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ONS-2014-048

April 3, 2014

10 CFR 50.90

U. S. Nuclear Regulatory Commission
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Duke Energy Carolinas, LLC
Oconee Nuclear Station (ONS), Units 1, 2, and 3
Docket Numbers 50-269, 50-270, and 50-287,
Renewed Operating Licenses DPR-38, DPR-47, and DPR-55

Subject: Licensing Basis for the Protected Service Water (PSW) System - Response to Request for Additional Information (RAI) Nos. 191-194; License Amendment Request (LAR) 2008-07 - Supplement 9

Reference:

1. Letter from Scott L. Batson, Vice President, Oconee Nuclear Station, Duke Energy Carolinas, LLC, to the U. S. Nuclear Regulatory Commission, "Responses to Request for Additional Information Item Nos. 172 through 189; License Amendment Request (LAR) 2008-07 - Supplement 7," dated December 18, 2013.
2. Letter from Scott L. Batson, Vice President, Oconee Nuclear Station, Duke Energy Carolinas, LLC, to the U. S. Nuclear Regulatory Commission, "Licensing Basis for the Protected Service Water System - Response to Request for Additional Information (RAI) No. 190; Revised Responses to RAI Nos. 134 and 165; License Amendment Request (LAR) 2008-07 - Supplement 8," dated February 14, 2014.
3. NRC RAI email from Richard Guzman (NRC) to Timothy D. Brown (Duke Energy) dated March 24, 2014.

On March 24, 2014, additional follow-up questions were received from the Nuclear Regulatory Commission (Ref. 3) regarding responses provided in references 1 and 2. The questions dealt primarily with the electrical testing and qualification of certain PSW electrical components.

Duke Energy's responses to these RAI items are contained in the Enclosure to this letter. These additional RAI items have been designated as numbers (Nos.) 191 through 194. Additionally, there are regulatory commitments associated with this letter. These are contained in a commitment table as an Attachment to this letter.

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If you have any questions in regard to this letter, please contact Stephen C. Newman, Regulatory Affairs Lead Engineer, Oconee Nuclear Station, at (864) 873-4388 or Timothy D. Brown, PSW Licensing Manager at (864) 873-3952.

I declare under penalty of perjury that the foregoing is true and correct. Executed on April 3, 2014.

Sincerely,

A handwritten signature in black ink, appearing to read "Scott L. Batson", with a stylized flourish at the end.

Scott L. Batson
Vice President
Oconee Nuclear Station

Enclosure: Responses to NRC RAI Nos. 191-194
Attachment: Regulatory Commitment Table

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cc: (w/enclosure/attachment)

Mr. Richard Guzman, Senior Project Manager
(by electronic mail only)
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ENCLOSURE

Responses to NRC RAI Nos. 191-194

RAI 191 [EEEEB4]

In letter dated February 14, 2014 (ADAMS Accession No. ML14055A068), the licensee submitted revised responses to RAIs 134 and 165, regarding licensee's environmental qualification (EQ) of the PSW-related equipment. Specifically, the licensee indicated that the 5.0 kilovolt (kV) motor operated manual transfer switches, located in the Auxiliary Building, which provide an electrical power connection to the High Pressure Injection (HPI) system from the PSW system, are being qualified in accordance IEEE Std. 323-1974, as the total integrated dose value has been revised for this area based on the licensee's revised calculation.

- a. The licensee stated that 5 kV motor operated transfer switches (1/2/3HPISXTRN001 and 002) will be qualified by test and analysis for the worst case radiation values, and the test reports will qualify the switches to IEEE Std.323-1974.

Since the licensee has not completed testing and analysis of the above equipment, and a summary result is not submitted for NRC staff's review, the staff requests that the future test and analysis be part of a commitment before the operation of the PSW/HPI system to demonstrate and verify the adequacy of the equipment and components EQ after testing and analysis. The licensee is requested to clarify the method to include this consideration in its response (i.e., as regulatory commitment).

- b. In the RAI 165 revised response, the licensee stated that new 5.0 kV manual disconnect/alignment switches (1/2/3HPISXALGN001) are located in the same EQ Zone as the 5.0 kV motor operated transfer switches. The table attached to the RAI response shows the 5.0 kV manual disconnect/alignment switches (Item 3 in the table) are also of the same parameters (i.e., safety class QA-1, qualified temperature, qualified relative humidity, and qualified pressure in a harsh environment). However, the licensee stated that these switches are not required to mitigate a loss of coolant accident because they are not routed through the HPI pump motor path, and therefore, not required to be qualified and will not be included in the EQ program.

Since these switches will be used to select either the "A" or "B" HPI pump, which means that these switches are electrically connected to the HPI system, and these switches are located in the same EQ Zone as 5.0 kV motor operated manual transfer switches, the NRC staff requests clarification as to why these switches will be qualified as Mild Environment switches per IEEE Std. 323-1983 and not in accordance with IEEE Std. -323-1974.

According to 10 CFR 50.49, safety-related electric equipment shall remain functional during design basis events, which are defined as conditions of normal operation, including anticipated operational occurrences, design basis accidents, external events, and natural phenomena. Additionally, the licensee's study ONDS-351, Rev 2 "Analysis of Postulated High Energy Line Breaks (HELBs) Outside of Containment" provided in letter dated December 16, 2011 (ML12003A070) states, "The study will serve as the new design basis for Units 1, 2, and 3 and be incorporated into the licensing basis." Since HELB will be the new design basis according the above study, the licensee must demonstrate why these switches are not required to be functional during and following design basis events (i.e. for the design basis events other than LOCA as discussed above). For example, a HELB event that could occur in the Oconee Nuclear Station Turbine Building (TB) resulting in the loss of all 4160 Volt electrical power supply and how it will be capable of shutting down the reactor and maintaining it in a safe shutdown condition during and following such events.

Duke Energy Response:

- a) The ONS modification process requires that final documentation of a component's equipment qualification be complete prior to turnover and use by the station's operations department. NSD 301, "Engineering Change Program," directs the cognizant site equipment qualification Subject Matter Expert (SME) to review the modification prior to final technical approval of the modification. These switches will be qualified by testing. Duke Energy commits to verifying that the 5.0 kV Motor Operated Transfer Switches have been environmentally qualified for the Total Integrated Dose (TID) present at their installed location in the Auxiliary Building for the Loss of Coolant Accident (LOCA) event. The TID includes the accident dose postulated following a LOCA.
- b) The HPI manual alignment switches are not active unless powered from the PSW power path. The PSW power path is not active until Operations closes the 4.16 kV switchgear breaker in the PSW building. The PSW power path provides an alternate power source to the HPI pumps. It is a separate and distinct power path from the normal (Engineered Safeguards (ES)) power path. The normal (ES) power path would be used to power the HPI pumps during and following a LOCA. The 5.0 kV Motor Operated Transfer Switches are required to maintain the normal (ES) power source through the switch following a LOCA. For that reason they are being qualified for the TID associated with a LOCA Harsh Environment.

Since the PSW system and its power path are not required to mitigate a LOCA, the manual alignment switch, used to route PSW power to either the "A" or "B" HPI pump (per unit), is likewise not required to mitigate a LOCA. Therefore, the manual alignment switches, although located in the same EQ zone as the 5.0 kV Motor Operated Transfer Switches, are designed to a TID associated with a Mild Environment. In addition, per the current HELB licensing basis, there are no HELBs in the vicinity of the manual alignment switches that would directly affect their capability. Duke Energy has uploaded the following one line diagrams for these switches to the SharePoint site:

- O-0702 Rev 35 (EC 91834) - ONS 1: One-Line Diagram 6900V and 4160V Station Auxiliary System,
- O-1702 Rev 23 (EC 91857) - ONS 2: One-Line Diagram 6900V and 4160V Station Auxiliary System,
- O-2702 Rev 25 (EC 91868) - ONS 3: One-Line Diagram 6900V & 4160V Auxiliary System, and
- O-6700 Rev 3 (EC 91834, 91857, 91868) - ONS 1, 2, 3: One-Line Diagram; Main PSW Switchgear; 13.8/4.16kV System.

RAI 192 [EEEE5]

In letter dated December 18, 2013 (ADAMS Accession No. ML13358A042), in response to RAI 173 [EEEE2], the licensee identified 7 (seven) PSW component types that have not been resolved for EQ.

These components are:

1. Rosemount Transmitters (models 1154 and 1154H);
2. MINCO/Westinghouse Resistance Temperature Detectors (RTDs)
3. Boston Insulated Wire cables

4. Viking electrical penetrations
5. Limitorque Motor Operated Valve (MOVs)
6. Tape Splice – Scotch 130C /EGS – SAIC, and 7). Power Operated Relief Valve *[sic]*. (Solenoid)

The licensee states, "Resolution of the above component limitations will be through a combination of additional component testing, component replacement, and/or providing containment cooling to reduce the containment temperature profile."

Since the licensee has not completed additional testing and analysis of the above equipment and a summary result is not submitted for staff's review, the staff requests that the future test and analysis be part of a commitment before operation of the PSW/HPI system to demonstrate adequacy of the equipment and components qualification after testing and analysis. The licensee is requested to clarify the method to include this consideration in its response (i.e., as regulatory commitment).

Duke Energy Response:

The ONS modification process requires that final documentation of a component's equipment qualification be complete prior to turnover and use by the station's operations department. NSD 301, "Engineering Change Program," directs the cognizant site equipment qualification Subject Matter Expert (SME) to review the modification prior to final technical approval of the modification. These components will be qualified by a combination of testing, component replacement, and/or providing containment cooling to reduce the containment temperature profile.

Duke Energy commits to verifying that the components provided in the December 18, 2013, RAI No. 173 response are designed for the temperature environment in the Reactor Building following PSW mitigated events by a combination of testing, component replacement, and/or providing containment cooling to reduce the containment temperature profile.

RAI 193 [EEEB6]

In letter dated December 18, 2013, in response to RAI 173 [EEEB2], the licensee identified Rosemount Transmitters (models 1154 and 1154H) that will be qualified through a combination of additional component testing, component replacement, and/or providing containment cooling to reduce the containment temperature profile. The NRC staff's review identified 10 CFR Part 21 Notifications [dated April 02, 2012 (ADAMS Accession No. ML12094A371) and September 6, 2011 (ADAMS Accession No. ML11251A198)], issued by Rosemount Nuclear Instruments, Inc. (RNII) on Rosemount transmitters (models 1154 and 1154H), and also NRC Information Notice 89-42, "Failure of Rosemount Models 1153 and 1154 Transmitters," (ADAMS Accession No. ML031180830). Please provide detailed justification on the use of the Rosemount transmitters (model 1154 and 1154H) for the proposed safety related PSW system.

Duke Energy Response

ONS has evaluated the 10CFR Part 21 notifications associated with the Rosemount Transmitter Models 1154 and 1154H. The notifications were entered into the station corrective action program. For the notification dated September 6, 2011, ONS was identified as in receipt of two (2) of the subject transmitters included in the 10CFR Part 21 notification. The two transmitters were located in one of the station's warehouses and were not installed into the plant. These two transmitters were returned to Rosemount following the notification. The notification dated April

2, 2012, determined that Model 1154 Series H Code 4-8 pressure transmitters had a significantly elevated or suppressed 4 mA point that may not meet the published steam pressure/temperature accuracy specification. While Model 1154 Series H transmitters are installed in the ONS containments, they are Range Code 9 pressure transmitters. As such the 10CFR Part 21 notification dated April 2, 2012, did not apply to ONS.

RAI 194 [EEEE7]

Attachment 1 (Revised PSW UFSAR) in letter dated December 18, 2013 states, "The PSW system reduces fire risk by providing a diverse QA-1 power supply to power safe shutdown equipment thus enabling the use of plant equipment for mitigation of certain fires as defined by the ONS Fire Protection Program. For certain scenarios inside the Turbine Building (TB) resulting in loss of 4160V essential power, either the SSF or PSW system is used for reaching safe shutdown."

The NRC staff did not find any discussion and analyses for these "certain scenarios" in the revised UFSAR. The licensee did not provide any details regarding certain scenarios inside the TB that will result in loss of 4160 V essential power in the revised UFSAR. Therefore, the staff is unable to make a conclusion on the aforementioned licensee statement. The staff requests that the licensee provide more specific information regarding the term "certain scenarios", including any detailed analyses and whether it has been previously reviewed and approved by the NRC staff.

Duke Energy Response

The statement, "For certain scenarios inside the Turbine Building (TB) resulting in loss of 4160V essential power, either the SSF or PSW system is used for reaching safe shutdown," and the use of the word 'certain' was intentionally used to indicate that the PSW system may be used for other event scenarios, apart from NFPA 805 fires. These other event scenarios have separate license amendments, specifically for High Energy Line Breaks (HELBs) and potentially tornado. ONS submitted the LARs for HELB and tornado in the 2008/2009 timeframe. The NRC and ONS agreed to suspend the NRC's review of these LARs so that the NRC and ONS could concentrate on licensing PSW for NFPA 805 as a result of the NRC order dated July 1, 2013.

ATTACHMENT

Regulatory Commitment Table

The following table identifies the regulatory commitments in this document. Any other statements in this submittal represent intended or planned actions. They are provided for information purposes and are not considered to be regulatory commitments.

Commitment	Due Date
1. Duke Energy commits to verifying that the 5.0 kV Motor Operated Transfer Switches have been environmentally qualified, by testing, for the Total Integrated Dose (TID) present at their installed location in the Auxiliary Building for the LOCA event.	Prior to PSW System Operability on each unit.
2. Duke Energy commits to verifying that the components provided in the December 18, 2013, RAI No. 173 response are designed for the temperature environment in the Reactor Building following PSW mitigated events by a combination of testing, component replacement, and/or providing containment cooling to reduce the containment temperature profile.	Prior to PSW System Operability on each unit.