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ONS-2017-048

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June 30, 2017

Attn: Document Control Desk  
U.S. Nuclear Regulatory Commission  
11555 Rockville Pike  
Rockville, MD 20852-2746

10 CFR 50.71(e)  
10 CFR 50.59(d)  
10 CFR 54.37(b)

Subject: Duke Energy Carolinas, LLC  
Oconee Nuclear Station, Units 1, 2, and 3  
Docket Nos. 50-269, 50-270, 50-287  
Updated Final Safety Analysis Report, Revision 26

Pursuant to 10 CFR 50.71(e), and in accordance with 10 CFR 50.4, Duke Energy Carolinas, LLC (Duke Energy) hereby submits the Oconee Nuclear Station Updated Final Safety Analysis Report (UFSAR), Revision 26. The effective date of the UFSAR revision is December 31, 2016, as indicated at the bottom of each page. Changes made in Revision 26 are indicated by side bars.

The Oconee UFSAR, Revision 26, is being provided in a non-redacted version (for Nuclear Regulatory Commission internal use) and a redacted version (for NRC public use). The two compact disks (CDs) enclosed are labelled accordingly. Duke Energy has marked the appropriate information in the redacted version as "Security-Related Information Withheld Under 10 CFR 2.390" using the criteria provided by the NRC in SECY-04-191. The contents are in Adobe Acrobat Portable Document Format (pdf).

As required by NRC guidance for electronic submissions, Attachment 1 provides a listing of the document components that comprise the enclosed CDs. Attachment 2 provides the List of Effective Pages (LOEP) for Tables and Figures. Attachment 3 provides insertion instructions for those receiving hardcopy distribution. Attachment 4 provides a listing of items removed in the 2016 UFSAR update. Attachment 5 provides the report of changes, tests, and experiments performed pursuant to 10 CFR 50.59(d).

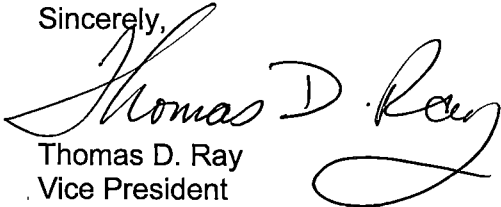
In addition, 10 CFR 54.37(b) requires that after the renewed license is issued, the UFSAR update must include any systems, structures and components (SSCs) newly identified that would have been subject to an aging management review or evaluation of time-limited aging analysis in accordance with 10 CFR 54.21. The UFSAR update must describe how the effects of aging are managed such that the intended function(s) in 10 CFR 54.4(b) will be effectively maintained during the period of extended operation. A review was completed to determine whether any newly-identified SSCs existed in support of submitting UFSAR Revision 26. As a result of this review, there were no newly-identified SSCs for which aging management reviews or time-limited aging analyses would apply.

IE47  
AD53  
NRR

This submittal document contains no new or revised regulatory commitments. If you have any questions regarding this submittal, please contact Kay Brocklesby at (864) 873-6661.

I declare under penalty of perjury that the foregoing is true and correct. Executed on June 30, 2017.

Sincerely,

A handwritten signature in black ink, reading "Thomas D. Ray". The signature is fluid and cursive, with the first name "Thomas" being the most prominent.

Thomas D. Ray  
Vice President  
Oconee Nuclear Station

Attachments:

1. Document Components on CD
2. List of Effective Pages (LOEP)
3. Update Insertion Instructions (for hardcopy distribution only)
4. List of Removed Items
5. 10 CFR 50.59 Summary Report

Enclosure:

1. CD containing Non-Redacted Version of Oconee Nuclear Station Updated Final Safety Analysis Report, 2016 Update – Rev 26
2. CD containing Redacted Version of Oconee Nuclear Station Updated Final Safety Analysis Report, 2016 Update – Rev 26

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cc (with attachments):

Ms. Catherine Haney, NRC Region II Administrator (CD)  
U.S. Nuclear Regulatory Commission  
Marquis One Tower  
245 Peachtree Center Ave., NE, Suite 1200  
Atlanta, GA 30303-1257

Ms. Audrey L. Klett, Project Manager (CD)  
U.S. Nuclear Regulatory Commission  
11555 Rockville Pike  
Mail Stop O-8B1A  
Rockville, MD 20852-2738

Mr. Eddy Crowe (hardcopy)  
Senior Resident Inspector  
Oconee Nuclear Station















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Attachment 1  
Document Components on CD  
(2 pages attached)

Files Currently on the Disc (51)

ONSUR26	6/22/2017 8:52 AM	File folder
000_ONS_UFSAR-Title-Page break.pdf	6/15/2017 6:07 AM	Adobe Acrobat D...
001_ONS_UFSAR_Rev 26_Ch_1_TXT.pdf	6/12/2017 10:16 AM	Adobe Acrobat D...
002_ONS_UFSAR_Rev 26_Ch_1_Tables.pdf	6/12/2017 10:20 AM	Adobe Acrobat D...
003_ONS_UFSAR_Rev 26_Ch_1_Figures.pdf	6/12/2017 10:21 AM	Adobe Acrobat D...
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007_ONS_UFSAR_Rev 26_Ch_3_TXT.pdf	6/14/2017 6:43 AM	Adobe Acrobat D...
008_ONS_UFSAR_Rev 26_Ch_3_Tables.pdf	6/12/2017 10:41 AM	Adobe Acrobat D...
009_ONS_UFSAR_Rev 26_Ch_3_Figures.pdf	6/15/2017 6:04 AM	Adobe Acrobat D...
010_ONS_UFSAR_Rev 26_Ch_4_TXT.pdf	6/12/2017 10:46 AM	Adobe Acrobat D...
011_ONS_UFSAR_Rev 26_Ch_4_Tables.pdf	6/12/2017 10:45 AM	Adobe Acrobat D...
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013_ONS_UFSAR_Rev 26_Ch_5_TXT.pdf	6/14/2017 6:45 AM	Adobe Acrobat D...
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016_ONS_UFSAR_Rev 26_Ch_6_TXT.pdf	6/14/2017 6:47 AM	Adobe Acrobat D...
017_ONS_UFSAR_Rev 26_Ch_6_Tables.pdf	6/12/2017 10:52 AM	Adobe Acrobat D...
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 041_ONS_UFSAR_Rev 26_Ch_15_TXT.pdf	6/14/2017 6:58 AM	Adobe Acrobat D...
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Attachment 2  
List of Effective Pages (LOEP)  
(56 pages attached)

Oconee Nuclear Station  
Updated Final Safety Analysis Report  
2016 List of Effective Pages

Page	Effective Date
<b>Chapter 1</b>	
1-i	31 DEC 2016
1-ii	31 DEC 2016
1-iii	31 DEC 2016
1.0-1	31 DEC 2016
1.0-2	31 DEC 2016
1.1-1	31 DEC 2016
1.1-2	31 DEC 2016
1.2-1	31 DEC 2016
1.2-2	31 DEC 2016
1.2-3	31 DEC 2016
1.2-4	31 DEC 2016
1.3-1	31 DEC 2016
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1.4-1	31 DEC 2016
1.4-2	31 DEC 2016
<b>Chapter 1 Tables</b>	
Table 1-1 (Page 1 of 2)	31 DEC 2000
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Figure 1-9 (Page 1 of 1)	31 DEC 2000
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2-vi	31 DEC 2016



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2-x	31 DEC 2016
2-xi	31 DEC 2016
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2.0-2	31 DEC 2016
2.1-1	31 DEC 2016
2.1-2	31 DEC 2016
2.1-3	31 DEC 2016
2.1-4	31 DEC 2016
2.2-1	31 DEC 2016
2.2-2	31 DEC 2016
2.3-1	31 DEC 2016
2.3-2	31 DEC 2016
2.3-3	31 DEC 2016
2.3-4	31 DEC 2016
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2.3-11	31 DEC 2016
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2.3-23	31 DEC 2016
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Attachment 3  
Update Insertion Instructions  
(for hardcopy distribution only)  
(1 page attached)



Update Insertion Instructions  
(for hardcopy distribution only)

1. Replace 2015 List of Effective Pages (LOEP) for Tables and Figures with the 2016 LOEP for Tables and Figures.
2. Replace entire text portions for each chapter with the updated text portion (including the Table of Contents, List of Figures, and List of Tables).
3. Update Tables and Figures according to the instructions below.

	<u>Remove</u>	<u>Insert</u>
<b>Chapter 3</b>	Table 3-68 (2013)	Table 3-68 (2016)
<b>Chapter 6</b>	Table 6-4 (2004)	Table 6-4 (2016)
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Attachment 4  
List of Removed Items  
(1 page attached)

#### List of Removed Items

1. Section 9.4.9 - References

Removed References 3, 4, and 5 relating to previous Fire Protection Plan correspondence that was superseded by Oconee's incorporation of NFPA 805. (Change Package 16-014)

2. Table 15-16 - Summary of Transient and Accident Doses Including the Effects of High Burnup Reload Cores with Replace Steam Generators

Removed O2C25 Cycle-Specific Fuel Handling Accident for Single Fuel Assembly Event based on implementation of Facility Operating License Amendments 401 for Unit 1, 403 for Unit 2, and 402 for Unit 3. (Change Package 16-013)

3. Section 18.3.1 – Alloy 600 Aging Management Program

Deleted fourth and fifth paragraphs which contained superfluous information. (Change Package 16-009)

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Attachment 5  
10 CFR 50.59 Report  
(11 pages attached)

**Title: EC 114397 - Allow Zinc to be Injected into the Reactor Coolant System for Units 1, 2, and 3 (AR 01930194)**

**Summary:**

Based on Electric Power Research Institute (EPRI) Reports 1001020 and 1003389, Oconee Nuclear Station (ONS) has implemented a Zinc Injection System (ZIS) to continuously add Depleted Zinc Acetate (DZA) in low flow/low concentrations to the ONS Unit 1, 2, and 3 Reactor Coolant System (RCS) for the beneficial purposes of radiation dose rate reduction and Primary Water Stress Corrosion Cracking (PWSCC) mitigation enhancement. ONS commissioned AREVA to perform a site study (AREVA Engineering Input Record (EIR) No. 51-9218398-003) to evaluate the suitability of DZA use in the RCS, and based on this site study, EC 114397 implements the corresponding Chemistry Program procedures for controlling the zinc injection processes and monitoring of associated RCS parameters to ensure that the RCS chemistry is maintained.

The chemistry and monitoring measures implemented by EC 114397 ensure that plant equipment continues to be capable of reliably performing its important to safety functions, and that use of DZA within the RCS does not create initiators of accidents previously evaluated in the UFSAR. Consequences of accidents previously described in the UFSAR are not increased, nor will the use of DZA within the RCS increase accident dose consequences through a malfunction of an SSC important to safety previously evaluated in the UFSAR. These activities do not create the possibility for an accident of a different type than any previously evaluated in the UFSAR, nor do they create a possibility for a malfunction of an SSC important to safety with a different result than any previously evaluated in the UFSAR. No design basis for a fission product barrier as described in the UFSAR is being exceeded or altered, and these activities do not result in a departure from a method of evaluation described in the UFSAR used in establishing the design bases or in the safety analyses.

**Title: VIPRE upgrade from mod 2t to mod 2.5adke (AR 01945738)**

**Summary:**

Duke Energy is upgrading the version of the VIPRE-01 thermal-hydraulics computer code from mod 2 as modified by Duke to mod 2.5 as modified by Duke (mod2.5adke). This code is used by the Duke Energy safety analysis group to simulate thermal-hydraulic conditions in the core to determine whether a rod or group of rods is undergoing departure from nucleate boiling (DNB). The code remains substantially the same. However, the default water properties functions, which approximate the steam tables for VIPRE, have been modified slightly by the code vendor to better match with the steam tables. It is possible this change could make results more or less conservative (i.e. the results might show more or less boiling in the core). Therefore, this code change screened in to the evaluation. The computer code was examined to determine whether changes in aggregate made a substantive difference to the results during the Software Quality Assurance process. This process determined that results were within 0.5% of previous results. Per NEI 96-07 Section 4.3.8.1, "Licensees may change one or more element of a method of evaluation such that results move in the nonconservative direction without prior NRC approval, provided the revised result is 'essentially the same' as the previous result. Results are 'essentially the same' if they are within the margin of error for the type of analysis being performed." As provided by the vendor code manual, the uncertainty of the VIPRE computer code is between 1 and 5%. The change to the results is within code uncertainty. Therefore, this 50.59 evaluation has concluded that the results are essentially the same, does not represent a departure from a method of evaluation, and no prior NRC approval is required.

**Title: EC 112284 - Add Redundant Train of Yellow Bus Differential Relaying  
(AR 1977440)**

**Summary:**

As requested by the North American Electric Reliability Corporation (NERC), Oconee Nuclear Station (ONS) has performed upgrades to the Differential Protective Relaying for the Yellow Bus in the ONS 230 kV switchyard. The Yellow Bus is considered safety related because it provides an emergency power path from the Keowee Hydro Station to the ONS emergency busses. A new train of Differential Protective Relaying has been added that consists of Differential Protective Relays, lockout relays, auxiliary relays, a test block, and trip indicating relays. As a part of this modification, the lockout relay in the existing Differential Protective Relay train was replaced with a qualified, equivalent lockout relay. The new Differential Protective Relay train uses the same lockout relay. The addition of a second Differential Protective Relay train was requested by the NERC to improve the reliability of the ONS switchyard. With a single Differential Protective Relay train, a phase to ground fault with the failure of the single train of Differential Protective Relaying would result in the de-energization of the ONS 230 kV switchyard and loss of generation from the ONS, Jocassee Hydro Station, and Keowee Hydro Station to the grid through the ONS switchyard. The addition of a second train of Differential Protective Relaying would ensure that with an assumed ground fault and a failure of one train of Differential Protective Relaying, the remaining Differential Protective Relaying train would isolate the Yellow Bus and not result in a loss of area generation. Isolation of the Yellow Bus would block the emergency power path from Keowee to the ONS emergency busses. A separate underground path from Keowee to the Oconee emergency busses would still be available. Inoperability of the Keowee overhead power path is addressed by the current ONS Technical Specifications. EC 112284 implements additional Yellow Bus protection. Neither valid actuation nor inadvertent actuation of the Differential Protective Relaying trains result in a station blackout or other analyzed event. An inadvertent trip of either train of Differential Protective Relaying would cause a loss of the overhead Keowee path. However, the additional Differential Protective Relaying train does not result in more than a minimal increase in the likelihood of occurrence of a malfunction of an SSC important to safety. Consequences of accidents previously described in the UFSAR are not increased, nor will the addition of a second Differential Protective Relaying train increase accident dose consequences through a malfunction of an SSC important to safety previously evaluated in the UFSAR. These activities do not create the possibility for an accident of a different type than any previously evaluated in the UFSAR, nor do they create a possibility for a malfunction of an SSC important to safety with a different result than any previously evaluated in the UFSAR.

**Title: EC 109548 Revision 000 - Unit 3 BWST Recirculation Isolation Valves - 10CFR50.59  
Evaluation of Digital Differential Pressure Transmitters, Revision 0 (AR 01995154)**

**Summary:**

The Nuclear Regulatory Commission (NRC) issued amendments for the Reverse Osmosis (RO) system by correspondence dated April 30, 2014. The connection from the BWSTs to the RO system includes redundant automatically actuated, safety-related, seismically qualified isolation valves between the RO system supply piping and the Borated Water Storage Tanks (BWSTs). These automatically actuated isolation valves also isolate the BWST recirculation pump from the BWST. The isolation valves actuate to close on declining BWST level before BWST TS level is reached, thereby isolating RO and Spent Fuel Pool Cooling (SFPC) purification systems from BWST prior to entering Reactor Building Emergency Sump (RBES) recirculation phase following drawdown of the BWST. Isolation of RO and SFPC purification systems prevents unanalyzed consequences from leakage from BWST into those systems' piping when in the RBES recirculation phase. The redundant control circuitry of the isolation valves contain two digital pressure transmitters which actuate on low BWST level to close the valves. Actuation of either one or both of the digital pressure transmitters will close both redundant valves and secure the BWST recirculation pump. Loss of power to the circuit, or loss of air to the valves will result in the valves closing.

The digital pressure transmitter used in this application has self-diagnostics and is configured to fail LO which closes the redundant valves. The digital pressure transmitter is demonstrated to be a very reliable device and has received a generic qualification from EPRI for use in mild environment nuclear applications.

The evaluation demonstrates that the proposed control circuitry for the redundant isolation valves will preserve the current licensing basis. The activity will not create more than a minimal increase in the frequency or consequences of accidents or malfunctions of SSCs important to safety. The proposed activity will not create the potential for a new type of unanalyzed event, has no impact on the fission product barriers and does not affect evaluation methodology. Therefore under 10CFR50.59 it is permissible to implement this modification without prior approval from the NRC.



**Title: EC 109548 Revision 000 - UNIT 3 BWST Level Set Point Change and Unit 1,2, and 3  
Tech Spec Bases Change (AR 01997209)**

**Summary:**

This 10 CFR 50.59 evaluation demonstrates it is acceptable to set the Reverse Osmosis (RO) system automatic isolation valve setpoints below the Borated Water Storage Tank (BWST) minimum technical specification level (as outlined in TS 3.5.4 as corresponding volume) as long as the RO system is isolated prior to swap over from the BWST to Reactor Building Emergency Sump (RBES) for postulated loss of coolant accidents.

This evaluation also demonstrates it is acceptable to change the Background Section of TS Bases 3.7.19 to indicate that the RO system automatic isolation valves are automatically isolated upon receipt of a low BWST level actuation signal prior to swap over to the sump as an Emergency Core Cooling System (ECCS) suction source.

The basis for acceptability is the credited safety function for the RO system automatic isolation valves is to provide the barrier integrity function of radiation confinement following a design basis accident. The RO system automatic isolation valves are considered a primary success pathway to maintain post-LOCA consequences (i.e., radiological dose) bounded by the safety analyses and function as a fission products barrier by preventing the release of radioactive material through the RO system piping as a result of back leakage from the sump into the BWST. The RO system piping has not been evaluated as a release pathway; therefore, isolating the RO system from the BWST prior to swap over to sump recirculation ensures the dose consequences are bounded by the safety analysis and meets the requirement of 10 CFR 50.36 Criterion 3.

The automatic isolation function of the RO system isolation valves are not required for meeting TS 3.5.4 BWST minimum inventory/volume operability requirements. The Oconee License Amendment and associated NRC Safety Evaluation indicate that operational controls established for RO system operation while the BWST is required to be operable to meet the requirements of TS 3.5.4 are acceptable.

**Title: Implement New Core Power Distribution (CPD) Comparison Criteria, Including a Change to the Applicable UFSAR Sections Describing the Comparisons (AR 01999095)**

**Summary:**

This 50.59 evaluation consisted solely of a change in a method of evaluation. Measured and predicted core power distributions (CPD) are compared during Power Escalation Testing at Oconee Nuclear Station (ONS) in accordance with the UFSAR. The prescribed comparison of single maximum measured and predicted radial and total peaking factors was replaced with a more rigorous comparison of the measured and predicted radial and total peaking factors in each fuel assembly with a measured peaking factor greater than one. New acceptance criteria were also determined for the new comparison scheme. In addition, minor clarifications of other acceptance criteria were made.

Sections 4.3.7.2.2 and 4.3.7.3.2 of the ONS UFSAR will be updated for the new acceptance criteria. An unnumbered table following UFSAR Section 4.3.7.4.3 will also be updated to reflect the new acceptance criteria. In addition, two ONS procedures, PT/0/A/0800/030 (CPD Comparison) and PT/0/A/0811/001 (Power Escalation Testing), will be revised solely to reflect the updated comparison criteria.

The new comparison scheme for radial and total peaking factors was determined to be a conservative replacement for the prior method. Other minor changes were determined to be essentially the same as the existing method of evaluation. Therefore, no License Amendment is required.

**Title: EC112282 Revision 002 - 230KV Red Bus Differential Upgrade Add a Second Set of Bus Differential Relay Protection (AR 02008482)**

**Summary:**

EC-112282 Rev. 000 adds a redundant train of Differential Relaying protection for the Red Bus in the ONS 230 kV Switchyard. EC-112882 Rev.001 did not impact the original 10CFR50.59 evaluation. EC-112882 Rev.002 revised the original 10CFR50.59 Evaluation to include discussion of partial turnovers after installation of the second channel of differential relaying for each Red Bus PCB breaker. The design of EC-112282 does not affect the function of the original channel of differential relaying which satisfies licensing requirements for bus protection prior to declaring the second channel of relaying as functional. Minimizing the equipment out of service time during implementation will make the equipment available for the Grid and for supporting Unit Offsite power sources while the second channel of differential relays are installed on the remaining Red Bus PCBs. Editorial changes were made to Questions 1 and 2 responses. A statement was added to the response to Question 2 to evaluate no adverse impacts to the Switchyard DC system. The List of References was updated to include the latest revisions. With the existing design, only a single train of Differential Relaying protection exists on the Red Bus. With the existing design a relay failure can result in a large loss of localized Generation. The initiating event would be a phase to ground bus fault with failed Bus Differential relaying. A phase to ground fault with the failure of the associated single phase differential relay to operate would be expected to result in the de-energizing of the Oconee 230kV switchyard.

**Title: EC 96548, Revision 000 - Unit 2 Main Power System Protective Relaying Upgrade  
(AR 02029931)**

**Summary:**

The purpose of EC 96548 is to improve the reliability, security, and monitoring capabilities of the protective relaying for the main power system. This upgrade will be accomplished by replacing most of the existing protective relays with a set of multifunction microprocessor-based relays. In addition to replacing the protective functions of the existing relays, the new microprocessor-based relays will include additional protective functions that are not provided by the existing relaying scheme. The manner in which the Main Power Protective Relaying can impact operability of the offsite power sources is unchanged. There is no impact on the Technical Specifications.

The Main Power System and its associated protective relaying are non-safety equipment/systems but are designed to support accident mitigation functions. Because they are backed by the safety-related onsite emergency power system, the Main Power System is not required and is not qualified to withstand external events; however, correct operation nor mis-operation of components within these systems can directly or indirectly lead to a turbine trip, analyzed in UFSAR Section 15.8. A failure or delay in the response in the primary protective relaying can lead to partial or complete loss of non-emergency AC power to the station auxiliaries.

The proposed change has been evaluated relative to each of the eight (8) evaluation questions in 10CFR50.59. Considering the probability and consequences of the various hardware failures and software failures of the proposed changes, the evaluation concluded that this change can be implemented without prior NRC approval.

**Title: EC 112284 Revision 002 - 230KV Yellow Bus Differential Upgrade - PCB 18 Partial Turnover 50.59 REV, PCB CT Test Data, Drawings (AR 02052674)**

**Summary:**

As requested by the North American Electric Reliability Corporation (NERC), Oconee Nuclear Station (ONS) has performed upgrades to the Differential Protective Relaying for the Yellow Bus in the ONS 230 kV switchyard. The Yellow Bus is considered safety related because it provides an emergency power path from the Keowee Hydro Station to the ONS emergency busses. A new train of Differential Protective Relaying has been added that consists of Differential Protective Relays, lockout relays, auxiliary relays, a test block, and trip indicating relays. As a part of this modification, the lockout relay in the existing Differential Protective Relay train was replaced with a qualified, equivalent lockout relay. The new Differential Protective Relay train uses the same lockout relay. The addition of a second Differential Protective Relay train was requested by the NERC to improve the reliability of the ONS switchyard. With a single Differential Protective Relay train, a phase to ground fault with the failure of the single train of Differential Protective Relaying would result in the de-energization of the ONS 230 kV switchyard and loss of generation from the ONS, Jocassee Hydro Station, and Keowee Hydro Station to the grid through the ONS switchyard. The addition of a second train of Differential Protective Relaying would ensure that with an assumed ground fault and a failure of one train of Differential Protective Relaying, the remaining Differential Protective Relaying train would isolate the Yellow Bus and not result in a loss of area generation. Isolation of the Yellow Bus would block the emergency power path from Keowee to the ONS emergency busses. A separate underground path from Keowee to the Oconee emergency busses would still be available. Inoperability of the Keowee overhead power path is addressed by the current ONS Technical Specifications. EC 112284 implements additional Yellow Bus protection. Neither valid actuation nor inadvertent actuation of the Differential Protective Relaying trains result in a station blackout or other analyzed event. An inadvertent trip of either train of Differential Protective Relaying would cause a loss of the overhead Keowee path. However, the additional Differential Protective Relaying train does not result in more than a minimal increase in the likelihood of occurrence of a malfunction of an SSC important to safety. Consequences of accidents previously described in the UFSAR are not increased, nor will the addition of a second Differential Protective Relaying train increase accident dose consequences through a malfunction of an SSC important to safety previously evaluated in the UFSAR. These activities do not create the possibility for an accident of a different type than any previously evaluated in the UFSAR, nor do they create a possibility for a malfunction of an SSC important to safety with a different result than any previously evaluated in the UFSAR. No design basis for a fission product barrier as described in the UFSAR is being exceeded or altered, and these activities do not result in a departure from a method of evaluation described in the UFSAR used in establishing the design bases or in the safety analyses.

**Title: EC 107911, Make 1, 2, 3CS-204 and 1, 2, 3CS-205 Credited as Auxiliary Building Flood Time Critical Valves and add CS, DW, and FW Systems to UFSAR Section 3.4.1.1.1 (AR 02055967)**

**Summary:**

Design improvements are implemented to the Coolant Storage (CS) System by crediting the seismic Bleed Holdup Tank (BHUT) Outlet valves (1, 2, 3CS-204 and 1, 2, 3CS-205) that were upgraded to seismic by previous ECs to form the class break from Duke Class D to Class E piping. This upgrade of the BHUT outlet valves now allow these valves to be credited to isolate a BHUT following a postulated seismic event and pipe break in the non-seismic portion of the CS piping. The previous ECs replaced the non-seismic valves with seismically qualified valves but did not credit the valves for mitigating an Auxiliary Building (AB) flood event. Engineering Change (EC) 107911 performs no physical work in the plant but credits the BHUT block valves as isolatable by operator action following a seismic event. Selected Licensee Commitment (SLC) 16.9.11a is revised to add the BHUT block valves as manual valves used in the AB flood Abnormal Procedure (AP); to add a requirement to keep FW-15 closed consistent with the FW Operating Procedure and the engineering calculation (OSC-8671); to add limitations on the Unit 1/Unit 2 RCW tank consistent with assumptions in calculation OSC-8671; and to replace the "operability" terminology with "functionality" terminology. UFSAR Section 3.4.1.1.1 will also be revised to add the CS system as a non-seismic system that credits operator action to mitigate a seismic-induced AB flood. Review of UFSAR Section 3.4.1.1.1, the AB flood AP, and the engineering calculation (OSC-8671) that had assessed the potential for non-seismic systems in the AB to disable safety related systems needed for safe shutdown, identified two additional systems that should have been listed in UFSAR Section 3.4.1.1.1 as potential AB flood systems. These two systems were the Demineralized Water (DW) System and the Filtered Water (FW) System. Both systems were already identified in SLC 16.9.11a so only UFSAR Section 3.4.1.1.1 required this additional update. The addition of the CS, DW, and FW Systems to UFSAR Section 3.4.1.1.1 as additional AB flood sources proposed by EC 107911 necessitated that a 10 CFR 50.59 Evaluation be performed.

In performing the 10 CFR 50.59 Evaluation, the determination was made that the EC 107911 addition of the CS System to UFSAR Section 3.4.1.1.1 and SLC 16.9.11a and the further addition of DW and FW to UFSAR Section 3.4.1.1.1 does not result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the UFSAR, since, concerning the UFSAR-described seismic event, UFSAR Section 3.4.1.1.1 assumes a single seismic-induced break in a non-seismic pipe. The addition of the CS, DW, and FW Systems to the UFSAR Section 3.4.1.1.1 description of AB flooding does not increase the risk of such an event since a single break in a non-seismic pipe is assumed. UFSAR Section 3.4.1.1.1 and the engineering calculation (OSC-8671) that had assessed the potential for non-seismic systems in the AB to disable safety related systems needed for safe shutdown, credit operator action to mitigate an AB flood event for breaks in non-seismic systems that are not normally isolated or don't have a limited volume. It was concluded that the addition of the CS, DW, and FW Systems to UFSAR Section 3.4.1.1.1 AB flood discussion do not result in more than a minimal increase in the likelihood of occurrence of a malfunction of an SSC important to safety previously evaluated in the UFSAR. Implementation of EC 107911 does not introduce SSC failures which could increase dose consequences described in the UFSAR, and does not result in more than a minimal increase in the consequences of a malfunction of an SSC important to safety previously evaluated in the UFSAR.

With the addition of the CS System to UFSAR Section 3.4.1.1.1 by EC 107911 and the further addition of the DW and FW Systems, these activities do not introduce accident initiation mechanisms for accidents of a different type than any previously evaluated in the UFSAR, and ensure that the possibility for a malfunction of an SSC important to safety with a different result than any previously evaluated in the UFSAR is not created.

ONS 2017-048  
Document Control Desk  
June 30, 2017

Although fuel cladding, RCS design pressure, and containment design pressure are identified as design basis limits for a fission product barrier (DBLFPBs), the fuel cladding, RCS design pressure, and the containment design pressure will NOT be exceeded or altered as a result of implementation EC 107911.

EC 107911 calculations do not revise or replace an evaluation methodology described in the UFSAR that is used in establishing the design basis or is used in the safety analyses.