Southern Nuclear

B. H. Whitley
Director
Regulatory Affairs

Southern Nuclear
Operating Company, Inc.
3535 Colonnade Parkway
Birmingham, AL 35243
Tel 205.992.7079

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10 CFR 52.63

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

Southern Nuclear Operating Company
Vogtle Electric Generating Plant Units 3 and 4
Request for License Amendment and Exemption:
Clarification of ITAAC Regarding Invessel Components (LAR-21-001)

Ladies and Gentlemen:

Pursuant to 10 CFR 52.98(c) and in accordance with 10 CFR 50.90, Southern Nuclear Operating Company (SNC) requests an amendment to the combined licenses (COLs) for Vogtle Electric Generating Plant (VEGP) Units 3 and 4 (License Numbers NPF-91 and NPF-92, respectively).

The requested amendment proposes to depart from plant-specific Design Control Document Tier 1 Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) information, and the corresponding COL Appendix C information, in a way that allows completion of the ITAAC prior to fuel load consistent with the existing facility design (which is not proposed to be changed by this LAR) and the requirements of 10 CFR 52.103(g). These changes reflect the interpretation and understanding discussed during the public telecoms with NRC Staff held August 12, 2021, and August 19, 2021.

Pursuant to 10 CFR 52.99(c)(1), SNC submitted VEGP Unit 3 ITAAC Closure Notification (ICN) for ITAAC Index No. 570 ICN via ND-20-0531 dated May 20, 2020 (ML20141L588). Pursuant to 10 CFR 52.99(c)(3), SNC also submitted VEGP Units 3&4 Uncompleted ITAAC Notifications (UINs) for ITAAC Index No. 68 UIN via ND-18-0094 dated February 14, 2018 (ML18045A380), ITAAC Index No. 75 UIN via ND-19-1333 dated October 31, 2019 (ML19305A429), ITAAC Index No. 515 UIN via ND-19-0302 dated April 16, 2019 (ML19106A221), ITAAC Index No. 565 UIN via ND-18-0227 dated February 22, 2018 (ML18054A565), and ITAAC Index No. 570 UIN via ND-18-0291 dated March 27, 2018 (ML18094A769). SNC is requesting withdrawal of these notifications.

Similar to LAR 16-014 (ML16236A265), a draft of each of the revised UINs (i.e., revised UINs for ITAAC Index Nos. 75. 515, 565, and 570) is provided with Enclosure 4 of this LAR for the NRC staff's information. No action is requested of the NRC staff regarding these draft revised UINs at this time. They are included with this LAR to provide an understanding of SNC's intended closure path for these ITAAC if the LAR is approved.

Enclosure 1 provides the regulatory evaluation, technical evaluation, exemption evaluation, and environmental considerations for the proposed changes.

Enclosure 2 provides the significant hazards consideration.

Enclosure 3 provides a description of the requested changes and includes markups depicting the requested changes to the VEGP Units 3 and 4 licensing basis documents.

Enclosure 4 provides draft revised UINs intended for VEGP Units 3 & 4 ITAAC 2.1.03.06.i (Index No. 75), ITAAC 2.5.01.03e (Index No. 515), and ITAAC 2.5.05.02.i (Index No. 565), and ITAAC 2.5.05.03b (Index No. 570), for information only.

This letter contains no regulatory commitments. This letter has been reviewed and determined not to contain security-related or other sensitive or proprietary information.

As discussed during the pre-submittal meeting on August 19, 2021, SNC requests expedited NRC staff approval of the license amendment to support completion of the ITAAC and final construction of VEGP Unit 3. The basis for an expedited review is also provided in Enclosure 1.

In accordance with 10 CFR 50.91, SNC is notifying the State of Georgia by transmitting a copy of this letter and its enclosures to the designated State Official.

Should you have any questions, please contact Amy Chamberlain at (205) 992-6361.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 24th of August 2021.

Respectfully submitted,

Brian H. Whitley
Director, Regulatory Affairs
Southern Nuclear Operating Company

Enclosures
1) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Request for License Amendment and Exemption: Clarification of ITAAC Regarding Invessel Components (LAR-21-001)
2) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Significant Hazards Consideration (LAR-21-001)
3) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Proposed Changes to Licensing Basis Documents (LAR-21-001)
4) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Draft Revised Uncompleted Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) Notices (UINs) Pending NRC Approval of LAR and Exemption (LAR-21-001) (For Information Only)

cc:

Southern Nuclear Operating Company / Georgia Power Company

Mr. S. E. Kuczynski (w/o enclosures)
Mr. P. P. Sena III (w/o enclosures)
Mr. M. D. Meier (w/o enclosures)
Mr. G. Chick
Mr. S. Stimac
Mr. P. Martino
Mr. D. L. McKinney (w/o enclosures)
Mr. T. W. Yelverton (w/o enclosures)
Mr. B. H. Whitley
Mr. W. Levis
Ms. C. A. Gayheart
Ms. M. Ronnlund
Mr. J. M DeLano
Mr. M. J. Yox
Mr. C. T. Defnall
Ms. A. C. Chamberlain
Mr. S. Leighty
Ms. K. Roberts
Mr. J. Haswell
Document Services RTYPE: VND.LI.L00
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Nuclear Regulatory Commission

Mr. M. King (w/o enclosures)
Mr. G. Bowman
Ms. M. Bailey (w/o enclosures)
Ms. A. Veil
Mr. G.J. Khouri
Mr. G. Armstrong
Mr. C. Patel
Mr. C. Santos
Mr. B. Kemker
Mr. J. Eargle
Mr. C. J. Even
Ms. N. C. Coovert
Mr. C. Welch
Mr. J. Gaslevic
Mr. O. Lopez-Santiago
Mr. M. Webb
Mr. B. Gleaves
Mr. T. Fredette
Ms. K. McCurry
Mr. B. Davis
Mr. J. Parent

Nuclear Regulatory Commission (continued)

Mr. B. Griman
Mr. P. McKenna

State of Georgia

Mr. R. Dunn

Oglethorpe Power Corporation

Mr. M. W. Price
Mr. B. Brinkman
Mr. E. Rasmussen

Municipal Electric Authority of Georgia

Mr. J. E. Fuller
Mr. S. M. Jackson

Dalton Utilities

Mr. T. Bundros

Westinghouse Electric Company, LLC

Mr. L. Oriani (w/o enclosures)
Mr. T. Rubenstein (w/o enclosures)
Mr. M. Corletti
Mr. Z. Harper

Other

Mr. S. W. Kline, Bechtel Power Corporation
Ms. L. A. Matis, Tetra Tech NUS, Inc.
Dr. W. R. Jacobs, Jr., Ph.D., GDS Associates, Inc.
Mr. S. Roetger, Georgia Public Service Commission
Mr. R. L. Trokey, Georgia Public Service Commission
Mr. K. C. Greene, Troutman Sanders
Mr. S. Blanton, Balch Bingham

Southern Nuclear Operating Company

ND-21-0772

Enclosure 1

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Request for License Amendment and Exemption:

Clarification of ITAAC Regarding Invessel Components
(LAR-21-001)

(This Enclosure consists of 19 pages, including this cover page.)

AMENDMENT AND EXEMPTION REQUEST

VOGTLE ELECTRIC GENERATING PLANT UNITS 3 AND 4

DOCKET NOS. 52-025 AND 52-026

1. INTRODUCTION

Southern Nuclear Operating Company (SNC) requests that the U.S. Nuclear Regulatory Commission (NRC or the Commission) amend Vogtle Electric Generating Plant (VEGP) Units 3 and 4, Combined License (COL) Numbers NPF-91 and NPF-92, respectively. In this License Amendment Request, SNC proposes to depart from plant-specific Tier 1 Design Control Document (DCD) information, with corresponding changes to the associated COL Appendix C information.

The requested amendment proposes changes that would revise the Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) Nos. 68 (2.1.03.01), 75 (2.1.03.06.i), 515 (2.5.01.03e), 565 (2.5.05.02.i), and 570 (2.5.05.03b) to exclude location specific inspection of components whose final location is in the reactor vessel or otherwise will not meet the acceptance criterion, since the components cannot be placed in their final location until after core fuel load. As noted in Updated Final Safety Analysis Report (UFSAR) Subsection 14.3.2.2, one of the selection criteria for ITAAC is that "the ITAAC do not include any inspections, tests, or analyses that are dependent upon conditions that exist only after fuel load." Pursuant to 10 CFR 52.103(g), all ITAAC must be completed prior to loading the initial core. Thus, these ITAAC cannot be completed as currently written, in light of the interpretation and understanding of NRC approved guidance that provides that "as-built" structures, systems and components (SSCs) must be in their final operational location prior to ITAAC Closure Notification (ICN) submittal, because these invessel components cannot be placed in their final operational location until after the 52.103(g) finding. Pursuant to selection criteria identified above, these inspections should not have been included as proposed ITAAC.

Pursuant to Section 52.63(b)(1) and 52.98(f) of Title 10 of the *Code of Federal Regulations* (10 CFR), SNC also requests an exemption in accordance with 10 CFR Part 52, Appendix D, "Design Certification Rule for the AP1000 Design," Section VIII.A.4. This exemption request will allow a departure from the corresponding portions of the certified information in Tier 1 of the generic DCD.

This enclosure requests approval of the license amendment and exemption necessary to implement the changes identified and shown in Enclosure 3. The discussions of changes to the plant-specific Tier 1 information also impact the corresponding COL Appendix C information. As discussed in Section 8 of this Enclosure, SNC is requesting expedited review of this request.

2. REGULATORY EVALUATION

As defined in Section II of Appendix D to 10 CFR Part 52, Tier 1 information includes inspections, tests, analyses, and acceptance criteria (ITAAC) and design descriptions, among other things.

10 CFR Part 52, Appendix D, Section III.B requires a licensee referencing 10 CFR Part 52, Appendix D to incorporate by reference and comply with the requirements of Appendix D, including all Tier 1 information contained in the generic AP1000 DCD.

Therefore, a licensee referencing Appendix D incorporates by reference the Tier 1 information contained in the generic DCD. The Tier 1 ITAAC and the design descriptions, along with the plant-specific ITAAC, were included in Appendix C of the COL at its issuance.

10 CFR Part 52, Appendix D, Section VIII.A.4 states that exemptions from Tier 1 information are governed by the requirements in 10 CFR 52.63(b)(1) and 10 CFR 52.98(f). It also states that the Commission will deny such a request if it finds that the design change will result in a significant decrease in the level of plant safety otherwise provided by the design.

10 CFR Part 52, Appendix D, Section VIII.B.5.a allows an applicant or licensee who references 10 CFR Part 52, Appendix D to depart from Tier 2 information without prior NRC approval, unless the proposed departure involves a change to or departure from Tier 1 information, Tier 2* information, the Technical Specifications, or requires a license amendment under 10 CFR Part 52, Appendix D, Section VIII , paragraphs B.5.b or B.5.c. The proposed amendment involves a departure from the plant-specific Tier 1 ITAAC information, but no changes are needed to the UFSAR. Thus, NRC approval is not required under this regulation.

10 CFR 52.63(b)(1) allows the licensee who references a design certification rule to request NRC approval for an exemption from one or more elements of the certification information. The Commission may only grant such a request if it determines that the exemption will comply with the requirements of 10 CFR 52.7, which, in turn, points to the requirements listed in 10 CFR 50.12 for specific exemptions. In addition, the Commission must consider whether special circumstances, as required by 10 CFR 52. 7 and 50.12, outweigh any decrease in safety that may result from the reduction in standardization caused by the exemption. Therefore, any exemption from the Tier 1 information certified by Appendix D to 10 CFR Part 52 must meet the requirements of 10 CFR 50.12, 52.7, and 52.63(b)(1).

10 CFR 52.97(b) requires the NRC to identify within the combined license the inspections, tests, and analyses, including those applicable to emergency planning, that the licensee shall perform, and the acceptance criteria that, if met, are necessary and sufficient to provide reasonable assurance that the facility has been constructed and will be operated in conformity with the license, the provisions of the Act, and the Commission's rules and regulations. The COL will continue to provide the necessary and sufficient ITAAC. As noted above, one criterion for a “necessary and sufficient” ITAAC is that it can be completed prior to the initial fuel loading.

10 CFR 52.98(f) requires NRC approval for a proposed amendment to the COL for any modification to, addition to, or deletion from the terms and conditions of a COL. The proposed amendment involves changes to plant-specific Tier 1 ITAAC information and its corresponding COL Appendix C information, so NRC approval is required.

10 CFR 50.49 requires that each holder of a combined license establish a program for environmental qualification of electric equipment important to safety and maintain documentation of that qualification. This request does not impact compliance with the environmental qualification requirements as delineated in 50.49.

The specific NRC technical requirements applicable to the proposed amendment are the general design criteria (GDC) in Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities." In particular, these technical requirements include the following GDC:

> *GDC 2, Design bases for protection against natural phenomena*. Structures, systems, and components important to safety shall be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunami, and seiches

without loss of capability to perform their safety functions. The design bases for these structures, systems, and components shall reflect: (1) Appropriate consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area, with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated, (2) appropriate combinations of the effects of normal and accident conditions with the effects of the natural phenomena and (3) the importance of the safety functions to be performed.

GDC 4, Environmental and dynamic effects design bases. Structures, systems, and components important to safety shall be designed to accommodate the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including loss-of-coolant accidents. These structures, systems, and components shall be appropriately protected against dynamic effects, including the effects of missiles, pipe whipping, and discharging fluids, that may result from equipment failures and from events and conditions outside the nuclear power unit. However, dynamic effects associated with postulated pipe ruptures in nuclear power units may be excluded from the design basis when analyses reviewed and approved by the Commission demonstrate that the probability of fluid system piping rupture is extremely low under conditions consistent with the design basis for the piping.

GDC 10, Reactor design. The reactor core and associated coolant, control, and protection systems shall be designed with appropriate margin to assure that specified acceptable fuel design limits are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences.

GDC 13, Instrumentation and control. Instrumentation shall be provided to monitor variables and systems over their anticipated ranges for normal operation, for anticipated operational occurrences, and for accident conditions as appropriate to assure adequate safety, including those variables and systems that can affect the fission process, the integrity of the reactor core, the reactor coolant pressure boundary, and the containment and its associated systems. Appropriate controls shall be provided to maintain these variables and systems within prescribed operating ranges.

GDC 19, Control room. A control room shall be provided from which actions can be taken to operate the nuclear power unit safely under normal conditions and to maintain it in a safe condition under accident conditions, including loss-of-coolant accidents. Adequate radiation protection shall be provided to permit access and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of 5 rem whole body, or its equivalent to any part of the body, for the duration of the accident. Equipment at appropriate locations outside the control room shall be provided (1) with a design capability for prompt hot shutdown of the reactor, including necessary instrumentation and controls to maintain the unit in a safe condition during hot shutdown, and (2) with a potential capability for subsequent cold shutdown of the reactor through the use of suitable procedures.

GDC 24, Separation of protection and control systems. The protection system shall be separated from control systems to the extent that failure of any single control system component or channel, or failure or removal from service of any single protection system component or channel which is common to the control and protection systems leaves intact a system satisfying all reliability, redundancy, and independence requirements of the protection system. Interconnection of the protection and control systems shall be limited so as to assure that safety is not significantly impaired.

Compliance with seismic qualification requirements, and with the 10 CFR 50.49, environmental qualification requirements, are not impacted and there are no changes to the design; thus, compliance with GDCs 2 and 4 are not affected. Since there are no changes to the design, compliance with GDC's 10, 13, 19 and 24, are not affected.

3. TECHNICAL JUSTIFICATION

3.1 TECHNICAL EVALUATION OF DEPARTURE

Background

This background identifies the affected ITAAC and identifies some pertinent information provided in the UFSAR and COL.

The reactor system (RXS) Design Commitment for ITAAC 2.1.03.01 (also referred to as ITAAC Index No. 68) states "The functional arrangement of the RXS is as described in the Design Description of this Section 2.1.3." The inspection identified to support confirmation of the RXS arrangement is identified as "Inspection of the as-built system will be performed." The acceptance criterion for the inspection is stated as "The as-built RXS conforms with the functional arrangement as described in the Design Description of this Section 2.1.3."

The RXS Design Commitment for ITAAC 2.1.03.06.i (also referred to as ITAAC Index No. 75) states "The seismic Category I equipment identified in Table 2.1.3-1 can withstand seismic design basis loads without loss of safety function." The inspection identified to support confirmation of the placed equipment is identified as "Inspection will be performed to verify that the seismic Category I equipment identified in Table 2.1.3-1 is located on the Nuclear Island." The acceptance criterion for the inspection of the placed equipment is stated as "The seismic Category I equipment identified in Table 2.1.3-1 is located on the Nuclear Island."

Another ITAAC 2.1.03.06.i (ITAAC Index No. 75) inspection identified to support confirmation of the placed equipment is identified as "Inspection will be performed for the existence of a report verifying that the as-built equipment including anchorage is seismically bounded by the tested or analyzed conditions." The acceptance criterion for this inspection of the placed equipment is stated as "A report exists and concludes that the as-built equipment including anchorage is seismically bounded by the tested or analyzed conditions."

The diverse actuation system (DAS) Design Commitment for ITAAC 2.5.01.03e (also referred to as ITAAC Index No. 515) states "The sensors identified on Table 2.5.1-3 are used for DAS input and are separate from those being used by the PMS and plant control system." The inspection identified to support confirmation of the DAS input sensors is identified as "Inspection of the as-built system will be performed." The acceptance criterion for the inspection is stated as "The sensors identified on Table 2.5.1-3 are used by DAS and are separate from those being used by the PMS and plant control system."

The in-core instrumentation system (IIS) Design Commitment for ITAAC 2.5.05.02.i, item 2 (also referred to as ITAAC Index No. 565) states "The seismic Category I equipment identified in Table 2.5.5-1 can withstand seismic design basis dynamic loads without loss of safety function." The item 2.i) inspection identified to support confirmation of the incore thimble assemblies is identified as "Inspection will be performed to verify that the seismic Category I equipment identified in Table 2.5.5-1 is located on the Nuclear Island." The item 2.i) acceptance criterion for the inspection is stated as "The seismic Category I equipment identified in Table 2.5.5-1 is located on the Nuclear Island."

The inspection identified for IIS ITAAC 2.5.05.02.i, item 2.iii) (also part of ITAAC Index No. 565) to support confirmation of the incore thimble assemblies is identified as "Inspection will be performed for the existence of a report verifying that the as-built equipment including anchorage is seismically bounded by the tested or analyzed conditions." The item 2.iii) acceptance criterion for the inspection is stated as "A report exists and concludes that the as-built equipment including anchorage is seismically bounded by the tested or analyzed conditions."

The IIS Design Commitment for ITAAC 2.5.05.02.i, item 3.ii) (also part of ITAAC Index No. 565) states "The Class 1E equipment identified in Table 2.5.5-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function, for the time required to perform the safety function." The item 3.ii) inspection identified to support confirmation of the incore thimble assemblies is identified as "Inspection will be performed of the as-built Class 1E equipment and the associated wiring, cables, and terminations located in a harsh environment." The item 3.ii) acceptance criterion for the inspection is stated as "A report exists and concludes that the as-built Class 1E equipment and the associated wiring, cables, and terminations identified in Table 2.5.5-1 as being qualified for a harsh environment are bounded by type tests, analyses, or a combination of type tests and analyses."

The IIS Design Commitment for ITAAC 2.5.05.03b (also referred to as ITAAC Index No. 570) states "The Class 1E cables between the Incore Thermocouple elements and the connector boxes located on the integrated head package have sheaths." The inspection identified to support confirmation of these cables is identified as "Inspection of the as-built system will be performed." The acceptance criterion for the inspection is stated as "The as-built Class 1E cables between the Incore Thermocouple elements and the connector boxes located on the integrated head package have sheaths."

Each of the above ITAAC have a common attribute of involving components that will not be in their final operational locations until after fuel load, and thus, the ITAAC closure cannot occur prior to initial fuel loading as required by 10 CFR 52.103(g). The ITAAC involve invessel components such as fuel assemblies, rod cluster control assemblies (RCCAs), gray rod control assemblies (GRCAs), incore instrumentation, and core exit temperature sensors (thermocouple assemblies).

UFSAR Subsection 9.1.4.2.2.4 notes that reactor assembly is achieved by reversing the steps described for reactor disassembly described in UFSAR Subsections 9.1.4.2.2.3 and 9.1.4.2.2.2. These UFSAR subsections describe the following activities beginning with loading the fuel assemblies into the reactor core.

- The upper internals are moved into the vessel, and the internals lift rig is removed.
- The control rod drive shafts are connected.
- The vessel head is transported from its storage pedestal and raised to above the vessel flange using the containment polar crane, and the vessel head is seated.
- The head cables are connected at the integrated head package (IHP) connector plate.

As described in UFSAR Subsection 4.4.6.1, "The incore instrumentation system consists of incore instrument thimble assemblies, which house fixed incore detectors, core exit thermocouple assemblies contained within an inner and outer sheath assembly, and associated signal processing and data processing equipment. There are 42 incore instrument

thimble assemblies: each is composed of multiple fixed incore detectors and one thermocouple." The UFSAR subsection also notes that the incore instrument thimble assemblies, or thimbles, "are inserted into the active core through the upper head and internals of the reactor vessel."

UFSAR Subsection 3.9.7 identifies the components which are part of the integrated head package (IHP) as including cables and incore instrumentation. Subsection 3.9.7.1 notes that "The components of the incore instrumentation system (IIS) that interface with the IHP are the QuickLoc stalk assembly and the IIS cables and connectors." Subsection 3.9.7.2 also notes that the IHP cables include those portions of the incore instrumentation "cables extending from the connector plates to the user devices," e.g., the core exit temperature sensors.

Under the heading of "Cables," Subsection 3.9.7.2 also states "The integrated head package cables include those portions of the control rod drive mechanism power cables, in-core instrumentation, and rod position indication instrumentation cables extending from the connector plates to the user devices. These cables remain with the integrated head package and are normally not disturbed. The individual cable length is sized to provide an orderly arrangement. A cable bridge spanning between the integrated head package to the operating deck is used to support the routing of integrated head package cables. A connector rack mounted to the end of the cable bridge is used to manage, support, and provide a means to quickly connect and disconnect the cables during the refueling outage." The connector rack is located on the integrated head package.

Under the heading of "In-core Instrumentation," Subsection 3.9.7.2 also states "The thermocouples and neutron detectors are routed through the integrated head package. These are inserted into the core through the reactor vessel head and upper internals assembly."

Thus, the UFSAR identifies this equipment for final installation following fuel loading.

<u>Discussion</u>

The ITAAC Index No. 68 Design Description for RXS includes the following key attributes:

- The reactor system (RXS) generates heat by a controlled nuclear reaction and transfers the heat generated to the reactor coolant, provides a barrier that prevents the release of fission products to the atmosphere and a means to insert negative reactivity into the reactor core and to shutdown the reactor core.

- The reactor core contains a matrix of fuel rods assembled into fuel assemblies using structural elements. Rod cluster control assemblies (RCCAs) are positioned and held within the fuel assemblies by control rod drive mechanisms (CRDMs).

- The RXS is operated during normal modes of plant operation, including startup, power operation, cooldown, shutdown and refueling.

- The component locations of the RXS are as shown in Table 2.1.3-3, including the pre-fuel load location for the RXS components that cannot be installed in their final operational configuration until fuel load occurs. Note, the RXS has no simplified figure.

Because certain RXS components will not be in their final operational location until after fuel is loaded, ITAAC Index No. 68 cannot be closed in conformance with the interpretation and understanding that "as-built" SSCs must be installed in their final operational location prior to ITAAC closure. Furthermore, for those certain RXS components, ITAAC Index No. 68 with this interpretation of "as-built" does not meet the UFSAR Subsection 14.3.2.2 selection criteria of "the ITAAC do not include any inspections, tests, or analyses that are dependent upon conditions that exist only after fuel load."

The ITAAC Index No. 68 key attributes identified above are verified by inspections and testing following the 52.103(g) finding and associated with fuel loading, precritical, and initial criticality testing. Specifically, testing is required per COL License Conditions 2.D.(3) and 2.D.(4) (as discussed in General Related Information below). Other ITAAC also demonstrate that the reactor system has been constructed in accordance with the design to the extent possible prior to fuel load. For example, ITAAC 2.1.03.02a (also referred to as ITAAC Index No. 69) demonstrates that the as-built RXS accommodates the fuel assembly and control rod drive mechanism pattern shown in Figure 2.1.3-1 and the control assemblies (rod cluster and gray rod) and drive rod arrangement shown in Figure 2.1.3-2. ITAAC 2.1.03.02c (also referred to as ITAAC Index No. 71) demonstrates that the as-built RXS accommodates the reactor vessel arrangement shown in Figure 2.1.3-3. ITAAC 2.1.03.03 (also referred to as ITAAC Index No. 72) demonstrates that inspections are performed and that the specified RXS components and pressure boundary welds meet ASME Code Section III requirements; additionally, a hydrostatic test is performed as required by the ASME Code Section III. ITAAC 2.1.03.06.i (also referred to as ITAAC Index No. 75) demonstrates that the specified equipment has been adequately qualified under seismic conditions and harsh environments per design requirements. ITAAC 2.1.03.13 (also referred to as ITAAC Index No. 88) demonstrates that the fuel assemblies and rod cluster control assemblies intended for the initial core load and listed in Table 2.1.3-1 have been designed and constructed in accordance with the principal design requirements. Finally, ITAAC 2.1.03.14 (also referred to as ITAAC Index No. 89) demonstrates the acceptability of the reactor vessel head top surface and penetration nozzles through a preservice visual examination.

Based on the above information, it is requested that ITAAC Index No. 68 be deleted.

The ITAAC Index No. 75 Acceptance Criteria 6.i) requires that the seismic Category I equipment identified in Table 2.1.3-1 is located on the Nuclear Island. The seismic Category I equipment identified in Table 2.1.3-1 includes components which are stored in protected environments until it is time for loading the initial core, namely the fuel assemblies, the rod cluster control assemblies, the gray rod cluster assemblies, and the incore instrument QuickLoc assemblies. UFSAR Subsection 4.2.1.6 identifies the rod cluster control assemblies and the gray rod cluster assemblies as incore components. UFSAR Subsection 3.9.5.1.2 identifies the incore instrument QuickLoc assemblies as incore components.

Fuel loading and operation of the RXS will not and cannot occur until the equipment is "on the Nuclear Island." Thus, confirming this equipment is "on the Nuclear Island" is an unnecessary requirement that does not serve the underlying purpose of ITAAC which is to confirm completion of activities that can be completed prior to the initial fuel load.

Additionally, the remaining inspections required by ITAAC Index No. 75 verify that the subject seismic Category I assemblies in Table 2.1.3-1 are qualified to be located on the Nuclear Island. For example, item 6.ii) of ITAAC Index No. 75 demonstrates that the seismic

Category I equipment can withstand seismic design basis loads without loss of safety function; item 6.iii) of ITAAC Index No. 75 demonstrates that the equipment including anchorage is seismically bounded by the tested or analyzed conditions; item 9.a.i) of ITAAC Index No. 75 demonstrates that the Class 1E equipment identified in Table 2.1.3-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function; item 9.a.ii) of ITAAC Index No. 75 demonstrates that the Class 1E equipment and the associated wiring, cables, and terminations identified in Table 2.1.3-1 as being qualified for a harsh environment are bounded by type tests, analyses, or a combination of type tests and analyses.

To close the ITAAC and confirm that seismic Category I components can withstand seismic design basis loads without loss of safety function, the components in the Table are designed to be located on the seismic Category I Nuclear Island. An inspection is conducted of the RXS to confirm the satisfactory installation (to the extent allowed prior to 52.103(g)) of the seismically qualified components. The inspection includes verification of equipment make/model/serial number and verification of equipment location (Building, Elevation, Room). The final location of the fuel assemblies, rod cluster control assemblies, gray rod cluster assemblies, and incore instrument QuickLoc assemblies is within the reactor vessel, and thus, are not installed in their final location until after the 10 CFR 52.103(g) finding has been made as part of initial fuel load. Therefore, the inspection of these invessel components listed in Table 2.1.3-1 do not meet the UFSAR Subsection 14.3.2.2 selection criteria for ITAAC that "the ITAAC do not include any inspections, tests, or analyses that are dependent upon conditions that exist only after fuel load" and should be excluded from ITAAC Index No. 75.

The assemblies are seismically qualified when located on the nuclear island. Pre-fuel-load inspections of these assemblies are performed but not in the final installed location, since that is not allowed by 52.103(g). The results of the inspection are documented to conclude that the seismic Category I components are located on the Nuclear Island except for the fuel assemblies, rod cluster control assemblies, gray rod cluster assemblies, and incore instrument QuickLoc assemblies.

Based on the above information, it is requested that ITAAC Index No. 75, item 6.i) be revised to exclude the invessel components.

The ITAAC Index No. 75 Acceptance Criteria 6.iii) requires a report that concludes that the "as-built" equipment including anchorage is seismically bounded by the tested or analyzed conditions.

The seismic Category I equipment identified in Table 2.1.3-1 includes the reactor vessel, the upper and lower internals assemblies, the fuel assemblies, rod assemblies, control rod drive mechanisms, incore instrument QuickLoc assemblies, and the source, intermediate and power range detectors. Per the COL license conditions governing testing and fuel loading and UFSAR Section 4.2 describing the fuel system design, the fuel assemblies, the rod cluster control assemblies, the gray rod cluster assemblies, and the incore instrument QuickLoc assemblies will not be installed in their final operational locations until after the initial core is loaded with fuel assemblies in the reactor vessel. Accordingly, these portions of ITAAC Index No. 75 cannot be closed in conformance with the interpretation and understanding that "as-built" SSCs must be installed in their final operational location prior to ITAAC closure. Prior

to fuel load, these attributes are verified by inspections and testing performed by the manufacturer and on-site, to the extent practical when not allowed to be in their final assembled "as-built" operational configuration. Inspections and tests following the 52.103(g) finding are performed associated with fuel loading, precritical, and initial criticality testing, as described in UFSAR Section 14.2.10 and required per COL License Conditions 2.D.(3) and 2.D.(4).

UFSAR Subsection 3.10.3 identifies that the final installed configuration is considered in confirming the seismic qualification. It states "The equipment qualification data packages and seismic analysis report for non-active mechanical equipment (with no environmental qualification requirements) identify the equipment mounting employed for qualification and establish interface requirements for the equipment to provide confidence that subsequent in-plant installation does not degrade the established qualification. Interface requirements are defined based on the test configuration and other design requirements. Dynamic coupling effects resulting from mounting the component according to these interface criteria are considered in the qualification program."

Thus, final installation confirmations that are addressed by other regulations and requirements which cannot be verified in its final operational location prior to fuel load need not (and cannot) be the subject of an "as-built" ITAAC. Therefore, the inspection of these invessel components listed in Table 2.1.3-1 with this interpretation of "as-built" do not meet the UFSAR Subsection 14.3.2.2 selection criteria for ITAAC that "the ITAAC do not include any inspections, tests, or analyses that are dependent upon conditions that exist only after fuel load" and should be excluded from ITAAC Index No. 75.

To the extent that the installation prior to fuel load is possible for other seismically-qualified components, an inspection is conducted to confirm the satisfactory installation of the seismically qualified components identified in the table. The inspection verifies the equipment make/model/serial number, as-designed equipment mounting orientation, anchorage and clearances, and electrical and other interfaces. For components not installed prior to fuel load, the pre-fuel-load inspection is accomplished by verifying a quality assurance data package exists that concludes that the equipment was constructed as per design. Additional verifications are performed following 52.103(g) as addressed in UFSAR Subsection 14.2.10.

The inspection conducted for each component in the table considers the critical seismic attributes identified in the associated Equipment Qualification Report for that component. The inspection confirms that the equipment, including anchorage, is seismically bounded by the tested or analyzed conditions.

Based on the above information, it is requested that ITAAC Index No. 75, item 6.iii) be revised to remove the "as-built" attribute of the inspection.

The ITAAC Index No. 515 Acceptance Criteria requires that the sensors identified in Table 2.5.1-3 are used by DAS and are separate from those being used by the PMS and plant control system. However, the inspection requirement is of the "as-built" system. The sensors identified in Table 2.5.1-3 include the core exit temperature sensors. However, pursuant to UFSAR Subsection 4.4.6.1, the sensors are to be installed within the core and thus, cannot be installed in their final operational location prior to constitution of a core by the initial fuel load. Accordingly, as currently written, ITAAC Index No. 515 cannot be closed in conformance with the interpretation and understanding that "as-built" SSCs must be installed in their final operational location prior to ITAAC closure. Furthermore, the inspection of these sensors with

this interpretation of "as-built" does not meet the UFSAR Subsection 14.3.2.2 selection criteria for ITAAC that "the ITAAC do not include any inspections, tests, or analyses that are dependent upon conditions that exist only after fuel load" and should be excluded from ITAAC Index No. 515.

Inspection of the as-built Diverse Actuation System (DAS) is performed to demonstrate that the sensors identified in Table 2.5.1-3, except for the core exit temperature sensor installation, are used for Diverse Actuation System (DAS) input and are separate from those being used by the Protection and Safety Monitoring System (PMS) and Plant Control System (PLS).

The DAS System Specification document requires that the sensors identified in the table be used for DAS input and are separate and independent from the sensor inputs in the PMS and plant control system. Construction drawings illustrate the DAS sensor flow and indication architecture. An inspection of Quality Release and Certificate of Conformance document, construction drawings, and completed construction records is performed to confirm that the sensors identified in the table were installed per the DAS sensor input requirements and are separate from those being used by the PMS and plant control system with the exception of the core exit temperature sensor installation.

Based on the above information, it is requested that ITAAC Index No. 515 be revised to remove the "as-built" installation attribute of these inspections for the core exit temperature sensors.

The ITAAC Index No. 565 Acceptance Criteria 2.i) requires that the seismic Category I equipment identified in Table 2.5.5-1 is located on the Nuclear Island. The seismic Category I equipment identified in Table 2.5.5-1 is the Incore Thimble Assemblies (at least three assemblies in each core quadrant). The incore thimble assemblies are stored in protected environments off the Nuclear Island until it is time for loading the initial core. These include the core exit temperature sensors of ITAAC Index No. 515. Storing such sensitive equipment "on the Nuclear Island" would unnecessarily subject it to potential damage. Further, fuel loading and loading of the incore thimble assemblies will not and cannot occur until the equipment is "on the Nuclear Island." Thus, this is an unnecessary requirement that does not serve the underlying purpose of ITAAC which are required to be completed prior to the initial fuel load. The remaining inspections required by ITAAC Index No. 565 verify that the seismic Category I equipment in Table 2.5.5-1 is qualified to be located on the Nuclear Island. For example, item 2.ii) of ITAAC Index No. 565 demonstrates that the seismic Category I equipment can withstand seismic design basis dynamic loads without loss of safety function; item 2.iii) of ITAAC Index No. 565 demonstrates that the equipment including anchorage is seismically bounded by the tested or analyzed conditions; item 3.a.i) of ITAAC Index No. 565 demonstrates that the Class 1E equipment identified in Table 2.5.5-1 as being qualified for a harsh environment, i.e., the equipment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function; item 3.a.ii) of ITAAC Index No. 565 demonstrates that the Class 1E equipment and the associated wiring, cables, and terminations identified in Table 2.5.5-1 as being qualified for a harsh environment are bounded by type tests, analyses, or a combination of type tests and analyses.

An inspection is conducted to confirm that the seismic Category I equipment identified in Table 2.5.5-1, the Class 1E Incore Thimble Assemblies, were manufactured per the qualified design. The inspection verifies the equipment make/model/serial number, as well as the as-designed anchorage point to the integrated grid assembly is seismically bounded by the

tested or analyzed conditions, IEEE Standard 344-1987, and NRC Regulatory Guide (RG) 1.100.

Based on the above information, it is requested that ITAAC Index No. 565, item 2.i) be deleted.

The ITAAC Index No. 565 Acceptance Criteria 2.iii) requires a report that concludes that the "as-built" equipment including anchorage is seismically bounded by the tested or analyzed conditions. The ITAAC Index No. 565 Acceptance Criteria 3.a)ii) requires a report that concludes that the "as-built" Class 1E equipment and the associated wiring, cables, and terminations identified in Table 2.5.5-1 as being qualified for a harsh environment are bounded by type tests, analyses, or a combination of type tests and analyses.

The seismic Category I equipment identified in Table 2.5.5-1 is the Incore Thimble Assemblies (at least three assemblies in each core quadrant). As discussed above, this equipment will not be installed in their final operational locations until after the initial core is loaded with fuel assemblies in the reactor vessel. Accordingly, these portions of ITAAC Index No. 565 cannot be closed in conformance with the interpretation and understanding that "as-built" SSCs must be installed in their final operational location prior to ITAAC closure. Furthermore, the inspection of the Incore Thimble Assemblies with this interpretation of "as-built" do not meet the UFSAR Subsection 14.3.2.2 selection criteria for ITAAC that "the ITAAC do not include any inspections, tests, or analyses that are dependent upon conditions that exist only after fuel load". Prior to fuel load, these attributes are verified by vendor inspections and testing; following the 52.103(g) finding, associated fuel loading and precritical testing will be performed in accordance with COL License Condition 2.D.(3).

UFSAR Subsection 3.10.3 identifies that the final installed configuration is considered in confirming the seismic qualification. It states, "The equipment qualification data packages and seismic analysis report for non-active mechanical equipment (with no environmental qualification requirements) identify the equipment mounting employed for qualification and establish interface requirements for the equipment to provide confidence that subsequent in-plant installation does not degrade the established qualification. Interface requirements are defined based on the test configuration and other design requirements. Dynamic coupling effects resulting from mounting the component according to these interface criteria are considered in the qualification program."

An inspection is conducted to confirm that the seismic category I equipment identified in Table 2.5.5-1, the Class 1E Incore Thimble Assemblies, were manufactured per the qualified design. The inspection verifies the equipment make/model/serial number, as well as the as-designed anchorage point to the integrated grid assembly. An EQ Reconciliation Report (EQRR) is completed to verify the seismic Category I equipment listed in the Table, including anchorage, is seismically bounded by the tested or analyzed conditions, IEEE Standard 344-1987, and NRC Regulatory Guide (RG) 1.100, Revision 2.

UFSAR Subsection 3.11.5 identifies that the environmental qualification (EQ) files developed by the reactor vendor are maintained as applicable for equipment and certain post-accident monitoring devices that are subject to a harsh environment. The contents of the qualification files are discussed in Section 3D.7. Appendix 3D, Subsection 3D.7.2.1 indicates that equipment is identified "by manufacturer, model or model series, and reference to other documents describing or depicting its construction, configuration, and modifications that are uniquely necessary after manufacture to its application in the AP1000 plant design." Subsection 3D.7.2.2 goes on to address installation requirements noting "So that the qualification represents the in-plant condition, the method of installation, as specified in

Section 1.2 of Attachment A, is in accordance with the supplier's installation instructions. Differences unique to safety-related applications in the AP1000 design are included, with appropriate reference to drawings, technical manual supplements, or mandatory modification packages."

In addition, Quality Control reviews the work package completion to confirm that the equipment is installed in a manner that is consistent with the as-tested/as-analyzed configuration.

Thus, final installation confirmations that are addressed by other regulations and requirements which cannot be verified in its final operational location prior to fuel load need not be the subject of an "as-built" ITAAC.

The harsh environment Class 1E equipment in the Table is qualified by the type testing and/or analyses identified in EQ Reports. Class 1E electrical equipment type testing is performed in accordance with IEEE Standard 323-1974 and RG 1.89, Revision 1, to meet the requirements of 10 CFR 50.49. Type testing of safety-related equipment meets the requirements of 10 CFR Part 50, Appendix A, General Design Criterion 4. The documentation identifies the EQ program and specific qualification method for each piece of Class 1E electrical equipment located in a harsh environment. Additional information about the methods used to qualify AP1000 safety-related equipment is provided in UFSAR Appendix 3D. EQ Reports and EQ Reconciliation Reports (EQRRs) contain applicable test reports/analysis and associated documentation and conclude that the equipment and the associated wiring, cables, and terminations can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

Inspection for harsh environment is accomplished by verifying a quality assurance data package exists that concludes that the equipment was constructed as per design.

Based on the above information, it is requested that ITAAC Index No. 565, item 2.iii) and item 3.a)ii) be revised to remove the "as-built" attribute of these inspections.

The ITAAC Index No. 570 Acceptance Criteria 3.b) requires that the as-built Class 1E cables between the Incore Thermocouple elements and the connector boxes located on the integrated head package have sheaths. During a public meeting on August 12, 2021, NRC staff explained the position that, in order to give full effect to the design considerations Staff understands to underly the ITAAC, this ITAAC should include the incore portion of the Class 1E cables, not just those on the integrated head package. These incore class 1E cables are subcomponents of the incore thimble assemblies, which as discussed above cannot be installed in their final operational location prior to constitution of a core by the initial fuel load.

The core exit temperature sensor is located in the Incore Instrument Thimble Assembly (IITA) which is inserted into the core. The other end of the IITA is outside the reactor vessel head at the QuickLoc. The IITA connects to the head area cable assembly which is then routed through and around the Integrated Head Package (IHP), across the cable bridge, through the IHP cable rack assembly and connects with its matching cable mounted on the connector plate, which is part of the Operating Deck Connector Panel.

It is requested that the Design Description, item 3.b) (supporting ITAAC Index No. 570), be revised for clarity, and that ITAAC Index No. 570, item 3.b) be revised for clarity and to remove the "as-built" attribute of the inspection. To give effect to the scope of this ITAAC expressed by NRC staff, the clarity changes include replacing the phrase "Incore Thermocouple

elements" with "Core Exit Temperature sensors" for consistency with other ITAAC nomenclature, removing the "location" information and clarifying the scope by replacing "connector boxes" with "connector plates" consistent with terms used in the FSAR and replacing "system" with "Class 1E cables" so that the inspection language is consistent with the Design Commitment and the Acceptance Criteria.

The ITAAC inspections for equipment which cannot be inspected in its final location include review of documentation such as the system design specifications, records of inspection of the components performed by the manufacturer prior to shipment to the plant site, Quality Release and Certificate of Conformance documentation, construction drawings, and completed construction records, including those performed on-site, to the extent possible given that the facility design does not allow certain components to be installed in their final operational configuration until after fuel is installed in the vessel.

Design specifications require internal metallic sheaths that surround and separate the individual Class 1E thermocouple wires from non-Class 1E detector wires, which are contained within an external spiral wound sheath. The design specifications also include performance tests for overvoltage, insulation resistance, and continuity. Successful test results indicate that the sheaths protect against credible single faults between the Class 1E and non-Class 1E signals.

The Quality Release and Certificate of Conformance document verifies the head area cable assembly acceptance test results. The Field Service Report document verifies the head area cable assemblies were installed on the integrated head package in accordance with design drawings and installation specifications issued for construction, and work package requirements. An additional Quality Release and Certificate of Conformance document verifies that the invessel Class 1E cables were installed within the incore thimble assemblies in accordance with design drawings and installation specifications and contains the incore thimble assemblies cable acceptance test results.

The Class 1E cables between the Core Exit Temperature sensors (these sensors are located within the incore thimble assemblies) and the connector plates (as described above, these connectors are beyond the integrated head package on the operating deck connector panel) are inspected to verify that the design specification and installation specifications are satisfied, to enable each cable to convey the safety-related core exit thermocouple signals to the PMS.

The inspections are performed and documented in accordance with manufacturer and vendor quality verification programs. The results of the inspections are documented in support of the ITAAC 2.5.05.03b Completion Packages. The inspections confirm that the Class 1E cables between the Core Exit Temperature sensors and the connector plates have sheaths.

As noted in UFSAR Subsection 14.2.10.1.7, incore instrumentation testing following installation of the components in the head and the head placement following core loading and prior to criticality will provide an additional confirmation that the components are installed in accordance with the approved design and are operating properly prior to plant heatup. This final testing includes electrical continuity checks and data comparison to verify proper operation. This testing is required per COL LC 2.D.(3)(c), including notification to the NRC of completion of testing per COL LC 2.D.(3)(e).

General Related Information

The proposed ITAAC revisions are also consistent with UFSAR Chapter 14 initial test descriptions. In particular, the incore instrumentation pre-operational testing in UFSAR Subsection 14.2.9.1.13 acceptance criteria indicates the testing addresses "individual component and integrated tests designed to confirm operation of the system components **outside the reactor vessel.**" The post fuel loading testing in UFSAR Subsection 14.2.10.1.7 for Incore Instrumentation System Precritical Verification identifies an objection of "Verify that the incore instrumentation thimbles have been installed correctly **following initial fuel loading**"

Finally, given the above testing discussions, the removed portions of ITAAC Index Nos. 68, 75 and 565 are duplicative of compliance with the regulations and Combined License Condition 2.D.(3) and 2.D.(4) in that 10 CFR 52.103(g) does not allow the initial fuel loading until after the ITAAC are found to be met, and the License Conditions require that the testing in UFSAR Subsection 14.2.10 be completed, and the completion must occur in a specific order, with those tests in Subsection 14.2.10 not being performed until after the initial fuel load. The tests cannot be completed in accordance with the License Conditions unless the equipment is "as-built" and located "on the Nuclear Island."

3.2 EVALUATION OF EXEMPTION

Pursuant to 10 CFR 52.7, the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR Part 52. As 10 CFR 52.7 further states, the Commission's consideration will be governed by 10 CFR 50.12, "Specific exemptions," which states that an exemption may be granted when: (1) the exemptions are authorized by law, will not present an undue risk to public health and safety, and are consistent with the common defense and security; and (2) special circumstances are present. Specifically, 10 CFR 50.12(a)(2) lists six special circumstances for which an exemption may be considered. It is necessary for one of these special circumstances to be present in order for the NRC to consider granting an exemption request. SNC has determined that the requested exemption meets the special circumstances of 10 CFR 50.12(a)(2)(ii). That subsection defines special circumstances as when "[a]pplication of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule." An analysis of each of these findings is presented below.

3.2.1 AUTHORIZED BY LAW

This exemption would allow SNC to implement approved revisions to Tier 1 information and corresponding information in COL Appendix C in the plant-specific DCD. This exemption is a permanent exemption limited in scope to particular Tier 1 information. Subsequent changes to this particular Tier 1, or any other Tier 1 information, would be subject to the exemption process specified in Section VIII.A.4 of Appendix D to 10 CFR Part 52 and the requirements of 10 CFR 52.63(b)(1). As stated above, 10 CFR Part 52, Appendix D, Section VIII.A.4 allows the NRC to grant exemptions from one or more elements of the Tier 1 information. Based on 10 CFR Part 52, Appendix D, Section VIII.A.4, SNC has determined that granting of the proposed exemption will not result in a violation of the Atomic Energy Act of 1954, as amended, or the Commission's regulations. Therefore, as required by 10 CFR 50.12(a)(1), the exemption is authorized by law.

3.2.2 NO UNDUE RISK TO PUBLIC HEATH AND SAFETY

The underlying purpose of Appendix D to 10 CFR Part 52 is to ensure that SNC will construct and operate the plant based on the approved information found in the plant-specific DCD incorporated by reference into the licensee's licensing basis. This exemption does not involve any change to the facility design. The proposed changes would revise Tier 1 information as presented in the ITAAC table to allow these ITAAC to be closed in light of the existing facility design and the interpretation that “as-built” SSCs must be installed in their final operational location prior to submission of the ICN. These changes will eliminate anomalies in the ITAAC resulting from guidance regarding as-built ITAAC closure and enable the licensee to safely construct and operate the facility consistent with the performance of the components for the AP1000 design certified by the NRC by revising the information mentioned above found in Tier 1 of the DCD. These changes will not impact the ability of the systems or equipment to perform their design function. These changes do not add any new equipment or system interfaces to the current plant design. The proposed changes do not introduce any new industrial, chemical, or radiological hazards that would represent a public health or safety risk, nor do they modify or remove any design or operational controls or safeguards intended to mitigate any existing on-site hazards. Furthermore, the proposed changes would not allow for a new fission product release path, result in a new fission product barrier failure mode, or create a new sequence of events that would result in significant fuel cladding failures. Accordingly, these changes do not present an undue risk from any new equipment or systems. Therefore, as required by 10 CFR 50.12(a)(1), SNC has determined that there is no undue risk to public health and safety.

3.2.3 CONSISTENT WITH COMMON DEFENSE AND SECURITY

The proposed exemption would allow changes to elements of the plant-specific Tier 1 DCD. This is a permanent exemption limited in scope to particular Tier 1 ITAAC information. Subsequent changes to Tier 1 information would be subject to full compliance by the licensee as specified in Section VIII.A.4 of Appendix D to 10 CFR Part 52. The proposed changes would revise Tier 1 information as presented in the ITAAC table. These changes will enable the licensee to safely construct and operate the facility consistent with the performance of the components for the AP1000 design certified by the NRC by revising the information mentioned above found in Tier 1 of the DCD. The changes do not alter or impede the design, function, or operation of any plant structures, systems, and components (SSCs) associated with the facility's physical or cyber security and, therefore, do not affect any plant equipment that is necessary to maintain a safe and secure plant status. In addition, the change has no impact on plant security or safeguards. Therefore, as required by 10 CFR 50.12(a)(1), SNC has determined that the common defense and security is not impacted by this exemption.

3.2.4 SPECIAL CIRCUMSTANCES

Special circumstances, in accordance with 10 CFR 50.12(a)(2)(ii), are present whenever application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule. The underlying purposes of Section III.B of Appendix D to 10 CFR Part 52 is to ensure that the licensee will construct and operate the plant based on the approved information found in the AP1000 DCD, which was incorporated by reference into the licensee's licensing basis. The proposed changes to Tier 1 will enable SNC to safely construct and operate the AP1000 facility consistent with established acceptance criteria used in the design certified by the NRC.

Special circumstances are present in the particular circumstances discussed in this license amendment request because the application of Section III.B of Appendix D to 10 CFR Part 52 in this circumstance does not serve the underlying purpose of the rule. The proposed change implements changes to Tier 1 information. This exemption request and associated revisions to Tier 1 information demonstrate that the applicable regulatory requirements will continue to be met. Consequently, the safety impact that may result from any reduction in standardization is minimized because the proposed change does not result in a reduction in the level of safety. Therefore, SNC has determined that the special circumstances required by 10 CFR 50.12(a)(2)(ii) for the granting of an exemption from Section III.B of Appendix D to 10 CFR Part 52 exist.

3.2.5 SPECIAL CIRCUMSTANCES OUTWEIGH REDUCED STANDARDIZATION

This exemption would allow the implementation of changes to Tier 1 information as proposed in the license amendment request. The proposed changes would revise Tier 1 ITAAC information. These changes will enable the licensee to safely construct and operate the facility consistent with the performance of the components for the AP1000 design certified by the NRC by updating the information mentioned above found in Tier 1 of the DCD. The design functions of the systems associated with this request are consistent with the current design of the plant in supporting the actual system functions. The design functions of these systems will continue to be maintained because the associated revisions to the Tier 1 information demonstrate that the applicable regulatory requirement will continue to be met. Consequently, the safety impact that may result from any reduction in standardization is minimized, because the proposed change does not result in a reduction in the level of safety. Based on the foregoing reasons, as required by 10 CFR Part 52.63(b)(1), SNC has determined that the special circumstances outweigh the effects the departure has on the standardization of the AP1000 design.

3.2.6 NO SIGNIFICANT REDUCTION IN SAFETY

This exemption would allow the implementation of changes to Tier 1 information as proposed in the license amendment request. The changes will not impact the functional capabilities of the SSCs. The proposed changes will not adversely affect the ability of the SSCs to perform their design functions and the level of safety provided by the current systems and equipment therein is unchanged. Therefore, based on the foregoing reasons and as required by 10 CFR Part 52, Appendix D, Section VIII.A.4, SNC has determined that granting the exemption would not result in a significant decrease in the level of safety otherwise provided by the design.

4. STATE CONSULTATION

In accordance with the Commission's regulations in 10 CFR 50.91(b)(2), the Georgia State official was notified of the proposed amendment.

5. ENVIRONMENTAL CONSIDERATIONS

The amendment and exemption change a requirement with respect to facility components located within the restricted area as defined in 10 CFR Part 20. The amendment and exemption involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. Enclosure 2 provides a finding that the requested amendment

and exemption involve no significant hazards consideration. Accordingly, the requested amendment and exemption meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the requested amendment or exemption.

6. CONCLUSION

SNC has determined that pursuant to Section VIII.A.4 of Appendix D to 10 CFR Part 52, the requested exemption (1) is authorized by law, (2) presents no undue risk to the public health and safety, (3) is consistent with the common defense and security, (4) presents special circumstances, (5) the special circumstances outweigh the potential decrease in safety due to reduced standardization, and (6) does not reduce the level of safety at the licensee's facility. Therefore, SNC requests the staff grant the proposed exemption from Tier 1 information.

SNC has concluded, based on the considerations discussed in Section 3.1, Technical Evaluation of the Departure, that there is reasonable assurance that: (1) the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public. Therefore, SNC requests the NRC Staff to find the changes proposed in this license amendment to be acceptable.

7. REFERENCES

7.1 Combined License NPF-91 for Vogtle Electric Generating Plant Unit 3, Southern Nuclear Operating Company (ADAMS Accession No. ML14100A106).

7.2 Combined License NPF-92 for Vogtle Electric Generating Plant Unit 4, Southern Nuclear Operating Company (ADAMS Accession No. ML14100A135).

7.3 VEGP Units 3 and 4 Updated Final Safety Analysis Report (UFSAR), Revision 10, and Plant-Specific Tier 1, Revision 9, dated June 14, 2021 (ADAMS Accession Nos. ML21179A098 and ML21179A097 respectively).

7.4 AP1000 Design Control Document, Revision 19, dated June 13, 2012 (ADAMS Accession No. ML11171A500).

7.5 U.S. Nuclear Regulatory Commission, "Final Safety Evaluation Report Related to the Combined Licenses for Vogtle Electric Generating Plant, Units 3 and 4," Volume 1, NUREG-2124, dated September 30, 2012 (ADAMS Accession No. ML12271A045).

7.6 Final Safety Evaluation Report Related to Certification of the AP1000 Standard Plant Design, NUREG-1793, Supplement 2, dated August 5, 2011 (ADAMS Accession No. ML112061231).

8. BASIS FOR EXPEDITED REVIEW

SNC requests an expedited review of this request by October 11, 2021, in order to allow SNC to proceed with completion of the identified Inspections, Tests, Analyses and Acceptance Criteria (ITAAC). Delayed review of this LAR will result in a delay in the completion of the VEGP units as discussed below.

As noted in Section 3.1 above, under the interpretation and understanding that as-built ITAAC cannot be closed until SSCs are installed in their final operational location, these ITAAC cannot be closed prior to fuel load as required for the 52.103(g) finding. Thus, NRC's review of this LAR will affect the critical path related activities leading to fuel load for Vogtle Unit 3, and similarly, for Vogtle Unit 4. Much of the Vogtle Unit 3 system inspections are already complete and verified, but final ITAAC closure is not possible without fuel load and reactor vessel head placement, and thus, approval of this change is required to complete the ITAAC and reach a 10 CFR 52.103(g) finding.

Therefore, SNC requests expedited NRC staff approval of the license amendment to support completion of the ITAAC and final completion of VEGP Unit 3. Delayed approval of this license amendment could result in a delay in completion of the associated ITAAC and subsequent completion activities. SNC similarly expects to expedite implementation of this proposed amendment within a short period following approval of the requested changes.

Additionally, while the schedule information is applicable only for VEGP Unit 3, the requested change is applicable to both units and is also requested for VEGP Unit 4 concurrent with the Unit 3 change.

Southern Nuclear Operating Company

ND-21-0772

Enclosure 2

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Significant Hazards Consideration

(LAR-21-001)

(This Enclosure consists of 3 pages, including this cover page**)**

SIGNIFICANT HAZARDS CONSIDERATION

Southern Nuclear Operating Company (SNC) is requesting issuance of an amendment to facility Operating License Nos. NPF-91 and NPF-92, issued to SNC for operation of the VEGP Units 3 and 4 respectively, located in Burke County, Georgia.

The proposed changes would revise the VEGP Units 3 and 4 combined license (COL) Appendix C (and corresponding plant-specific Design Control Document (DCD) Tier 1) information. Specifically, the request proposes to revise the Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) 2.1.03.01 (68), ITAAC 2.1.03.06.i (75), ITAAC 2.5.01.3e (515), ITAAC 2.5.05.02.i (565), and ITAAC 2.5.05.03b (570), specified in COL Appendix C, for inspection of invessel installed components. Since these components are to be installed in the reactor vessel, the component(s) cannot be installed at their final operational location at the plant site prior to constitution of a core by the initial fuel load. Thus, approval of this change is required to allow completion of the ITAAC and to reach a 10 CFR 52.103(g) finding. There is no change to the facility design, nor is there any change to the planned verification activities, both before and after fuel load, for these invessel components—taking into account the location of these components prior to fuel load, the necessary installation activities required for fuel loading to occur, and the startup testing activities required by the COL and Chapter 14 of the UFSAR. Because this proposed change requires a departure from Tier 1 information in the Westinghouse AP1000 DCD, SNC also requested an exemption from the requirements of the Generic DCD Tier 1 in accordance with section 52.63(b)(1) of title 10 of the *Code of Federal Regulations* (10 CFR).

As required by 10 CFR 50.91(a), SNC provides the following analysis of the issue of no significant hazards consideration, which is presented below:

1. **Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?**

   Response: No.

   The proposed revisions have been found to continue to provide the required functional capability of the safety systems for previously evaluated accidents and anticipated operational occurrences. The affected system is not an initiator of any accident analyzed in the Updated Final Safety Analysis Report (UFSAR), nor do the changes involve an interface with any structure, system, or component (SSC) accident initiator or initiating sequence of events, and thus, the probabilities of the accidents evaluated in the UFSAR are not affected. The proposed changes do not involve a change to any mitigation sequence or the predicted radiological releases due to postulated accident conditions, thus, the consequences of the accidents evaluated in the UFSAR are not affected.

   The UFSAR describes the analyses of various design basis transients and accidents to demonstrate compliance of the design with the acceptance criteria for these events. The acceptance criteria for the various events are based on meeting the relevant regulations and general design criteria and are a function of the anticipated frequency of occurrence of the event and potential radiological consequences to the public. The revised ITAAC maintains the plant conditions, and thus, maintains the frequency designation and consequence level as previously evaluated.

   Therefore, the proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. **Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?**

   Response: No.

   The proposed revisions have been found to continue to confirm the required functional capability of the safety systems for previously evaluated accidents and anticipated operational occurrences. The proposed revisions do not change the function of the related systems, and thus, the changes do not introduce a new failure mode, malfunction or sequence of events that could adversely affect safety or safety-related equipment.

   Therefore, the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. **Does the proposed amendment involve a significant reduction in a margin of safety?**

   Response: No.

   The proposed revisions have been found to continue to provide the required functional capability of the safety systems for previously evaluated accidents and anticipated operational occurrences. The proposed revisions do not change the function of the related systems nor significantly affect the margins provided by the systems. No safety analysis or design basis acceptance limit/criterion is challenged or exceeded by the requested changes.

   Therefore, the proposed amendment does not involve a significant reduction in a margin of safety.

Based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public. Therefore, it is concluded that the requested amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

Southern Nuclear Operating Company

ND-21-0772

Enclosure 3

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Proposed Changes to Licensing Basis Documents

(LAR-21-001)

Additions identified by blue underlined text.
~~Deletions Identified by red strikethrough of text.~~
* * * indicates omitted existing text that is not shown.

(This Enclosure consists of 9 pages, including this cover page)

LICENSING BASIS CHANGE DESCRIPTIONS

COL Appendix C Table 2.1.3-2, Index No. 68:

- Remove ITAAC No. 2.1.03.01.

COL Appendix C Table 2.1.3-2, Index No. 75:

- Revise ITAAC No. 2.1.03.06.i, item 6.i) to remove confirmation of location of the fuel assemblies (and contents) and the incore instrument QuickLoc assemblies.
- Revise ITAAC No. 2.1.03.06.i, item 6.iii), to remove the inspection of “as-built” equipment.

COL Appendix C Table 2.5.1-4, Index No. 515:

- Revise ITAAC No. 2.5.01.03e to remove Core Exit Temperature sensor installation from “as-built” inspection requirement.

COL Appendix C Table 2.5.5-2, Index No. 565:

- Remove ITAAC No. 2.5.05.02.i, item 2.i).
- Revise ITAAC No. 2.5.05.02.i, item 2.iii) to remove “as-built” from the inspection requirement.
- Revise ITAAC No. 2.5.05.02.i, item 3.a)ii) to remove “as-built” from the inspection requirement. the inspection requirement.

COL Appendix C Section 2.5.5, Design Description (related to Index No. 570):

- Revise Design Description item 3.b) to clarify the scope of the Design Commitment.

COL Appendix C Table 2.5.5-2, Index No. 570:

- Revise ITAAC No. 2.5.05.03b, item 3.b) to remove “as-built” from the inspection requirement and to clarify the scope of the Design Commitment, Inspection, and Acceptance Criteria.

Plant-specific Tier 1 Table 2.1.3-2:

- Remove ITAAC item No. 1.

Plant-specific Tier 1 Table 2.1.3-2:

- Revise ITAAC item No. 6.i) to remove confirmation of location of the fuel assemblies (and contents) and the incore instrument QuickLoc assemblies.
- Revise ITAAC item No. 6.iii) to remove the inspection of “as-built” equipment.

Plant-specific Tier 1 Table 2.5.1-4:

- Revise ITAAC item No. 3.e to remove Core Exit Temperature sensor installation from “as-built” inspection.

Plant-specific Tier 1 Section 2.5.5, Design Description (related to Index No. 570):

- Revise Design Description item 3.b) to clarify the scope of the Design Commitment.

Plant-specific Tier 1 Table 2.5.5-2:

- Remove ITAAC item No. 2.i).
- Revise ITAAC item No. 2.iii) to remove “as-built” from the inspection requirement.
- Revise ITAAC item No. 3.a)ii) to remove “as-built” from the inspection requirement.
- Revise ITAAC item No. 3.b) to remove “as-built” from the inspection requirement and to clarify the scope of the Design Commitment, Inspection, and Acceptance Criteria.

Markups of the licensing basis documents are provided on the following pages.

COL Appendix C Table 2.1.3-2 (for ITAAC Index Nos. 68 and 75) is revised as follows:

Table 2.5.1-4 Inspections, Tests, Analyses, and Acceptance Criteria				
No.	**ITAAC No.**	**Design Commitment**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
68	2.1.03.01	1. ~~The functional arrangement of the RXS is as described in the Design Description of this Section 2.1.3.~~	Not used. ~~Inspection of the as-built system will be performed.~~	Not used. ~~The as-built RXS conforms with the functional arrangement as described in the Design Description of this Section 2.1.3.~~

…

75	2.1.03.06.i	6. The seismic Category I equipment identified in Table 2.1.3-1 can withstand seismic design basis loads without loss of safety function.	i) Inspection will be performed to verify that the seismic Category I equipment identified in Table 2.1.3-1 (except fuel assemblies, rod cluster control assemblies, gray rod cluster assemblies, and incore instrument QuickLoc assemblies) is located on the Nuclear Island. ii) … (no changes) iii) Inspection will be performed for the existence of a report verifying that the ~~as-built~~ equipment including anchorage is seismically bounded by the tested or analyzed conditions.	i) The seismic Category I equipment identified in Table 2.1.3-1 (except fuel assemblies, rod cluster control assemblies, gray rod cluster assemblies, and incore instrument QuickLoc assemblies) is located on the Nuclear Island. ii) … (no changes) iii) A report exists and concludes that the ~~as-built~~ equipment including anchorage is seismically bounded by the tested or analyzed conditions.

COL Appendix C Table 2.5.1-4 (for ITAAC Index No. 515) is revised as follows:

Table 2.5.1-4 Inspections, Tests, Analyses, and Acceptance Criteria				
No.	**ITAAC No.**	**Design Commitment**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
515	2.5.01.03e	3.e) The sensors identified on Table 2.5.1-3 are used for DAS input and are separate from those being used by the PMS and plant control system.	Inspection of the as-built system will be performed except for the core exit temperature sensor installation.	The sensors identified on Table 2.5.1-3 are used by DAS and are separate from those being used by the PMS and plant control system.

COL Appendix C Table 2.5.5-2 is revised (for ITAAC Index No. 565) as follows:

Table 2.5.5-2
Inspections, Tests, Analyses, and Acceptance Criteria

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
565	2.5.05.02.i	2. The seismic Category I equipment identified in Table 2.5.5-1 can withstand seismic design basis dynamic loads without loss of safety function.	i) Not used. ~~Inspection will be performed to verify that the seismic Category I equipment identified in Table 2.5.5-1 is located on the Nuclear Island.~~ ii)… (no changes) iii) Inspection will be performed for the existence of a report verifying that the ~~as-built~~ equipment including anchorage is seismically bounded by the tested or analyzed conditions.	i) Not used. ~~The seismic Category I equipment identified in Table 2.5.5-1 is located on the Nuclear Island.~~ ii)… (no changes) iii) A report exists and concludes that the ~~as-built~~ equipment including anchorage is seismically bounded by the tested or analyzed conditions.
		3.a) The Class 1E equipment identified in Table 2.5.5-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function, for the time required to perform the safety function.	i)… (no changes) ii) Inspection will be performed of the ~~as-built~~ Class 1E equipment and the associated wiring, cables, and terminations located in a harsh environment.	i)… (no changes) ii) A report exists and concludes that the ~~as-built~~ Class 1E equipment and the associated wiring, cables, and terminations identified in Table 2.5.5-1 as being qualified for a harsh environment are bounded by type tests, analyses, or a combination of type tests and analyses.

COL Appendix C Section 2.5.5, Design Description, item 3.b, is revised as follows (for ITAAC Index No. 570):

b) The Class 1E cables between the Core Exit Temperature sensors ~~Incore Thermocouple elements~~ and the connector plates, ~~boxes, located on the integrated head package)~~ have sheaths.

COL Appendix C Table 2.5.5-2 is revised (for ITAAC Index No. 570) as follows:

Table 2.5.5-2
Inspections, Tests, Analyses, and Acceptance Criteria

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
570	2.5.05.03b	3.b) The Class 1E cables between the Core Exit Temperature sensors ~~Incore Thermocouple elements~~ and the connector plates ~~boxes located on the integrated head package~~ have sheaths.	Inspection of the ~~as-built system~~ Class 1E cables will be performed.	The ~~as-built~~ Class 1E cables between the Core Exit Temperature sensors ~~Incore Thermocouple elements~~ and the connector plates ~~boxes located on the integrated head package~~ have sheaths.

Plant-Specific Tier 1 Table 2.1.3-2 is revised (for ITAAC Index Nos. 68 and 75) as follows:

Table 2.1.3-2 Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
1. Not used. ~~The functional arrangement of the RXS is as described in the Design Description of this Section 2.1.3.~~	Not used. ~~Inspection of the as-built system will be performed.~~	Not used. ~~The as-built RXS conforms with the functional arrangement as described in the Design Description of this Section 2.1.3.~~

…

6. The seismic Category I equipment identified in Table 2.1.3-1 can withstand seismic design basis loads without loss of safety function.	i) Inspection will be performed to verify that the seismic Category I equipment identified in Table 2.1.3-1 (except fuel assemblies, rod cluster control assemblies, gray rod cluster assemblies, and incore instrument QuickLoc assemblies) is located on the Nuclear Island. ii) … (no changes) iii) Inspection will be performed for the existence of a report verifying that the ~~as-built~~ equipment including anchorage is seismically bounded by the tested or analyzed conditions.	i) The seismic Category I equipment identified in Table 2.1.3-1 (except fuel assemblies, rod cluster control assemblies, gray rod cluster assemblies, and incore instrument QuickLoc assemblies) is located on the Nuclear Island. ii) … (no changes) iii) A report exists and concludes that the ~~as-built~~ equipment including anchorage is seismically bounded by the tested or analyzed conditions.

Plant-Specific Tier 1 Table 2.5.1-4 is revised (for ITAAC Index No. 515) as follows:

Table 2.5.1-4 Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
3.e) The sensors identified on Table 2.5.1-3 are used for DAS input and are separate from those being used by the PMS and plant control system	Inspection of the as-built system will be performed except for the core exit temperature sensor installation.	The sensors identified on Table 2.5.1-3 are used by DAS and are separate from those being used by the PMS and plant control system.

Plant-Specific Tier 1 Section 2.5.5, Design Description, item 3.b, is revised (related to ITAAC Index No. 570) as follows:

b) The Class 1E cables between the Core Exit Temperature sensors ~~Incore Thermocouple elements~~ and the connector plates ~~boxes located on the integrated head package~~ have sheaths.

Plant-Specific Tier 1 Table 2.5.5-2 is revised (for ITAAC Index No. 565) as follows:

Table 2.5.5-2 Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
2. The seismic Category I equipment identified in Table 2.5.5-1 can withstand seismic design basis dynamic loads without loss of safety function.	i) Not used. ~~Inspection will be performed to verify that the seismic Category I equipment identified in Table 2.5.5-1 is located on the Nuclear Island.~~ ii)… (no changes) iii) Inspection will be performed for the existence of a report verifying that the ~~as-built~~ equipment including anchorage is seismically bounded by the tested or analyzed conditions.	i) Not used. ~~The seismic Category I equipment identified in Table 2.5.5-1 is located on the Nuclear Island.~~ ii)… (no changes) iii) A report exists and concludes that the ~~as-built~~ equipment including anchorage is seismically bounded by the tested or analyzed conditions.
3.a) The Class 1E equipment identified in Table 2.5.5-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function, for the time required to perform the safety function.	i)… (no changes) ii) Inspection will be performed of the ~~as-built~~ Class 1E equipment and the associated wiring, cables, and terminations located in a harsh environment.	i)… (no changes) ii) A report exists and concludes that the ~~as-built~~ Class 1E equipment and the associated wiring, cables, and terminations identified in Table 2.5.5-1 as being qualified for a harsh environment are bounded by type tests, analyses, or a combination of type tests and analyses.

Plant-Specific Tier 1 Table 2.5.5-2 is revised (for ITAAC Index No. 570) as follows:

Table 2.5.5-2 Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
3.b) The Class 1E cables between the Core Exit Temperature sensors ~~Incore Thermocouple elements~~ and the connector plates ~~boxes located on the integrated head package~~ have sheaths.	Inspection of the ~~as-built system~~ Class 1E cables will be performed.	The ~~as-built~~ Class 1E cables between the Core Exit Temperature sensors ~~Incore Thermocouple elements~~ and the connector plates ~~boxes located on the integrated head package~~ have sheaths.

Southern Nuclear Operating Company

ND-21-0772

Enclosure 4

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Draft Revised Uncompleted Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) Notices (UINs) Pending NRC Approval of LAR and Exemption

(LAR-21-001)

(For Information Only)

(This Enclosure consists of 21 pages, including this cover page)

ITAAC 2.1.03.06 (Index No. 75) UIN.

ITAAC Statement

Design Commitment:

6. The seismic Category I equipment identified in Table 2.1.3-1 can withstand seismic design basis loads without loss of safety function.

9.a) The Class 1E equipment identified in Table 2.1.3-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

Inspections, Tests, Analyses:

i) Inspection will be performed to verify that the seismic Category I equipment identified in Table 2.1.3-1 (except fuel assemblies, rod cluster control assemblies, gray rod cluster assemblies, and incore instrument QuickLoc assemblies) is located on the Nuclear Island.

ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.

iii) Inspection will be performed for the existence of a report verifying that the equipment including anchorage is seismically bounded by the tested or analyzed conditions.

i) Type tests, analysis, or a combination of type tests and analysis will be performed on Class 1E equipment located in a harsh environment.

ii) Inspection will be performed of the as-built Class 1E equipment and the associated wiring, cables, and terminations located in a harsh environment.

Acceptance Criteria:

i) The seismic Category I equipment identified in Table 2.1.3-1 (except fuel assemblies, rod cluster control assemblies, gray rod cluster assemblies, and incore instrument QuickLoc assemblies) is located on the Nuclear Island.

ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis loads without loss of safety function.

iii) A report exists and concludes that the equipment including anchorage is seismically bounded by the tested or analyzed conditions.

i) A report exists and concludes that the Class 1E equipment identified in Table 2.1.3-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist

before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

ii) A report exists and concludes that the as-built Class 1E equipment and the associated wiring, cables, and terminations identified in Table 2.1.3-1 as being qualified for a harsh environment are bounded by type tests, analyses, or a combination of type tests and analyses.

ITAAC Completion Description

This ITAAC requires that inspections, tests, and analyses be performed and documented to ensure the Reactor System (RXS) components identified as seismic Category I or Class 1E in the Combined License (COL) Appendix C, Table 2.1.3-1 (the Table) are designed and constructed in accordance with applicable requirements.

i) The seismic Category I equipment identified in Table 2.1.3-1 (except fuel assemblies, rod cluster control assemblies, gray rod cluster assemblies, and incore instrument QuickLoc assemblies) is located on the Nuclear Island.

To assure that seismic Category I components can withstand seismic design basis loads without loss of safety function, all the components in the Table are designed to be located on the seismic Category I Nuclear Island. In accordance with Equipment Qualification (EQ) Walkdown ITAAC Guideline (Reference 1), an inspection is conducted of the RXS to confirm the satisfactory installation of the seismically qualified components. The inspection includes verification of equipment make/model/serial number and verification of equipment location (Building, Elevation, Room). Fuel assemblies, rod cluster control assemblies, gray rod cluster assemblies, and incore instrument QuickLoc assemblies, are not installed in their final location until after the 10 CFR 52.103(g) finding has been made as part of initial fuel load. Per item ii below, the assemblies are seismically qualified when located on the nuclear island. Inspections of these assemblies are performed but not in the final installed location, since that is not allowed by 52.103(g). The EQ As-Built Reconciliation Reports (EQRR) (Reference 2) identified in Attachment A document the results of the inspection and conclude that the seismic Category I components are located on the Nuclear Island except for the fuel assemblies, rod cluster control assemblies, gray rod cluster assemblies, and incore instrument QuickLoc assemblies.

ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis loads without loss of safety function.

Seismic Category I components in the Table require type tests and/or analyses to demonstrate structural integrity and operability. Structural integrity of the passive seismic Category I mechanical equipment is demonstrated by analysis in accordance with American Society of Mechanical Engineers (ASME) Code Section III (Reference 7).

Safety-related (Class 1E) electrical equipment in the Table is seismically qualified by type testing combined with analysis in accordance with Institute of Electrical and Electronics

Engineers (IEEE) Standard 344-1987 (Reference 8). The specific qualification method (i.e., type testing, analysis, or combination) used for each component in the Table is identified in Attachment A. Additional information about the methods used to qualify AP1000 safety-related equipment is provided in the Updated Final Safety Analysis Report (UFSAR) Appendix 3D (Reference 9). The EQ Reports (Reference 10) identified in Attachment A contain applicable test reports and associated documentation and conclude that the seismic Category I equipment can withstand seismic design basis loads without loss of safety function.

iii) A report exists and concludes that the equipment including anchorage is seismically bounded by the tested or analyzed conditions.

To the extent that the installation prior to fuel load is possible, an inspection (Reference 1) is conducted to confirm the satisfactory installation of the seismically qualified components in the Table. The inspection verifies the equipment make/model/serial number, as-designed equipment mounting orientation, anchorage and clearances, and electrical and other interfaces. For components not installed prior to fuel load, the inspection is accomplished by verifying a quality assurance data package (Reference 5) exists that concludes that the equipment was constructed as per design.

The inspection conducted for each component in the table will consider the critical seismic attributes identified in the associated EQ Report for that component. The inspection will confirm that the equipment, including anchorage, is seismically bounded by the tested or analyzed conditions.

Attachment A identifies the EQRR (Reference 6) completed to verify that the seismic Category I equipment listed in the Table, including anchorage, are seismically bounded by the tested or analyzed conditions, IEEE Standard 344-1987 (Reference 8) and NRC Regulatory Guide (RG) 1.100 (Reference 11).

i) A report exists and concludes that the Class 1E equipment identified in Table 2.1.3-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

The harsh environment Class 1E components in the Table are qualified by type testing and/or analyses. Class 1E electrical component type testing is performed in accordance with IEEE Standard 323-1974 (Reference 12) and RG 1.89 (Reference 2) to meet the requirements of

10 CFR 50.49. Type testing of safety-related equipment meets the requirements of 10 CFR Part 50, Appendix A, General Design Criterion 4. Attachment A identifies the EQ program and specific qualification method for each safety-related mechanical or Class 1E electrical component located in a harsh environment. Additional information about the methods used to qualify AP1000 safety-related equipment is provided in the UFSAR Appendix 3D (Reference 9). EQ Reports (Reference 10) identified in Attachment A contain applicable test reports and

associated documentation and conclude that the equipment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

ii) A report exists and concludes that the as-built Class 1E equipment and the associated wiring, cables, and terminations identified in Table 2.1.3-1 as being qualified for a harsh environment are bounded by type tests, analyses, or a combination of type tests and analyses.

To the extent that the installation prior to fuel load is possible, an inspection is conducted to confirm the satisfactory installation of the harsh qualified as-built components in the Table. The inspection verifies the equipment location, make/model/serial number, as-designed equipment mounting, wiring, cables, and terminations and confirms that the environmental conditions for the zone in which the component is mounted are bounded by the tested and/or analyzed conditions.

The EQRR (Reference 6) identified in Attachment A document this inspection and conclude that the harsh environment Class 1E equipment and the associated wiring, cables, and terminations are bounded by the qualified configuration and IEEE Standard 323-1974 (Reference 12).

Together, these reports (References 6 and 10) provide evidence that the ITAAC Acceptance Criteria requirements are met:

- A report exists and concludes that the seismic Category I equipment can withstand seismic design basis loads without loss of safety function;
- A report exists and concludes that the equipment including anchorage is seismically bounded by the tested or analyzed conditions;
- A report exists and concludes that the as-built Class 1E equipment identified in Table 2.1.3-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function; and
- A report exists and concludes that the as-built Class 1E equipment and the associated wiring, cables, and terminations identified in Table 2.1.3-1 as being qualified for a harsh environment are bounded by type tests, analyses, or a combination of type tests and analyses.

References 6 and 10 are available for NRC inspection as part of the Unit 3 and Unit 4 ITAAC 2.1.03.06.i Completion Packages (References 3 and 4, respectively).

List of ITAAC Findings

In accordance with plant procedures for ITAAC completion, Southern Nuclear Operating Company (SNC) performed a review of all ITAAC findings pertaining to the subject ITAAC and

associated corrective actions. This finding review, which included now-consolidated ITAAC Indexes 76, 77, 81, and 82, found no relevant ITAAC findings associated with this ITAAC.

References (available for NRC inspection)

1. ND-RA-001-014, Rev. 2, “EQ Walkdown ITAAC Guideline”
2. Regulatory Guide 1.89, Rev 1, “Environmental Qualification of Certain Electric Equipment Important to Safety for Nuclear Power Plants”
3. 2.1.03.06.i-U3-CP-RevX, ITAAC Completion Package
4. 2.1.03.06.i-U4-CP-RevX, ITAAC Completion Package
5. APP-XXX-VQQ-XXX, Rev. X, “Quality Assurance Data Package”
6. EQ Reconciliation Reports as identified in Attachment A for Units 3 and 4
7. American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section III, “Rules for Construction of Nuclear Power Plant Components,” 1998 Edition with 2000 Addenda
8. IEEE Standard 344-1987, “IEEE Recommended Practices for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations”
9. Vogtle 3&4 Updated Final Safety Analysis Report Appendix 3D, “Methodology for Qualifying AP1000 Safety-Related Electrical and Mechanical Equipment”
10. Equipment Qualification Reports as identified in Attachment A
11. Regulatory Guide 1.100, Rev. 2, "Seismic Qualification of Electric and Mechanical Equipment for Nuclear Power Plants"
12. IEEE Standard 323-1974, "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations Completion Package
13. NEI 08-01, “Industry Guideline for the ITAAC Closure Process Under 10 CFR Part 52”

Attachment A

System: Reactor System (RXS)

Equipment Name+	Tag No.+	Seismic Cat. I +	Class 1E/ Qual. For Harsh Envir.+ 3	Envir. Zone 1	Envir Qual Program 2	Type of Qual.	EQ Reports	EQRR
RV (Reactor Vessel)	RXS-MV-01	Yes	-	N/A	N/A	Analysis	APP-MV01-Z0R-101	2.1.03.06.i-U3/4-EQRR-PCDXXX
Reactor Upper Internals Assembly	RXS-MI-01	Yes	-	N/A	N/A	Analysis	APP-MI01-S3R-002	2.1.03.06.i-U3/4-EQRR-PCDXXX
Reactor Lower Internals Assembly	RXS-MI-02	Yes	-	N/A	N/A	Analysis	APP-MI01-S3R-002	2.1.03.06.i-U3/4-EQRR-PCDXXX

Equipment Name+	Tag No.+	Seismic Cat. I +	Class 1E/ Qual. For Harsh Envir.+ 3	Envir. Zone 1	Envir Qual Program 2	Type of Qual.	EQ Reports	EQRR
Fuel Assemblies (157 locations)	RXS-FA-A07/ A08/ A09/ B05/ B06/ B07/ B08/ B09/ B10/ B11/ C04/ C05/ C06/ C07/ C08/ C09/ C10/ C11/ C12/ D03/ D04/ D05/ D06/ D07/ D08/ D09/ D10/ D11/ D12/ D13/ E02/ E03/ E04/ E05/ E06/ E07/ E08/ E09/ E10/ E11/ E12/ E13/ E14/ F02/ F03/ F04/ F05/ F06/ F07/ F08/ F09/ F10/ F11/ F12/ F13/ F14/ G01/ G02/ G03/ G04/ G05/ G06/ G07/ G08/ G09/ G10/ G11/ G12/ G13/ G14/ G15/ H01/ H02/ H03/ H04/ H05/ H06/ H07/ H08/ H09/ H10/ H11/ H12/ H13/ H14/ H15/ J01/ J02/ J03/ J04/ J05/ J06/ J07/ J08/ J09/ J10/ J11/ J12/ J13/ J14/ J15/ K02/ K03/ K04/ K05/ K06/ K07/ K08/ K09/ K10/ K11/ K12/ K13/ K14/ L02/ L03/ L04/ L05/ L06/ L07/ L08/ L09/ L10/ L11/ L12/ L13/ L14/ M03/ M04/ M05/ M06/ M07/ M08/ M09/ M10/ M11/ M12/ M13/ N04/ N05/ N06/ N07/ N08/ N09/ N10/ N11/ N12/ P05/ P06/ P07/ P08/ P09/ P10/ P11/ R07/ R08/ R09	Yes	-	N/A	N/A	Analysis	CN-NRFE-10-21 CN-NRFE-13-1	2.1.03.06.i-U3/4-EQRR-PCDXXX

Equipment Name+	Tag No.+	Seismic Cat. I +	Class 1E/ Qual. For Harsh Envir.+ 3	Envir. Zone 1	Envir Qual Program 2	Type of Qual.	EQ Reports	EQRR
Rod Cluster Control Assemblies (RCCAs) (minimum 53 locations)	RXS-FR-B06/ B10/ C05/ C07/ C09/ C11/ D06/ D08/ D10/ E03/ E05/ E07/ E09/ E11/ E13/ F02/ F04/ F12/ F14/ G03/ G05/ G07/ G09/ G11/ G13/ H04/ H08/ H12/ J03/ J05/ J07/ J09/ J11/ J13/ K02/ K04/ K12/ K14/ L03/ L05/ L07/ L09/ L11/ L13/ M06/ M08/ M10/ N05/ N07/ N09/ N11/ P06/ P10	Yes	-	N/A	N/A	Analysis	NRFE-14-1	2.1.03.06.i-U3/4-EQRR-PCDXXX
Gray Rod Cluster Assemblies (GRCAs) (16 locations)	RXS-FG-B08/ D04/ D12/ F06/ F08/ F10/ H02/ H06/ H10/ H14/ K06/ K08/ K10/ M04/ M12/ P08	Yes	-	N/A	N/A	Analysis	NRFE-14-1	2.1.03.06.i-U3/4-EQRR-PCDXXX

Equipment Name+	Tag No.+	Seismic Cat. I +	Class 1E/ Qual. For Harsh Envir.+ 3	Envir. Zone 1	Envir Qual Program 2	Type of Qual.	EQ Reports	EQRR
Control Rod Drive Mechanisms (CRDMs) (69 Locations)	RXS-MV-11B06/ 11B08/ 11B10/ 11C05/ 11C07/ 11C09/ 11C11/ 11D04/ 11D06/ 11D08/ 11D10/ 11D12/ 11E03/ 11E05/ 11E07/ 11E09/ 11E11/ 11E13/ 11F02/ 11F04/ 11F06/ 11F08/ 11F10/ 11F12/ 11F14/ 11G03/ 11G05/ 11G07/ 11G09/ 11G11/ 11G13/ 11H02/ 11H04/ 11H06/ 11H08/ 11H10/ 11H12/ 11H14/ 11J03/ 11J05/ 11J07/ 11J09/ 11J11/ 11J13/ 11K02/ 11K04/ 11K06/ 11K08/ 11K10/ 11K12/ 11K14/ 11L03/ 11L05/ 11L07/ 11L09/ 11L11/ 11L13/ 11M04/ 11M06/ 11M08/ 11M10/ 11M12/ 11N05/ 11N07/ 11N09/ 11N11/ 11P06/ 11P08/ 11P10	Yes	No/ No	N/A	N/A	Analysis	APP-MV11-S3R-002	2.1.03.06.i-U3/4-EQRR-PCDXXX
Incore Instrument QuickLoc Assemblies (8 Locations)	RXS-MY-Y11 through Y18	Yes	-	N/A	N/A	Analysis	APP-MV01-S3R-002	2.1.03.06.i-U3/4-EQRR-PCDXXX
Source Range Detectors (4)	RXS-JE-NE001A/ NE001B/ NE001C/ NE001D	Yes	Yes/ Yes	1	E *	Type Testing & Analysis	APP-JE92-VBR-001 / APP-JE92-VBR-002	2.1.03.06.i-U3/4-EQRR-PCDXXX

Equipment Name+	Tag No.+	Seismic Cat. I +	Class 1E/ Qual. For Harsh Envir.+ 3	Envir. Zone 1	Envir Qual Program 2	Type of Qual.	EQ Reports	EQRR
Intermediate Range Detectors (4)	RXS-JE-NE002A/ NE002B/ NE002C/ NE002D	Yes	Yes/ Yes	1	E * S	Type Testing & Analysis	APP-JE92-VBR-001 / APP-JE92-VBR-002	2.1.03.06.i-U3/4-EQRR-PCDXXX
Power Range Detectors – Lower (4)	RXS-JE-NE003A/ NE003B/ NE003C/ NE003D	Yes	Yes/ Yes	1	E * S	Type Testing & Analysis	APP-JE92-VBR-001 / APP-JE92-VBR-002	2.1.03.06.i-U3/4-EQRR-PCDXXX
Power Range Detectors – Upper (4)	RXS-JE-NE004A/ NE004B/ NE004C/ NE004D	Yes	Yes/ Yes	1	E * S	Type Testing & Analysis	APP-JE92-VBR-001 / APP-JE92-VBR-002	2.1.03.06.i-U3/4-EQRR-PCDXXX

Notes:

+ Excerpt from COL Appendix C Table 2.1.3-1
1. See Table 3D.5-1 of UFSAR
2. E = Electrical Equipment Program (limit switch and the motor operator, squib operator, solenoid operator)
   S = Qualified for submergence or operation with spray
   * = Harsh Environment
3. Dash (-) indicates not applicable
4. The Unit 3/4 EQRR are numbered "2.1.03.06.i-U3/4-EQRR-PCDXXX"

ITAAC 2.5.01.03e (Index No. 515) UIN.

ITAAC Statement

Design Commitment

3.e) The sensors identified on Table 2.5.1-3 are used for DAS input and are separate from those being used by the PMS and plant control system.

Inspections, Tests, Analyses

Inspection of the as-built system will be performed except for the core exit temperature sensor installation.

Acceptance Criteria

The sensors identified on Table 2.5.1-3 are used by DAS and are separate from those being used by the PMS and plant control system.

ITAAC Completion Description

Inspection of the as-built Diverse Actuation System (DAS) is performed to demonstrate that the sensors identified in Combined License (COL) Appendix C Table 2.5.1-3 (Attachment A), except for the core exit temperature sensor installation, are used for Diverse Actuation System (DAS) input and are separate from those being used by the Protection and Safety Monitoring System (PMS) and Plant Control System (PLS).

The DAS System Specification Document (References 1 and 2) requires that the sensors identified in Attachment A be used for DAS input and are separate and independent from the sensor inputs in the PMS and plant control system. Construction drawing SV3/4-DAS-J0-001, (References 3 and 4), illustrates the DAS sensor flow and indication architecture. An inspection of Quality Release and Certificate of Conformance documentation, construction drawings, and completed construction records was performed in accordance with SV3/4-DAS-ITR-800515 (References 5 and 6), to confirm that the sensors identified in Attachment A were installed per the DAS sensor input requirements of References 1 and 2 and are separate from those being used by the PMS and plant control system.

The inspection results are documented in References 5 and 6 and confirm that the sensors identified in Attachment A are used by DAS and are separate from those being used by the PMS and plant control system.

References 1 through 6 are available for NRC inspection as part of the Unit 3 and Unit 4 ITAAC 2.5.01.03e Completion Package (References 8 and 9).

List of ITAAC Findings

In accordance with plant procedures for ITAAC completion, Southern Nuclear Operating Company performed a review of all ITAAC findings pertaining to the subject ITAAC and associated corrective actions. This review found there are no relevant findings associated with the ITAAC. The ITAAC completion review is documented in the ITAAC Completion Package 2.5.01.03e (References 8 and 9) and is available for NRC review.

References (available for NRC inspection)

1. SV3-DAS-J4-001, “AP1000 Diverse Actuation System System Design Specification”, Revision 3
2. SV4-DAS-J4-001, “AP1000 Diverse Actuation System System Design Specification”, Revision 3
3. SV3-DAS-J0-001, “Diverse Actuation System (DAS) Sensor Flow and Indication Architecture”, Revision 1
4. SV4-DAS-J0-001, “Diverse Actuation System (DAS) Sensor Flow and Indication Architecture”, Revision 1
5. SV3-DAS-ITR-800515, “Unit 3 Inspection Results of Diverse Actuation System (DAS) Sensor Hardware Diversity: ITAAC 2.5.01.03e NRC Index Number: 515”, Revision 0
6. SV4-DAS-ITR-800515, “Unit 4 Inspection Results of Diverse Actuation System (DAS) Sensor Hardware Diversity: ITAAC 2.5.01.03e NRC Index Number: 515”, Revision 0
7. NEI 08-01, “Industry Guideline for the ITAAC Closure Process Under 10 CFR Part 52”, Revision 5 - Corrected
8. 2.5.01.03e-U3-CP-Rev0, “ITAAC Completion Package”
9. 2.5.01.03e-U4-CP-Rev0, “ITAAC Completion Package”

Attachment A
Excerpt from COL Table 2.5.1-3

Equipment Name	Tag Number
Reactor Coolant System (RCS) Hot Leg Temperature	RCS-300A
RCS Hot Leg Temperature	RCS-300B
Steam Generator 1 Wide-range Level	SGS-044
Steam Generator 1 Wide-range Level	SGS-045
Steam Generator 2 Wide-range Level	SGS-046
Steam Generator 2 Wide-range Level	SGS-047
Pressurizer Water Level	RCS-305A
Pressurizer Water Level	RCS-305B
Containment Temperature	VCS-053A
Containment Temperature	VCS-053B
Core Exit Temperature	IIS-009
Core Exit Temperature	IIS-013
Core Exit Temperature	IIS-030
Core Exit Temperature	IIS-034
Rod Control Motor Generator Voltage	PLS-001
Rod Control Motor Generator Voltage	PLS-002

ITAAC 2.5.05.02.i (Index No. 565) UIN.

ITAAC Statement

Design Commitment

2. The seismic Category I equipment identified in Table 2.5.5-1 can withstand seismic design basis dynamic loads without loss of safety function.

3.a) The Class 1E equipment identified in Table 2.5.5-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function, for the time required to perform the safety function.

Inspections, Tests, Analyses

i) Not used.

ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.

iii) Inspection will be performed for the existence of a report verifying that the equipment including anchorage is seismically bounded by the tested or analyzed conditions.

i) Type tests, analysis, or a combination of type tests and analysis will be performed on Class 1E equipment located in a harsh environment.

ii) Inspection will be performed of the Class 1E equipment and the associated wiring, cables, and terminations located in a harsh environment.

Acceptance Criteria

i) Not used.

ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis dynamic loads without loss of safety function.

iii) A report exists and concludes that the equipment including anchorage is seismically bounded by the tested or analyzed conditions.

i) A report exists and concludes that the Class 1E equipment identified in Table 2.5.5-1 as being qualified for a harsh environment. This equipment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

ii) A report exists and concludes that the Class 1E equipment and the associated wiring, cables, and terminations identified in Table 2.5.5-1 as being qualified for a harsh environment are bounded by type tests, analyses, or a combination of type tests and analyses.

ITAAC Completion Description

This ITAAC requires that inspections, tests, and analyses be performed and documented to ensure the In-core Instrumentation System (IIS) equipment identified as seismic Category I or Class 1E in the Combined License (COL) Appendix C, Table 2.5.5-1 (the Table) is designed and constructed in accordance with applicable requirements.

ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis dynamic loads without loss of safety function.

Seismic Category I equipment in the Table requires type tests and/or analyses to demonstrate structural integrity and operability. Structural integrity of the passive seismic Category I mechanical equipment is demonstrated by analysis in accordance with American Society of Mechanical Engineers (ASME) Code Section III (Reference 2).

Safety-related (Class 1E) electrical equipment in the Table is seismically qualified by type testing combined with analysis in accordance with Institute of Electrical and Electronics Engineers (IEEE) Standard 344-1987 (Reference 3). This equipment includes safety-related (Class 1E) field sensors and the safety-related electrical cables and connector assemblies. The specific qualification method (i.e., type testing, analysis, or combination) used for each piece of equipment in the Table is identified in Attachment A. Additional information about the methods used to qualify AP1000 safety-related equipment is provided in the Updated Final Safety Analysis Report (UFSAR) Appendix 3D (Reference 4). The EQ Reports (Reference 5) identified in Attachment A contain applicable test reports and associated documentation and conclude that the seismic Category I equipment can withstand seismic design basis loads without loss of safety function.

iii) A report exists and concludes that the equipment including anchorage is seismically bounded by the tested or analyzed conditions.

An inspection (Reference 13) was conducted to confirm that the seismic category I equipment identified in Table 2.5.5-1, the Class 1E Incore Thimble Assemblies, were manufactured per the qualified design. The inspection verified the equipment make/model/serial number, as well as the as-designed anchorage point to the integrated grid assembly.

Attachment A identifies the EQRR (Reference 1) that was completed to verify the seismic Category I equipment listed in the Table, including anchorage, is seismically bounded by the tested or analyzed conditions, IEEE Standard 344-1987 (Reference 3), and NRC Regulatory Guide (RG) 1.100 (Reference 6).

i) A report exists and concludes that the Class 1E equipment identified in Table 2.5.5-1 as being qualified for a harsh environment. This equipment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

The harsh environment Class 1E equipment in the Table is qualified by type testing and/or analyses. Class 1E electrical equipment type testing is performed in accordance with IEEE Standard 323-1974 (Reference 7) and RG 1.89 (Reference 8) to meet the requirements of 10 CFR 50.49. Type testing of safety-related equipment meets the requirements of 10 CFR Part 50, Appendix A, General Design Criterion 3. Attachment A identifies the EQ program and specific qualification method for each piece of Class 1E electrical equipment located in a harsh environment. Additional information about the methods used to qualify AP1000 safety-related equipment is provided in the UFSAR Appendix 3D (Reference 4). EQ Reports (Reference 5) identified in Attachment A contain applicable test reports/analysis and associated documentation and conclude that the equipment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

ii) A report exists and concludes that the Class 1E equipment and the associated wiring, cables, and terminations identified in Table 2.5.5-1 as being qualified for a harsh environment are bounded by type tests, analyses, or a combination of type tests and analyses.

The harsh environment Class 1E equipment in the Table is qualified by the type testing and/or analyses identified in the EQ Reports listed in Attachment A. Class 1E electrical equipment type testing is performed in accordance with IEEE Standard 323-1974 (Reference 7) and RG 1.89 (Reference 8) to meet the requirements of 10 CFR 50.49. Type testing of safety-related equipment meets the requirements of 10 CFR Part 50, Appendix A, General Design Criterion 4. Attachment A identifies the EQ program and specific qualification method for each piece of Class 1E electrical equipment located in a harsh environment. Additional information about the methods used to qualify AP1000 safety-related equipment is provided in the UFSAR Appendix 3D (Reference 4). EQ Reports (Reference 5) and EQRR Reports (Reference 1) identified in Attachment A contain applicable test reports/analysis and associated documentation and conclude that the equipment and the associated wiring, cables, and terminations can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

Inspection is accomplished by verifying a quality assurance data package (Reference 14) exists that concludes that the equipment was constructed as per design.

Together, these reports (References 1, 5 and 14) provide evidence that the ITAAC Acceptance Criteria requirements are met:

- A report exists and concludes that the seismic Category I equipment can withstand seismic design basis dynamic loads without loss of safety function;

- A report exists and concludes that the equipment including anchorage is seismically bounded by the tested or analyzed conditions;
- A report exists and concludes that the Class 1E equipment identified in Table 2.5.5-1 as being qualified for a harsh environment. This equipment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function;
- A report exists and concludes that the Class 1E equipment and the associated wiring, cables, and terminations identified in Table 2.5.5-1 as being qualified for a harsh environment are bounded by type tests, analyses, or a combination of type tests and analyses.

References 1, 5 and 14 are available for NRC inspection as part of the Unit 3 and Unit 4 ITAAC 2.5.05.02.i Completion Packages (References 9 and 10, respectively).

List of ITAAC Findings

In accordance with plant procedures for ITAAC completion, Southern Nuclear Operating Company (SNC) performed a review of all ITAAC findings pertaining to the subject ITAAC and associated corrective actions. This finding review, which included now-consolidated ITAAC Indexes 566, 567, 568, and 569, found no relevant ITAAC findings associated with this ITAAC.

References (available for NRC inspection)

1. EQ Reconciliation Reports (EQRR) as identified in Attachment A for Units 3 and 4
2. American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section III, “Rules for Construction of Nuclear Power Plant Components,” 1998 Edition with 2000 Addenda
3. IEEE Standard 344-1987, “IEEE Recommended Practices for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations”
4. Vogtle 3&4 Updated Final Safety Analysis Report Appendix 3D, “Methodology for Qualifying AP1000 Safety-Related Electrical and Mechanical Equipment”
5. Equipment Qualification (EQ) Reports as identified in Attachment A
6. Regulatory Guide 1.100, Rev. 2, "Seismic Qualification of Electric and Mechanical Equipment for Nuclear Power Plants"
7. IEEE Standard 323-1974, "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations”
8. Regulatory Guide 1.89, Rev 1, “Environmental Qualification of Certain Electric Equipment Important to Safety for Nuclear Power Plants”
9. 2.5.05.02.i-U3-CP-RevX, “Completion Package for Unit 3 ITAAC 2.5.05.02.i [Index Number 565]”
10. 2.5.05.02.i-U4-CP-RevX, “Completion Package for Unit 4 ITAAC 2.5.05.02.i [Index Number 565]”
11. NEI 08-01, “Industry Guideline for the ITAAC Closure Process Under 10 CFR Part 52”
12. DCP_DCP_######, “Summary of IITA Equipment Qualification”
13. SVP_SVP_018473, “Incore Instrumentation Thimble Assemblies Seismic Qualification Summary”
14. APP-XXX-VQQ-XXX, Rev. X, “Quality Assurance Data Package”

Attachment A

System: In-core Instrumentation System (IIS)

Equipment Name +	Seismic Cat. I +	Class 1E/ Qual. For Harsh Envir. +	Envir. Zone 1	Envir Qual Program 2	Type of Qual.	EQ Reports	EQRR
Incore Thimble Assemblies (at least three assemblies in each core quadrant)	Yes	Yes(4)/Yes(4)	1	E * S	Type Tests & Analysis	DCP_DCP_###### (Harsh) SVP_SVP_018473 (Seismic)	2.5.05.02.i-U3-EQRR-PCDXXX

Notes:

+ Excerpt from COL Appendix C Table 2.5.5-1

2. See Table 3D.5-1 of UFSAR

3. E - Electrical Equipment Program
   S = Qualified for submergence or operation with spray
   * - Harsh Environment

4. The Unit 4 EQRR are numbered "2.5.05.02.i-U4-EQRR-PCDXXX"

5. Only applies to the safety-related assemblies. There are at least two safety-related assemblies in each core quadrant.

ITAAC 2.5.05.03b (Index No. 570) UIN.

ITAAC Statement

Design Commitment

3.b) The Class 1E cables between the Core Exit Temperature sensors and the connector plates have sheaths.

Inspections/Tests/Analyses

Inspection of the Class 1E cables will be performed.

Acceptance Criteria

The Class 1E cables between the Core Exit Temperature sensors and the connector plates have sheaths.

ITAAC Completion Description

Inspection of the Class 1E cables between the Core Exit Temperature sensors (these sensors are located within the incore thimble assemblies) and the connector plates (these connectors are beyond the integrated head package on the operating deck connector panel) is performed to verify that the Class 1E cables have sheaths.

The incore thimble assemblies and the connection panel located on the Integrated Head Package (IHP) are connected by Class 1E head area cable assemblies (wires and connectors), which transmit the safety-related core exit temperature signals to the protection and safety monitoring system (PMS). The incore thimble assemblies contain Class 1E cables which connect the Core Exit Temperature sensors to the connector on the end of the incore thimble assemblies.

Design specifications require internal metallic sheaths that surround and separate the Class 1E thermocouple wires from non-Class 1E detector wires, which are contained within an external spiral wound sheath. The design specifications also include performance tests for overvoltage, insulation resistance, and continuity. Successful test results indicate that the sheaths protect against credible single faults between the Class 1E and non-Class 1E signals.

The Quality Release and Certificate of Conformance (References 1 and 2) verifies the head area cable assembly acceptance test results. The Field Service Report (References 3 and 4) verifies the head area cable assemblies were installed on the integrated head package in accordance with design drawings and installation specifications issued for construction, and work package requirements. The Quality Release and Certificate of Conformance (References 5 and 6) verifies that the in-vessel Class 1 E cables were installed within the incore thimble assemblies in accordance with design drawings and installation specifications and contains the incore thimble assemblies cable acceptance test results.

The Class 1E cables between the Core Exit Temperature sensors and the connector plates are inspected to verify that the design specification and installation specifications are satisfied, to enable each cable to convey the safety-related core exit thermocouple signals to the PMS, as identified in the Combined License (COL) Appendix C ITAAC 2.5.05.03b, Design Description.

The inspections are performed and documented in accordance with manufacturer and vendor quality verification programs. The results of the inspections are documented in the Unit 3 and Unit 4 Principal Closure Documents (References 1 through 6) supporting the ITAAC 2.5.05.03b Completion Package (References 7 and 8). The inspections confirm that the Class 1E cables between the Core Exit Temperature sensors and the connector plates have sheaths.

The Unit 3 and Unit 4 Principal Closure Documents (References 1 through 6) are available for NRC inspection as part of the Unit 3 and Unit 4 ITAAC 2.5.05.03b Completion Package.

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 were no relevant ITAAC findings associated with this ITAAC. The ITAAC completion review is documented in the ITAAC Completion Package for ITAAC 2.5.05.03b (References 7 and 8) and are available for NRC review.

References (available for NRC inspection)

1. SV3-EW25-VQQ-002, Rev 0, Quality Release & Certificate of Conformance
2. SV4-EW25-VQQ-002, Rev 0, Quality Release & Certificate of Conformance
3. SV3-MV10-S8R-001, Revision 0, AP1000 - Vogtle 3 Field Service Report - Integrated Head Package Field Assembly, (IHPFA)
4. SV3-MV10-S8R-001, Revision 0, AP1000 - Vogtle 4 Field Service Report - Integrated Head Package Field Assembly, (IHPFA)
5. SV3-JE90-VQQ-001, Rev. 1, “Quality Release & Certificate of Conformance – JE90”
6. SV4-JE90-VQQ-001, Rev. 1, “Quality Release & Certificate of Conformance – JE90”
7. 2.5.05.03b-U3-CP-Rev0, ITAAC Completion Package
8. 2.5.05.03b-U4-CP-Rev0, ITAAC Completion Package