefore, upon the loss of an AC vital bus electrical power distribution subsystems, the redundant AC subsystem in the alternate train will be capable of providing necessary power to ESF systems. Thus, the NRC staff finds that there is reasonable assurance of defense-in-depth upon declaring one or more AC vital bus electrical power distribution subsystems inoperable.

With respect to safety margins, the safety margins present in the remaining equipment will not be affected by the loss of an AC vital bus subsystems since the use of the RICT Program does not affect the design of the plant (See Section 3.1.3 of this SE for the evaluation of safety margins).

3.1.2.1.1.13 TS 3.8.9 Condition C – One or More DC Electrical Power Distribution Subsystems Inoperable

The licensee has requested to use the RICT Program to extend the existing CT of 2 hours for this condition. The proposed CT to restore the one or more DC electrical power distribution subsystems to operable status is 2 hours or in accordance with the RICT. One or more DC electrical power distribution subsystems refers to the inoperability of any component(s) in either train A or B that would not result in a loss of function. The high estimate for the calculated RICT for this condition (as provided in Enclosure 1 of the LAR dated September 13, 2012) is 176.94 days. However, as established in the proposed language in the TS Chapter 5, “Administrative Controls,” TS Section 5.5.22, “Risk Informed Completion Time Program,” a RICT may not exceed 30 days. Therefore, the licensee may have up to 30 days to restore the one or more DC electrical power distribution subsystems to operable status.

The function of the DC electrical power distribution subsystems is to provide necessary power to ESF systems. Assuming that Condition C (one or more DC electrical power distribution subsystems inoperable) is the only applicable condition in TS 3.8.9 for the plant configuration, the redundant DC electrical power distribution subsystem located in the alternate train has the capacity to provide necessary power to ESF systems. Additionally, temporary modifications providing power to important loads fed from the inoperable bus or implementation of FLEX procedures can be established.

In addition to the TS required actions, the RICT Program requires the licensee to employ RMAs at the earliest time possible, but no later than the calculated RMAT. Section 3.1.2 of this SE provides further discussion of RMAs and RMAT. In the supplement to the LAR dated April 14, 2017 (Reference 13), the licensee provided examples of RMAs that are considered during a DC subsystem RICT to ensure adequate defense-in-depth:

(1) Limit the potential for a loss of offsite power by terminating all activities in the low voltage and high voltage switchyard.

(2) Maintain operability and availability of redundant and diverse electrical systems.

(3) Maintain/establish operability/availability of important mitigating SSCs.
(4) Work to establish alternate power to the 125 V DC bus by temporary modification or by implementation of FLEX procedures.

(5) Evaluate weather predictions and take appropriate actions to mitigate potential impacts of severe weather.

As stated in Table E1.1 of the supplement to the LAR dated April 14, 2017 (Reference 13), the design success criteria for this condition is one of two DC subsystems. Therefore, upon the loss of a DC electrical power distribution subsystems, the redundant DC subsystem in the alternate train will be capable of providing necessary power to ESF systems. Thus, the NRC staff finds that there is reasonable assurance of defense-in-depth upon declaring one or more DC electrical power distribution subsystems inoperable.

With respect to safety margins, the safety margins present in the remaining equipment will not be affected by the loss of a DC subsystem since the use of the RICT Program does not affect the design of the plant (See Section 3.1.3 of this SE for the evaluation of safety margins).

3.1.2.1.2 Technical Specification Loss of Function Conditions

Technical Specification loss of function (TS LOF) conditions are conditions where the LCO is not met and the plant has insufficient TS operable equipment to meet the specified safety function of the system.

The following proposed new conditions meet the definition of TS LOF:

- **TS 3.8.1 Condition G** - Three or more required AC sources inoperable
- **TS 3.8.1 Condition D** – Two DC electrical power sources inoperable.
- **TS 3.8.7 Condition B** – Two or more required inverters inoperable.
- **TS 3.8.9 Condition D** – Two or more electrical power distribution subsystems inoperable that result in a loss of safety function.

The following condition does not meet the definition of loss of function condition:

- **TS 3.8.1 Condition F** – Two DGs inoperable

Current TS 3.8.1 Condition F (renumbered as E) is applicable when two DGs are inoperable. LCO 3.8.1 requires, in part, that two qualified circuits between the offsite transmission network and the onsite Class 1E AC electrical power distribution system and two DGs capable of supplying the onsite Class 1E power distribution subsystem be operable.

During normal operation, the credited circuits between the offsite transmission network are supplying power to the onsite Class 1E power distribution system, and the DGs are in standby. Therefore, if the DGs are inoperable, there is not technically a loss of the TS safety function. However, the DGs are the credited source of power to the Class 1E buses in the accident analysis. The offsite transmission system is not safety-related and is assumed to be unavailable in several accident analyses. For this reason, it is appropriate that inoperability of two DGs be treated as a loss of TS safety function. To that end, the licensee has included the standard note of applicability for TS-LOF restrictions to the TS condition.
The NRC staff finds that the licensee has appropriately identified electrical power system TS conditions that merit application of the TS LOF restrictions. Therefore, the NRC staff concludes the proposed TSs to be acceptable. The NRC staff's assessment of the acceptability of TS LOF action statements and implementation within the RICT Program is discussed previously in Section 3.1.2 and Section 1.2.1 of this SE.

3.1.2.2 Key Principle 2: Overall Defense-in-Depth Conclusion

The LAR proposes to modify the VEGP TS requirements to permit the use of RICTs in accordance with Nuclear Energy Institute (NEI) 06-09 0-A, Risk Informed Technical Specifications Initiative 4b, Risk-Managed Technical Specifications (RMTS) Guidelines,” (Reference 29). The NRC staff has reviewed the licensee's proposed TS changes and supporting documentation. The NRC staff has determined that the proposed modifications regarding implementation of the RICT will ensure adequate equipment performance as required by their safety functions during postulated events.

As discussed above in this SE, the NRC staff has evaluated proposed electrical system CT extensions and concluded that (1) the changes maintain the intent of the design criteria; (2) the specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded as a result of anticipated operational occurrences preserving system redundancy, independence, and diversity commensurate with the expected frequency, consequences of challenges to the system, and uncertainties; and (3) sufficient capacity and capability is maintained to assure that containment integrity and other vital functions are maintained in the event of postulated accidents preserving the independence of barriers.

The NRC staff concludes that the proposed changes are consistent with the defense-in-depth philosophy with respect to the requirements in GDC 17 concerning availability, capacity, and capability of the electrical power systems. The proposed changes are also consistent with 10 CFR 50.36(c)(2) because the lowest functional capability or performance levels of equipment required for safety is maintained. Therefore, the NRC staff concludes the proposed changes acceptable and consistent with the principle of defense-in-depth.

3.1.3 Key Principle 3: Evaluation of Safety Margins

In accordance with RG 1.177, Revision 1 (Reference 36), sufficient safety margins are maintained when:

- Codes and standards (e.g., American Society of Mechanical Engineers (ASME), Institute of Electrical and Electronic Engineers) or alternatives approved for use by the NRC are met (i.e., the proposed TS allowed outage time or surveillance test interval change is not in conflict with approved Codes and Standards relevant to the subject system).

- Safety analysis acceptance criteria in the Final Safety Analysis Report (FSAR) are met, or proposed revisions provide sufficient margin to account for analysis and data uncertainties (e.g., the proposed TS CT change does not adversely affect any assumptions or inputs to the safety analysis, or, if such inputs are

5 The Vogtle improved Standard Technical Specifications use the terminology “completion times” and “surveillance frequency” in place of “allowed outage time” and “surveillance test interval.”
affected, justification is provided to ensure sufficient safety margin will continue to exist). For TS CT changes, an assessment should be made of the effect on the FSAR acceptance criteria assuming the plant is in the CT (i.e., the subject equipment is inoperable) and there are no additional failures. Such an assessment should result in the identification of all situations in which entry into the proposed CT could result in failure to meet an intended safety function.

Use of the RICT Program to determine an extended CT will not affect SNC’s commitment to the codes and standards used in the design of the plant. The licensee is not proposing in this application to change any quality standard, material, or operating specification and the acceptance criteria for operability of equipment. Therefore, the design basis analyses for SNC remain applicable.

When one or more trains in a system become inoperable, either from a failure or from a voluntary action, an LCO will not be met, and the appropriate TS conditions must be identified and entered. TS conditions that are entered when an LCO cannot be met result in a temporary reduction in safety margin because less equipment is available to fulfill the safety function. The specified TS required actions must be completed and the train(s) returned to operable within the prescribed CTs or a plant shutdown is required. As discussed in NEI 06-09 0-A, the RMTS allows the prescribed CTs to be replaced with RICTs, which are calculated based on risk impact.

The NRC staff evaluated the effect on safety margins when the RICT is applied to extend the CT up to a backstop of 30 days in a TS condition with sufficient trains remaining operable to fulfill the TS safety function. Although SNC will be able to have design basis equipment out of service longer than the current TS allow, any increase in unavailability is expected to be insignificant and is addressed by the consideration of the single failure criterion in the design-basis analyses. Acceptance criteria for operability of equipment are not changed and, as long as sufficient trains remain operable to fulfill the TS safety function, the operability of the remaining train(s) ensures that the current safety margins are maintained. The NRC staff finds that as long as the specified TS safety function remains operable, sufficient safety margins would be maintained during the extended CT of the RICT program. The NRC staff has evaluated specific proposed changes to the TS as described in Section 3.2 of this SE.

After entry into a TS condition, an emergent failure or an additional degraded or non-conforming condition may be discovered for additional equipment that results in insufficient trains of equipment remaining operable to perform the specified safety function (i.e., TS LOF). The NEI 06-09 0-A topical report states that for emergent conditions, a RICT may be applied upon TS LOF provided one or more of the trains are considered PRA Functional. Unlike the configuration when the RMTS program is applied to a TS condition with sufficient trains remaining operable to fulfill the TS safety function, application of PRA Functional could reduce the remaining capability of the mitigative functions beyond that previously approved. Additionally, if alternative support SSCs than those credited for operability are to be used, the capability of the alternative support systems could also affect the available safety margins and should be identified and included in the safety margin evaluation. Therefore, the additional reduction in safety margins needs to be evaluated based on the reduction in capability of the remaining available equipment to satisfy the design basis functions.

Some TS safety functions are modelled in the PRA, some are partially modeled, and some are not modeled. As defined in NEI 06-09 0-A, PRA Functionality only discusses functions that are, or could be, modelled in the PRA and affect core damage frequency (CDF) and large early
release frequency (LERF). For example, the containment spray system removes heat from the containment atmosphere which indirectly removes decay heat from the reactor. This indirect cooling could be modelled in a PRA to affect CDF but is generally not modelled because of its negligible impact. The containment spray system also provides long-term containment pressure control and containment atmosphere iodine removal. Pressure control might be modelled in a PRA to avoid long-term containment failure but iodine removal is not modelled. If the design basis success criteria parameter values can be met for containment spray, all the different functions can be satisfied with sufficient safety margins because the safety margins are included in the design basis parameter selection. If, however, PRA Functional is defined when only the success criteria parameter values that affect CDF and LERF acceptance guidelines can be met (which might include no required functionality), reductions in safety margin are introduced both by the PRA thermal hydraulic analyses and whether the PRA success criteria parameters are sufficient for the design basis functions that are not modelled in the PRA. For this reason, the NRC staff's May 17, 2007 SE on NEI 06-09 0-A included a limitation and condition requiring that appropriate disposition or programmatic restriction be provided by the licensee if the PRA success criteria (e.g., number of SSCs required, flowrate, etc.) are not consistent with licensing basis assumptions.

The licensee has not provided detailed information comparing the PRA functional parameters such as successful flowrates and actuation timing to the design basis parameters for each TS condition in Table E1-1, “Revised TS LCO Conditions to Corresponding PRA Functions,” of the LAR dated September 13, 2012. Instead, in the proposed Administrative Controls section of its TSs, by letter dated April 14, 2017 (Reference 13), SNC proposed to add the following constraints in TS 5.5.22.f.1 and 5.5.22.f.2, respectively:

- Any SSCs credited in the PRA Functionality determination shall be the same SSCs relied upon to perform the specified Technical Specifications safety function.
- Design basis success criteria parameters shall be met for all design basis accident scenarios for establishing PRA Functionality during a Technical Specifications loss of function condition where a RICT is applied.

The NRC staff finds that replacing design basis success criteria parameter values with PRA success parameter values may reduce safety margins. Without a comprehensive description of the PRA functions and associated success criteria parameter values (including any alternative support system SSCs), and a comparison of these functions and values with the design basis, an unanalyzed and potentially unacceptable reduction of safety margins may occur.

The NRC staff recognizes that the RICT will always be calculated based on the PRA success criteria. Using less conservative PRA success criteria to calculate RICT will result in longer RICTs than would be obtained if the design basis success criteria would be imposed on the PRA. However, during this slightly longer RICT compared to one based on design basis success criteria, the capability to satisfy the design basis success criteria is retained and there is no reduction in safety margins beyond that which has already been accepted. Thus, the NRC staff finds conditions TS 5.5.22.f.1 and 5.5.22.f.2 provide confidence that the licensee can extend the CTs without unanalyzed reduction in safety margins because the design basis success criteria parameters will be at the same level and provided by the same equipment as has been accepted currently.
In its letter dated June 2, 2017 (Reference 15), SNC modified the application of TS 5.5.22.1 for TS 3.7.14, "Two ESF Room Cooler and Safety-Related Chiller trains shall be OPERABLE." The licensee added a note to Condition B, "Two ESF room coolers" inoperable to provide for ESF room doors to be opened to maintain acceptable temperatures within the rooms. Therefore SSCs other than the TS SSCs are credited and the design basis success criteria parameters values will not be met (i.e., 150 °F will be reached instead of 104 °F after 24 hours). The increased ambient temperature for the 24-hour duration of the PRA mission time is a reduction in the margin of safety which may increase the probability temperature induced failure of the SSCs in the room. Room heat-up calculations are fairly straightforward because they do not involve changes to geometry or other complex phenomena and therefore the results of the calculations are fairly certain. The NRC staff has previously reviewed (Reference 15) and accepted (Reference 42) allowing ambient room temperature to reach 150 °F for the 24-hour PRA mission time instead of the design-basis ambient temperature of 104 °F. The NRC staff concluded that the licensee adequately described the use of phenomenological models, experimental studies, and manufacturer recommendations to develop a set of screening criteria. The details of these analyses were provided as an attachment to the licensee's response. Successive screening criteria are used to ensure room cooling is not dismissed without firm justification. Based on the above, the NRC staff concludes that the licensee's approach is acceptable. The NRC staff's review is limited to opening doors for the purpose of room cooling and did no address, or approve, the impact of open doors on any other safety function(s) performed by the doors.

3.1.4 Key Principle 4: Change in Risk Consistent with the Safety Goal Policy Statement

The NRC staff evaluated whether the change in risk from the proposed changes was small and consistent with the intent of the Commission's Safety Goal Policy Statement. The NRC staff evaluated the licensee's proposed changes against the three-tiered approach in RG 1.177, Revision 1 (Reference 35), for a licensee's evaluation of the risk associated with a proposed TS CT change.

3.1.4.1 Tier 1: PRA Capability and Insights

The first tier evaluates the impact of the proposed changes on plant operational risk. The Tier 1 review involves two aspects: (1) the technical acceptability of the VEGP PRA models and their application to the proposed changes, and (2) review of the PRA results and insights described in the licensee's application.

3.1.4.1.1 PRA Quality

The NRC staff evaluated the licensee's PRA quality to determine whether the PRA used to implement the RICT Program is of sufficient scope, level of detail, and technical adequacy for this application. The NRC staff evaluated the PRA quality information provided by the licensee's application, including industry peer review results and the self-assessment of PRA models used for internal and external events, such as fires, floods, and seismic events, against RG 1.200, Revision 2 (Reference 36).

The VEGP PRA model is composed of an Internal Events PRA (including internal flooding) and a Fire PRA. Vogtle does not have a seismic PRA, but a seismic CDF and LERF contribution is included for RICT calculations. The licensee screened out other external hazard events, described below, as not a significant contributor for a RICT calculation; however, the licensee
has a process to include contributions from these hazards if they become important for a RICT calculation. The VEGP PRA model is also used as the CRMP model with modifications as described in Enclosure 6 of the LAR dated September 13, 2012.

The NRC staff evaluated the PRA quality information provided by the licensee in the LAR, as supplemented by responses to RAIs dated July 17, 2014 (Reference 4), the peer review facts and observations (F&Os) for the Internal Events PRA and the Fire PRA given in the LAR Enclosure 2, and External hazards information in the LAR Enclosure 3.

Internal Events PRA (Including Internal Flooding)

As clarified in a supplemental response to the LAR dated July 17, 2014 (Reference 4), in May 2009, a full scope peer review of the VEGP Internal Events PRA was performed against the requirements of ASME PRA Standard RA-Sc-2005 (Reference 43) and Regulatory Guide (RG) 1.200, Revision 1 (Reference 44). The results identified three “not met” F&Os. A gap assessment was performed between ASME PRA Standard ASME RA-Sc-2007 (Reference 45), as clarified by RG 1.200, Revision 1, and the ASME/ANS PRA Standard ASME/ANS RA-Sa-2009 (Reference 37), as clarified by RG 1.200, Revision 2. This assessment was provided in the LAR Table E2.3, “Comparison of RG 1.200 Revision 1 and Revision 2 SRs Applicable to CC I/II, CC II/III and CC I/II/III,” and updated in a supplement to the LAR dated July 17, 2014 (Reference 4).

The NRC staff reviewed each peer review F&O resolution in the LAR, as well as the licensee’s gap assessment. A summary of the NRC staff’s evaluation of the resolutions of F&Os designated as “not met” are provided below.

F&O HR-G6-01 is related to not performing a reasonableness check as a part of the human reliability analysis Revision 4 update. The ASME standard states that the peer review should include the human failure events and compare those to their final human error probabilities relative to each other to check their reasonableness. The NRC staff finds the licensee’s resolution appropriately dispositions the F&O for the application because the licensee performed a reasonableness check for all human reliability analyses to resolve this F&O.

F&O QU-D3-01 is related to not providing sufficient evidence of a comparison study of their PRA results against the results from similar plants. Vogtle performed a comparison study between their facility and two other facilities. The NRC staff finds that the resolution appropriately dispositions the F&O for the application because the licensee performed a comparison study to resolve the F&O.

F&O LE-G5-01 is related to not identifying limitations in the LERF analysis that would impact applications. In the F&O disposition, VEGP discussed the LERF scenarios included in its PRA model. The NRC staff finds that the licensee has adequately addressed this F&O because it showed that the LERF scenarios sufficiently covered the LERF scenarios outlined in the ASME/ANS standard with respect to the RICT Program.

The NRC staff finds that the Vogtle Internal Events PRA has been peer reviewed in accordance with ASME PRA Standard RA-Sb-2005 (Reference 46) and RG 1.200, Revision 1, and that SNC has performed a gap assessment against the current PRA standard and RG 1.200, Revision 2 which showed that there were no significant issues identified for the Vogtle RICT Program. Therefore, the NRC staff finds that the licensee has adequately dispositioned the F&Os to support the Internal Events PRA technical adequacy for the Vogtle RICT program.
Fire PRA

The VEGP Fire PRA model was reviewed in 2012 by the Pressurized Water Reactors Owners Group against the ASME/ANS Standard, RG 1.200, Revision 2, which addresses ASME/ANS RA-Sa-2009, and topical report NEI 07-12, “Fire Probabilistic Risk Assessment (FPRA) Peer Review Process Guidelines,” November 2008 (Reference 47). Following the Pressurized Water Reactors Owners Group peer review, a focused-scope peer review also was conducted for the qualitative and quantitative screening elements that were dispositioned as not applicable. The focused-scope peer review did not identify any additional F&Os.

F&O FSS-E3-01 involved uncertainty associated with the input parameters to the fire modeling analyses and uncertainty associated with NUREG/CB-6850, Supplement 1, “Fire Probabilistic Risk Assessment Methods Enhancements,” September 2010 (Reference 48), fire frequency values. With regards to uncertainty associated with the input parameters to the fire modeling analyses, the licensee stated that the results are already conservative and any uncertainty analysis would tend to lower the CDF/LERF results. The NRC staff finds that this disposition adequately addresses this source of uncertainty since it is conservative. With regards to uncertainty associated with NUREG/CB-6850 fire frequency values, SNC will update the Fire PRA, as discussed in a supplemental response to the LAR dated July 17, 2014 (Reference 4), with NRC-accepted updated fire ignition frequencies and compare the new baseline CDF and LERF from quantified sources to the RG 1.174 acceptance criteria. The PRA update process will be controlled by SNC procedures that include maintaining the total CDF and LERF mean values from all quantified sources documented in the LAR, including impact of changes to fire ignition frequency updates, within the RG 1.174 risk acceptance guidelines of 1E-4/yr (CDF) or 1E-5/yr (LERF). The NRC staff finds these activities to be acceptable because they ensure the technical adequacy of the Fire PRA model with respect to fire ignition frequencies. The update is included as an implementation item for the amendment and is further discussed in Section 4.0 of this SE.

By letter dated July 17, 2014, in response to NRC staff questions (Reference 4), SNC identified four Fire PRA methods which may not be consistent with NRC-accepted methods. The licensee’s response noted that, upon identification, these methods were replaced with NRC-accepted methods and is, therefore, acceptable to the NRC staff. In addition, in a subsequent response dated November 11, 2014 (Reference 5), the licensee indicated that it will also update the Fire PRA model to include guidance in NUREG/CB-7150, “Joint Assessment of Cable Damage and Quantification of Effects from Fire (JACQUE-FIRE),” Volume 2, May 2014 (Reference 49), which is supported by a letter from the NRC to NEI, “Supplemental Interim Technical Guidance on Fire-induced Circuit Failure Mode Likelihood Analysis,” dated April 23, 2014 (Reference 50) and its Enclosure (Reference 51). This issue has been included as an implementation item in Section 4.0 of this SE.

The NRC staff, however, noted in the review of the response to NRC staff questions on a separate LAR for Vogtle dated July 2, 2013 (Reference 52), that a Fire PRA method associated with modeling the main control room was not contributing to the RICT calculation due to overly conservative modeling. The Vogtle Fire PRA uses a conditional core damage probability of 1.0 as a screening value for all main control room abandonment scenarios. Thus, as modeled, equipment out-of-service results in zero risk increase for this portion of the Fire PRA model. In a supplemental response dated November 11, 2014 (Reference 5), the licensee stated that this portion of the Fire PRA model did not require further development to evaluate equipment out of service since it would not be a significant contributor to a RICT due to main control room
abandonment risk being dominated by human error events. The NRC staff finds that the main control room abandonment risk increase is not necessarily insignificant for a RICT if remote shutdown equipment were to be out of service, even though human error events may dominate the Fire PRA baseline risk. The NRC staff concludes that this Fire PRA modeling issue should be addressed consistent with NEI 06-09 0-A guidance for a RICT calculation, which allows use of bounding analyses. SNC has proposed to address this issue as an implementation item. The NRC staff considers this acceptable.

Based on the above, the NRC staff concludes that the Fire PRA has been adequately peer reviewed against the current version of the PRA standard and RG 1.200, and that the licensee has adequately dispositioned the F&Os to support the technical adequacy of the Fire PRA for the Vogtle RICT program.

Shutdown Risk

Shutdown risk assessment is not applicable to this LAR since the LAR only applies to Modes 1 and 2.

PRA Quality Conclusions

The NRC staff has reviewed the results of the peer reviews to assess whether the PRA is adequate to support the RICT Program. Issues with respect to capability category II (CC II) that were identified as F&Os during the PRA peer reviews have been submitted by the licensee along with the licensee’s disposition of each F&O. The issues have been resolved satisfactorily or will be resolved before implementation of the RICT Program. The licensee has also established a periodic update and review process for the PRA and associated CRMP model. Therefore, the NRC staff concludes the quality of the PRA adequate to support the RICT Program because the licensee has (1) reviewed the PRA using endorsed guidance and adequately resolved all identified issues and (2) established a periodic update and review process to update the PRA and associated CRMP model to incorporate changes made to the plant and PRA methods and data and any new methods will be subject to NRC review via license amendment. In addition, the NRC staff finds that the seismic and other external hazard analyses (which do not have PRA models) provides a bounding approach for the RICT Program consistent with the NEI 06-09 0-A guidance on bounding analyses.

3.1.4.1.2 Scope of the PRA

Topical report NEI 06-09 0-A requires a quantitative assessment of the potential impact on risk due to impacts from internal and external events, including internal fires, floods, and other significant external events. As discussed in Section 3.1.4.1.1 of this SE, the VEGP PRA used for the RICT Program includes PRA models for internal events, internal flooding, and fire events. The RICT calculation also includes seismic events by a bounding analysis approach and is discussed in Section 3.1.4.1.3 of this SE. Other external events may use a bounding analysis if applicable during a TS LCO.

SNC addressed other external hazards in Enclosure 3 of the LAR, “Information Supporting Justification of Bounding Analyses or Excluding Sources of Risk Not Addressed by the PRA Model.” The VEGP Individual Plant Examination of External Events (IPEEE) study (Reference 53) was updated for the LAR. External events hazards are considered first by screening or determining if they are not a significant contributor to RICT calculations. If the external event hazard does not meet those considerations, then the external event hazard is
included in the RICT calculation. All external hazards were screened or shown in the LAR not to be a significant consideration for the RICT calculation except seismic events. These determinations were made by showing that a bounding analysis met the NUREG-75/087, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants, LWR Edition," 1975 (Reference 54), screening criteria for CDF, and that the bounding incremental core damage probability is not significant to the decision in computing a RICT.

The following external hazards considered were identified in Table E3.1 of the LAR: seismic events, accidental aircraft impacts, external flooding, extreme winds and tornados (including generated missiles), turbine-generated missiles, external fires, accidents from nearby facilities, release of chemicals stored at the site, transportation accidents, and pipeline accidents (e.g., natural gas).

The RICT calculations include a risk contribution from seismic events in addition to internal events, internal flooding, and internal fire events. The seismic CDF used in the RICT calculations is 2.0E-5/year, which is based on NUREG-1488, "Revised Livermore Seismic Hazard Estimates for Sixth-Nine Nuclear Power Plant Sites East of the Rocky Mountains," April 1994 (Reference 55), and is more conservative than the April 1989 Electric Power Research Institute study, "Probabilistic Seismic Hazard Evaluation at Nuclear Plant Sites in the Central and Eastern United States: Resolution of the Charleston Issue" (Reference 56), and the 2008 United States Geological Survey study Appendix D (Reference 57). This value represents the convolution of the VEGP seismic hazard curve with an assumed limiting plant fragility based on the high confidence of low probability of failure of 0.3g, as reported in the VEGP IPEEE. A seismic LERF of 2E-7/year is used for a RICT based on the conditional large early release probability of 0.01 from the VEGP Internal Events PRA.

In certain instances, hazards which were initially screened out from the RICT calculation, may be considered quantitatively if the plant configuration could impact the bounding analysis. For VEGP, as a precondition to entering a RICT, plant procedures assure that if the design basis assumptions applicable to a hazard is temporarily not applicable (for example, barrier degradation), which may increase the likelihood of a plant challenge from loss of equipment that is not considered out of service within the RICT Program, appropriate compensatory measures are implemented to accomplish the following: 1) compensate for loss of protection, or 2) an incremental CDF/LERF equal to the applicable hazard frequency for all impacted equipment will be added to the incremental CDF/LERF resulting from the unavailability of SSCs attributed to the LCO condition for which a RICT is calculated. The steps to calculate a bounding CDF and LERF were provided in the LAR Enclosure 3.

The NRC staff finds that the approach for including external events risk in the RICT calculations to be acceptable because the LAR used updated external events hazards analysis from the VEGP IPEEE in the screening analysis to meet the NUREG-75/087 CDF screening criteria; it follows the NEI 06-09 o-A guidance for application of bounding analysis; and, it includes external event risk if design basis assumptions applicable to a hazard is not applicable during a TS LCO.

The licensee has limited the mode applicability of the RICT Program to Modes 1 and 2 for which its existing PRA modes are considered applicable. The RICT program cannot, therefore, be applied in Modes 3 and 4.
The NRC staff concludes that the scope of the PRA is adequate for the RICT Program since it is consistent with the guidelines of RG 1.200, Revision 2, for the PRA models and with NEI 06-09 0-A for the bounding analyses.

3.1.4.1.3 PRA Modeling

To evaluate a RICT for a given TS LCO action requirement, the specific systems or components involved should be modeled in the PRA. For each TS LCO for which the RICT Program is proposed to apply, the licensee identified that: (1) the system is included in the VEGP PRA models, or has addressed systems not in the PRA either in the LAR or in response to an RAI; (2) the success criteria parameters used to determine PRA Functional determination are the same as the design basis success criteria parameters or, if different, a plant-specific analyses used to support the PRA are justified; and (3) the CRMP provides the capability to select the system as out of service in order to calculate a RICT and the CRMP is maintained consistent with the baseline PRA model with modifications to the CRMP model to reflect the current plant versus the average plant.

The licensee included Table E1.1 in the LAR that provided, at a high level, the SSCs identified in each TS LCO condition and the associated PRA and design basis success criteria. The addition of the two restrictions, TS 5.5.22.f.1 and 5.5.22.f.2, ensure that, irrespective of any differences between the PRA and the design basis, a RICT will not be applied unless the design basis functions can be fulfilled successfully. If a RICT can be applied, the length of the RICT will appropriately depend on the as-operated risk of the as-modelled configuration in the PRA. The inclusion or exclusion of individual systems or system functions in the PRA is unimportant beyond a general PRA technical adequacy determination that non-negligible system functions contributing to risk have been modeled adequately. Similarly, justification of PRA success criteria that differ from design basis success criteria is also unnecessary beyond the PRA technical adequacy determination that the PRA success criteria are adequately modeled and reasonable.

With respect to item (3), the VEGP PRA model serves as the model used by the CRMP tool, which is used to perform the RICT calculations. The VEGP CRMP tool is the Equipment Out of Service (EOOS) tool. The EOOS tool is used to evaluate the PRA model with a zero-maintenance baseline and the actual plant configuration. In order to reflect the current plant configuration versus an average plant configuration, the EOOS model includes adjustments made to the PRA model. These adjustments are described in the LAR Table E6.2, “Changes Made during Translation to CRMP Model.” The EOOS tool used to perform the RICT calculations provides a user interface which supports the RICT Program by providing a method to evaluate the plant configuration.

In Attachment 1 to Enclosure 3 of the September 13, 2012, LAR, the licensee stated that any change in risk due to the seismic contribution from the (un-modelled) seismic scenarios, "is accomplished by adding a permanent seismic contribution of 2E-05 CDF and 2E-07 LERF to the EOOS logic model that is used to quantify instantaneous CDF and LERF whenever a RICT is in effect. This method ensures that an incremental seismic CDF and LERF equal to the bounding [seismic CDF and seismic LERF] is added to internal and fire events incremental CDF and LERF contribution for every RICT occurrence. The [incremental core damage probability/incremental large early release probability] acceptance criteria of 1E-05 CDF and 1E-06 LERF are then used within the EOOS framework to calculate the resulting RICT and RMAT based on the total configuration-specific delta CDF and LERF attributed to internal, fire and the seismic bounding CDF and LERF values." The NRC staff finds that addition of a fixed,
bounded seismic contribution to all change in risk evaluation results is acceptable because this adds the maximum risk contribution from the missing scenarios to every result used in the RMTS program.

Section 3.3.6 of NEI 06-09 0-A, “Common Cause Failure Consideration,” provides guidance for considering common cause failure in RICT assessments. The guidance states that for all RICT assessments of planned configurations, the treatment of common cause failures in the quantitative configuration risk management tools may be performed by considering only the removal of the planned equipment and not adjusting common cause failure terms. The guidance continues that for RICT assessments involving unplanned or emergent conditions, the potential for common cause failure is considered during the operability determination process. The requirement to consider additional RMAs before completing the extent of condition evaluation of the operability determination was introduced by the NRC staff in the May 17, 2007, SE for NEI 06-09 0-A as an additional measure to account for the increased potential that the first failure was caused by a common cause failure mechanism.

The NRC approval of NEI 06-09 0-A is based on RG 1.177, as indicated in the NRC SE to NEI 06-09 0-A. Regulatory Guide 1.177 states that when a component is rendered inoperable in order to perform preventative maintenance, the common cause failure contributions in the remaining operable components should be modified to remove the inoperable component and to only include common cause failure of the remaining components. The regulatory guide also states that when a component is rendered inoperable because it fails, the common cause failure probability for the remaining redundant components should be increased to represent the conditional failure probability due to common cause failure of these components, in order to account for the possibility that the first failure was caused by a common cause failure mechanism.

For planned maintenance, if a component is one of two redundant components, the second component is always assigned only the random failure probability consistent with both guidance documents. If, however, one component from a common cause failure group of three or more components is declared inoperable, RG 1.177 states that the common cause failure of the remaining components should be modified while NEI 06-09 0-A states that the common cause failure terms need not be adjusted.

The NRC staff requested a description of how common cause failures for groups of three or more components are included in the RICT calculation in a planned maintenance scenario. In its RAI response dated May 4, 2017 (Reference 14), the licensee explained that it models common cause failures as basic events for every combination of multiple failures in a common cause failure group and assigns each basic event a probability based on its data evaluations - one of several acceptable alternatives to model common cause failure. For planned inoperability, the licensee sets the appropriate independent failure to “true” and makes no other changes while calculating a RICT. Full implementation of RG 1.177 guidance would require that the licensee remove all non-applicable failure combinations (i.e., all common cause failure combinations including the inoperable component) and modify all the remaining basic event probabilities to reflect the reduced number of redundant components. The licensee provided an example demonstrating that retaining invalid basic events and not modifying the remaining basic event probabilities result in a negligible differences in the calculated RICT.

Due to the wide range of common cause failure probabilities and numbers of redundant component in common cause failure groups, the conclusions from the licensee’s example that the change in results is negligible may not be generically valid. Not removing invalid
combinations retains a larger number of common cause failure basic events. Not modifying the remaining probabilities yields lower individual common cause failure event probabilities. The NRC staff notes that the licensee’s method is a straightforward simplifying calculation that has both conservative and non-conservative impacts. The NRC staff also notes that common cause failure probability estimates are very uncertain and retaining precision in calculations using these probabilities will not necessarily improve the accuracy of the results. Therefore, the NRC staff concludes that the licensee’s method is acceptable because it does not systematically and purposefully produce non-conservative results and because the calculations reasonably include common cause failures consistent with the accuracy of the estimates.

The NRC staff requested a description of how common cause failures for redundant components are included in the RICT calculations following an emergent failure. In RAI responses dated April 14 and May 4, 2017 (References 13 and 14, respectively), the licensee clarified that, unless it establishes a high degree of confidence that there is no common cause failure mechanism, it will either 1) numerically modify the probability that the redundant component is failed from a common cause failure mechanism consistent with the guidance in RG 1.177 while calculating the RICT or 2) would develop and implement RMAs that target the success of the redundant and/or diverse of the failed SSC. Any RMAs developed to target the functions of the failed SSC(s) will be in addition to any RMAs that are already credited in the RICT calculation. If, for either option, the licensee determines that a common cause failure mechanism exists, the redundant SSC must be declared inoperable and cannot be considered available for PRA functional. The NRC staff finds that the first option is acceptable because it quantitatively incorporates the potential common cause failure into the estimated RICT consistent with guidance on including common cause failures in RG 1.177. The NRC staff finds the second option is acceptable because identifying the redundant and/or diverse SSCs and developing RMAs targeting the function(s) provides adequate additional confidence that the function(s) will be available while investigation into the potential for common cause failure is completed.

3.1.4.1.4 Scope of Applicability

According to NEI 06-09 0-A, an RMTS program (e.g., RICT Program) defines the scope of equipment used to define plant configurations to which calculation of a RICT may be applied. In a supplement dated July 17, 2014 (Reference 4), SNC clarified that the scope of equipment for which a RICT can be calculated for the RICT Program is only equipment within any TS that has a RICT. Table E1.1 of the LAR dated September 13, 2012, described whether or not the SSCs are modeled consistent with the TS scope.

In addition to those systems described in the LAR Table E1.1, the NRC staff noted that the LAR Table E6.1 also describes some SSCs not modeled in the PRA baseline. In a supplement, SNC provided updated information that the SSCs listed in Table E6.1 are all reflected in the configuration risk management model (i.e., EOOS model). Therefore, the NRC staff concludes, based on the information in Table E1.1 and the updated information in response to PRA RAI 11 for Table E6.1, that the systems necessary for the RICT Program are included in the VEGP PRA.

3.1.4.1.5 Assumptions

Using PRAs to evaluate TS changes requires consideration of a number of assumptions made within the PRA or application of the PRA that can have a significant influence on the ultimate acceptability of the proposed changes.
Enclosure 7 of the LAR addresses NEI 06-09 0-A, Item 10, which requires consideration of key assumptions and sources of uncertainty. The baseline Internal Events PRA and Fire PRA assumptions and sources of uncertainty were peer reviewed, as described in Enclosure 7. The licensee systematically identified and evaluated assumptions for the RICT Program.

The baseline PRA does not include seasonal variations from hazards but there are certain initiating events that can be affected by seasonal variations (e.g., loss of offsite power, loss of service water, etc.). The assumptions involve applying the generic industry frequency for the loss of offsite power event developed in NUREG/CR-6890, “Reevaluation of Station Blackout Risk at Nuclear Power Plants,” December 2005 (Reference 58). In the LAR Table E7.1, the licensee further states that the nuclear service cooling water cooling towers are not required during cold weather months. Limiting Condition for Operation (LCO) 3.8.1, AC Sources, and LCO 3.7.9, Nuclear Service Cooling Water, were the LCOs impacted by this uncertainty. A sensitivity analysis was not performed for this situation. The licensee stated that the RICT Program will include a qualitative consideration of weather events as part of the RMA decision process when LCO 3.8.1 CTs are extended to address this source of uncertainty. The licensee further stated that seasonal variations on loss of service water are addressed by CRMP model changes. As discussed in the LAR Table E7.2, the CRMP model will be modified to use the most limiting success criteria for the NSCW fans to account for seasonal variations in wet bulb temperature, instead of the average success criteria used in the baseline PRA.

In its supplement dated July 17, 2014 (Reference 4), and with respect to uncertainty in the reliability of a PRA functional SSC, SNC stated that PRA functionality to mean that the SSC’s nominal reliability can be used to calculate a RICT. In addition, according to the PRA RAI 8 response, if the VEGP RICT program determines an SSC is not PRA Functional, the SSC will be treated as failed for the RICT calculation. The NRC staff finds this approach acceptable because, if the licensee determines that the SSC’s nominal reliability in the PRA model (from which the EOOS model is made) is not applicable based on the failure mechanism causing the degraded condition, then the RICT calculation will treat the SSC as failed. Furthermore, the SSC’s nominal reliability remains applicable and consistent with the definition of PRA functionality in NEI 06-09 0-A, process requirement number 11.1.2 (i.e., further degradation that could impact PRA functionality is not expected during the RICT).

Based the above, the NRC staff concludes that the VEGP RICT program is consistent with the guidance in NEI 06-09 0-A for PRA assumptions. The NRC staff’s evaluation of the sources of uncertainty and sensitivity analysis is discussed in Section 3.1.4.1.6 of this SE.

3.1.4.1.6 Sensitivity and Uncertainty Analyses

Risk-informed analyses of TS changes can be affected by uncertainties arising from assumptions made during the PRA model’s development and application. The licensee followed guidance in NUREG-1855, Volume 1, “Guidance on the Treatment of Uncertainties Associated with PRAs in Risk-Informed Decision Making,” March 2009 (Reference 59), which RG 1.174 cites as guidance for treatment of uncertainties associated with PRAs. Enclosure 7 of the LAR provided the key sources of uncertainty and sensitivity analyses to assess the impact on the RICT Program and to determine if additional RMAs are necessary to address the source of uncertainty.

In the LAR, Enclosure 7, the licensee states that High reactor coolant system pressure impacts the potential for induced steam generator tube rupture. All core damage sequences are
considered high pressure sequences, except for vessel rupture and large or medium loss-of-coolant accidents, where the induced steam generator tube rupture failure mode is possible. As a result, the licensee asserts that the baseline PRA model may overestimate the contribution of induced steam generator tube rupture to LERF. The assumptions involve scenarios, with significant reactor coolant pump seal leakage, a stuck open pressurizer safety/relief valve, or a pressurizer PORV open for feed-and-bleed cooling, that are considered conservatively high reactor coolant system pressure scenarios. The licensee performed sensitivity analyses by reclassifying the identified scenarios as low reactor coolant system pressure to determine impact on LERF. The licensee’s analysis indicated that the baseline internal events PRA model showed that this assumption has no impact on calculated LERF and did not identify any mandatory RMAs.

The NRC staff review found that the licensee’s evaluation of potential sources of uncertainty, and the identification of the key assumptions and sources of uncertainty, was appropriate. Therefore, the NRC staff finds that the treatment of model uncertainties for risk evaluation of extended CTs is reasonable for this application and consistent with the guidance identified in NEI 06-09 0-A.

3.1.4.1.7  PRA Results and Insights

The proposed change implements a process to determine TS RICTs rather than specific changes to individual TS CTs. NEI 06-09 0-A requires periodic assessment of the risk incurred due to operation beyond the front-stop CTs due to implementation of a RICT Program and comparison to the guidance of RG 1.174 for small increases in risk.

Based on the NRC staff’s SE for NEI 06-09 0-A, the cumulative impact of implementation of an RMTS is assessed periodically as required by NEI 06-09 0-A, and must be shown to result in a total risk impact below 1E-5/year for changes to CDF, and below 1E-6/year for changes to LERF, and the total CDF and total LERF must be reasonably shown to be less than 1E-4/year and 1E-5/year, respectively. Enclosure 4 of the LAR shows that the estimated total CDF and LERF meet the 1E-4/year CDF and 1E-5/year LERF criteria of RG 1.174 consistent with the guidance in NEI 06-09 0-A and that these guidelines be satisfied whenever a RICT is implemented.

3.1.4.1.8  Administrative Controls

The licensee has an established PRA model maintenance and update process as described in Enclosure 5 of the LAR for the Internal Events PRA and the Fire PRA. Changes to the plant, which are related to design basis assumptions applicable to an external events hazard, are considered for a RICT calculation. As described in the LAR, when a PRA model change is required for a RICT but cannot be immediately implemented for a significant plant change or a model error, the process calls for either one of the following actions: alternative analyses to conservatively bound the expected risk impacts of the changes, or administrative restrictions on the use of the RICT Program for extended CTs are put in place until the model changes are completed. According to the LAR, alternative analyses become part of the RICT Program calculation process until the plant changes are incorporated into the PRA model during the next update. The NRC staff finds that the process described in Enclosure 5 of the LAR is consistent with NEI 06-09 0-A which allows for use of bounding analyses.

As captured by the license condition discussed in Section 4.0 of this SE, changes to the PRA are expected over time to reflect the as-built, as-operated, and maintained plant and reflect the
operating experience at the plant as specified in RG 1.200, Revision 2. The license condition also states that methods to assess the risk from extending the completion times must be PRA methods accepted as part of the license amendment or other methods approved by the NRC for generic use. If the licensee wishes to change its methods, and the change in methods is outside the bounds of this license condition, the licensee will need prior NRC approval via a license amendment.

The quality assurance practices for the PRA models include meeting the ASME/ANS PRA standards and RG 1.200, which includes guidance for performing peer reviews and focused-scope peer reviews. The quality assurance practices for the EOOS model (referred to as the CRMP model in the LAR) are discussed in Enclosure 6 of the LAR. According to the LAR, for maintenance of an existing EOOS model, changes made to the baseline PRA model in translation to the EOOS model, and changes made to the EOOS configuration files are controlled and documented by departmental procedures. Those procedures specify an acceptance test to be performed after every EOOS model update. This test verifies proper translation of the baseline PRA models and acceptance of all changes made to the baseline PRA models pursuant to translation to the EOOS model. This test also verifies correct mapping of plant components into the EOOS model.

The licensee has qualification and training programs in developing and using EOOS as described in Enclosure 6 of the LAR. The RICT Program training, described in Enclosure 8 of the LAR, includes training for individuals who will be directly involved in the implementation of the RICT Program, as well as other individuals who may have some involvement with the RICT Program.

The licensee stated that RICT program procedures are being developed. Completion of draft procedures necessary for the RICT Program is an implementation item to be completed prior to implementation of the VEGP RICT Program as discussed in Section 4.0 of this SE. Because these procedures will be completed as part of the RICT Program implementation, the NRC staff finds this acceptable.

Based on the above analysis, the NRC staff finds that the licensee has established appropriate programmatic and procedural controls for its RICT Program, consistent with the guidance of NEI 06-09 0-A. Training of plant personnel has been provided throughout all levels of the organization, commensurate with each position's responsibilities within the RICT Program. The NRC staff notes that the licensed operators in the control room have responsibility for assuring compliance with the TS, and that the RICT Program training provided assures the licensee's staff understands risk concepts, and provides them with the necessary skills to determine the appropriate RICT when operating under an extended CT within the RICT Program. Based on the above, the NRC staff concludes that the licensee has proposed acceptable administrative controls to assure proper implementation of the RICT Program.

3.1.4.2 Tier 2: Avoidance of Risk-Significant Plant Configurations

The second tier provides that a licensee should provide reasonable assurance that risk-significant plant equipment outage configurations will not occur when specific plant equipment is taken out-of-service in accordance with the proposed TS change.

The NEI 06-09 0-A topical report does not permit voluntary entry into high-risk configurations, which would exceed instantaneous CDF and LERF limits of 1E-3/year and 1E-4/year, respectively. It further requires implementation of RMAs when the actual or anticipated risk
accumulation during a RICT will exceed one-tenth of the incremental core damage probability or incremental large early release probability limit. Such RMAs may include rescheduling planned activities to lower risk periods or implementing risk-reduction measures. The limits established for entry into a RICT and for RMA implementation are consistent with the guidance of Nuclear Management and Resources Council (NUMARC) 93-01, Revision 4A, “Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants,” April 2011 (Reference 60), endorsed by RG 1.160, “Monitoring the Effectiveness of Maintenance at Nuclear Power Plants,” May 2012 (Reference 61), as applicable to plant maintenance activities. The RICT Program requirements are consistent with the principle of Tier 2 to avoid risk-significant configurations.

Based on the licensee’s incorporation of NEI 06-09 0-A in the TS, and consistent with the guidance of RG 1.174, Revision 2, and RG 1.177, Revision 1, the NRC staff finds the licensee’s Tier 2 program is acceptable and supports the proposed implementation of the RICT Program.

3.1.4.3 Tier 3: Risk-Informed Configuration Risk Management

The NRC staff reviewed the licensee’s proposed changes against Tier 3 of RG 1.177, Revision 1 (Reference 36), regarding impacts of maintenance activities on plant operational risk. The guidance of Tier 3 states that a licensee should ensure that the risk impact of out-of-service equipment is evaluated appropriately prior to performing any maintenance activity.

The NEI 06-09 0-A topical report addresses Tier 3 guidance by requiring assessment of the RICT to be based on the plant configuration of all SSCs, including safety-related and non-safety-related SSCs. A plant configuration is considered risk-significant when the incremental core damage probability or the incremental large early release probability exceeds one-tenth of the risk on which the RICT is based, generally 1E-5 and 1E-6 incremental core damage probability and incremental large early release probability respectively. If a risk-significant plant configuration exists, then NEI 06-09 0-A, via the RICT Program in the TSs, would require the licensee to implement compensatory measures and RMAs. Therefore, the NRC staff determined that the RICT Program provides a methodology to assess and address risk-significant configurations. The NRC staff also determined that the proposed changes will require reassessment of any plant configuration changes to be completed in a timely manner based on the more restrictive limit of any applicable TS action requirement or a maximum of 12 hours after the configuration change occurs.

Because the TSs will require the licensee to follow NEI 06-09 0-A, and because the proposed changes are consistent with the Tier 3 guidance of RG 1.177, Revision 1, the NRC staff finds the proposed changes acceptable.

3.1.4.4 Conclusions

The licensee has demonstrated the technical adequacy and scope of its PRA models, and that the models can support implementation of the RICT Program for determining CTs. Proper consideration of key assumptions and sources of uncertainty have been made. The risk metrics are consistent with the approved methodology of NEI 06-09 0-A, and the RICT Program is controlled administratively through plant procedures and training. The RICT Program follows the NRC-approved methodology in NEI 06-99 0-A. The NRC staff concludes that the RICT Program satisfies the fourth key safety principle of RG 1.177 and is, therefore, acceptable.
3.1.5 Key Principle 5: Performance Measurement Strategies – Implementation and Monitoring Program

Regulatory Guides 1.174 and 1.177 (References 35 and 36, respectively) establish the need for an implementation and monitoring program to ensure that extensions to TS CTs do not degrade operational safety over time and that no adverse degradation occurs due to unanticipated degradation or common cause mechanisms. An implementation and monitoring program is intended to ensure that the impact of the proposed TS change continues to reflect the reliability and availability of SSCs impacted by the change. Regulatory Guide 1.174 states that monitoring performed in conformance with the Maintenance Rule, 10 CFR 50.65, can be used when the monitoring performed is sufficient for the SSCs affected by the risk-informed application. In a supplement to the LAR dated July 17, 2014 (Reference 4), SNC noted that the SSCs in the scope of the RICT Program that have their CTs extended by entry into the RICT Program are monitored to ensure their safety performance is not degraded. According to Enclosure 9 of the LAR dated September 13, 2012 (Reference 1), the SSCs in the scope of the RICT Program are also in the scope of the Maintenance Rule. In addition, according to the response to PRA RAI 7 dated July 17, 2014 (Reference 4), the VEGP RICT Program does not change the stated TS performance criteria (e.g., flow rate, response times, stroke times, setpoints, etc.).

Section 3.3.3 of NEI 06-09 0-A requires that the licensee track the risk associated with all entries beyond the front-stop CT, and Section 2.3.1 provides a requirement for assessing cumulative risk, including a periodic evaluation of any increase in risk due to the use of the RMTS program to extend the CTs. According to Enclosure 9 of the LAR, SNC calculates cumulative risk at least every refueling cycle, not to exceed 24 months. The licensee converts the cumulative incremental core damage probability and the incremental large early release probability into average annual values which are then compared to the limits of RG 1.174. If any limits are exceeded, corrective actions are taken to ensure future plant operational risk is within the acceptance guidance. This evaluation assures that RMTS program implementation meets RG 1.174 guidance for small risk increases. The licensee is implementing NEI 06-09 0-A via the RICT Program and therefore complies with this RMTS program requirement.

Given that the RICT Program follows the NRC-approved methodology NEI 06-09 0-A, the NRC staff concludes that the RICT Program satisfies the fifth key safety principle of RG 1.177.

3.2 Plant-Specific Changes

Several of the proposed TS changes have characteristics that differ from the characteristics described in the preceding section. This section describes and evaluates those changes.

3.2.1 LCO 3.5.2, ECCS – Operating

Limiting Condition for Operation 3.5.2 requires two ECCS trains to be OPERABLE. Condition A is applicable when one or more ECCS trains are inoperable. Typically when both required trains of a system are inoperable, there is a loss of function and the constraints of TS 5.5.22 parts b, c.2, c.3, d, e, f, g, and h are applicable. These constraints are not applicable in this case because Condition A also contains a specific performance requirement that must be met. In order for Condition A to be applicable, there must be at least 100 percent of the ECCS flow equivalent to a single OPERABLE ECCS train available. Otherwise, LCO 3.0.3 would apply. LCO 3.0.3 requires that the unit be placed in MODE 3 within 7 hours and MODE 4 within 13 hours. Therefore, the constraints of TS 5.5.22 parts b, c.2, c.3, d, e, f, g, and h are not
applied for the configuration of two ECCS trains being inoperable. Thus, the NRC staff concludes that this change is acceptable.

3.2.2 LCO 3.6.2, Containment Air Locks

Condition C is applicable when one or more containment air locks are inoperable for reasons other than Condition A or B. There are three required actions associated with this condition. Required Action C.1 requires immediately evaluating overall containment leakage rate per LCO 3.6.1. Required Action C.2 requires verifying a door is closed in the affected air lock within 1 hour. Required Action C.3 requires restoring the air lock to OPERABLE status within 24 hours.

The licensee stated that it would not consider the airlock to be PRA Functional if an airlock door is open. The licensee provided additional discussion noting that the applicable TS Bases identify that even with both doors failing the seal test, the overall containment leakage rate can still be within limits. Further, a PRA Functional evaluation could be performed to support a 30-day RICT backstop. The NRC staff considers that PRA functionality, as applied for TS LCO 3.6.2 Condition C, may represent a condition outside the airlock limit, but cannot represent a condition outside the containment limits; otherwise, the containment would be inoperable and the appropriate condition of LCO 3.6.1, with its shorter CT, would be limiting. Since the specified safety function could still be accomplished while in Condition C, the NRC staff determined that the constraints applicable to a TS loss of function (LOF) condition are not required for this condition. Thus, the NRC staff concludes that this change is acceptable.

3.2.3 LCO 3.6.3, Containment Isolation Valves

The RICT Program is intended to apply to those required actions that restore compliance with the LCO (i.e., required actions that specify restoring SSCs to operable status). Limiting Condition for Operation 3.6.3 requires that each containment isolation valve be OPERABLE. For Conditions A, B, and C of LCO 3.6.3, the required action is to isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured. The required action does not technically restore compliance with the LCO. However, the required action ensures that the affected flow path is isolated which minimizes containment leakage. The LCO 3.6.1 requires that containment be OPERABLE. As described above, these conditions represent an inoperable containment penetration, but containment leakage would remain within its limits or the appropriate condition of LCO 3.6.1 with its shorter CT would be applicable.

Condition A is applicable when one or more penetration flow paths with one containment isolation valve is inoperable except for purge valve leakage not within limit. In this condition, one containment isolation valve in the penetration remains operable and capable of isolating the penetration. Therefore, Condition A does not represent a TS LOF configuration.

Condition B applies when one or more penetration flow paths with two containment isolation valves inoperable except for purge valve leakage not within limit. In this condition, neither containment isolation valve may be capable of isolating the penetration. Condition B represents a TS LOF and the constraints of TS 5.5.22 parts b, c.2, c.3, d, e, f, g, and h are applicable.

Condition C applies when one or more penetration flow paths with one or more containment purge valves not within purge valve leakage limits. In this condition, neither purge valve may be
capable of isolating the purge system. Condition C represents a TS LOF and the constraints of TS 5.5.22 parts b, c.2, c.3, d, e, f, g, and h are applicable.

Based on the above, the NRC staff concludes that the proposed changes to LCO 3.6.3 are appropriate.

3.2.4 LCO 3.7.14, ESF Room Cooler and Safety-Related Chiller System

New Condition B is applicable when two ESF room cooler and safety related chiller trains are inoperable. This condition represents a TS LOF and the constraints of TS 5.5.22 parts b, c.2, c.3, d, e, f, g, and h are applicable. The licensee requested an exception to the constraints of part f to allow the crediting of opening doors to maintain acceptable temperatures within the room. The NRC staff found this exception acceptable and the staff's evaluation of this exception is included in Sections 3.1.2, 3.1.3, and 3.1.4 of this SE. The NRC staff's review is limited to opening doors for the purpose of room cooling and did not address, nor approve, the impact of open doors on any other function(s) performed by the doors.

3.2.5 LCO 3.8.1, Alternating Current (AC) Sources – Operating

In a letter dated April 18, 2016, SNC proposed changes to TS 3.8.1, AC Sources – Operating. The proposed changes would align LCO 3.8.1 for the VEGP with LCO 3.8.1, as presented in NUREG-1431, Revision 4, “Standard Technical Specifications - Westinghouse Plants,” April 2012 (Reference 62). Specifically, the proposed changes are:

1. Condition A is applicable when one required offsite circuit is inoperable.
   
   Required Action A.3 requires restoration of the required offsite circuit to OPERABLE status.

   The current CT is 72 hours.

   The proposed CT is 72 hours or in accordance with the RICT.

2. Condition B is applicable when one DG is inoperable.

   Required Action B.2 requires verifying SAT is available within 1 hour and once per 12 hours thereafter.

   The proposed change is to delete Required Action B.2, and renumber the remaining required actions and references to required actions accordingly.

   Required Action B.5.1 requires verifying an enhanced black-start combustion turbine generator (CTG) is functional by verifying the CTG and the black-start diesel generator starts and achieves steady state voltage and frequency within 72 hours or within 72 hours prior to entry into Condition B.

   As an alternative to Required Action B.5.1, Required Action B.5.2 requires starting and running at least one CTG while in Condition B within 72 hours or prior to entry into Condition B for preplanned maintenance.
Required Actions B.5.1 and B.5.2 are modified by a note which states Required Action B.5.1 is only applicable if the combined reliability of the enhanced black-start CTGs and the black-start diesel generator is \( \geq 95\% \). Otherwise, Required Action B.5.2 applies.

The proposed change is to delete Required Actions B.5.1 and B.5.2 and the associated note.

The remaining required action associated with Condition B would be retained as Required Action B.4. The CT for this required action is being changed from "14 days from discovery of failure to meet LCO" to 72 hours.

3. Condition C is deleted. It is no longer needed because the required actions it references are being deleted.

4. The CT for the following conditions is modified to allow the option of using a RICT. As an editorial change, the conditions and required actions are renumbered.

- Condition D (renumbered as C) is applicable when two required offsite circuits are inoperable.
- Condition E (renumbered as D) is applicable when one required offsite circuit is inoperable and one DG is inoperable.
- Condition F (renumbered as E) is applicable when two DGs are inoperable. The condition is modified by notes stating that it is not applicable when second DG intentionally made inoperable; and that the following Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.
- Condition G (renumbered as F) is applicable when one automatic load sequencer is inoperable.

5. A new Condition G is proposed to be added. Condition G would be applicable when three or more required AC sources are inoperable. The condition is modified by a note stating that it is not applicable when three or more AC sources are intentionally made inoperable.

The proposed Required Action G.1 is to restore required inoperable AC sources to operable status, with a proposed CT of 1 hour or in accordance with the RICT.

The proposed Condition G would replace and modify existing Condition I.

Condition H is the default condition, which becomes applicable when the required actions and CTs for the other conditions are not met. As an editorial change, Condition H is modified to reflect the changes in Conditions A through G.

3.2.5.1 Revision to Front-Stop Completion Time

The NRC staff reviewed the proposed changes to the front stop in TS 3.8.1 using traditional engineering analysis. The front stop is the fixed CT by which a required action must be completed when an LCO is not met. For purposes of this evaluation, the terms allowed outage
time and CT are used interchangeably to describe the length of time permitted to restore a component to operable status.

The licensee is proposing to revise Condition B, One DG inoperable, to delete the current allowance that permits inoperability of a DG for an extended CT of up to 14 days if specific, additional actions are taken. The specific, additional actions are delineated in Required Actions B.2, B.5.1, and B.5.2. Required Action B.2 requires verification that the SAT is available within 1 hour and once per 12 hours thereafter. Required Actions B.5.1 and B.5.2 verify the availability of an alternate AC source within 72 hours or prior to entry into Condition B. The proposed changes would replace the requirement to restore the DG to operable status within 14 days with a requirement to restore the DG to operable status within 72 hours.

The NRC staff concludes that the proposed changes would delete the conditions, required actions, and CTs inserted via Amendment Nos. 100 and 68 for Vogtle, Units 1 and 2, respectively, on May 20, 1998 (Reference 63). These amendments allowed an extended CT for one inoperable emergency diesel generator of 14 days. The emergency diesel generator CT extension, in part, was based on the availability and reliability of the Plant Wilson Combustion Turbine Facility, the Wilson Line, and the Vogtle SAT. During the review of this change, the NRC staff used traditional engineering analysis, PRA methods, and a review of operating experience. The licensee is proposing to delete the allowed outage time extension and the required actions that were established specifically to support the extended allowed outage time.

The proposed front-stop CT for Condition B would permit one DG to be inoperable for 72 hours. The NRC staff compared this CT to the guidance provided in Regulatory Guide 1.93, Revision 0, “Availability of Electric Power Sources,” December 1974 (Reference 64). Regulatory Position C.1 addresses the situation when the available AC power sources are one less than the LCO. The Regulatory Position states that power operation may continue for a period that should not exceed 72 hours if system stability is such that a subsequent single failure would not cause total loss of offsite power. The NRC staff concludes that the proposed revised front-stop CT is consistent with this Regulatory Position.

The NRC staff reviewed the corresponding Standard Technical Specifications for AC Sources as contained in NUREG-1431, Revision 4 (Reference 62). The NRC staff concludes the revised LCO 3.8.1 Condition B front stop is consistent with the corresponding Condition B in the Standard Technical Specifications. Based on the considerations described above, the NRC staff concludes that the proposed changes to delete the extended CT for one DG out-of-service, and the required actions necessary to support this extended CT are acceptable.

3.2.5.2 Insertion of a Risk-Informed Completion Time

The NRC staff notes that application of a RICT could permit an inoperable DG to remain inoperable for a period not to exceed 30 days. Technical Specification 5.5.22 requires that the RICT Program be implemented in accordance with NEI 06-09 0-A, Risk-Managed Technical Specifications (RMTS) Guidelines," which states that risk assessments involve computation of an RMAT and a RICT. For emergent or planned events, if the RMAT is exceeded or expected to be exceeded, appropriate compensatory RMAs must be identified and implemented. Section 3.4 of NEI 06-09 0-A discusses the framework for RMAs, including compensatory measures and contingency plans. Examples of risk management activities are provided in Section 3.4.3 of NEI 06-09 0-A.
The existing TS would require verification that the SAT is available within 1 hour of the DG being declared inoperable (existing Required Action B.2) and verification that Plant Wilson is available prior to entry into Condition B or within 72 hours of the DG being declared inoperable (Required Actions B.5.1 and B.5.2). These prescriptive required actions are being deleted and replaced by the RICT Program requirements to determine RMAs and RMATs that are determined appropriate based on the specific plant configuration.

The existing TS 3.8.1 is consistent with the guidance contained in Branch Technical Position 8-8, "Onsite (Emergency Diesel Generators) and Offsite Power Sources Allowed Outage Time Extensions," February 2012 (Reference 65). The guidance in Branch Technical Position 8-8 is supported, in part, by a risk-informed evaluation. The RICT Program, as described in NEI 06-09 0-A, provides a risk-informed methodology to permit extensions of CT(s) provided risk is assessed and managed within a CRMP. The NRC staff determined that the controls regarding the establishment of RMAs are appropriate for ensuring risk is assessed and managed without the inclusion of specific compensatory actions in the TS.

3.2.5.3 Treatment of Condition F (renumbered as Condition E)

Condition F (renumbered as Condition E) is applicable when two DGs are inoperable. The LCO 3.8.1 requires, in part, that two qualified circuits between the offsite transmission network and the onsite Class 1E AC electrical power distribution system and two DGs capable of supplying the onsite Class 1E power distribution subsystem be operable.

During normal operation, the qualified circuits between the offsite transmission network are supplying power to the onsite Class 1E power distribution system, and the DGs are in standby. Therefore, if the DGs are inoperable, there is not technically a loss of the TS safety function. However, the DGs are the credited source of power to the Class 1E buses in the accident analysis. The offsite transmission system is not safety-related and is assumed to be unavailable in several accident analyses. For this reason, inoperability of two DGs is treated as a loss of TS safety function configuration.

The condition is modified by notes stating that it is not applicable when a second DG is intentionally made inoperable and that the following TS Section 5.5.22 constraints are applicable: parts b, c.2, c.3, d, e, f, g, and h.

The proposed changes would modify the required actions and CTs if LCO 3.8.1 is not met. The LCO is not being changed. The regulation under 10 CFR 50.36(c)(2)(i) states that when an LCO of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the TSs until the condition can be met. This change would only modify the remedial actions contained in the TS. Based on the above, the NRC staff concludes that the remedial actions and CTs in the proposed TS are acceptable. Therefore, the requirements of 10 CFR 50.36(c)(2)(i) continue to be met.

4.0 CHANGES TO THE OPERATING LICENSE

The licensee proposed Amendments to Appendix D, "Additional Conditions," of Facility Operating License Nos. NPF-68 and NPF-81 for Vogtle, Units 1 and 2, respectively, as provided in the letter dated April 14, 2017 (Reference 13). The proposed license condition states:

Southern Nuclear Operating Company (SNC) is approved to implement the Risk Informed Completion Time Program as specified in the license amendment.

The licensee shall implement the items listed in Enclosure 1, Implementation items of SNC letter NL-15-0381 dated March 16, 2015 prior to the implementation of the Risk Informed Completion Time Program.

The risk assessment approach and methods, shall be acceptable to the NRC, be based on the as-built, as-operated, and maintained plant, and reflect the operating experience of the plant as specified in RG 1.200. Methods to assess the risk from extending the completion times must be PRA methods accepted as part of this license amendment, or other methods approved by the NRC for generic use. If the licensee wishes to change its methods, and the change is outside the bounds of this license condition, the licensee will seek prior NRC approval, via a license amendment.

The implementation items of the letter dated March 16, 2015, are as follows:

1. SNC shall modify the PRA success criteria to be consistent with the current design basis criteria for Technical Specifications Condition A of the Limiting Conditions for Operation 3.7.5 that was identified in Table E1.1 of Enclosure 1 to the license amendment request dated September 13, 2012 before implementation of the RICT program.

2. SNC shall resolve all F&Os identified as not resolved (IE-A4-01, IE-D1-01, AS-A11-01, SY-B3-01, DA-C2-01, IF-C2a-01, and QU-F5-01) in Table E2.2 of Enclosure 2 to the license amendment request dated September 13, 2012 before implementation of the RICT program.

3. SNC shall have the necessary procedures for implementing the RICT program in place before implementation of the RICT program.

4. SNC shall update the fire PRA model to include the guidance in NUREG/CR-7150, Vol. 2 (JACQUE-FIRE) which is supported by the Supplemental Interim Technical Guidance on Fire-Induced Circuit Failure Mode Likelihood Analysis (ADAMS Accession No.: ML14086A165 and ML14017A135).

5. SNC shall implement procedural guidance that represents the use of “should” in the following sentence quoted from section 3.3.6, “Common Cause Failure Considerations,” of NEI 06-09 Revision 0-A, to mean “shall” in the implementation of the RICT program:

Page 3-22:
"In addition to a determination of operability on the affected component, the operator should (emphasis added) make a judgement with regard to whether the operability of similar or redundant components might be affected."
6. SNC shall modify the Vogtle Configuration Risk Management Program Fire PRA model that supports implementation of the RICT Program to reflect one of the following two options:

Option A: Add bounding delta CDF and delta LERF values for the calculated delta CDF and delta LERF values when a TS inoperable SSC needed for remote shutdown, consistent with plant operating procedures, is determined not to be PRA functional. These values will bound the change in the core damage frequency and the large early release frequency for the main control room abandonment fire scenarios.

Option B: Expand the fire PRA model logic to estimate the conditional core damage probability (CCDP) from the main control room abandonment fire scenarios versus using a CCDP of 1.0.

The NRC staff notes that prior approval would be required for a change to the RICT Program or the implementation of the RICT Program as described in the TS Administrative Controls Section 5.5.22, and the implementation items in Enclosure 1 of SNC's letter dated March 16, 2015 (Reference 7). Prior NRC approval will also be required for changes to the PRA and non-PRA methods that have not been previously approved by the NRC in this SE or methods that have not been approved for generic use.

In the LAR and in the licensee's responses to the NRC staff's RAIs, there were certain specific actions that the NRC staff identified as being necessary to support the conclusion that the implementation of the proposed program met the requirements of the RICT Program. The NRC staff's finding on the acceptability of the implementation of the RICT Program for the TS LCOs in this SE is dependent on the completion of the six implementation items in Enclosure 1 in SNC letter dated March 16, 2015 (Reference 7).

The NRC staff concludes that this license condition, and the implementation items in Enclosure 1 of the licensee's letter dated March 16, 2015, is acceptable because it adequately implements the RICT Program using models, methods, and approaches consistent with applicable guidance that are acceptable to the NRC. For each implementation item, the licensee and the NRC staff have reached a satisfactory resolution involving the level of detail and main attributes that will be incorporated into the program upon completion. The implementation items have been included as an explicit part of the license condition and, therefore, may be appropriately relied upon for the formulation of a regulatory decision.

The NRC staff, through an onsite audit or during future inspections, may choose to examine the closure of the implementation items, with the expectation that any issues discovered during this review, or concerns with regard to adequate completion of the implementation item, would be tracked and dispositioned appropriately under the licensee's corrective action program and could be subject to appropriate NRC enforcement action.

5.0 SUMMARY

5.1 NRC Staff Findings and Conclusions

The NRC staff finds that the licensee's proposed implementation of the RICT Program for the identified scope of TS LCO action requirements is consistent with the guidance of
NEI 06-09 0-A, subject to the limitations and conditions evaluated in Section 4.0 of this SE. The licensee's methodology for assessing the risk impact of extended CTs, including the individual CT extension impacts in terms of incremental core damage probability and incremental large early release probability, and the overall program impact in terms of $\Delta$CDF and $\Delta$LERF, is accomplished using PRA models of sufficient scope and technical adequacy based on consistency with the guidance of RG 1.200, Revision 2. For external hazards which do not have PRA models, the licensee will use bounding analyses in accordance with NEI 06-09 0-A guidance. The RICT calculation uses the PRA model as translated into the CRMP tool, and the licensee has an acceptable process in place to ensure the quality of the translation. In addition, the NRC staff finds that the proposed implementation of the RICT Program addresses the RG 1.177 defense-in-depth philosophy and safety margins to ensure that they are adequately maintained, and includes adequate administrative controls as well as performance monitoring programs.

5.2 Technical Evaluation Conclusions

Based on the above, the NRC staff has evaluated the proposed changes against each of the five key principles in RG 1.177 and RG 1.174 and reached the conclusions summarized below.

The proposed changes to the LCO conditions and the remedial actions are acceptable and will continue to meet 10 CFR 50.36(c)(2), 50.57(a)(2), and 50.57(a)(6) are met. Therefore, the NRC staff concludes that the proposed change meets key principle 1: change meets current regulations.

When the TS function remains operable in an existing LCO condition some reduction in defense-in-depth has already been evaluated and accepted for a limited period of time during the current CT, and the RICT provides solely a risk-informed extension for operating in that plant condition. For TS LOF, the licensee's use of a 24-hour backstop, when applied together with the conditions that 1) the same SSCs relied on in the LCO be available and 2) the design basis function success parameters can still be achieved limit any unacceptable change to the elements of defense-in-depth described in RG 1.174. Therefore, the NRC staff concludes that the proposed change meets key principle 2: change is consistent with defense-in-depth philosophy.

Implementation of the methodology as described in the licensee's TS 5.5.22 provides confidence that the licensee can extend the CTs without any unanalyzed reduction in safety margins because the design-basis success criteria parameters will be at the same level and provided by the same equipment as has been currently accepted. Therefore, the NRC staff concludes that the proposed change meets key principle 3: maintain sufficient safety margins.

The defense-in-depth and safety margin implications of the single exception that uses SSCs not used in the TSs and does not meet the design basis success criteria, TS 3.7.14, "Two ESF Room Cooler and Safety-Related Chiller trains shall be OPERABLE," has been evaluated above and found acceptable.6

The licensee has demonstrated the technical adequacy and scope of its PRA models, and that the models can support implementation of the RICT Program for determining CTs. The risk metrics are consistent with the approved methodology of NEI 06-09 0-A, and the RICT Program

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6 The NRC staff's review was limited to the opening of doors for the purpose of room cooling and did not address, or approve, the impact of open doors on any other function(s) performed by the door.
is controlled administratively through plant procedures and training. Therefore, the NRC staff concludes that the proposed change meets key principle 4: proposed increases in CDF or risk are small and are consistent with the Commissions Safety Goal Policy Statement.

The SSCs in the scope of the RICT Program that have their CT extended by entry into the RICT Program are monitored to ensure their safety performance is not degraded because the SSCs in the scope of the RICT Program are also in the scope of the Maintenance Rule. RG 1.174 states that monitoring performed in conformance with the Maintenance Rule, 10 CFR 50.65, can be used when the monitoring performed is sufficient for the SSCs affected by the risk-informed application. The licensee converts the cumulative incremental core damage probability and the incremental large early release probability into average annual values which are then compared to the limits of RG 1.174. If any limits are exceeded, corrective actions are taken to ensure future plant operational risk is within the acceptance guidance. The NRC staff, therefore, concludes that the proposed change meets key principle 5: use performance measurement strategies to monitor the change.

The application of the CRMP for the RICT Program will assure timely identification of any risk-significant configurations, and prompt implementation of appropriate compensatory measures and RMAs, satisfying Tier 2 and Tier 3 of RG 1.177. If a PRA model change is required for a RICT calculation but cannot be implemented immediately, an alternative bounding method to perform the RICT calculation, which is consistent with NEI 06-09 0-A guidance, is discussed in Section 3.1.4.1.8 of this SE.

Based on the above, the NRC staff concludes that the proposed changes satisfy the key principles of risk-informed decision-making identified in RG 1.174 and RG 1.177 and, therefore, the requested adoption of the proposed changes to the TSs, license condition, implementation items, and associated guidance is acceptable.

6.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Georgia State official was notified of the proposed issuance of the amendments on May 23, 2017. The State official had no comments.

7.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to the installation or use of facility components located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (80 FR 13913, March 17, 2015). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

8.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by
operation in the proposed manner; (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations; and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

9.0 REFERENCES


Request for Additional Information (CAC Nos. ME9555 and ME9556)," dated February 24, 2017 (ADAMS Accession No. ML17058A127).


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SUBJECT: VOGTLE ELECTRIC GENERATING PLANT, UNITS 1 AND 2 – ISSUANCE OF AMENDMENTS REGARDING IMPLEMENTATION OF TOPICAL REPORT NUCLEAR ENERGY INSTITUTE 06-09, "RISK-INFORMED TECHNICAL SPECIFICATIONS INITIATIVE 4B, RISK MANAGED TECHNICAL SPECIFICATION GUIDELINES," REVISION 0-A (CAC NOS. ME9555 AND ME9556) DATED AUGUST 8, 2017

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NCP-2015-009, ADAMS Accession No. ML15322A197 ** Via Phone
EEEB BC agreed with NCP-2015-009. As a result of changes made in response to NCP-2015-009, concurred on SE. EEEB branch was reorganized to EEOB during concurrence process.

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