Southern Nuclear

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ND-19-1571
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U.S. Nuclear Regulatory Commission
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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 2.5.04.02.i [Index Number 557]

Ladies and Gentlemen:

Pursuant to 10 CFR 52.99(c)(3), Southern Nuclear Operating Company hereby notifies the NRC that as of December 31, 2019, Vogtle Electric Generating Plant (VEGP) Unit 3 and Unit 4 Uncompleted Inspection, Test, Analysis, and Acceptance Criteria (ITAAC) Item 2.5.04.02.i [Index Number 557] has not been completed greater than 225-days prior to initial fuel load. The Enclosure describes the plan for completing ITAAC 2.5.04.02.i [Index Number 557]. 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.

Southern Nuclear Operating Company (SNC) previously submitted Notice of Uncompleted ITAAC 225-days Prior to Initial Fuel Load for Item 2.5.04.02.i [Index Number 557] ND-19-1272 [ML19298B121], dated October 25, 2019. This resubmittal supersedes ND-19-1272 in its entirety.

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 706-848-1575.

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 2.5.04.02.i [Index Number 557]

MJY/CWM/sfr

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Southern Nuclear Operating Company
ND-19-1571
Enclosure

Vogtle Electric Generating Plant (VEGP) Unit 3 and Unit 4 Completion Plan for Uncompleted ITAAC 2.5.04.02.i [Index Number 557]

ITAAC Statement

Design Commitment

2. The DDS provides for the minimum inventory of displays, visual alerts, and fixed position controls, as identified in Table 2.5.4-1. 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 at the RSW. The controls listed with a "Yes" in the "Control" column are provided at the RSW.

Inspections/Tests/Analyses

i) An inspection will be performed for retrievability of plant parameters at the RSW.

ii) An inspection and test will be performed to verify that the plant parameters are used to generate visual alerts that identify challenges to critical safety functions.

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

Acceptance Criteria

i) The plant parameters listed in Table 2.5.4-1 with a "Yes" in the "Display" column can be retrieved at the RSW.

ii) The plant parameters listed in Table 2.5.4-1 with a "Yes" in the "Alert" column are used to generate visual alerts that identify challenges to critical safety functions. The visual alerts actuate in accordance with their logic and values.

iii) For each test of a control listed in Table 2.5.4-1 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.

ITAAC Completion Description

Multiple ITAAC are performed to verify that the Data Display and Processing System (DDS) provides for the minimum inventory of displays, visual alerts, and fixed position controls, as identified in COL Appendix C Table 2.5.4-1 (Attachment A), 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 at the Remote Shutdown Workstation (RSW), and the controls listed with a "Yes" in the "Control" column are provided at the RSW. The subject ITAAC performs inspections on the displays in Attachment A to verify the listed plant parameters can be retrieved at the RSW, inspections and testing of the alerts in Attachment A to verify that the listed plant parameters are used to generate visual alerts that identify challenges to critical safety functions, and testing of the controls listed in Attachment A to verify the listed controls generate actuation signals.

The plant parameters listed in Table 2.5.4-1 with a "Yes" in the "Display" column can be retrieved at the RSW.

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

The inspection is performed in accordance with 3-DDS-ITPP-520 and 4-DDS-ITPP-520 (Reference 1 and 2) and visually confirms that when each of the plant parameters identified in Attachment A with a "Yes" in the "Display" column is recalled at the RSW, the recalled plant parameter appears on a display monitor.

The inspection results are included in References 1 and 2 and confirm that the plant parameters listed in Table 2.5.4-1 with a "Yes" in the "Display" column can be retrieved at the RSW.

References 1 and 2 are available for NRC inspection as part of the Unit 3 and Unit 4 ITAAC 2.5.04.02.i Completion Packages (References 30 and 31).

The plant parameters listed in Table 2.5.4-1 with a "Yes" in the "Alert" column are used to generate visual alerts that identify challenges to critical safety functions. The visual alerts actuate in accordance with their logic and values.

Inspections and testing are performed to verify the retrievability of the VEGP Unit 3 and Unit 4 visual alerts at the RSW. The inspections and testing confirm that the plant parameters listed in Attachment A with a "Yes" in the "Alert" column are used to generate visual alerts that identify challenges to critical safety functions (CSF) and actuate in accordance with their logic and values.

This ITAAC is completed as a combination of:

- PMS Factory Acceptance Test (FAT) – Functional testing of PMS inputs, outputs, logic, and function
- Site software installation and regression test – Hardware and software integration verification and testing of post system delivery changes.
- Preoperational Test of communication – Functional testing of the communication between the PMS output and the DDS input
- DDS FAT– Functional testing of DDS inputs, outputs, logic, and function
- Preoperational Test of the as-built RSW – Visual inspection and test of the visual alerts at the as-built RSW

The PMS FAT was performed in accordance with PMS Software Program Manual WCAP-16096 (Reference 3), PMS Test Plan APP-PMS-T5-001 (Reference 4) and applicable Codes and Standards described in Vogtle 3 and 4 UFSAR Chapter 7 (Reference 33). The DDS FAT was performed in accordance with PLS Test Plan APP-PLS-T5-001 (Reference 5).

The logic that generates the visual alerts is contained in both the Qualified Data Processing System (QDPS) of the PMS and the Nuclear Applications Programs (NAPs) of the DDS and are tested as follows:

- Logic and values of visual alerts generated in the QDPS are verified in the PMS FAT
- Logic and values of visual alerts generated in the NAPs are verified in the DDS FAT

During the FAT, the plant parameters were simulated and adjusted to create applicable alert conditions. PMS outputs were monitored, and it was confirmed that the visual alerts actuate in accordance with their correct logic and values. This testing was performed in accordance with FAT Test Procedure APP-PMS-T1P-010 (Reference 6). The results of the PMS testing are documented in the FAT test reports APP-PMS-T2R-010 (Reference 7). The FAT results confirm that the PMS inputs and outputs, logic and installed software function correctly to provide for the visual alerts, as identified in Attachment A.

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 8.7.0.1 and B-GEN-ITPCI-001 (References 22, 23, and 34). References 22, 23, and 34 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 for hardware changes (References 27 and 28) and software changes (References 29, 35, and 36) if additional testing is needed for the as-built system.

To provide communication between the PMS and DDS, the Maintenance and Test Panel (MTP) in a given PMS division provides an isolated (optical-to-electrical isolation) pathway from the intra-divisional communication bus to the Advant/Ovation Interface (AOI) Gateway associated with that division. Over the divisional AOI Gateway, the MTP transfers certain real-time data from the division's AF100 bus to the non-safety Real Time Data Network to support control and information system functions performed in non-safety systems, such as the DDS. Testing in 3-PMS-ITPP-521 and 4-PMS-ITPP-521 (References 8 and 9) verifies the AOI gateway by ensuring datapoints on PMS which are output to the DDS match those on the DDS.

During the DDS FAT, inputs to the DDS were simulated and adjusted to create applicable alert conditions and it was confirmed that the logic and functionality of the DDS supports the visual alerts. This testing was performed in accordance with FAT Test Procedures APP-DDS-T1P-001 and APP-PCS-T1P-100 (References 10 and 11). The results of the testing are documented in the FAT test reports APP-DDS-T1R-001 and APP-PCS-T2R-100 (References 12 and 13).

Testing is performed in accordance with 3-DDS-ITPP-520 and 4-DDS-ITPP-520 (References 1 and 2) to verify that when the applicable DDS input is simulated, each plant parameter listed in Attachment A with a "Yes" in the "Alert" column is used to generate visual alerts that identify challenges to CSF at the RSW. Testing in References 1 and 2 forces the applicable DDS input parameter from an engineering workstation and visually confirms that when each of the plant parameters identified in Attachment A with a "Yes" in the "Alert" column is used to generate visual alerts that identify challenges to CSF, the summoned plant visual alert appears on a display monitor at the RSW.

The completed Unit 3 and Unit 4 factory test results (References 7, 12, and 13), FCNs (References 22, 23, and 34), regression test results (References 27, 28, 29, 35, and 36), and preoperational test results (References 1, 2, 8, and 9) confirm that the plant parameters listed in Table 2.5.4-1 with a "Yes" in the "Alert" column are used to generate visual alerts that identify challenges to critical safety functions. The visual alerts actuate in accordance with their logic and values.

References 1, 2, 7 through 9, 12, 13, 22, 23, 27 through 29 and 34 through 36 are available for NRC inspection as part of the Unit 3 and Unit 4 ITAAC 2.5.04.02.i Completion Packages (References 30 and 31).

For each test of a control listed in Table 2.5.4-1 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 system is performed using each RSW control. The test confirms that for each test of a control listed in Table 2.5.4-1 (Attachment A) 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.

This ITAAC is completed as a combination of:

- Factory Acceptance Test – Functional testing of the PMS control circuit
- Site software installation and regression test – Hardware and software integration verification and testing of post system delivery changes
- Component test – testing of the remote shutdown room switches, including their interface with PMS and full testing of the hydrogen igniter soft controls at the RSW

The Factory Acceptance Testing (FAT) follows the guidance of NEI 08-01 Section 9.4 (Reference 32) 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 3), PMS Test Plan APP-PMS-T5-001 (Reference 4), and applicable Codes and Standards described in Vogtle 3 and 4 UFSAR Chapter 7 (Reference 33).

The FAT included testing of PMS inputs and outputs, logic, and functionality. During this test, the manual inputs to the PMS were simulated and it was confirmed that the actuation signals were generated for the minimum inventory of controls at the RSW identified in Attachment A. This testing was performed in accordance with the PMS FAT procedures APP-PMS-T1P-007 and APP-PMS-T1P-008 (References 14 and 15). The results of the tests are documented in the FAT test reports SV0/SV3/SV4-PMS-T2R-007 and SV0/SV3/SV4-PMS-T2R-008 (References 16 through 21).

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 8.7.0.1 and B-GEN-ITPCI-001 (References 22, 23, and 34). References 22, 23, and 34 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 for hardware changes (References 27 and 28) and software changes (Reference 29, 35, and 36) if additional testing is needed for the as-built system.

Component testing of the dedicated RSW controls identified in Attachment A is performed in accordance with component test packages SNCXXXXXX (Unit 3) and SNCYYYYYY (Unit 4) (References 24 and 25). These component test packages utilize B-GEN-ITPCI-006, (Reference 26) to test the RSW manual controls. Selected RSW manual controls are actuated and PMS inputs are confirmed by visually inspecting the digital input light emitting diodes. The completed Unit 3 and Unit 4 component test packages confirm that select RSW manual control actuations are received at the PMS.

For the containment hydrogen igniters, testing is performed in accordance with 3-DDS-ITPP-520 and 4-DDS-ITPP-520 (References 1 and 2). Testing in References 1 and 2 verifies the Hydrogen Control System (VLS) is available then the containment hydrogen igniters are energized using soft controls from the RSW. Local voltage verification at the igniter control relays verifies the hydrogen igniter soft controls generate an actuation signal and is documented in the test.

The completed Unit 3 and Unit 4 FAT results (References 16 through 21), FCNs (References 22, 23, and 34), regression test results (References 27, 28, 29, 35, and 36), completed component test packages (References 24 and 25), and preoperational test results (References 1 and 2) confirm that for each test of a control listed in Table 2.5.4-1 with a "Yes" in the "Control" column, an actuation signal is generated.

References 1, 2, 16 through 25, 27 through 29, and 34 through 36 are available for NRC inspection as part of the Unit 3 and Unit 4 ITAAC 2.5.04.02.i Completion Packages (References 30 and 31).

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. 3-DDS-ITPP-520, "Data and Display Processing System Remote Shutdown Room Preoperational Test Procedure"
2. 4-DDS-ITPP-520, "Data and Display Processing System Remote Shutdown Room Preoperational Test Procedure"
3. WCAP-16096 "Software Program Manual for Common Q Systems" Revision 4A"
4. APP-PMS-T5-001, "AP1000 Protection and Safety Monitoring System Test Plan"
5. APP-PLS-T5-001, "AP1000 Plant Control System/Data Display and Processing System Test Plan"
6. APP-PMS-T1P-010, "AP1000 Protection and Safety Monitoring System Qualified Data Processing System Channel Integration Test Procedure"
7. APP-PMS-T2R-010 "AP1000 Protection and Safety Monitoring System Qualified Data Processing System Channel Integration Test Report"
8. 3-PMS-ITPP-521, "Protection and Safety Monitoring System Logic Test Preoperational Test Procedure"
9. 4-PMS-ITPP-521, "Protection and Safety Monitoring System Logic Test Preoperational Test Procedure"

10. APP-DDS-T1P-001, "AP1000 Data Display and Processing System Application Programs Test Procedure"
11. APP-PCS-T1P-100, "AP1000 Plant Control System Passive Containment Cooling System (PCS) Software Test Procedure"
12. APP-DDS-T1R-001, "AP1000 Data Display and Processing System Application Programs Test Report"
13. APP-PCS-T2R-100, "AP1000 Plant Control System Passive Containment Cooling System (PCS) Software Test Report"
14. APP-PMS-T1P-007, "AP1000 Protection and Safety Monitoring System – Reactor Trip Channel Integration Test Procedure"
15. APP-PMS-T1P-008, "AP1000 Protection and Safety Monitoring System – System-Level Engineered Safety Features Channel Integration Test Procedure"
16. SV0-PMS-T2R-007, "AP1000 Protection and Safety Monitoring System – Reactor Trip Channel Integration Test Report"
17. SV3-PMS-T2R-007, "Vogtle Unit 3 AP1000 Protection and Safety Monitoring System – Reactor Trip Channel Integration Test Report"
18. SV4-PMS-T2R-007, "Vogtle Unit 4 AP1000 Protection and Safety Monitoring System – Reactor Trip Channel Integration Test Report"
19. SV0-PMS-T2R-008, "AP1000 Protection and Safety Monitoring System System-Level Engineered Safety Features Channel Integration Test Report"
20. SV3-PMS-T2R-008, "Vogtle Unit 3 AP1000 Protection and Safety Monitoring System System-Level Engineered Safety Features Channel Integration Test Report"
21. SV4-PMS-T2R-008, "Vogtle Unit 4 AP1000 Protection and Safety Monitoring System System-Level Engineered Safety Features Channel Integration Test Report"
22. SV3-GW-GCW-300, Field Change Notice "AP1000 Vogtle Unit 3 PMS Initial Software Installation - Software Release 8.7.0.1" (WO SCNXXXXXX)
23. SV4-GW-GCW-XXX, Field Change Notice "AP1000 Vogtle Unit 4 PMS Initial Software Installation - Software Release 8.7.0.1" (WO SCNYYYYYY)
24. SNCXXXXXX
25. SNCYYYYYY
26. B-GEN-ITPCI-006, "Main Control Room & Remote Shutdown Room"
27. 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"
28. GIC-AP1000-HEDS-YY-XXX, Rev. X "Regression Testing Analysis for Vogtle Unit 4 Protection and Safety Monitoring System (PMS) Baseline X.X to Y.Y Hardware Modifications Performed at Site" (YY-XXX is the Year-Letter #)
29. SV0-PMS-T2R-050, "Vogtle AP1000 Protection and Safety Monitoring System Fuel Load Regression Test Report"
30. 2.5.04.02.i-U3-CP-Rev 0, ITAAC Completion Package
31. 2.5.04.02.i-U4-CP-Rev 0, ITAAC Completion Package
32. NEI 08-01, "Industry Guideline for the ITAAC Closure Process Under 10 CFR Part 52"
33. Vogtle Electric Generating Plant (VEGP) Units 3 and 4 Updated Final Safety Analysis Report (UFSAR)
34. B-GEN-ITPCI-001, "PMS CABINETS"
35. SV3-PMS-T2R-150-R0 "AP1000 Protection and Safety Monitoring System System Integration Test Integrated System Validation Test Report"
36. SV4-PMS-T2R-150-R0 "AP1000 Protection and Safety Monitoring System System Integration Test Integrated System Validation Test Report"

Attachment A*

Minimum Inventory of Controls, Displays, and Alerts at the RSW			
Description*	**Control***	**Display***	**Alert[(1)]***
Neutron Flux	-	Yes	Yes
Neutron Flux Doubling	-	No	Yes
Startup Rate	-	Yes	Yes
Reactor Coolant System (RCS) Pressure	-	Yes	Yes
Wide-range Hot Leg Temperature	-	Yes	No
Wide-range Cold Leg Temperature	-	Yes	Yes
RCS Cooldown Rate Compared to the Limit Based on RCS Pressure	-	Yes	Yes
Wide-range Cold Leg Temperature Compared to the Limit Based on RCS Pressure	-	Yes	Yes
Change of RCS Temperature by more than 5°F in the last 10 minutes	-	No	Yes
Containment Water Level	-	Yes	Yes
Containment Pressure	-	Yes	Yes
Pressurizer Water Level	-	Yes	Yes
Pressurizer Water Level Trend	-	Yes	No
Pressurizer Reference Leg Temperature	-	Yes	No
Reactor Vessel-Hot Leg Water Level	-	Yes	Yes
Pressurizer Pressure	-	Yes	No
Core Exit Temperature	-	Yes	Yes
RCS Subcooling	-	Yes	Yes
RCS Cold Overpressure Limit	-	Yes	Yes
In-containment Refueling Water Storage Tank (IRWST) Water Level	-	Yes	Yes
Passive Residual Heat Removal (PRHR) Flow	-	Yes	Yes
PRHR HX Outlet Temperature	-	Yes	Yes
PRHR HX Inlet Isolation and Control Valve Status	-	Yes	Yes
Passive Containment Cooling System (PCS) Storage Tank Water Level	-	Yes	No
PCS Cooling Flow	-	Yes	No
IRWST to Normal Residual Heat Removal System (RNS) Suction Valve Status	-	Yes	Yes
Remotely Operated Containment Isolation Valve Status	-	Yes	No
Containment Area High-range Radiation Level	-	Yes	Yes
Containment Pressure (Extended Range)	-	Yes	No
Core Makeup Tank (CMT) Level	-	Yes	No
Manual Reactor Trip (also initiates turbine trip)	Yes	-	-
Manual Safeguards Actuation	Yes	-	-
Manual CMT Actuation	Yes	-	-
Manual Automatic Depressurization System (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	-	-

Attachment A*

Minimum Inventory of Controls, Displays, and Alerts at the RSW			
Description*	**Control***	**Display***	**Alert[1]***
Manual Containment Recirculation Actuation	Yes	-	-
Manual Containment Isolation	Yes	-	-
Manual Main Steam Line Isolation	Yes	-	-
Manual Feedwater Isolation	Yes	-	-
Manual Containment Hydrogen Igniter (Nonsafety-related)[2]	Yes	-	-
Manual Containment Vacuum Relief	Yes	-	-

Note: Dash (-) indicates not applicable.

1. These parameters are used to generate visual alerts that identify challenges to the critical safety functions. For the RSW, the visual alerts are embedded in the nonsafety-related displays as visual signals.

2. Containment hydrogen igniter control is provided as a "soft" control.

* Excerpt from COL Appendix C Table 2.5.4-1