

## Vogle PEmails

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**From:** Hoellman, Jordan  
**Sent:** Friday, August 24, 2018 9:13 AM  
**To:** Vogle PEmails  
**Subject:** SNC's Response to Comments on UIN for ITAAC Index No. 616  
**Attachments:** NRC comment status sheet July 12 (UIN 616 response), 08-22-18.docx; UIN 616.pdf

Please see the attached two documents for regarding the UIN for ITAAC Index No. 616.

The first document is the issue tracking sheet. The first half of the issue tracking sheet are the initial NRC comments provided and the corresponding SNC responses discussed on the 7/12 public call. The 2<sup>nd</sup> half of the tracking sheets are the NRC comments verbally provided during the 7/19 public call. SNC's responses are also included.

The second document is a draft revision of UIN 616.

**Hearing Identifier:** Vogtle\_COL\_Docs\_Public  
**Email Number:** 345

**Mail Envelope Properties** (SN6PR0901MB2366C764445B1C7B937215D8D5360)

**Subject:** SNC's Response to Comments on UIN for ITAAC Index No. 616  
**Sent Date:** 8/24/2018 9:13:03 AM  
**Received Date:** 8/24/2018 9:13:09 AM  
**From:** Hoellman, Jordan

**Created By:** Jordan.Hoellman2@nrc.gov

**Recipients:**  
"Vogtle PEmails" <Vogtle.PEmails@nrc.gov>  
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| <b>Files</b>                                                       | <b>Size</b> | <b>Date &amp; Time</b> |       |
|--------------------------------------------------------------------|-------------|------------------------|-------|
| MESSAGE                                                            | 515         | 8/24/2018 9:13:09 AM   |       |
| NRC comment status sheet July 12 (UIN 616 response), 08-22-18.docx |             |                        | 27369 |
| UIN 616.pdf                                                        | 164356      |                        |       |

**Options**  
**Priority:** Standard  
**Return Notification:** No  
**Reply Requested:** No  
**Sensitivity:** Normal  
**Expiration Date:**  
**Recipients Received:**

**VOGTLE ICN/UIIN ISSUES TRACKING SHEET**

| Date | ITEM # | ICN UIN | TOPIC                                | ITAAC INDEX #  | ISSUE                                                                                                                                                                                                                                                                                                                                                                                                                        | Licensee Comment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------|--------|---------|--------------------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7/12 | 2      | UIN     | IDS Equip<br>Quals<br>and<br>ratings | V3 / V4<br>616 | <ol style="list-style-type: none"> <li>1. Each ITAAC section should be uniquely identified throughout the document not just in the DC. See agreed on example UIN for consolidated ITAAC 2.3.06.02a (Index No. 355).</li> <li>2. Completion description for #7 – clearly identify how the load requirements were established. How does the last sentence in 3rd paragraph apply with respect to the 4th paragraph?</li> </ol> | <ol style="list-style-type: none"> <li>1. Each Acceptance Criteria (AC) in the ITAAC Completion Description has been identified with the corresponding Design Commitment number, consistent with consolidated ITAAC 2.3.06.02a (Index No. 355).</li> <li>2. Revised paragraph 3 of AC #7 to identify the analyses that established the load requirements.</li> </ol> <p>Revised paragraph 4 to clarify comparisons of as-built information to analyzed load requirements.</p> <p>Combined paragraphs 4 and 5.</p> <p>Adjusted reference numbers throughout Completion Description AC #7 - #10 to reflect 2 new references added to AC #7.</p> <p>Comments above were submitted on 07-17-18 and discussed in the public call on 07-19-18.</p> |
| 7/19 |        |         |                                      |                | <p>The following issues were discussed in the public call on 07-19-18;</p> <ol style="list-style-type: none"> <li>3. Are momentary loads included in the analyzed load requirements, or only continuous loads?</li> <li>4. The last sentence in paragraph 1 is not applicable to DC #7 of the ITAAC.</li> </ol>                                                                                                              | <ol style="list-style-type: none"> <li>3. Momentary and continuous loads are applied in the analyses to establish a load duty cycle on each battery for the period following the event.</li> <li>4. The last sentence of paragraph 1 in DC #7 has been deleted.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

**Southern Nuclear Operating Company  
ND-18-xxxx  
Enclosure**

**Vogtle Electric Generating Plant (VEGP) Unit 3 and Unit 4  
Completion Plan for Uncompleted ITAAC 2.6.03.07 [Index Number 616]**

**DRAFT**

## **ITAAC Statement**

### **Design Commitment**

7. The IDS dc battery fuses and battery charger circuit breakers, and dc distribution panels, MCCs, and their circuit breakers and fuses, are sized to supply their load requirements.
8. Circuit breakers and fuses in IDS battery, battery charger, dc distribution panel, and MCC circuits are rated to interrupt fault currents.
9. The IDS batteries, battery chargers, dc distribution panels, and MCCs are rated to withstand fault currents for the time required to clear the fault from its power source.
10. The IDS electrical distribution system cables are rated to withstand fault currents for the time required to clear the fault from its power source.

### **Inspections/Tests/Analyses**

Analyses for the as-built IDS dc electrical distribution system to determine the capacities of the battery fuses and battery charger circuit breakers, and dc distribution panels, MCCs, and their circuit breakers and fuses, will be performed.

Analyses for the as-built IDS dc electrical distribution system to determine fault currents will be performed.

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### **Acceptance Criteria**

Analyses for the as-built IDS dc electrical distribution system exist and conclude that the capacities of as-built IDS battery fuses and battery charger circuit breakers, and dc distribution panels, MCCs, and their circuit breakers and fuses, as determined by their nameplate ratings, exceed their analyzed load requirements.

Analyses for the as-built IDS dc electrical distribution system exist and conclude that the analyzed fault currents do not exceed the interrupt capacity of circuit breakers and fuses in the battery, battery charger, dc distribution panel, and MCC circuits, as determined by their nameplate ratings.

Analyses for the as-built IDS dc electrical distribution system exist and conclude that the fault current capacities of as-built IDS batteries, battery chargers, dc distribution panels, and MCCs, as determined by manufacturer's ratings, exceed their analyzed fault currents for the time required to clear the fault from its power source as determined by the circuit interrupting device coordination analyses.

Analyses for the as-built IDS dc electrical distribution system exist and conclude that the IDS dc electrical distribution system cables will withstand the analyzed fault currents, as determined by manufacturer's ratings, for the time required to clear the fault from its power source as determined by the circuit interrupting device coordination analyses.

### **ITAAC Completion Description**

Analyses for the as-built Class 1E dc and Uninterruptible Power Supply System (IDS) dc electrical distribution system are performed to verify the system is sized to supply the load requirements, the analyzed fault currents do not exceed the interrupting capacity of the protective devices, and the system equipment and cables are rated to withstand fault currents.

7. Analyses for the as-built IDS dc electrical distribution system exist and conclude that the capacities of as-built IDS battery fuses and battery charger circuit breakers, and dc distribution panels, MCCs, and their circuit breakers and fuses, as determined by their nameplate ratings, exceed their analyzed load requirements.

Analyses for the as-built IDS dc electrical distribution system are performed to verify that the capacities of as-built IDS battery fuses and battery charger circuit breakers, and switchboards, dc distribution panels, motor control centers (MCCs), and their circuit breakers and fuses ("the IDS equipment"), as determined by their nameplate ratings, exceed their analyzed load requirements.

The load requirements of the IDS batteries, chargers, inverters, and regulating transformers are determined to ensure power is provided to the loads required following a loss of all ac power sources, coincident with a design basis accident. The load requirements of the Division A and D equipment are based upon providing the momentary and continuous loads required during the first 24-hours of the event. The load requirements of the Division B and C equipment are based upon providing the momentary and continuous loads required during the first 72-hours following the event. The load requirements and equipment capacity analyses are documented in APP-IDS-E0C-001 and APP-IDS-E0C-002 (References 4 and 5). The nameplate ratings of the IDS equipment are inspected in accordance with the Construction Quality Verification Program (Reference 6). The as-built nameplate ratings of the IDS equipment are compared to the analyzed 24-hour and 72-hour load requirements, to verify the capacities of the IDS equipment exceed the analyzed load requirements. The results of these analyses and comparisons are documented in the Unit 3 and Unit 4 Principal Closure Documents (References 7 and 8, respectively) supporting the Unit 3 and Unit 4 ITAAC 2.6.03.07 Completion Packages (References 9 and 10 respectively) and conclude that the capacities of as-built IDS battery fuses and battery charger circuit breakers, and switchboards, dc distribution panels, MCCs, and their circuit breakers and fuses, as determined by their nameplate ratings, exceed their analyzed load requirements.

Principal Closure Documents XXX and YYY exist and are available for NRC inspection as part of the Unit 3 and Unit 4 ITAAC 2.6.03.07 Completion Packages.

8. Analyses for the as-built IDS dc electrical distribution system exist and conclude that the analyzed fault currents do not exceed the interrupt capacity of circuit breakers and fuses in the battery, battery charger, dc distribution panel, and MCC circuits, as determined by their nameplate ratings.

Analyses for the as-built IDS dc electrical distribution system are performed to verify that the analyzed fault currents do not exceed the interrupting capacity of circuit breakers and fuses in the battery, battery charger, switchboards, dc distribution panel, and MCC (“the IDS equipment”) circuits, as determined by their nameplate ratings.

The minimum required interrupting capacity rating of circuit breakers and fuses in the IDS equipment circuits are determined by calculation and summarized in the IDS Short Circuit Analysis (Reference 11) and the IDS Protection Coordination Study (Reference 12). These calculations utilize the worst case short circuit contribution from each battery, battery charger, and motor load of the IDS, which determines the minimum required protective device interrupting capacity in accordance with the criteria stated in the IEEE Standard 946, Sections 7.1 and 7.9 (Reference 1), IEEE Standard 741 (Reference 2), and IEEE Standard 242 (Reference 3).

The nameplate capacity ratings of the as-built IDS circuit breakers and fuses in the IDS equipment circuits are inspected in accordance with the Construction Quality Verification Program (Reference 6). The nameplate rating for each of these circuit breakers and fuses is evaluated to assure the device interrupting capacity exceeds the minimum required interrupting capacity rating.

The combination of the as-built IDS inspection results and the analyses documented in the IDS Short Circuit Analysis and the IDS Protection Coordination Study conclude that the analyzed fault currents do not exceed the interrupting capacity of circuit breakers and fuses in the battery, battery charger, switchboards, dc distribution panel, and MCC circuits, as determined by their nameplate ratings. The as-built IDS inspection results, the IDS Short Circuit Analysis and the IDS Protection Coordination Study analysis results are documented in the Unit 3 and Unit 4 Principal Closure Documents XXX and YYY (References 7 and 8, respectively) supporting the Unit 3 and Unit 4 ITAAC 2.6.03.07 Completion Packages (References 9 and 10, respectively)

Principal Closure Documents XXX and YYY exist and are available for NRC inspection as part of the Unit 3 and Unit 4 ITAAC 2.6.03.07 Completion Packages.

9. Analyses for the as-built IDS dc electrical distribution system exist and conclude that the fault current capacities of as-built IDS batteries, battery chargers, dc distribution panels, and MCCs, as determined by manufacturer’s ratings, exceed their analyzed fault currents for the time required to clear the fault from its power source as determined by the circuit interrupting device coordination analyses.

Analyses for the as-built IDS dc electrical distribution system are performed to verify that the fault current capacities of as-built IDS batteries, battery chargers, switchboards, dc distribution panels, and MCCs (“the IDS equipment”), as determined by manufacturer’s ratings, exceed their analyzed fault currents for the time required to clear the fault from its power source as determined by the circuit interrupting device coordination analyses. Fault current and circuit interrupting device coordination analysis requirements for the IDS dc electrical distribution system are performed in accordance with the criteria stated in IEEE Standard 946, (Reference 1), IEEE Standard 741 (Reference 2), and IEEE Standard 242 (Reference 3).

The worst case short circuit (fault) currents of the IDS equipment are determined by the IDS Short Circuit Analysis (Reference 11). The results of this analysis are used in combination with

the circuit interrupting device IDS Protection Coordination Study (Reference 12) to determine the worst case analyzed fault currents.

The manufacturer's nameplate fault current ratings of the IDS equipment are inspected in accordance with the Construction Quality Verification Program (Reference 6). The as-built fault current rating for each piece of the IDS equipment, as documented in inspection records, are then compared to the fault current information determined in References 11 and 12 to verify that the fault current capacities of the IDS equipment exceed the analyzed fault currents.

The results of these analyses and comparisons are documented in the Unit 3 and Unit 4 Principal Closure Documents XXX and YYY (References 7 and 8, respectively) supporting the Unit 3 and Unit 4 ITAAC 2.6.03.07 Completion Packages (References 9 and 10, respectively) and conclude that the fault current capacities of as-built IDS batteries, battery chargers, switchboards, dc distribution panels, and MCCs, as determined by manufacturer's ratings, exceed their analyzed fault currents for the time required to clear the fault from its power source as determined by the circuit interrupting device coordination analyses.

Principal Closure Documents XXX and YYY exist and are available for NRC inspection as part of the Unit 3 and Unit 4 ITAAC 2.6.03.07 Completion Packages.

10. Analyses for the as-built IDS dc electrical distribution system exist and conclude that the IDS dc electrical distribution system cables will withstand the analyzed fault currents, as determined by manufacturer's ratings, for the time required to clear the fault from its power source as determined by the circuit interrupting device coordination analyses.

Analyses for the as-built IDS dc electrical distribution system are performed to verify that the IDS dc electrical distribution system cables will withstand the analyzed fault currents, as determined by manufacturer's ratings, for the time required to clear the fault from its power source as determined by the circuit interrupting device coordination analyses. Fault current and circuit interrupting device coordination analysis requirements for the IDS dc electrical distribution system are performed in accordance with the criteria stated in IEEE Standard 946, (Reference 1), IEEE Standard 741 (Reference 2), and IEEE Standard 242 (Reference 3).

The worst case short circuit (fault) currents of the as-built IDS dc electrical distribution system cables are determined by calculation and are summarized in the IDS Short Circuit Analysis (Reference 11). The results of this analysis are used in combination with the circuit interrupting device IDS Protection Coordination Study (Reference 12) to determine the worst case analyzed fault currents.

The as-built IDS dc electrical distribution system cables are inspected in accordance with the Construction Quality Verification Program (Reference 6). Each cable is inspected by Quality Control when it is removed from the specified cable reel. The manufacturer's unique cable reel number is recorded during the inspection. The cable reel number provides traceability to the manufacturer's rating of the cable. Each cable termination is inspected by Quality Control following installation. The inspection records provide traceability to the manufacturer's rating for each cable terminal.

The manufacturer's rating of the cable and cable terminals, as traceable through inspection records, are compared to the fault current information determined in References 11 and 12 to



verify that the fault current capacities of as-built IDS dc electrical distribution system cables, as determined by manufacturer's ratings, exceed their analyzed fault currents.

The results of these analyses and comparisons are documented in the Unit 3 and Unit 4 Principal Closure Documents XXX and YYY (References 7 and 8) supporting the Unit 3 and Unit 4 ITAAC 2.6.03.07 Completion Packages (References 9 and 10), and conclude that the fault current capacities of as-built IDS dc electrical distribution system cables, as determined by manufacturer's ratings, exceed their analyzed fault currents for the time required to clear the fault from its power source as determined by the circuit interrupting device coordination analyses.

Principal Closure Document XXX exists and is available for NRC inspection as part of the ITAAC 2.6.03.07 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 finding review, which included the now-consolidated ITAAC Indexes 617, 618, and 619, found the following Notice of Nonconformance (NON) associated with this ITAAC.

- 1) 99901467/2016-201-01 (open)

### **References (available for NRC inspection)**

1. IEEE Standard 946, "IEEE Recommended Practice for the Design of DC Auxiliary Power Systems for Generating Stations," 1992
2. IEEE Standard 741, "IEEE Standard Criteria for the Protection of Class 1E Power Systems and Equipment in Nuclear Power Generating Stations," 1997
3. IEEE Standard 242, "IEEE Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems," 1986
4. APP-IDS-E0C-001, "Class 1E 250 VDC Battery Sizing, Charger Sizing, and Available Short Circuit Current", Rev. X
5. APP-IDS-E0C-002, "Class 1E DC and UPS (IDS) Inverter and Regulating Transformer Sizing", Rev. X
6. 26139-000-4MP-T81C-N7101, "Construction Quality Verification Program"
7. Unit 3 Principal Closure Document XXX
8. Unit 4 Principal Closure Document YYY
9. 2.6.03.07-U3-CP-Rev 0, ITAAC Completion Package
10. 2.6.03.07-U4-CP-Rev 0, ITAAC Completion Package
11. IDS Short Circuit Analysis, Rev. X
12. IDS Protection Coordination Study, Rev. X