

OCT 31 2019

Docket Nos.: 52-025
52-026ND-19-1323
10 CFR 52.99(c)(3)U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555-0001

Southern Nuclear Operating Company
Vogtle Electric Generating Plant Unit 3 and Unit 4
Notice of Uncompleted ITAAC 225-days Prior to Initial Fuel Load
Item 2.5.02.06a.ii [Index Number 530]

Ladies and Gentlemen:

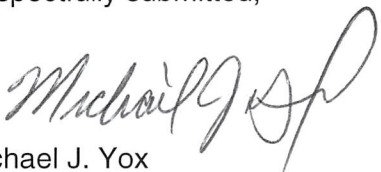
Pursuant to 10 CFR 52.99(c)(3), Southern Nuclear Operating Company hereby notifies the NRC that as of October 18, 2019, Vogtle Electric Generating Plant (VEGP) Unit 3 and Unit 4 Uncompleted Inspection, Test, Analysis, and Acceptance Criteria (ITAAC) Item 2.5.02.06a.ii [Index Number 530] has not been completed greater than 225-days prior to initial fuel load. The Enclosure describes the plan for completing ITAAC 2.5.02.06a.ii [Index Number 530]. Southern Nuclear Operating Company will at a later date provide additional notifications for ITAAC that have not been completed 225-days prior to initial fuel load.

This notification is informed by the guidance described in NEI-08-01, *Industry Guideline for the ITAAC Closure Process Under 10 CFR Part 52*, which was endorsed by the NRC in Regulatory Guide 1.215. In accordance with NEI 08-01, this notification includes ITAAC for which required inspections, tests, or analyses have not been performed or have been only partially completed. All ITAAC will be fully completed and all Section 52.99(c)(1) ITAAC Closure Notifications will be submitted to NRC to support the Commission finding that all acceptance criteria are met prior to plant operation, as required by 10 CFR 52.103(g).

This letter contains no new NRC regulatory commitments.

If there are any questions, please contact Tom Petrak at 706-8530-1575.

Respectfully submitted,



Michael J. Yox
Regulatory Affairs Director Vogtle 3&4

Enclosure: Vogtle Electric Generating Plant (VEGP) Unit 3 and Unit 4
Completion Plan for Uncompleted ITAAC 2.5.02.06a.ii [Index Number 530]

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Document Services RTYPE: VND.LI.L06

File AR.01.02.06

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**Southern Nuclear Operating Company
ND-19-1323
Enclosure**

**Vogtle Electric Generating Plant (VEGP) Unit 3 and Unit 4
Completion Plan for Uncompleted ITAAC 2.5.02.06a.ii [Index Number 530]**

ITAAC Statement

Design Commitment

6.a) The PMS initiates an automatic reactor trip, as identified in Table 2.5.2-2, when plant process signals reach specified limits.

6.b) The PMS initiates automatic actuation of engineered safety features, as identified in Table 2.5.2-3, when plant process signals reach specified limits.

6.c) The PMS provides manual initiation of reactor trip and selected engineered safety features as identified in Table 2.5.2-4.

8.a) The PMS provides for the minimum inventory of displays, visual alerts, and fixed position controls, as identified in Table 2.5.2-5. The plant parameters listed with a "Yes" in the "Display" column and visual alerts listed with a "Yes" in the "Alert" column can be retrieved in the MCR. The fixed position controls listed with a "Yes" in the "Control" column are provided in the MCR.

8.c) Displays of the open/closed status of the reactor trip breakers can be retrieved in the MCR.

9.a) The PMS automatically removes blocks of reactor trip and engineered safety features actuation when the plant approaches conditions for which the associated function is designed to provide protection. These blocks are identified in Table 2.5.2-6.

9.b) The PMS two-out-of-four initiation logic reverts to a two-out-of-three coincidence logic if one of the four channels is bypassed. All bypassed channels are alarmed in the MCR.

9.c) The PMS does not allow simultaneous bypass of two redundant channels.

Inspections/Tests/Analyses

An operational test of the as-built PMS will be performed using real or simulated test signals.

An operational test of the as-built PMS will be performed using real or simulated test signals.

An operational test of the as-built PMS will be performed using the PMS manual actuation controls.

i) An inspection will be performed for retrievability of plant parameters in the MCR.

iii) An operational test of the as-built system will be performed using each MCR fixed position control.

Inspection will be performed for retrievability of displays of the open/closed status of the reactor trip breakers in the MCR.

An operational test of the as-built PMS will be performed using real or simulated test signals.

An operational test of the as-built PMS will be performed.

An operational test of the as-built PMS will be performed. With one channel in bypass, an attempt will be made to place a redundant channel in bypass.

Acceptance Criteria

ii) PMS output signals to the reactor trip switchgear are generated after the test signal reaches the specified limit. This needs to be verified for each automatic reactor trip function.

Appropriate PMS output signals are generated after the test signal reaches the specified limit. These output signals remain following removal of the test signal. Tests from the actuation signal to the actuated device(s) are performed as part of the system-related inspection, test, analysis, and acceptance criteria.

ii) PMS output signals are generated for reactor trip and selected engineered safety features as identified in Table 2.5.2-4 after the manual initiation controls are actuated.

i) The plant parameters listed in Table 2.5.2-5 with a "Yes" in the "Display" column, can be retrieved in the MCR.

iii) For each test of an as-built fixed position control listed in Table 2.5.2-5 with a "Yes" in the "Control" column, an actuation signal is generated. Tests from the actuation signal to the actuated device(s) are performed as part of the system-related inspection, test, analysis and acceptance criteria.

Displays of the open/closed status of the reactor trip breakers can be retrieved in the MCR.

The PMS blocks are automatically removed when the test signal reaches the specified limit.

The PMS two-out-of-four initiation logic reverts to a two-out-of-three coincidence logic if one of the four channels is bypassed. All bypassed channels are alarmed in the MCR.

The redundant channel cannot be placed in bypass.

ITAAC Completion Description

Multiple ITAAC are performed to verify that:

- The Protection and Safety Monitoring System (PMS) initiates an automatic reactor trip, as identified in Table 2.5.2-2, when plant process signals reach specified limits.
- The PMS provides manual initiation of reactor trip and selected engineered safety features as identified in Table 2.5.2-4.
- The PMS provides for the minimum inventory of displays, visual alerts, and fixed position controls as identified in Table 2.5.2-5, with the plant parameters listed with a "Yes" in the "Display" column and visual alerts listed with a "Yes" in the "Alert" column retrievable in the MCR (Main Control Room), and the fixed position controls listed with a "Yes" in the "Control" column provided in the MCR.

The subject ITAAC requires:

- An operational test of the as-built PMS be performed using real or simulated test signals to verify PMS output signals to the reactor trip switchgear are generated after the test signal reaches the specified limit for each automatic reactor trip function
- An operational test of the as-built PMS be performed using the PMS manual actuation controls to verify PMS output signals are generated for reactor trip and selected engineered safety features as identified in Table 2.5.2-4 after the manual initiation controls are actuated.
- An inspection be performed to verify the plant parameters listed in Table 2.5.2-5 with a "Yes" in the "Display" column, can be retrieved in the MCR
- An operational test of the as-built system be performed using each MCR fixed position control to verify for each test of an as-built fixed position control listed in Table 2.5.2-5 with a "Yes" in the "Control" column, an actuation signal is generated.

This ITAAC also performs:

- An operational test of the as-built PMS using real or simulated test signals to verify appropriate PMS output signals are generated after the test signal reaches the specified limit and remain following removal of the test signal to demonstrate the PMS initiates automatic actuation of engineered safety features, as identified in Table 2.5.2-3, when plant process signals reach specified limits,
- An inspection for retrievability of displays of the open/closed status of the reactor trip breakers in the MCR to demonstrate displays of the open/closed status of the reactor trip breakers can be retrieved in the MCR
- An operational test of the as-built PMS using real or simulated test signals to demonstrate the PMS automatically removes blocks of reactor trip and engineered safety features actuation identified in Table 2.5.2-6 when the plant approaches conditions for which the associated function is designed to provide protection
- An operational test of the as-built PMS to demonstrate the PMS two-out-of-four initiation logic reverts to a two-out-of-three coincidence logic if one of the four channels is bypassed and bypassed channels are alarmed in the MCR, and
- An operational test of the as-built PMS in which with one channel in bypass, an attempt will be made to place a redundant channel in bypass to demonstrate the PMS does not allow simultaneous bypass of two redundant channels.

ii) PMS output signals to the reactor trip switchgear are generated after the test signal reaches the specified limit. This needs to be verified for each automatic reactor trip function.

An operational test of the as-built PMS is performed using simulated test signals. The operational test verifies that PMS output signals to the reactor trip switchgear are generated after the test signal reaches the specified limit for each automatic reactor trip function identified in COL Appendix C Table 2.5.2-2 (Attachment A).

This ITAAC is completed as a combination of:

- Factory Acceptance Test – Functional testing of each PMS automatic reactor trip from the test signal input to the PMS output signals to the reactor trip switchgear

- Site software installation and regression test – Hardware and software integration verification and testing of post system delivery changes

The Factory Acceptance Testing (FAT) follows the guidance of NEI 08-01 Section 9.4 (Reference 49) for the as-built tests to be performed at other than the final installed location. The FAT was performed in accordance with PMS Software Program Manual WCAP-16096 (Reference 1), PMS Test Plan APP-PMS-T5-001 (Reference 2), and applicable Codes and Standards described in Vogtle 3 and 4 UFSAR Chapter 7 (Reference 48).

The FAT included testing of PMS inputs and outputs, logic, and functionality. During the test, the process parameters were simulated and adjusted to create applicable reactor trip conditions. PMS signals at reactor trip computer point PMSY-RXTR (Y = A, B, C, or D in accordance with its PMS division) were monitored and it was confirmed that each automatic reactor trip function works as designed from the simulated input to reactor trip computer point PMSY-RXTR. This testing was performed in accordance with FAT Test Procedures APP-PMS-T1P-007 (Reference 3) and APP-PMS-T1P-035 (Reference 4). The results of this testing are documented in FAT test reports SV0/SV3/SV4-PMS-T2R-007 (References 5 through 7) and SV0/SV3/SV4-PMS-T2R-035 (References 8 through 10) Test Case TPS35-01. Attachment A provides a listing of test cases used in References 5 through 7. During testing in FAT Test Procedure APP-PMS-T1P-012 (Reference 11), a Steam Generator-2 Level Low-2 is initiated, signals at the computer point PMSY-RXTR are verified, the shunt trip outputs from PMS are verified to turn on, and the under voltage outputs from PMS are verified to turn off. The results of this testing are documented in the FAT test reports SV0/SV3/SV4-PMS-T2R-012 (References 12 through 14) Test Case B17.

Additional hardware and software installation and associated inspections and testing are performed on-site to verify that the cabinets are intact and functional in accordance with Units 3 and 4 for applicable Field Change Notifications (FCNs) AP1000 Vogtle Unit 3 PMS Initial Software Installation - Software Release 8.7.0.1 and AP1000 Vogtle Unit 4 PMS Initial Software Installation - Software Release X.X.X.X (References 15 and 16). References 15 and 16 include steps that confirm and document successful software load and further confirm the physical properties of the as-built PMS. A regression analysis (i.e., change evaluation) is performed post-delivery and installation for hardware changes (References 17 and 18) and software changes (Reference 19) to determine if additional testing is needed for the as-built system.

The completed Unit 3 and Unit 4 FAT test reports (References 5 through 10 and 12 through 14), FCNs (References 15 and 16), and regression test results (References 17 through 19) confirm that appropriate PMS output signals are generated after the test signal reaches the specified limit. These output signals remain following removal of the test signal. Tests from the actuation signal to the actuated device(s) are performed as part of the system-related inspection, test, analysis, and acceptance criteria.

References 5 through 10 and 12 through 19 are available for NRC inspection as part of the ITAAC 2.5.02.06a.ii Unit 3 and 4 Completion Packages (References 46 and 47).

Appropriate PMS output signals are generated after the test signal reaches the specified limit. These output signals remain following removal of the test signal. Tests from the actuation signal to the actuated device(s) are performed as part of the system-related inspection, test, analysis, and acceptance criteria.

An operational test of the as-built PMS is performed using simulated test signals. The operational test verifies that appropriate PMS output signals are generated after the test signal reaches the specified limit and that these output signals remain following removal of the test signal.

This ITAAC is completed as a combination of:

- Factory Acceptance Test – Functional testing of PMS automatic engineered safety features from the test signal input to the actuation signal output
- Site software installation and regression test – Hardware and software integration verification and testing of post system delivery changes.

The Factory Acceptance Testing (FAT) follows the guidance of NEI 08-01 Section 9.4 (Reference 49) for the as-built tests to be performed at other than the final installed location. The FAT was performed in accordance with PMS Software Program Manual WCAP-16096 (Reference 1), PMS Test Plan APP-PMS-T5-001 (Reference 2), and applicable Codes and Standards described in Vogtle 3 and 4 UFSAR Chapter 7 (Reference 48).

The FAT includes testing of PMS inputs and outputs, logic, and functionality. During this test, the initial conditions for the test scenarios were established and confirmed that the setpoints and logics which generated output signals for all the engineered safety features (ESF) identified in COL Table 2.5.2-3 (Attachments B and C) work as designed. Testing initially inputs a test signal that verifies the bistable and coincidence logic of the PMS, as documented in the test cases shown in Attachment B. The output from the PMS is then sent to modules that operate the devices in the field with the output signals of these modules documented in the test cases shown in Attachment C. Additionally, output signals which are designed to remain following removal of the test signal were verified in the test cases shown in Attachment C. This testing was performed in accordance with FAT Test Procedures APP-PMS-T1P-007 (Reference 3), APP-PMS-T1P-008 (Reference 20), APP-PMS-T1P-009 (Reference 21), APP-PMS-T1P-012 (Reference 11), and APP-PMS-T1P-035 (Reference 4). The results of the tests are documented in FAT Test Reports SV0/SV3/SV4-PMS-T2R-007 (References 5 through 7), SV0/SV3/SV4-PMS-T2R-008 (References 22 through 24), APP/SV3/SV4-PMS-T2R-009 (References 25 through 27), and SV0/SV3/SV4-PMS-T2R-012 (References 12 through 14), and SV0/SV3/SV4-PMS-T2R-035 (References 8 through 10) Test Case TPS35-01. Attachments B and C provide a listing of test cases used in References 5 through 7, 12 through 14 and 22 through 27.

The output signals for the Turbine Trip ESF function are designed to not remain following removal of the test signal and is not included in the testing above. In the event of a Turbine Trip, manual operator action is performed to latch the Turbine.

Additional hardware and software installation and associated inspections and testing are performed on-site to verify that the cabinets are intact and functional in accordance with Units 3 and 4 for applicable Field Change Notifications (FCNs) AP1000 Vogtle Unit 3 PMS Initial Software Installation - Software Release 8.7.0.1 and AP1000 Vogtle Unit 4 PMS Initial Software Installation - Software Release X.X.X.X (References 15 and 16). References 15 and 16 include steps that confirm and document successful software load and further confirm the physical properties of the as-built PMS. A regression analysis (i.e., change evaluation) is performed post-delivery and installation for hardware changes (References 17 and 18) and software changes (Reference 19) to determine if additional testing is needed for the as-built system.

The completed Unit 3 and Unit 4 FAT test reports (References 5 through 10, 12 through 14, and 22 through 27), FCNs (References 15 and 16), and regression test results (References 17 through 19) confirm that appropriate PMS output signals are generated after the test signal reaches the specified limit. These output signals remain following removal of the test signal. Tests from the actuation signal to the actuated device(s) are performed as part of the system-related inspection, test, analysis, and acceptance criteria.

References 5 through 10, 12 through 19, and 22 through 27 are available for NRC inspection as part of the ITAAC 2.5.02.06a.ii Unit 3 and 4 Completion Packages (References 46 and 47).

ii) PMS output signals are generated for reactor trip and selected engineered safety features as identified in Table 2.5.2-4 after the manual initiation controls are actuated.

An operational test of the as-built PMS is performed using PMS manual actuation controls. The operational test verifies that PMS output signals are generated for reactor trip and selected engineered safety features as identified in Table 2.5.2-4 after the manual initiation controls are actuated.

This ITAAC is completed as a combination of:

- Factory Acceptance Test – testing of PMS logic and functions using simulated manual initiation control inputs and verifying generation of the outputs for reactor trip and ESF functions
- Site software installation and regression test – Hardware and software integration verification and testing of post system delivery changes to confirm integrity of as-built system post installation
- Component Test – testing of the as-built manual initiation controls and verifying the inputs to PMS for ESF functions
- Preoperational Test – testing of the as-built manual initiation controls and verifying the inputs to PMS for reactor trip functions

The Factory Acceptance Testing (FAT) follows the guidance of NEI 08-01 Section 9.4 (Reference 49) for the as-built tests to be performed at other than the final installed location. The FAT was performed in accordance with PMS Software Program Manual WCAP-16096 (Reference 1), PMS Test Plan APP-PMS-T5-001 (Reference 2), and applicable Codes and Standards described in Vogtle 3 and 4 UFSAR Chapter 7 (Reference 48).

The FAT included testing of PMS inputs and outputs, logic, and functionality. During this test, the manual initiation control inputs to the PMS were simulated and it was confirmed that the output signals were actuated for reactor trip and selected engineered safety features manual actuations as identified in COL Appendix C Table 2.5.2-4 (Attachment D). This testing was performed in accordance with the PMS FAT procedures APP-PMS-T1P-007 (Reference 3) and APP-PMS-T1P-008 (Reference 20). The results of the tests are documented in the FAT test reports SV0/SV3/SV4-PMS-T2R-007 (References 5 through 7) and SV0/SV3/SV4-PMS-T2R-008 (References 22 through 24). Attachment D provides a listing of test scenarios within each FAT procedure.

Additional hardware and software installation and associated inspections and testing are performed on-site to verify that the cabinets are intact and functional in accordance with Units 3

and 4 for applicable Field Change Notifications (FCNs) AP1000 Vogtle Unit 3 PMS Initial Software Installation - Software Release 8.7.0.1 and AP1000 Vogtle Unit 4 PMS Initial Software Installation - Software Release X.X.X.X (References 15 and 16). References 15 and 16 include steps that confirm and document successful software load and further confirm the physical properties of the as-built PMS. A regression analysis (i.e., change evaluation) is performed post-delivery and installation for hardware changes (References 17 and 18) and software changes (Reference 19) to determine if additional testing is needed for the as-built system.

Testing of selected ESF manual initiation controls identified in Attachment D is performed in accordance with component test packages SNCXXXXXX (Unit 3) and SNCYYYYYY (Unit 4) (References 28 and 29). These component test packages utilize B-GEN-ITPCI-006 (Reference 30) to test ESF manual initiation controls. Selected ESF manual initiation controls are actuated and confirmed at the PMS input, by visually inspecting the digital input LED. The completed Unit 3 and Unit 4 component test packages confirm that select ESF manual controls actuations are received at PMS.

Testing of reactor trip manual controls is performed in accordance with pre-operational tests 3/4-PMS-ITPP-504 (References 31 and 32) to test reactor trip manual initiation controls. Reactor trip manual initiation controls PMS-HS025 and PMS-HS026 are actuated in the Main Control Room (MCR) and Manual Reactor Trip Logic Trip is verified on each divisional safety display. The completed Unit 3 and Unit 4 test procedures confirm that each RTCB trip status is changed after actuation of manual controls.

The completed Unit 3 and Unit 4 FAT test reports (References 5 through 7 and 22 through 24), FCNs (References 15 and 16), regression test results (References 17 through 19), completed component test packages (References 28 and 29), and completed preoperational test results (References 31 and 32), confirm that the PMS output signals are generated for reactor trip and selected engineered safety features as identified in Table 2.5.2-4 after the manual initiation controls are actuated.

References 5 through 7, 15 through 19, 22 through 24, and 28 through 32 are available for NRC inspection as part of the ITAAC 2.5.02.06a.ii Completion Packages (References 46 and 47).

i) The plant parameters listed in Table 2.5.2-5 with a "Yes" in the "Display" column, can be retrieved in the MCR.

An inspection is performed to verify the retrievability of the VEGP Unit 3 and Unit 4 plant parameters in the MCR. The inspection for retrievability confirms that the plant parameters listed in Attachment E with a "Yes" in the "Display" column (Attachment E) can be retrieved in the MCR.

The inspection is performed in accordance with Work Orders SNC921600 (Unit 3) and SNCZZZZZZ (Unit 4) (References 33 and 34) and visually confirms that when each of the plant parameters identified in Attachment E with a "Yes" in the "Display" column is recalled using the MCR PMS Visual Display Units (VDUs), the expected display appears on the PMS VDU.

The inspection results are included in References 33 and 34 and confirm that the plant parameters listed in Table 2.5.2-5 with a "Yes" in the "Display" column can be retrieved in the MCR.

References 33 and 34 are available for NRC inspection as part of the Unit 3 and Unit 4 ITAAC 2.5.02.06a.ii Completion Packages (References 46 and 47).

iii) For each test of an as-built fixed position control listed in Table 2.5.2-5 with a "Yes" in the "Control" column, an actuation signal is generated. Tests from the actuation signal to the actuated device(s) are performed as part of the system-related inspection, test, analysis and acceptance criteria.

An operational test of the as-built PMS is performed using each MCR fixed position control to verify that for each test of an as-built fixed position control listed in Table 2.5.2-5 with a "Yes" in the "Control" column (Attachment E), an actuation signal is generated.

This ITAAC is completed as a combination of:

- Factory Acceptance Test – testing of PMS logic and functions using simulated fixed position control inputs and verifying generation of the actuation signal output
- Site software installation and regression test – Hardware and software integration verification and testing of post system delivery changes to confirm integrity of as-built system post installation
- Component Test – testing of the as-built fixed position controls and verifying the inputs to PMS for ESF functions
- Preoperational Test – testing of the as-built fixed position controls and verifying the inputs to PMS for reactor trip functions

The Factory Acceptance Testing (FAT) follows the guidance of NEI 08-01 Section 9.4 (Reference 49) for the as-built tests to be performed at other than the final installed location. The FAT was performed in accordance with PMS Software Program Manual WCAP-16096 (Reference 1), PMS Test Plan APP-PMS-T5-001 (Reference 2), and applicable Codes and Standards described in Vogtle 3 and 4 UFSAR Chapter 7 (Reference 48).

The FAT included testing of PMS inputs and outputs, logic, and functionality. During this test, the fixed position control inputs to the PMS were simulated and it was confirmed that the actuation signals were generated for reactor trip and selected engineered safety features manual actuations as identified in Attachment E. This testing was performed in accordance with the PMS FAT procedures APP-PMS-T1P-007 (Reference 3) and APP-PMS-T1P-008 (Reference 20). The results of the tests are documented in the FAT test reports SV0/SV3/SV4-PMS-T2R-007 (References 5 through 7) and SV0/SV3/SV4-PMS-T2R-008 (References 22 through 24). Attachment F provides a listing of test scenarios within each FAT procedure.

Additional hardware and software installation and associated inspections and testing are performed on-site to verify that the cabinets are intact and functional in accordance with Units 3 and 4 for applicable Field Change Notifications (FCNs) AP1000 Vogtle Unit 3 PMS Initial Software Installation - Software Release 8.7.0.1 and AP1000 Vogtle Unit 4 PMS Initial Software Installation - Software Release X.X.X.X (References 15 and 16). References 15 and 16 include steps that confirm and document successful software load and further confirm the physical properties of the as-built PMS. A regression analysis (i.e., change evaluation) is performed post-delivery and installation for hardware changes (References 17 and 18) and software changes (Reference 19) to determine if additional testing is needed for the as-built system.

Testing of selected ESF fixed position controls identified in Attachment E is performed in accordance with component test packages SNCAAAAAA (Unit 3) and SNCBBBBBB (Unit 4) (References 35 and 36). These component test packages utilize B-GEN-ITPCI-006 (Reference 30) to test ESF fixed position controls. Selected ESF fixed position controls identified in Attachment E are actuated and confirmed at the PMS input, by visually inspecting the digital input LED.

Testing of the Manual ADS and IRWST Injection Unblock is performed in accordance with Unit 3 and Unit 4 component test packages SNCAAAAAA and SNCBBBBBB (References 35 and 36). These component test packages utilize B-GEN-ITPCI-039 (Reference 43) to direct the performance of test procedures 3/4-PMS-OTS-17-012 (References 44 and 45). The Manual ADS and IRWST Injection Unblock fixed position control switch is taken to unblock in the MCR and the block is verified to be removed at the Component Interface Modules (CIM).

Testing of reactor trip fixed position controls is performed in accordance with pre-operational tests 3/4-PMS-ITPP-504 (References 31 and 32) to test reactor trip fixed position controls. Reactor trip fixed position controls are actuated in the Main Control Room (MCR) and Manual Reactor Trip Logic Trip is verified on each divisional safety display. The completed Unit 3 and Unit 4 test procedures confirm that each RTCB trip status is changed after actuation of the manual reactor trip fixed position controls.

The completed Unit 3 and Unit 4 FAT test reports (References 5 through 7 and 22 through 24), FCNs (References 15 and 16), regression test results (References 17 through 19), completed component test packages (References 35 and 36), and completed preoperational test results (References 31 and 32) confirm that for each test of an as-built fixed position control listed in Attachment E with a "Yes" in the "Control" column, an actuation signal is generated. Tests from the actuation signal to the actuated device(s) are performed as part of the system-related inspection, test, analysis and acceptance criteria.

References 5 through 7, 15 through 19, 22 through 24, 31, 32, 35, and 36 are available for NRC inspection as part of the Unit 3 and Unit 4 ITAAC 2.5.02.06a.ii Completion Packages (References 46 and 47).

Displays of the open/closed status of the reactor trip breakers can be retrieved in the MCR.

An inspection is performed to verify the displays of the open/closed status of the reactor trip breakers can be retrieved in the MCR.

The inspection is performed in accordance with 3/4-PMS-ITPP-504 (References 31 and 32) and visually confirms that when each of the displays of the open/closed status of the reactor trip breakers are summoned using the MCR PMS Visual Display Units (VDUs), the expected display appears on the PMS VDU.

The inspection results are included in References 31 and 32 and confirm that displays of the open/closed status of the reactor trip breakers can be retrieved in the MCR.

References 31 and 32 are available for NRC Inspection as part of the Unit 3 and Unit 4 ITAAC 2.5.02.06a.ii Completion Packages (References 46 and 47).

The PMS blocks are automatically removed when the test signal reaches the specified limit.

An operational test of the as-built PMS is performed using simulated test signals to verify that PMS blocks are automatically removed when the test signal reaches the specified limit.

This ITAAC is completed as a combination of:

- Factory Acceptance Test – functional testing of PMS ability to automatically remove blocks
- Site software installation and regression test – Hardware and software integration verification and testing of post system delivery changes

The Factory Acceptance Testing (FAT) follows the guidance of NEI 08-01 Section 9.4 (Reference 49) for the as-built tests to be performed at other than the final installed location. The FAT was performed in accordance with PMS Software Program Manual WCAP-16096 (Reference 1), PMS Test Plan APP-PMS-T5-001 (Reference 2), and applicable Codes and Standards described in Vogtle 3 and 4 UFSAR Chapter 7 (Reference 48).

The FAT included testing of PMS inputs and outputs, logic, and functionality. During this test, the initial condition for the test scenarios was established and confirmed that PMS blocks are automatically removed as appropriate for the reactor trip and engineered safety feature actuation blocks identified in COL Appendix C Table 2.5.2-6. During the test, the process parameters were simulated and adjusted to create applicable unblock conditions, PMS unblock signals were monitored, and it was confirmed that the automatic unblock functions work as designed. This testing was performed in accordance with FAT Test Procedures APP-PMS-T1P-008 and APP-PMS-T1P-035 (Reference 20 and 4). The results of the testing are documented in the FAT test reports SV0/SV3/SV4-PMS-T2R-008 (References 22 through 24) and SV0/SV3/SV4-PMS-T2R-035 (References 8 through 10) Test Case TPS35-01. Attachment G provides a listing of test cases used in References 22 through 24. Attachment H provides a matrix which correlates the ESF PMS blocks to the ESF functions identified in COL Appendix C Table 2.5.2-6.

Additional hardware and software installation and associated inspections and testing are performed on-site to verify that the cabinets are intact and functional in accordance with Units 3 and 4 for applicable Field Change Notifications (FCNs) AP1000 Vogtle Unit 3 PMS Initial Software Installation - Software Release 8.7.0.1 and AP1000 Vogtle Unit 4 PMS Initial Software Installation - Software Release X.X.X.X (References 15 and 16). References 15 and 16 include steps that confirm and document successful software load and further confirm the physical properties of the as-built PMS. A regression analysis (i.e., change evaluation) is performed post-delivery and installation for hardware changes (References 17 and 18) and software changes (Reference 19) to determine if additional testing is needed for the as-built system.

The completed Unit 3 and Unit 4 FAT test reports (References 8 through 10 and 22 through 24), FCNs (References 15 and 16), and regression test results (References 17 through 19) confirm that the PMS blocks are automatically removed when the test signal reaches the specified limit.

References 8 through 10, 15 through 19, and 22 through 24 are available for NRC inspection as part of the Unit 3 and 4 ITAAC 2.5.02.06a.ii Completion Packages (References 46 and 47).

The PMS two-out-of-four initiation logic reverts to a two-out-of-three coincidence logic if one of the four channels is bypassed. All bypassed channels are alarmed in the MCR.

An operational test of the as-built PMS is performed to verify that PMS two-out-of-four initiation logic reverts to a two-out-of-three coincidence logic if one of the four channels is bypassed and that all bypassed channels are alarmed in the MCR.

This ITAAC is completed as a combination of:

- Factory Acceptance Test – functional testing of PMS to ensure two-out-of-four initiation logic reverts to a two-out-of-three coincidence logic if one of the four channels is bypassed and that all bypassed channels are alarmed in the MCR.
- Site software installation and regression test – Hardware and software integration verification and testing of post system delivery changes
- Pre-operational Test – functional testing of PMS to ensure that an alarm is received in the MCR when a channel is bypassed.

The Factory Acceptance Testing (FAT) follows the guidance of NEI 08-01 Section 9.4 (Reference 49) for the as-built tests to be performed at other than the final installed location. The FAT was performed in accordance with PMS Software Program Manual WCAP-16096 (Reference 1), PMS Test Plan APP-PMS-T5-001 (Reference 2), and applicable Codes and Standards described in Vogtle 3 and 4 UFSAR Chapter 7 (Reference 48).

The FAT included testing of PMS inputs and outputs, logic, and functionality. During this test, the initial condition for the test scenarios was established and confirmed that PMS two-out-of-four initiation logic reverts to a two-out-of-three coincidence logic if one of the four channels is bypassed. During the test, one of the four PMS channels was taken to bypass, PMS logic was monitored, and it was confirmed that the change in logic works as designed. This testing was performed in accordance with FAT Test Procedures APP-PMS-T1P-026 (Reference 37). The results of the testing are documented in the FAT test reports SV0/SV3/SV4-PMS-T2R-026 (References 38 through 40). Attachment I provides a listing of test cases used to test the PMS initiation logic and channel bypass logic.

Additional hardware and software installation and associated inspections and testing are performed on-site to verify that the cabinets are intact and functional in accordance with Units 3 and 4 for applicable Field Change Notifications (FCNs) AP1000 Vogtle Unit 3 PMS Initial Software Installation - Software Release 8.7.0.1 and AP1000 Vogtle Unit 4 PMS Initial Software Installation - Software Release X.X.X.X (References 15 and 16). References 15 and 16 include steps that confirm and document successful software load and further confirm the physical properties of the as-built PMS. A regression analysis (i.e., change evaluation) is performed post-delivery and installation for hardware changes (References 17 and 18) and software changes (Reference 19) to determine if additional testing is needed for the as-built system.

Testing of bypass alarms in the MCR is performed in accordance with pre-operational tests 3/4-PMS-ITPP-521 (References 41 and 42). Each PMS division is individually placed in partial bypass at the Maintenance and Test Panel (MTP) and the bypassed channel alarms are verified in the MCR. The completed Unit 3 and Unit 4 test procedures confirm that each RTCB trip status is changed after actuation of the manual reactor trip fixed position controls.

The completed Unit 3 and Unit 4 FAT test reports (References 38 through 40), FCNs (References 15 and 16), regression test results (References 17 through 19), and completed preoperational test results (References 41 and 42), confirm that the PMS two-out-of-four initiation logic reverts to a two-out-of-three coincidence logic if one of the four channels is bypassed and that all bypassed channels are alarmed in the MCR.

References 38 through 40, 15 through 19, 41, and 42 are available for NRC inspection as part of the ITAAC 2.5.02.06a.ii Unit 3 and 4 Completion Packages (References 46 and 47).

The redundant channel cannot be placed in bypass.

An operational test of the as-built PMS is performed by attempting to place a redundant channel in bypass with one channel in bypass to verify the redundant channel cannot be placed in bypass.

This ITAAC is completed as a combination of:

- Factory Acceptance Test – functional testing of PMS to ensure redundant channels cannot be placed in bypass with one channel in bypass
- Site software installation and regression test – Hardware and software integration verification and testing of post system delivery changes

The Factory Acceptance Testing (FAT) follows the guidance of NEI 08-01 Section 9.4 (Reference 49) for the as-built tests to be performed at other than the final installed location. The FAT was performed in accordance with PMS Software Program Manual WCAP-16096 (Reference 1), PMS Test Plan APP-PMS-T5-001 (Reference 2), and applicable Codes and Standards described in Vogtle 3 and 4 UFSAR Chapter 7 (Reference 48).

The FAT included testing of PMS inputs and outputs, logic, and functionality. During this test, the initial condition for the test scenarios was established and confirmed that with one channel of PMS in bypass, the redundant channel cannot be placed in bypass. During the test, one of the four PMS channels was taken to bypass, an attempt to place a redundant channel in bypass was made, and it was confirmed that the redundant channel cannot be placed in bypass. This testing was performed in accordance with FAT Test Procedure APP-PMS-T1P-026 (Reference 37). The results of the testing are documented in the FAT test reports SV0/SV3/SV4-PMS-T2R-026 (References 38 through 40). Attachment I provides a listing of test cases used to test that a redundant PMS channel cannot be placed in bypass.

Additional hardware and software installation and associated inspections and testing are performed on-site to verify that the cabinets are intact and functional in accordance with Units 3 and 4 for applicable Field Change Notifications (FCNs) AP1000 Vogtle Unit 3 PMS Initial Software Installation - Software Release 8.7.0.1 and AP1000 Vogtle Unit 4 PMS Initial Software Installation - Software Release X.X.X.X (References 15 and 16). References 15 and 16 include steps that confirm and document successful software load and further confirm the physical properties of the as-built PMS. A regression analysis (i.e., change evaluation) is performed post-delivery and installation for hardware changes (References 17 and 18) and software changes (Reference 19) to determine if additional testing is needed for the as-built system.

The completed Unit 3 and Unit 4 FAT test reports (References 38 through 40), FCNs (References 15 and 16), and regression test results (References 17 through 19) confirm that with one PMS channel in bypass, the redundant channel cannot be placed in bypass.

References 38 through 40 and 15 through 19 are available for NRC inspection as part of the ITAAC 2.5.02.06a.ii Unit 3 and 4 Completion Packages (References 46 and 47).

List of ITAAC Findings

In accordance with plant procedures for ITAAC completion, Southern Nuclear Operating Company (SNC) performed a review of all findings pertaining to the subject ITAAC and associated corrective actions. This review found there are no relevant ITAAC findings associated with this ITAAC.

References (available for NRC inspection)

1. WCAP-16096 "Software Program Manual for Common Q Systems" Revision 4A
2. APP-PMS-T5-001, Rev. 5, "AP1000 Protection and Safety Monitoring System Test Plan"
3. APP-PMS-T1P-007, "AP1000 Protection and Safety Monitoring System – Reactor Trip Channel Integration Test Procedure"
4. APP-PMS-T1P-035, "AP1000 Protection and Safety Monitoring System Display Calibration Data Test Procedure"
5. SV3-PMS-T2R-007, "Vogtle Unit 3 AP1000 Protection and Safety Monitoring System Display Calibration Data Test Report"
6. SV4-PMS-T2R-007, "Vogtle Unit 4 AP1000 Protection and Safety Monitoring System Display Calibration Data Test Report"
7. SV0-PMS-T2R-007, "AP1000 Protection and Safety Monitoring System Display Calibration Data Test Report"
8. SV3-PMS-T2R-035, "Vogtle Unit 3 AP1000 Protection and Safety Monitoring System – Reactor Trip Channel Integration Test Report"
9. SV4-PMS-T2R-035, "Vogtle Unit 4 AP1000 Protection and Safety Monitoring System – Reactor Trip Channel Integration Test Report"
10. SV0-PMS-T2R-035, "AP1000 Protection and Safety Monitoring System – Reactor Trip Channel Integration Test Report"
11. APP-PMS-T1P-012, "AP1000 Protection and Safety Monitoring System – System Integration Test for Time Response Test Procedure"
12. SV3-PMS-T2R-012, "Vogtle Unit 3 AP1000 Protection and Safety Monitoring System – System Integration Test for Time Response Test Report"
13. SV4-PMS-T2R-012, "Vogtle Unit 4 AP1000 Protection and Safety Monitoring System – System Integration Test for Time Response Test Report"
14. SV0-PMS-T2R-012, "AP1000 Protection and Safety Monitoring System – System Integration Test for Time Response Test Report"
15. SV3-GW-GCW-300, Field Change Notice "AP1000 Vogtle Unit 3 PMS Initial Software Installation - Software Release 8.7.0.1" (WO SCNXXXXXX)
16. SV4-GW-GCW-XXX, Field Change Notice "AP1000 Vogtle Unit 4 PMS Initial Software Installation - Software Release 8.7.0.1" (WO SCNYYYYYY)

17. GIC-AP1000-HEDS-19-001, Rev. 0 "Regression Testing Analysis for Vogtle Unit 3 Protection and Safety Monitoring System (PMS) Baseline 8.2 to 8.4 Hardware Modifications Performed at Site"
18. GIC-AP1000-HEDS-YY-XXX, Rev. X "Regression Testing Analysis for Vogtle Unit 4 Protection and Safety Monitoring System (PMS) Baseline X.X to X.X Hardware Modifications Performed at Site" (YY-XXX is the Year-Letter #)
19. SV0-PMS-T2R-050, "AP1000 Protection and Safety Monitoring System Channel Integration Test Integrated System Validation Test Report"
20. APP-PMS-T1P-008, "AP1000 Protection and Safety Monitoring System – System-Level Engineered Safety Features Channel Integration Test Procedure"
21. APP-PMS-T1P-009, "AP1000 Protection and Safety Monitoring System – Integrated Logic Processor Component Logic Channel Integration Test Procedure"
22. SV3-PMS-T2R-008, "Vogtle Unit 3 AP1000 Protection and Safety Monitoring System – System-Level Engineered Safety Features Channel Integration Test Report"
23. SV4-PMS-T2R-008, "Vogtle Unit 4 AP1000 Protection and Safety Monitoring System – System-Level Engineered Safety Features Channel Integration Test Report"
24. SV0- PMS-T2R-008, "AP1000 Protection and Safety Monitoring System – System-Level Engineered Safety Features Channel Integration Test Report"
25. SV3-PMS-T2R-009, "Vogtle Unit 3 AP1000 Protection and Safety Monitoring System – Integrated Logic Processor Component Logic Channel Integration Test Report"
26. SV4-PMS-T2R-009, "Vogtle Unit 4 AP1000 Protection and Safety Monitoring System – Integrated Logic Processor Component Logic Channel Integration Test Report"
27. APP-PMS-T2R-009, "AP1000 Protection and Safety Monitoring System – Integrated Logic Processor Component Logic Channel Integration Test Report"
28. SNCXXXXXX
29. SNCYYYYYY
30. B-GEN-ITPCI-006, "Main Control Room & Remote Shutdown Room"
31. 3-PMS-ITPP-504, "PMS REACTOR TRIP BREAKERS"
32. 4-PMS-ITPP-504, "PMS REACTOR TRIP BREAKERS"
33. SNC921600, "Perform ITAAC 2.5.02.06a.ii, Item 8.a.i"
34. SNCZZZZZZ
35. SNCAAAAAA
36. SNCBBBBBB
37. APP-PMS-T1P-026, "AP1000 Protection and Safety Monitoring System Display Partial Actuate / Partial Bypass Test Procedure"
38. SV0-PMS-T2R-026, "AP1000 Protection and Safety Monitoring System Display Partial Actuate / Partial Bypass Test Report"
39. SV3-PMS-T2R-026, "Vogtle Unit 3AP1000 Protection and Safety Monitoring System Display Partial Actuate / Partial Bypass Test Report"
40. SV4-PMS-T2R-026, "Vogtle Unit 4 AP1000 Protection and Safety Monitoring System Display Partial Actuate / Partial Bypass Test Report"
41. 3-PMS-ITPP-521, "Protection and Safety Monitoring System Logic Test Preoperational Test Procedure"

- 42. 4-PMS-ITPP-521, "Protection and Safety Monitoring System Logic Test Preoperational Test Procedure"
- 43. B-GEN-ITPCI-039, "PMS CIM Component Test Procedure"
- 44. 3-PMS-OTS-17-012, "ADS & IRWST Injection Block and Squib Valve Testing"
- 45. 4-PMS-OTS-17-012, "ADS & IRWST Injection Block and Squib Valve Testing"
- 46. 2.5.02.06a.ii -U3-CP-Rev 0 "U3 ITAAC 2.5.02.06a.ii Completion Package"
- 47. 2.5.02.06a.ii -U4-CP-Rev 0 "U4 ITAAC 2.5.02.06a.ii Completion Package"
- 48. Vogtle Electric Generating Plant (VEGP) Units 3 and 4 Updated Final Safety Analysis Report (UFSAR)
- 49. NEI 08-01, "Industry Guideline for the ITAAC Closure Process Under 10 CFR Part 52"

Attachment A

**Excerpt from COL Appendix C Table 2.5.2-2
Automatic Reactor Trip Testing (SV0/SV3/SV4-PMS-T2R-007)**

Reactor Trip	Div A Test Case	Div B Test Case	Div C Test Case	Div D Test Case
Source Range High Neutron Flux Reactor Trip	TPS01A-01.1	TPS01B-01.1	TPS01C-01.1	TPS01D-01.1
Intermediate Range High Neutron Flux Reactor Trip	TPS01A-02.1	TPS01B-02.1	TPS01C-02.1	TPS01D-02.1
Power Range High Neutron Flux (Low Setpoint) Trip	TPS01A-03.1	TPS01B-03.1	TPS01C-03.1	TPS01D-03.1
Power Range High Neutron Flux (High Setpoint) Trip	TPS01A-04.1	TPS01B-04.1	TPS01C-04.1	TPS01D-04.1
Power Range High Positive Flux Rate Trip	TPS01A-05.1	TPS01B-05.1	TPS01C-05.1	TPS01D-05.1
Reactor Coolant Pump High-2 Bearing Water Temperature Trip RCP1A	TPS01A-12.1	TPS01B-12.1	TPS01C-12.1	TPS01D-12.1
Reactor Coolant Pump High-2 Bearing Water Temperature Trip RCP1B	TPS01A-12.2	TPS01B-12.2	TPS01C-12.2	TPS01D-12.2
Reactor Coolant Pump High-2 Bearing Water Temperature Trip RCP2A	TPS01A-12.3	TPS01B-12.3	TPS01C-12.3	TPS01D-12.3
Reactor Coolant Pump High-2 Bearing Water Temperature Trip RCP2B	TPS01A-12.4	TPS01B-12.4	TPS01C-12.4	TPS01D-12.4
Overtemperature Delta-T Trip	TPS01A-07.1	TPS01B-07.1	TPS01C-07.1	TPS01D-07.1
Overtemperature Delta-T Trip	TPS01A-07.2	TPS01B-07.2	TPS01C-07.2	TPS01D-07.2
Overpower Delta-T Trip	TPS01A-08.1	TPS01B-08.1	TPS01C-08.1	TPS01D-08.1
Pressurizer Low-2 Pressure Trip	TPS01A-09.1	TPS01B-09.1	TPS01C-09.1	TPS01D-09.1
Pressurizer High-2 Pressure Trip	TPS01A-13.1	TPS01B-13.1	TPS01C-13.1	TPS01D-13.1
Pressurizer High-3 Water Level Trip	TPS01A-14.1	TPS01B-14.1	TPS01C-14.1	TPS01D-14.1
Low-2 Reactor Coolant Flow Trip HL 1	TPS01A-10.1	TPS01B-10.1	TPS01C-10.1	TPS01D-10.1
Low-2 Reactor Coolant Flow Trip HL 2	TPS01A-10.2	TPS01B-10.2	TPS01C-10.2	TPS01D-10.2
Low-2 Reactor Coolant Pump Speed Trip	TPS01A-11.1	TPS01B-11.1	TPS01C-11.1	TPS01D-11.1
Low-2 Steam Generator Narrow Range Water Level Trip SG1	TPS01A-15.1	TPS01B-15.1	TPS01C-15.1	TPS01D-15.1
Low-2 Steam Generator Narrow Range Water Level Trip SG2	TPS01A-16.1	TPS01B-16.1	TPS01C-16.1	TPS01D-16.1
High-3 Steam Generator Water Level Trip SG1	TPS01A-17.1	TPS01B-17.1	TPS01C-17.1	TPS01D-17.1
High-3 Steam Generator Water Level Trip SG2	TPS01A-18.1	TPS01B-18.1	TPS01C-18.1	TPS01D-18.1
Automatic or Manual Safeguards Actuation Trip	TPS01A-19.1	TPS01B-19.1	TPS01C-19.1	TPS01D-19.1
Automatic or Manual Depressurization System Actuation Trip	TPS01A-20.1	TPS01B-20.1	TPS01C-20.1	TPS01D-20.1
Automatic or Manual Core Makeup Tank (CMT) Injection Trip	TPS01A-21.1	TPS01B-21.1	TPS01C-21.1	TPS01D-21.1
Passive Residual Heat Removal (PRHR) Actuation Reactor Trip	TPS01A-06.1	TPS01B-06.1	TPS01C-06.1	TPS01D-06.1

Attachment B

**Excerpt from COL Appendix C Table 2.5.2-3*
Bistable & Coincident Logic Testing (SV0/SV3/SV4-PMS-T2R-008)**

Engineered Safety Function*	Div A Test Case	Div B Test Case	Div C Test Case	Div D Test Case
Safeguards Actuation	TPS02A-01.1	TPS02B-01.1	TPS02C-01.1	TPS02D-01.1
	TPS02A-01.3	TPS02B-01.3	TPS02C-01.3	TPS02D-01.3
	TPS02A-01.4	TPS02B-01.4	TPS02C-01.4	TPS02D-01.4
	TPS02A-01.5	TPS02B-01.5	TPS02C-01.5	TPS02D-01.5
	TPS02A-01.6	TPS02B-01.6	TPS02C-01.6	TPS02D-01.6
	TPS02A-01.7	TPS02B-01.7	TPS02C-01.7	TPS02D-01.7
Containment Isolation	TPS02A-02	TPS02B-02	TPS02C-02	TPS02D-02
Automatic Depressurization System (ADS) Actuation	TPS02A-05.2	TPS02B-05.2	TPS02C-05.2	TPS02D-05.2
	TPS02A-05.3	TPS02B-05.3	TPS02C-05.3	TPS02D-05.3
	TPS02A-05.4	TPS02B-05.4	TPS02C-05.4	TPS02D-05.4
	TPS02A-05.5	TPS02B-05.5	TPS02C-05.5	TPS02D-05.5
	TPS02A-05.6	TPS02B-05.6	TPS02C-05.6	TPS02D-05.6
Main Feedwater Isolation	N/A	TPS02B-07.1	N/A	TPS02D-07.1
	TPS02A-07.2	TPS02B-07.2	TPS02C-07.2	TPS02D-07.2
	N/A	N/A	N/A	TPS02D-07.3
Reactor Coolant Pump Trip - See FAT SV0/SV3/SV4-PMS-T2R-007 for additional RCP Trip Test Cases	TPS02A-06	TPS02B-06	TPS02C-06	TPS02D-06
CMT Injection - See FAT SV0/SV3/SV4-PMS-T2R-012 for additional CMT Injection Test Cases	TPS02A-04.1	TPS02B-04.1	TPS02C-04.1	TPS02D-04.1
	TPS02A-04.2	TPS02B-04.2	TPS02C-04.2	TPS02D-04.2
	TPS02A-04.3	TPS02B-04.3	TPS02C-04.3	TPS02D-04.3
Turbine Trip (Isolated signal to non-safety equipment)	TPS02A-09.1	TPS02B-09.1	TPS02C-09.1	TPS02D-09.1
	TPS02A-09.2	TPS02B-09.2	TPS02C-09.2	TPS02D-09.2
	TPS02A-28	TPS02B-28	TPS02C-28	TPS02D-28
Steam Line Isolation	N/A	TPS02B-11.1	N/A	TPS02D-11.1
	TPS02A-11	TPS02B-11.2	TPS02C-11	TPS02D-11.2
	N/A	TPS02B-11.3	N/A	TPS02D-11.3
	N/A	TPS02B-11.4	N/A	TPS02D-11.4
	TPS02A-01.4	TPS02B-01.4	TPS02C-01.4	TPS02D-01.4
	TPS02A-01.5	TPS02B-01.5	TPS02C-01.5	TPS02D-01.5
Steam Generator Relief Isolation	N/A	TPS02B-25.1	N/A	TPS02D-25.1
	N/A	TPS02B-25.2	N/A	TPS02D-25.2
Steam Generator Blowdown Isolation	N/A	TPS02B-12.1	N/A	TPS02D-12.1
	N/A	TPS02B-12.2	N/A	TPS02D-12.2
Passive Containment Cooling Actuation	TPS02A-13	TPS02B-13	TPS02C-13	N/A
Startup Feedwater Isolation	N/A	TPS02B-14.1	N/A	TPS02D-14.1
	N/A	TPS02B-14.2	N/A	TPS02D-14.2
	N/A	TPS02B-14.3	N/A	TPS02D-14.3

Attachment B (cont.)

**Excerpt from COL Appendix C Table 2.5.2-3*
Bistable & Coincident Logic Testing (SV0/SV3/SV4-PMS-T2R-008) (cont.)**

Engineered Safety Function*	Div A Test Case	Div B Test Case	Div C Test Case	Div D Test Case
Passive Residual Heat Removal (PRHR) Heat Exchanger Alignment	TPS02A-04.1	TPS02B-04.1	TPS02C-04.1	TPS02D-04.1
	TPS02A-08.1	TPS02B-08.1	N/A	TPS02D-08.1
	TPS02A-08.2	TPS02B-08.2	TPS02C-08.2	TPS02D-08.2
	TPS02A-08.3	TPS02B-08.3	N/A	TPS02D-08.3
	TPS02A-08.4	TPS02B-08.4	TPS02C-08.4	TPS02D-08.4
Block of Boron Dilution	TPS02A-15.1	TPS02B-15	TPS02C-15.1	TPS02D-15.1
	TPS02A-15.2	N/A	TPS02C-15.2	TPS02D-15.2
Chemical and Volume Control System (CVS) Makeup Line Isolation	TPS02A-16.1	TPS02B-16	TPS02C-16.1	TPS02D-16.1
	TPS02A-16.2	N/A	TPS02C-16.2	TPS02D-16.2
	TPS02A-16.3	N/A	N/A	N/A
Steam Dump Block (Isolated signal to non-safety equipment)	N/A	TPS02B-11.1	N/A	TPS02D-11.1
	N/A	TPS02B-17.1	N/A	TPS02D-17.1
	N/A	TPS02B-17.2	N/A	TPS02D-17.2
	N/A	TPS02B-17.3	N/A	TPS02D-17.3
Main Control Room Isolation, Air Supply Initiation, and Electrical Load De-energization - See FAT SV0-PMS-T2R-008 for additional MCR Isolation, Air Supply Initiation, and Electrical Load De-energization for test cases	TPS02A-18.1	TPS02B-18.1	TPS02C-18.1	N/A
	TPS02A-18.2	TPS02B-18.2	TPS02C-18.2	N/A
	TPS02A-18.3	TPS02B-18.3	TPS02C-18.3	N/A
Auxiliary Spray and Purification Line and Zinc/Hydrogen Addition Isolation	TPS02A-19	TPS02B-19	TPS02C-19	TPS02D-19
Containment Air Filtration System Isolation	TPS02A-20	TPS02B-20	TPS02C-20	TPS02D-20
Normal Residual Heat Removal Isolation	TPS02A-21.1	TPS02B-21.1	N/A	TPS02D-21.1
	TPS02A-21.2	TPS02B-21.2	N/A	N/A
Refueling Cavity and Spent Fuel Pool Cooling System (SFS) Isolation - See FAT SV0/SV3/SV4-PMS-T2R-008 for additional Refueling Cavity and Spent Fuel Pool Cooling System (SFS) Isolation test cases	TPS02A-22	TPS02B-22	TPS02C-22	N/A
In-Containment Refueling Water Storage Tank (IRWST) Injection	TPS02A-03	TPS02B-03	TPS02C-03	TPS02D-03
IRWST Containment Recirculation	TPS02A-10.1	TPS02B-10.1	TPS02C-10.1	TPS02D-10.1
	TPS02A-10.2	TPS02B-10.2	TPS02C-10.2	TPS02D-10.2

Attachment B (cont.)

**Excerpt from COL Appendix C Table 2.5.2-3*
Bistable & Coincident Logic Testing (SV0/SV3/SV4-PMS-T2R-008) (cont.)**

Engineered Safety Function*	Div A Test Case	Div B Test Case	Div C Test Case	Div D Test Case
CVS Letdown Isolation	TPS02A-23	TPS02B-23	TPS02C-23	TPS02D-23
Pressurizer Heater Block (Isolated signal to non-safety equipment)	TPS02A-04.1	N/A	N/A	N/A
	TPS02A-08.2	N/A	N/A	N/A
Containment Vacuum Relief	TPS02A-27	N/A	TPS02C-27	N/A
Component Cooling System Containment Isolation Valve Closure	TPS02A-01.1	TPS02B-01.1	TPS02C-01.1	TPS02D-01.1
	TPS02A-01.3	TPS02B-01.3	TPS02C-01.3	TPS02D-01.3
	TPS02A-01.4	TPS02B-01.4	TPS02C-01.4	TPS02D-01.4
	TPS02A-01.5	TPS02B-01.5	TPS02C-01.5	TPS02D-01.5
	TPS02A-01.6	TPS02B-01.6	TPS02C-01.6	TPS02D-01.6
	TPS02A-01.7	TPS02B-01.7	TPS02C-01.7	TPS02D-01.7
	TPS02A-06	TPS02B-06	TPS02C-06	TPS02D-06

**Excerpt from COL Appendix C Table 2.5.2-3*
Bistable & Coincident Logic Testing (SV0/SV3/SV4-PMS-T2R-007)**

Engineered Safety Function*	Div A Test Case	Div B Test Case	Div C Test Case	Div D Test Case
Reactor Coolant Pump Trip - Additional RCP Trip Test Cases	TPS01A-12.1	TPS01B-12.1	TPS01C-12.1	TPS01D-12.1
	TPS01A-12.2	TPS01B-12.2	TPS01C-12.2	TPS01D-12.2
	TPS01A-12.3	TPS01B-12.3	TPS01C-12.3	TPS01D-12.3
	TPS01A-12.4	TPS01B-12.4	TPS01C-12.4	TPS01D-12.4

**Excerpt from COL Appendix C Table 2.5.2-3*
Bistable & Coincident Logic Testing (SV0/SV3/SV4-PMS-T2R-012)**

Engineered Safety Function*	Div A Test Case	Div B Test Case	Div C Test Case	Div D Test Case
CMT Injection	TPS12-ESF_ AUTO-A1	TPS12-ESF_ AUTO-B1	TPS12-ESF_ AUTO-C1	TPS12-ESF_ AUTO-D1

**Excerpt from COL Appendix C Table 2.5.2-3*
Bistable & Coincident Logic Testing (SV0-PMS-T2R-008)**

Engineered Safety Function*	Div A Test Case	Div B Test Case	Div C Test Case	Div D Test Case
Main Control Room Isolation, Air Supply Initiation, and Electrical Load De-energization	TPS02A-18.4	TPS02B-18.4	TPS02C-18.4	N/A
Refueling Cavity and Spent Fuel Pool Cooling System (SFS) Isolation	TPS02A-22.2	TPS02B-22.2	TPS02C-22.2	TPS02D-22.2

Attachment C

Excerpt from COL Appendix C Table 2.5.2-3*
Component Interface Module (CIM) Output Testing (APP/SV3/SV4-PMS-T2R-009)

Engineered Safety Function*	Test Cases
Safeguards Actuation - Actuates the following Engineered Safety Functions sections: <ul style="list-style-type: none"> o Containment Isolation o Main Feedwater Isolation o Chemical and Volume Control System (CVS) Makeup Line Isolation o Normal Residual Heat Removal Isolation o CMT Injection o Component Cooling System Containment Isolation Valve Closure 	Test cases associated with Safeguards Actuation included in the sections noted.
Containment Isolation	TPS03A-01.8
	TPS03A-01.9
	TPS03A-01.10
	TPS03A-01.11
	TPS03A-01.12
	TPS03A-01.14
	TPS03A-01.15
	TPS03A-01.16
	TPS03A-01.17
	TPS03A-01.26
	TPS03A-01.27
	TPS03A-01.33
	TPS03B-01.5
	TPS03B-01.8
	TPS03B-01.9
	TPS03B-01.17
	TPS03B-01.25
	TPS03B-01.26
	TPS03B-01.27
	TPS03C-01.3
	TPS03C-01.22
	TPS03D-01.2
	TPS03D-01.6
	TPS03D-01.7
	TPS03D-01.8
	TPS03D-01.9
	TPS03D-01.10
	TPS03D-01.11
	TPS03D-01.12
	TPS03D-01.14
	TPS03D-01.15
	TPS03D-01.16
	TPS03D-01.17
	TPS03D-01.19

Attachment C (cont.)

**Excerpt from COL Appendix C Table 2.5.2-3*
Component Interface Module (CIM) Output Testing (APP/SV3/SV4-PMS-T2R-009) (cont.)**

Engineered Safety Function*	Test Cases
Automatic Depressurization System (ADS) Actuation - In addition, actuates CMT Injection, Passive Residual Heat Removal (PRHR) Heat Exchanger Alignment, and In-Containment Refueling Water Storage Tank (IRWST) Injection. Test cases associated with CMT Injection, Passive Residual Heat Removal (PRHR) Heat Exchanger Alignment, and In-Containment Refueling Water Storage Tank (IRWST) Injection included in those sections.	TPS03A-01.28
	TPS03A-01.29
	TPS03A-01.31
	TPS03A-01.32
	TPS03A-01.34
	TPS03A-01.39
	TPS03A-01.40
	TPS03A-01.41
	TPS03A-01.42
	TPS03B-01.11
	TPS03B-01.18
	TPS03B-01.19
	TPS03B-01.44
	TPS03B-01.45
	TPS03B-01.46
	TPS03B-01.47
	TPS03B-01.48
	TPS03B-01.49
	TPS03B-01.50
	TPS03C-01.12
	TPS03C-01.20
	TPS03C-01.25
	TPS03C-01.26
	TPS03C-01.27
	TPS03D-01.32
	TPS03D-01.39
	TPS03D-01.42
	TPS03D-01.43
	TPS03D-01.48
Main Feedwater Isolation	TPS03B-01.40
	TPS03B-01.41
	TPS03B-01.42
	TPS03B-01.43
	TPS03D-01.21
	TPS03D-01.22
	TPS03D-01.28
	TPS03D-01.29
	TPS03D-01.30
	TPS03D-01.31
	TPS03D-01.58
	TPS03D-01.59
	TPS03D-01.60

Attachment C (cont.)

Excerpt from COL Appendix C Table 2.5.2-3*
Component Interface Module (CIM) Output Testing (APP/SV3/SV4-PMS-T2R-009) (cont.)

Engineered Safety Function*	Test Cases
Reactor Coolant Pump Trip	TPS03A-07.3
	TPS03B-01.20
	TPS03B-01.21
	TPS03B-01.22
	TPS03B-01.23
	TPS03C-01.8
	TPS03C-01.9
	TPS03C-01.10
	TPS03C-01.11
	TPS03D-07.6
	TPS03D-07.7
CMT Injection - In addition, actuates Passive Residual Heat Removal (PRHR) Heat Exchanger Alignment, CVS Letdown Isolation, and Pressurizer Heater Block (Isolated signal to nonsafety equipment). Test cases associated with Passive Residual Heat Removal (PRHR) Heat Exchanger Alignment, CVS Letdown Isolation, and Pressurizer Heater Block (Isolated signal to nonsafety equipment) included in those sections.	TPS03A-01.6
	TPS03B-01.2
	TPS03C-01.2
	TPS03C-07.3
	TPS03D-01.1
	TPS03D-07.2
Steam Line Isolation - In addition, actuates Steam Dump Block (Isolated signal to non-safety equipment). Test cases associated with Steam Dump Block (Isolated signal to non-safety equipment) included in that section.	TPS03B-01.33
	TPS03B-01.34
	TPS03B-01.36
	TPS03B-01.37
	TPS03B-01.38
	TPS03B-01.39
	TPS03B-01.6
	TPS03B-01.7
	TPS03D-01.24
	TPS03D-01.25
	TPS03D-01.26
	TPS03D-01.27
	TPS03D-01.4
	TPS03D-01.5
	TPS03D-01.44
	TPS03D-01.45
	TPS03D-01.55
	TPS03D-01.56
Steam Generator Relief Isolation	TPS03B-01.14
	TPS03B-01.31
	TPS03D-01.20
	TPS03D-01.35
Steam Generator Blowdown Isolation	TPS03B-01.4
	TPS03B-01.5
	TPS03D-01.2
	TPS03D-01.3

Attachment C (cont.)
Excerpt from COL Appendix C Table 2.5.2-3*

Component Interface Module (CIM) Output Testing (APP/SV3/SV4-PMS-T2R-009) (cont.)

Engineered Safety Function*	Test Cases
Passive Containment Cooling Actuation	TPS03A-01.7
	TPS03A-07.16
	TPS03B-01.3
	TPS03B-07.2
	TPS03C-07.10
	TPS03C-07.2
Startup Feedwater Isolation	TPS03B-01.15
	TPS03B-01.32
	TPS03D-01.23
	TPS03D-01.36
	TPS03D-01.61
	TPS03D-01.62
Passive Residual Heat Removal (PRHR) Heat Exchanger Alignment - In addition, actuates Steam Generator Blowdown Isolation. Test cases associated with Steam Generator Blowdown Isolation included in that section.	TPS03A-01.19
	TPS03A-07.17
	TPS03B-01.4
	TPS03B-01.5
	TPS03B-01.10
	TPS03B-01.35
	TPS03D-01.2
	TPS03D-01.3
Block of Boron Dilution	TPS03D-01.13
	TPS03A-01.13
Chemical and Volume Control System (CVS) Makeup Line Isolation	TPS03C-01.5
	TPS03A-01.21
Steam Dump Block (Isolated signal to non-safety equipment)	TPS03D-07.3
	TPS03B-01.51
	TPS03B-01.52
	TPS03B-01.53
	TPS03B-01.54
	TPS03B-01.55
	TPS03B-01.56
	TPS03D-01.49
	TPS03D-01.50
	TPS03D-01.51
	TPS03D-01.52
	TPS03D-01.53
	TPS03D-01.54
Main Control Room Isolation, Air Supply Initiation, and Electrical Load De-energization	TPS03A-01.23
	TPS03A-01.24
	TPS03A-01.25
	TPS03B-01.1
	TPS03B-01.16
	TPS03C-01.1
	TPS03C-01.15
	TPS03C-01.16

Attachment C (cont.)
Excerpt from COL Appendix C Table 2.5.2-3*

Component Interface Module (CIM) Output Testing (APP/SV3/SV4-PMS-T2R-009) (cont.)

Engineered Safety Function*	Test Cases
Main Control Room Isolation, Air Supply Initiation, and Electrical Load De-energization (cont.)	TPS03C-01.17
	TPS03C-01.18
	TPS03C-01.6
Auxiliary Spray and Purification Line and Zinc/Hydrogen Addition Isolation	TPS03A-01.12
	TPS03A-07.11
	TPS03A-07.20
	TPS03C-01.4
	TPS03C-07.8
	TPS03D-01.7
	TPS03D-01.12
Containment Air Filtration System Isolation	TPS03A-01.14
	TPS03A-01.15
	TPS03A-01.33
	TPS03C-01.22
	TPS03D-01.14
	TPS03D-01.16
Normal Residual Heat Removal Isolation	TPS03A-01.28
	TPS03A-01.29
	TPS03B-01.46
	TPS03B-01.47
	TPS03B-01.50
	TPS03B-01.9
	TPS03D-01.46
	TPS03D-01.47
Refueling Cavity and Spent Fuel Pool Cooling System (SFS) Isolation	TPS03A-01.26
	TPS03A-01.27
	TPS03B-07.7
In-Containment Refueling Water Storage Tank (IRWST) Injection	TPS03A-01.38
	TPS03B-01.30
	TPS03C-01.24
	TPS03D-01.41
IRWST Containment Recirculation	TPS03A-01.20
	TPS03A-01.37
	TPS03B-01.29
	TPS03B-07.3
	TPS03C-01.23
	TPS03D-01.40
CVS Letdown Isolation	TPS03A-01.17
	TPS03D-01.19
Pressurizer Heater Block (Isolated signal to non-safety equipment)	TPS03A-01.1
	TPS03A-01.2
	TPS03A-01.3
	TPS03A-01.4
	TPS03A-01.5

Attachment C (cont.)

Excerpt from COL Appendix C Table 2.5.2-3*

Component Interface Module (CIM) Output Testing (APP/SV3/SV4-PMS-T2R-009) (cont.)

Engineered Safety Function*	Test Cases
Containment Vacuum Relief	TPS03A-01.33
	TPS03C-01.22
Component Cooling System Containment Isolation Valve Closure	TPS03B-01.8
	TPS03D-01.10
	TPS03D-01.9

Attachment D

Excerpt from COL Appendix C Table 2.5.2-4*
Component Interface Module (CIM) Output Testing (SV0/SV3/SV4-PMS-T2R-007)

Switch Description*	Tag	Div A Test Cases	Div B Test Cases	Div C Test Cases	Div D Test Cases
Manual Safeguards Actuation	PMS-HS033	TPS01A-19.1	TPS01B-19.1	TPS01C-19.1	TPS01D-19.1
Manual Safeguards Actuation	PMS-HS034	TPS01A-19.1	TPS01B-19.1	TPS01C-19.1	TPS01D-19.1

Excerpt from COL Appendix C Table 2.5.2-4*
PMS Manually Actuated Function Testing (SV0/SV3/SV4-PMS-T2R-008)

Switch Description*	Tag	Div A Test Cases	Div B Test Cases	Div C Test Cases	Div D Test Cases
Containment Isolation	PMS-HS027	TPS02A-02	TPS02B-02	TPS02C-02	TPS02D-02
Containment Isolation	PMS-HS028	TPS02A-02	TPS02B-02	TPS02C-02	TPS02D-02
Depressurization System Stages 1, 2, and 3 Actuation	PMS-HS001	TPS02A-05.1	TPS02B-05.1	TPS02C-05.1	TPS02D-05.1
Depressurization System Stages 1, 2, and 3 Actuation	PMS-HS002	TPS02A-05.1	TPS02B-05.1	TPS02C-05.1	TPS02D-05.1
Depressurization System Stages 1, 2, and 3 Actuation	PMS-HS101	TPS02A-05.1	TPS02B-05.1	TPS02C-05.1	TPS02D-05.1
Depressurization System Stages 1, 2, and 3 Actuation	PMS-HS102	TPS02A-05.1	TPS02B-05.1	TPS02C-05.1	TPS02D-05.1
Depressurization System Stage 4 Actuation	PMS-HS003	TPS02A-05.4	TPS02B-05.4	TPS02C-05.4	TPS02D-05.4
Depressurization System Stage 4 Actuation	PMS-HS004	TPS02A-05.4	TPS02B-05.4	TPS02C-05.4	TPS02D-05.4
Depressurization System Stage 4 Actuation	PMS-HS103	TPS02A-05.4	TPS02B-05.4	TPS02C-05.4	TPS02D-05.4
Depressurization System Stage 4 Actuation	PMS-HS104	TPS02A-05.4	TPS02B-05.4	TPS02C-05.4	TPS02D-05.4
Feedwater Isolation	PMS-HS031	N/A	TPS02B-07.1	N/A	TPS02D-07.1
Feedwater Isolation	PMS-HS032	N/A	TPS02B-07.1	N/A	TPS02D-07.1
Core Makeup Tank Injection Actuation	PMS-HS015	TPS02A-04.1	TPS02B-04.1	TPS02C-04.1	TPS02D-04.1
Core Makeup Tank Injection Actuation	PMS-HS016	TPS02A-04.1	TPS02B-04.1	TPS02C-04.1	TPS02D-04.1
Steam Line Isolation	PMS-HS021	N/A	TPS02B-11.1	N/A	TPS02D-11.1
Steam Line Isolation	PMS-HS022	N/A	TPS02B-11.1	N/A	TPS02D-11.1

Attachment D (cont.)
Excerpt from COL Appendix C Table 2.5.2-4*
PMS Manually Actuated Function Testing (SV0/SV3/SV4-PMS-T2R-008) (cont.)

Switch Description*	Tag	Div A Test Cases	Div B Test Cases	Div C Test Cases	Div D Test Cases
Passive Containment Cooling Actuation	PMS-HS017	TPS02A-13	TPS02B-13	TPS02C-13	N/A
Passive Containment Cooling Actuation	PMS-HS018	TPS02A-13	TPS02B-13	TPS02C-13	N/A
Passive Residual Heat Removal Heat Exchanger Alignment	PMS-HS023	TPS02A-08.1	TPS02B-08.1	N/A	TPS02D-08.1
Passive Residual Heat Removal Heat Exchanger Alignment	PMS-HS024	TPS02A-08.1	TPS02B-08.1	N/A	TPS02D-08.1
IRWST Injection	PMS-HS007	TPS02A-03	TPS02B-03	TPS02C-03	TPS02D-03
IRWST Injection	PMS-HS008	TPS02A-03	TPS02B-03	TPS02C-03	TPS02D-03
IRWST Injection	PMS-HS107	TPS02A-03	TPS02B-03	TPS02C-03	TPS02D-03
IRWST Injection	PMS-HS108	TPS02A-03	TPS02B-03	TPS02C-03	TPS02D-03
Containment Recirculation Actuation	PMS-HS005	TPS02A-10.1	TPS02B-10.1	TPS02C-10.1	TPS02D-10.1
Containment Recirculation Actuation	PMS-HS006	TPS02A-10.1	TPS02B-10.1	TPS02C-10.1	TPS02D-10.1
Containment Recirculation Actuation	PMS-HS105	TPS02A-10.1	TPS02B-10.1	TPS02C-10.1	TPS02D-10.1
Containment Recirculation Actuation	PMS-HS106	TPS02A-10.1	TPS02B-10.1	TPS02C-10.1	TPS02D-10.1
Main Control Room Isolation, Air Supply Initiation, and Electrical Load De-energization	PMS-HS019	TPS02A-18.3	TPS02B-18.3	TPS02C-18.3	N/A
Main Control Room Isolation, Air Supply Initiation, and Electrical Load De-energization	PMS-HS020	TPS02A-18.3	TPS02B-18.3	TPS02C-18.3	N/A
Steam Generator Relief Isolation	PMS-HS041	N/A	TPS02B-25.1	N/A	TPS02D-25.1
Steam Generator Relief Isolation	PMS-HS042	N/A	TPS02B-25.1	N/A	TPS02D-25.1
Chemical and Volume Control System Isolation	PMS-HS029	TPS02A-16.2	N/A	N/A	TPS02D-16.2
Chemical and Volume Control System Isolation	PMS-HS030	TPS02A-16.2	N/A	N/A	TPS02D-16.2
Normal Residual Heat Removal System Isolation	PMS-HS013	TPS02A-21.1	TPS02B-21.1	N/A	TPS02D-21.1
Normal Residual Heat Removal System Isolation	PMS-HS014	TPS02A-21.1	TPS02B-21.1	N/A	TPS02D-21.1
Normal Residual Heat Removal System Isolation	PMS-HS113	TPS02A-21.1	TPS02B-21.1	N/A	TPS02D-21.1

Attachment D (cont.)

**Excerpt from COL Appendix C Table 2.5.2-4
PMS Manually Actuated Function Testing (SV0/SV3/SV4-PMS-T2R-008) (cont.)**

Switch Description*	Tag	Div A Test Cases	Div B Test Cases	Div C Test Cases	Div D Test Cases
Normal Residual Heat Removal System Isolation	PMS-HS114	TPS02A-21.1	TPS02B-21.1	N/A	TPS02D-21.1
Containment Vacuum Relief	PMS-HS044	TPS02A-27	N/A	TPS02C-27	N/A
Containment Vacuum Relief	PMS-HS045	TPS02A-27	N/A	TPS02C-27	N/A

Attachment E

Excerpt from COL Appendix C Table 2.5.2-5*

Description*	Control*	Display*
Neutron Flux	-	Yes
Neutron Flux Doubling	-	No
Startup Rate	-	Yes
Reactor Coolant System (RCS) Pressure	-	Yes
Wide-range Hot Leg Temperature	-	Yes
Wide-range Cold Leg Temperature	-	Yes
RCS Cooldown Rate Compared to the Limit Based on RCS Pressure	-	Yes
Wide-range Cold Leg Temperature Compared to the Limit Based on RCS Pressure	-	Yes
Change of RCS Temperature by more than 5°F in the last 10 minutes	-	No
Containment Water Level	-	Yes
Containment Pressure	-	Yes
Pressurizer Water Level	-	Yes
Pressurizer Water Level Trend	-	Yes
Pressurizer Reference Leg Temperature	-	Yes
Reactor Vessel-Hot Leg Water Level	-	Yes
Pressurizer Pressure	-	Yes
Core Exit Temperature	-	Yes
RCS Subcooling	-	Yes
RCS Cold Overpressure Limit	-	Yes
IRWST Water Level	-	Yes
PRHR Flow	-	Yes
PRHR HX Outlet Temperature	-	Yes
PRHR HX Inlet Isolation and Control Valve Status		Yes
Passive Containment Cooling System (PCS) Storage Tank Water Level	-	Yes
PCS Cooling Flow	-	Yes
IRWST to Normal Residual Heat Removal System (RNS) Suction Valve Status	-	Yes
Remotely Operated Containment Isolation Valve Status (2)	-	Yes
Containment Area High-range Radiation Level	-	Yes
Containment Pressure (Extended Range)	-	Yes
CMT Level	-	Yes
Manual Reactor Trip (also initiates turbine trip)	Yes	-
Manual Safeguards Actuation	Yes	-
Manual CMT Actuation	Yes	-
Manual MCR Emergency Habitability System Actuation	Yes	-
Manual ADS Stages 1, 2, and 3 Actuation	Yes	-
Manual ADS Stage 4 Actuation	Yes	-
Manual PRHR Actuation	Yes	-
Manual Containment Cooling Actuation	Yes	-
Manual IRWST Injection Actuation	Yes	-
Manual Containment Recirculation Actuation	Yes	-
Manual Containment Isolation	Yes	-
Manual Main Steam Line Isolation	Yes	-
Manual Feedwater Isolation	Yes	-
Manual Containment Vacuum Relief	Yes	-
Manual ADS and IRWST Injection Unblock	Yes	-

Note: Dash (-) indicates not applicable.

Attachment F

Excerpt from COL Appendix C Table 2.5.2-5*

Fixed Position Controls in MCR Testing (SV0/SV3/SV4-PMS-T2R-007)					
Control*	Tag	Div A Test Cases	Div B Test Cases	Div C Test Cases	Div D Test Cases
Manual Safeguards Actuation	PMS-HS033	TPS01A-19.1	TPS01B-19.1	TPS01C-19.1	TPS01D-19.1
Manual Safeguards Actuation	PMS-HS034	TPS01A-19.1	TPS01B-19.1	TPS01C-19.1	TPS01D-19.1

Excerpt from COL Appendix C Table 2.5.2-5*

Fixed Position Controls in MCR Testing (SV0/SV3/SV4-PMS-T2R-008)

Control*	Tag	Div A Test Cases	Div B Test Cases	Div C Test Cases	Div D Test Cases
Manual CMT Actuation	PMS-HS015	TPS02A-04.1	TPS02B-04.1	TPS02C-04.1	TPS02D-04.1
Manual CMT Actuation	PMS-HS016	TPS02A-04.1	TPS02B-04.1	TPS02C-04.1	TPS02D-04.1
Manual MCR Emergency Habitability System Actuation	PMS-HS019	TPS02A-18.3	TPS02B-18.3	TPS02C-18.3	N/A
Manual MCR Emergency Habitability System Actuation	PMS-HS020	TPS02A-18.3	TPS02B-18.3	TPS02C-18.3	N/A
Manual ADS Stages 1, 2, and 3 Actuation	PMS-HS001	TPS02A-05.1	TPS02B-05.1	TPS02C-05.1	TPS02D-05.1
Manual ADS Stages 1, 2, and 3 Actuation	PMS-HS002	TPS02A-05.1	TPS02B-05.1	TPS02C-05.1	TPS02D-05.1
Manual ADS Stages 1, 2, and 3 Actuation	PMS-HS101	TPS02A-05.1	TPS02B-05.1	TPS02C-05.1	TPS02D-05.1
Manual ADS Stages 1, 2, and 3 Actuation	PMS-HS102	TPS02A-05.1	TPS02B-05.1	TPS02C-05.1	TPS02D-05.1
Manual ADS Stage 4 Actuation	PMS-HS003	TPS02A-05.4	TPS02B-05.4	TPS02C-05.4	TPS02D-05.4
Manual ADS Stage 4 Actuation	PMS-HS004	TPS02A-05.4	TPS02B-05.4	TPS02C-05.4	TPS02D-05.4
Manual ADS Stage 4 Actuation	PMS-HS103	TPS02A-05.4	TPS02B-05.4	TPS02C-05.4	TPS02D-05.4
Manual ADS Stage 4 Actuation	PMS-HS104	TPS02A-05.4	TPS02B-05.4	TPS02C-05.4	TPS02D-05.4
Manual PRHR Actuation	PMS-HS023	TPS02A-08.1	TPS02B-08.1	N/A	TPS02D-08.1
Manual PRHR Actuation	PMS-HS024	TPS02A-08.1	TPS02B-08.1	N/A	TPS02D-08.1
Manual Containment Cooling Actuation	PMS-HS017	TPS02A-13	TPS02B-13	TPS02C-13	N/A
Manual Containment Cooling Actuation	PMS-HS018	TPS02A-13	TPS02B-13	TPS02C-13	N/A
Manual IRWST Injection Actuation	PMS-HS007	TPS02A-03	TPS02B-03	TPS02C-03	TPS02D-03
Manual IRWST Injection Actuation	PMS-HS008	TPS02A-03	TPS02B-03	TPS02C-03	TPS02D-03

Attachment F (cont.)

**Excerpt from COL Appendix C Table 2.5.2-5*
Fixed Position Controls in MCR Testing (SV0/SV3/SV4-PMS-T2R-008) (cont.)**

Control*	Tag	Div A Test Cases	Div B Test Cases	Div C Test Cases	Div D Test Cases
Manual IRWST Injection Actuation	PMS-HS107	TPS02A-03	TPS02B-03	TPS02C-03	TPS02D-03
Manual IRWST Injection Actuation	PMS-HS108	TPS02A-03	TPS02B-03	TPS02C-03	TPS02D-03
Manual Containment Recirculation Actuation	PMS-HS005	TPS02A-10.1	TPS02B-10.1	TPS02C-10.1	TPS02D-10.1
Manual Containment Recirculation Actuation	PMS-HS006	TPS02A-10.1	TPS02B-10.1	TPS02C-10.1	TPS02D-10.1
Manual Containment Recirculation Actuation	PMS-HS105	TPS02A-10.1	TPS02B-10.1	TPS02C-10.1	TPS02D-10.1
Manual Containment Recirculation Actuation	PMS-HS106	TPS02A-10.1	TPS02B-10.1	TPS02C-10.1	TPS02D-10.1
Manual Containment Isolation	PMS-HS027	TPS02A-02	TPS02B-02	TPS02C-02	TPS02D-02
Manual Containment Isolation	PMS-HS028	TPS02A-02	TPS02B-02	TPS02C-02	TPS02D-02
Manual Main Steam Line Isolation	PMS-HS021	N/A	TPS02B-11.1	N/A	TPS02D-11.1
Manual Main Steam Line Isolation	PMS-HS022	N/A	TPS02B-11.1	N/A	TPS02D-11.1
Manual Feedwater Isolation	PMS-HS031	N/A	TPS02B-07.1	N/A	TPS02D-07.1
Manual Feedwater Isolation	PMS-HS032	N/A	TPS02B-07.1	N/A	TPS02D-07.1
Manual Containment Vacuum Relief	PMS-HS044	TPS02A-27	N/A	TPS02C-27	N/A
Manual Containment Vacuum Relief	PMS-HS045	TPS02A-27	N/A	TPS02C-27	N/A

Attachment G

**Excerpt from COL Appendix C Table 2.5.2-6*
PMS Block Testing (SV0/SV3/SV4-PMS-T2R-008)**

PMS Block	Div A Test Cases	Div B Test Cases	Div C Test Cases	Div D Test Cases
Source Range High Neutron Flux Reactor Trip*	TPS01A-1.1	TPS01B-1.1	TPS01C-1.1	TPS01D-1.1
	TPS01A-01.1	TPS01B-01.1	TPS01C-01.1	TPS01D-01.1
Intermediate Range High Neutron Flux Reactor Trip*	TPS01A-2.1	TPS01B-2.1	TPS01C-2.1	TPS01D-2.1
Power Range High Neutron Flux (Low Setpoint) Trip*	TPS01A-03.1	TPS01B-03.1	TPS01C-03.1	TPS01D-03.1
Pressurizer Low-2 Pressure Trip*	TPS01A-09.1	TPS01B-09.1	TPS01C-09.1	TPS01D-09.1
Pressurizer High-3 Water Level Trip*	TPS01A-14.1	TPS01B-14.1	TPS01C-14.1	TPS01D-14.1
Low-2 Reactor Coolant Flow Trip*	TPS01A-10.1	TPS01B-10.1	TPS01C-10.1	TPS01D-10.1
	TPS01A-10.2	TPS01B-10.2	TPS01C-10.2	TPS01D-10.2
Low-2 Reactor Coolant Pump Speed Trip*	TPS01A-11.1	TPS01B-11.1	TPS01C-11.1	TPS01D-11.1
High-3 Steam Generator Water Level Trip*	TPS02A-01.3	TPS02B-01.3	TPS02C-01.3	TPS02D-01.3
Low-2 Steam Generator Narrow Range Water Level Trip*	TPS02A-08.4	TPS02B-08.4	TPS02C-08.4	TPS02D-08.4
ESF - Safeguards Actuation Block	TPS02A-01.2	TPS02B-01.2	TPS02C-01.2	TPS02D-01.2
ESF - Steamline/Feedwater Isolation and Safeguards Block	TPS02A-01.2	TPS02B-01.2	TPS02C-01.2	TPS02D-01.2
ESF - Pressurizer Pressure Low Safeguards Block	TPS26-1.014	TPS26-1.072	TPS26-1.135	TPS26-1.196
ESF - FWS/CVS Makeup Isolation & Turbine Trip Block	TPS26-1.015	TPS26-1.073	TPS26-1.136	TPS26-1.197
ESF - Pressurizer Level Low CMT Block	TPS26-1.016	TPS26-1.074	TPS26-1.137	TPS26-1.198
ESF - Low SG Water Level PRHR Actuation Block	TPS02A-04.2	TPS02B-04.2	TPS02C-04.2	TPS02D-04.2
ESF - Low RCS WR Pressure CVS/PRHR Block	TPS02A-01.3	TPS02B-01.3	TPS02C-01.3	TPS02D-01.3
ESF - Flux Doubling Block	TPS02A-01.3	TPS02B-01.3	TPS02C-01.3	TPS02D-01.3
ESF - CVS Letdown Isolation Block	N/A	TPS26-1.078	TPS26-1.141	N/A
ESF - RNS Safeguards Block	N/A	TPS26-1.079	TPS26-1.142	N/A
ESF - Low-2 T _{AVG} Steam Dump Block	TPS26-1.020	TPS26-1.080	TPS26-1.143	TPS26-1.201

Attachment H

Excerpt from COL Appendix C Table 2.5.2-6*
ESF Block to ESF Function Matrix

	Safeguards Actuation Block	Steamline / Feedwater Isolation and Safeguards Block	Pressurizer Pressure Low Safeguards Block	FWS/CVS Makeup Isolation & Turbine Trip Block	Pressurizer Level Low CMT Block	Low SG Water Level PRHR Actuation Block	Low RCS WR Pressure CVS/PRHR Block	Flux Doubling Block	CVS Letdown Isolation Block	RNS Safeguards Block	Low-2 T _{AVG} Steam Dump Block
Automatic Safeguards*	X	X	X								
Containment Isolation*	X	X	X								
Main Feedwater Isolation*	X	X	X	X							
Reactor Coolant Pump Trip*	X	X	X								
Core Makeup Tank Injection*	X	X	X		X	X					
Steam Line Isolation*		X									
Startup Feedwater Isolation*		X		X							
Block of Boron Dilution*								X			
Chemical and Volume Control System Isolation*	X	X	X	X							
Chemical and Volume Control System Letdown Isolation*	X	X	X						X		
Steam Dump Block*											X
Auxiliary Spray and Letdown Purification Line Isolation*	X	X	X	X	X						
Passive Residual Heat Removal Heat Exchanger Alignment*	X	X	X		X	X	X				
Normal Residual Heat Removal System Isolation*	X	X	X							X	

Attachment I
PMS Bypass Testing (SV0/SV3/SV4-PMS-T2R-026)

Bypass Description	Div A Test Cases	Div B Test Cases	Div C Test Cases	Div D Test Cases
High Source Range Flux	TPS26-1.001	TPS26-1.059	TPS26-1.122	TPS26-1.183
Flux Doubling	TPS26-1.002	TPS26-1.060	TPS26-1.123	TPS26-1.184
High Intermediate Range Flux	TPS26-1.003	TPS26-1.061	TPS26-1.124	TPS26-1.185
High Power Range Flux Low Setpoint	TPS26-1.004	TPS26-1.062	TPS26-1.125	TPS26-1.186
High Power Range Flux Low Setpoint	TPS26-1.005	TPS26-1.063	TPS26-1.126	TPS26-1.187
High Power Range Flux Rate	TPS26-1.006	TPS26-1.064	TPS26-1.127	TPS26-1.188
Over Power Delta T	TPS26-1.007	TPS26-1.065	TPS26-1.128	TPS26-1.189
Overtemperature Delta T	TPS26-1.008	TPS26-1.066	TPS26-1.129	TPS26-1.190
High-1 Pressurizer Level	TPS26-1.009	TPS26-1.067	TPS26-1.130	TPS26-1.191
High-2 Pressurizer Level	TPS26-1.010	TPS26-1.068	TPS26-1.131	TPS26-1.192
High-3 Pressurizer Level	TPS26-1.011	TPS26-1.069	TPS26-1.132	TPS26-1.193
Low-1 Pressurizer Level	TPS26-1.012	TPS26-1.070	TPS26-1.133	TPS26-1.194
Low-2 Pressurizer Level	TPS26-1.013	TPS26-1.071	TPS26-1.134	TPS26-1.195
Low-2 Pressurizer Pressure	TPS26-1.014	TPS26-1.072	TPS26-1.135	TPS26-1.196
High-2 Pressurizer Pressure	TPS26-1.015	TPS26-1.073	TPS26-1.136	TPS26-1.197
Low-3 Pressurizer Pressure	TPS26-1.016	TPS26-1.074	TPS26-1.137	TPS26-1.198
Low-2 Hot Leg 1 RCS Flow	TPS26-1.017	TPS26-1.075	TPS26-1.138	TPS26-1.199
Low-2 Hot Leg 2 RCS Flow	TPS26-1.018	TPS26-1.076	TPS26-1.139	TPS26-1.200
Low-2 Spent Fuel Pool Level	TPS26-1.019	TPS26-1.077	TPS26-1.140	N/A
Low-2 RCS Hot Leg Level	N/A	TPS26-1.078	TPS26-1.141	N/A
Low-4 RCS Hot Leg Level	N/A	TPS26-1.079	TPS26-1.142	N/A
Low RCS Wide Range Press	TPS26-1.020	TPS26-1.080	TPS26-1.143	TPS26-1.201
High-3 Pressurizer Level	TPS26-1.021	TPS26-1.081	TPS26-1.144	TPS26-1.202
Low-2 T _{COLD} Leg 2	TPS26-1.022	TPS26-1.082	TPS26-1.145	TPS26-1.203
Low-1 T _{AVG}	TPS26-1.023	TPS26-1.083	TPS26-1.146	TPS26-1.204
Low-2 T _{AVG}	TPS26-1.024	TPS26-1.084	TPS26-1.147	TPS26-1.205
Low-2 T _{AVG}	TPS26-1.025	TPS26-1.085	TPS26-1.148	TPS26-1.206
Low-2 T _{COLD} Leg 1	TPS26-1.026	TPS26-1.086	TPS26-1.149	TPS26-1.207
RCP Underspeed	TPS26-1.027	TPS26-1.087	TPS26-1.150	TPS26-1.208
High-2 RCP 1A Bearing Temperature	TPS26-1.028	TPS26-1.088	TPS26-1.151	TPS26-1.209
High-2 RCP 1B Bearing Temperature	TPS26-1.029	TPS26-1.089	TPS26-1.152	TPS26-1.210
High-2 RCP 2A Bearing Temperature	TPS26-1.030	TPS26-1.090	TPS26-1.153	TPS26-1.211
High-2 RCP 2B Bearing Temperature	TPS26-1.031	TPS26-1.091	TPS26-1.154	TPS26-1.212
Low-2 SG1 Startup Feed Water Flow	N/A	TPS26-1.092	N/A	TPS26-1.213
Low-2 SG2 Startup Feed Water Flow	N/A	TPS26-1.093	N/A	TPS26-1.214
Low-2 SG1 Narrow Range Level	TPS26-1.032	TPS26-1.094	TPS26-1.155	TPS26-1.215
Low-2 SG2 Narrow Range Level	TPS26-1.033	TPS26-1.095	TPS26-1.156	TPS26-1.216
High-3 SG1 Narrow Range Level	TPS26-1.034	TPS26-1.096	TPS26-1.157	TPS26-1.217
High-3 SG2 Narrow Range Level	TPS26-1.035	TPS26-1.097	TPS26-1.158	TPS26-1.218
High-1 SG1 Narrow Range Level	TPS26-1.036	TPS26-1.098	TPS26-1.159	TPS26-1.219

Attachment I (cont.)

PMS Bypass Testing (SV0/SV3/SV4-PMS-T2R-026) (cont.)

Bypass Description	Div A	Div B	Div C	Div D
High-1 SG2 Narrow Range Level	TPS26-1.037	TPS26-1.099	TPS26-1.160	TPS26-1.220
Low-2 SG1 Wide Range Level	TPS26-1.038	TPS26-1.100	TPS26-1.161	TPS26-1.221
Low-2 SG2 Wide Range Level	TPS26-1.039	TPS26-1.101	TPS26-1.162	TPS26-1.222
Low-2 SG1 Pressure	TPS26-1.040	TPS26-1.102	TPS26-1.163	TPS26-1.223
Low-2 SG2 Pressure	TPS26-1.041	TPS26-1.103	TPS26-1.164	TPS26-1.224
Negative SG1 Pressure Rate High	TPS26-1.042	TPS26-1.104	TPS26-1.165	TPS26-1.225
Negative SG2 Pressure Rate High	TPS26-1.043	TPS26-1.105	TPS26-1.166	TPS26-1.226
High-3 SG1 Narrow Range Level	TPS26-1.044	TPS26-1.106	TPS26-1.167	TPS26-1.227
High-3 SG2 Narrow Range Level	TPS26-1.045	TPS26-1.107	TPS26-1.168	TPS26-1.228
High T _{HOT}	TPS26-1.046	TPS26-1.108	TPS26-1.169	TPS26-1.229
PRHR Actuation	TPS26-1.047	TPS26-1.109	TPS26-1.170	TPS26-1.230
High-2 Containment Pressure	TPS26-1.048	TPS26-1.110	TPS26-1.171	TPS26-1.231
Low-2 Containment Pressure	TPS26-1.049	TPS26-1.111	TPS26-1.172	TPS26-1.232
High-1 Containment Radiation	TPS26-1.050	TPS26-1.112	TPS26-1.173	TPS26-1.233
High-2 Containment Radiation	TPS26-1.051	TPS26-1.113	TPS26-1.174	TPS26-1.234
Battery Charger UV	TPS26-1.052	TPS26-1.114	TPS26-1.175	TPS26-1.235
Battery Charger UV	TPS26-1.053	TPS26-1.115	TPS26-1.176	TPS26-1.236
Low-3 CMT A Narrow Range Upper	TPS26-1.054	TPS26-1.116	TPS26-1.177	TPS26-1.237
Low-3 CMT B Narrow Range Upper	TPS26-1.055	TPS26-1.117	TPS26-1.178	TPS26-1.238
Low-6 CMT A Narrow Range Lower	TPS26-1.056	TPS26-1.118	TPS26-1.179	TPS26-1.239
Low-6 CMT B Narrow Range Lower	TPS26-1.057	TPS26-1.119	TPS26-1.180	TPS26-1.240
Low-3 IRWST Narrow Range Level	TPS26-1.058	TPS26-1.120	TPS26-1.181	TPS26-1.241
High MCR Supply Radiation	N/A	TPS26-1.121	TPS26-1.182	N/A
Low Containment Pressure	TPS26-1.258	TPS26-1.259	TPS26-1.260	TPS26-1.261
Low IRWST Wide Range Level	N/A	N/A	TPS26-1.262	TPS26-1.263