

UNITED STATES NUCLEAR REGULATORY COMMISSION REGION II 245 PEACHTREE CENTER AVENUE NE, SUITE 1200 ATLANTA, GEORGIA 30303-1257

November 30, 2011

Mr. T. Preston Gillespie, Jr. Site Vice President Duke Energy Carolinas, LLC Oconee Nuclear Station 7800 Rochester Highway Seneca, SC 29672

SUBJECT: OCONEE NUCLEAR STATION UNIT 2 – NRC POST-APPROVAL SITE INSPECTION FOR LICENSE RENEWAL, INSPECTION REPORT 05000270/2011015

Dear Mr. Gillespie:

On November 04, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed a Post-Approval Site Inspection for License Renewal at your Oconee Nuclear Station, Unit 2. The enclosed report documents the inspection results, which were discussed on November 04, 2011, with members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel. Based on the results of this inspection, no findings were identified.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of

NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <u>http://www.nrc.gov/reading-rm/adams.html</u> (the Public Electronic Reading Room).

Sincerely,

/**RA**/

Steven J. Vias, Chief Engineering Branch 3 Division of Reactor Safety

Docket Nos. 50-270 License Nos. DPR-47

Enclosure: NRC Inspection Report 05000270/2011015 w/Attachment: Supplemental Information

cc w/encl: (See page 3)

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Distribution w/encl: C. Evans, RII EICS (Part 72 Only) L. Douglas, RII EICS (Linda Douglas) OE Mail (email address if applicable) RIDSNRRDIRS PUBLIC RidsNrrPMOconee Resource

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SIGNATURE	/RA/	/RA/	/RA/	/RA/		
NAME	L. LAKE	M. COURSEY	S. VIAS	J. BARTLEY		
DATE	11/ 29 /2011	11/ 15 /2011	11/ 30/2011	11/ 29 /2011		
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OFFICIAL RECORD COPYDOCUMENT NAME: S:\DRS\Eng Branch 3\INSPECTIONS\Working Documents\INPUTS\Inputs 2011\Oconee U2 Phase I 2011015 LRI LFL MSC.docx

cc w/encl: Division of Radiological Health TN Dept. of Environment & Conservation 401 Church Street Nashville, TN 37243-1532

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos:	50-270
License Nos:	DPR-47
Report No:	05000270/2011015
Licensee:	Duke Energy Carolinas, LLC
Facility:	Oconee Nuclear Station, Unit 2
Location:	Seneca, SC 29672
Dates:	October 31 – November 04, 2011
Inspectors:	Louis Lake, Senior Reactor Inspector (Lead Inspector) Michael Coursey, Reactor Inspector
Approved by:	Steven J. Vias, Chief Engineering Branch 3 Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000270/2011015; October 31 – November 04, 2011; Oconee Nuclear Station Unit 2; Post Approval Site Inspection for License Renewal.

The report covers an inspection conducted by regional inspectors in accordance with NRC Manual Chapter 2516 and NRC Inspection Procedure 71003, Post-Approval Site Inspection for License Renewal.

Based on the sample selected for review, the inspectors determined that commitments, license conditions, and regulatory requirements associated with the renewed facility operating license were either being met or, where commitment actions had not been completed, the licensee had administrative controls in place to ensure completion before the period of extended operation.

The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

REPORT DETAILS

4. OTHER ACTIVITIES

40A5 Other Activities

.1 Post-Approval Site Inspection for License Renewal – IP 71003 (Phase 1)

a. Inspection Scope

(1) Implementation of License Conditions and Commitments, including Aging Management Programs

The inspectors reviewed a sample of license renewal activities scheduled for the autumn 2011 refueling outage, which was the second to last outage prior to the Period of Extended Operation (PEO). The inspectors conducted this inspection in order to maximize observations of the actual implementation of license conditions, commitments, and Aging Management Programs (AMPs) before the PEO (October 16, 2013). The inspection's objectives were to verify that the licensee completed the necessary actions to: (a) comply with the conditions stipulated in the renewed facility operating license; (b) meet the license renewal commitments described in NUREG-1723, "Safety Evaluation Report (SER) Related to the License Renewal of Oconee Nuclear Station; and (c) meet the future activities, including AMPs, described in the Updated Final Safety Analysis Report (UFSAR) supplement submitted pursuant to 10 CFR 54.21(d). A summary of the license renewal commitments for Oconee Nuclear Station is also available in an NRC Memorandum dated March 6, 2007 (ML070640041).

Inspection of one-time inspection commitments for the Pressurizer were conducted during a NRC inspection performed in April 2011 and presented in Oconee Nuclear Station Unit 1, NRC Post-Approval Site Inspection for License Renewal, Inspection Report 05000269/2011013 dated May 5, 2011 (ML111250604). The report included inspections of those one-time inspections at that time. The inspection report also identified the need for a follow-up inspection to further evaluate and inspect the one-time inspections required to be performed on the Pressurizer Heater Bundles (PHBs) and the cladding surface on the internals of the Pressurizer. See Commitment Item 5 – Pressurizer Examinations for specific details.

Additionally, the inspectors verified that the licensee met the commitments associated with one-time cast iron Selective Leaching Inspections, one-time Pressurizer examinations, one-time Reactor Building Spray System Inspections, and Insulated Cables and Connections AMP. Each of these areas is delineated as a specific license renewal commitment in the NRC Memorandum dated March 6, 2007.

The inspectors also performed a walk-down of the Unit 2 Reactor Building containment area, performed a walk-down of the auxiliary building and reactor building civil engineering structures and components, and observed a licensee inspection of main condenser tubing eddy current testing and a visual observation of the conditions of the 2B2 main condenser inlet water box. Each of these activities is pursuant to the licensee's UFSAR Section 18 under Aging Management Programs and Activities.

The inspection sample for the selected commitment items are described below. Specific documents reviewed are listed in the report attachment.

One-Time Inspection Items for License Renewal

Commitment Item 1 - Conduct a One-Time Cast Iron Selective Leaching Inspection

Commitment Item 1 in the NRC Memorandum dated March 6, 2007, specified that one-time Cast Iron Selective Leaching Inspections would be performed prior to the end of the initial operating license term. NUREG-1723 and the UFSAR supplement for license renewal described the inspections to be performed in accordance with this commitment which includes a visual examination and Brinnell Hardness check of the inside surface of cast iron pump casings.

The inspectors reviewed records of the Low Pressure Service Water Pump – C Inspection dated August 25, 2011. There was no indication of unacceptable loss of material in this component due to Selective Leaching. Additionally, the inspectors noted that the balance of committed inspections, as documented in the UFSAR and NUREG-1723, had been scheduled for the Auxiliary Service Water System, Chilled Water System, High Pressure Service Water System, Service Water System (Keowee), and Condensate System.

Commitment Item 5 – Pressurizer Examinations

Commitment Item 5 in the NRC Memorandum dated March 6, 2007, specified that Pressurizer examinations would be performed prior to the end of the initial operating license term. NUREG-1723 and the UFSAR supplement for license renewal described the planned visual examinations of the internal cladding, spray line, spray head, and heater bundle penetration welds.

The examination of the Pressurizer internal cladding, spray line, and spray head would consist of a one-time visual examination (VT-3) in accordance with Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code. This examination was accomplished during the Unit 1 Spring 2011 outage and is detailed in Oconee Nuclear Station Unit 1 – NRC Post-Approval Site Inspection for License Renewal, Inspection Report 05000269/2011013 dated May 5, 2011 (ML111250604)

The licensee had committed to perform the surface examinations on the Alloy 600 PHB penetration welds when the PHBs would be replaced. Based on the availability of material components for this replacement, the licensee plans to replace these PHBs in the spring 2014 outage, which falls within the PEO, and has requested an allowance to suspend the VT-3 inspections based on the timeframe of their replacement. Inspection of a similar model Pressurizer with similar operating conditions and length of operating history (TMI-1 with a Babcock and Wilcox Pressurizer with Alloy 600 cladding and Alloy 82/182 welds) suggests that there would be minimal additional degradation by extending the Pressurizer into the PEO where the Alloy 600 materials will be replaced by the less susceptible austenitic stainless steel. Further, the licensee will continue to perform the VT-2 exam of the exterior of the Pressurizer heater diaphragm plates to check for leakage in this area for the Unit 1 Pressurizer to ensure no leakage is emanating from the Heater Bundle area. The acceptance criterion for this exam is identified as no evidence of borated water leakage. This augmented exam was performed in response to Code Case N-722.

This commitment only applies to the Unit 1 Pressurizer. The Units 2 and 3 Pressurizers are fabricated of austenitic stainless steel. Austenitic stainless steel materials show a higher resistance to primary water stress corrosion cracking. Therefore, Unit 2 and Unit 3 Pressurizers are not within the scope of Commitment Item 5.

Commitment Item 6 - Reactor Building Spray System Inspection

Commitment Item 6 in the NRC Memorandum dated March 6, 2007, specified that Reactor Building Spray System (RBSS) inspections would be performed prior to the end of the initial operating license term. This is to characterize any loss of material from pitting corrosion and cracking due to stress corrosion cracking of the stainless steel components in the RBSS that are periodically exposed to a borated water environment.

As stated in the licensee's UFSAR section 18.2.6 the most susceptible location is between BS-1 and BS-2 and the normally open drain valve BS-15 or BS-20 respectively. The location of these components is inside the reactor building area near penetration 14.

The licensee inspected RBSS piping in the 2B RBSS header inside the reactor building near Penetration 14. There were no indications of wastage or corrosion of this line as shown by radiographic examination. As a result no further periodic inspections are planned by the licensee at this time.

Ongoing License Renewal Commitments and Aging Management Program Items

Commitment Item 12 – Implement Insulated Cables and Connections Aging Management Program

Commitment Item 12 in the NRC Memorandum dated March 6, 2007, specified that the licensee implement an Insulated Cables and Connections AMP. The goal of this AMP, in accordance with the licensee's UFSAR section 18.3.14, is to provide reasonable assurance that the license renewal intended functions of insulated cables and connections will be maintained consistent with the current licensing basis through the PEO.

The inspectors reviewed corrective action program documents related to the inspection and walk-down of insulated cables and connections for the spent fuel pool area, transformer yard, Maintenance Support Building, and Cable Room and cable shaft. None of the documented issues represented a condition adverse to quality.

UFSAR Section 18.3.3, Containment Inservice Inspection Plan

Chapter 18 of the UFSAR supplement specified that the ISI Program for Containment Inspection of concrete containments and containment steel liners implements the requirements in 10 CFR 50.55a and Subsections IWE and IWL of the ASME Code Section XI. The UFSAR supplement also specified that the aging effect for the containment steel liner is loss of material and the aging effects for the concrete are loss of material, cracking, and change in material properties. Additionally, the scope and frequency of examination would be in accordance with 10 CFR 50.55a, and Subsections IWE and IWL. These inspections would provide reasonable assurance that aging effects associated with the containment liner and concrete are detected prior to compromising design basis requirements.

The inspectors conducted a walk-down of all accessible elevations of the Unit 2 containment building with emphasis on passive SSCs such as the containment liner, moisture barriers, piping supports, containment penetrations, concrete structures, and protective coatings.

UFSAR Section 18.3.13, Inspection Program for Civil Engineering Structures and Components

Chapter 18 of the UFSAR supplement specified that the Inspection Program for Civil Engineering Structures and Components is intended to meet the requirements of 10 CFR 50.65 requirements for monitoring the effectiveness of maintenance at nuclear power plants (Maintenance Rule). The licensee conducts these inspections in accordance with EDM - 410 Inspection Program for Civil Engineering Structures and Components, Rev. 14.

The inspectors performed a walk-down of the accessible regions of the exterior of the Auxiliary Building near the main steam relief penetrations and the interior lower level of the reactor building. The walk-down focused on identifying and monitoring mechanical components, civil structures and components and their condition for degradation of caulking, sealants and waterstops; and nuclear safety-related structures which enclose, support, or protect nuclear safety-related systems and components and non-safety related structures whose failure may prevent a nuclear safety-related system or component from fulfilling its intended function.

<u>UFSAR Section 18.3.17.11, Preventive Maintenance Activities - Main Condenser</u> <u>Tubing Examination</u>

Chapter 18 of the UFSAR supplement specified that the licensee inspect ten percent of the tubes in one-half of the condenser each refueling outage by eddy current testing. Tubes in each half of the condenser are examined every other refueling outage. Tubing wall loss acceptance criterion is to be maintained less than 60% through wall indications. Tubes with a wall loss greater than 60% through wall will receive an engineering evaluation to justify continued service or are plugged.

The inspectors performed an observation of the data acquisition activities within the 2B2 Waterbox Inlet to the Main Condenser for Unit 2. The inspectors also observed the material condition of the 2B2 waterbox. This observation was done to assess both the general material condition of the waterbox as well as the effectiveness of the licensee's AMP's in this area.

(2) Review of License Renewal Commitment Changes

The inspectors reviewed license renewal commitment change documents to verify the licensee followed the guidance in Nuclear Energy Institute (NEI) 99-04, "Guidelines for Managing NRC Commitment Changes," for any change to Commitment Items 1, 5, 6, and 12. The inspectors verified that the licensee properly evaluated, reported, and approved, where necessary, changes to license renewal commitments listed in the UFSAR in accordance with 10 CFR 50.59. Specifically, the inspectors reviewed the 50.59 screening for suspending the requirement for the VT-3 inspection of the Alloy 600 penetration welds of the PHB.

As mentioned above, the licensee had committed to performing these examinations prior to the PEO when the PHBs were to be replaced. However, due to a lack of component availability, the PHB is scheduled to be replaced during the Unit 1 spring outage in 2014. This puts the replacement within the PEO that will begin February 6, 2013.

The inspectors did not identify any examples where commitment changes were not consistent with the guidance in NEI 99-04. The review of remaining license renewal commitment changes is scheduled to be completed during the Phase 2 implementation of inspection procedure 71003, scheduled to be performed in 2013.

The inspectors also reviewed changes to the licensee's UFSAR for incorporation of ASME Code Case N-729-1 into their ISI Program and Changes to Alloy 600 Aging Management Program.

(3) Review of Newly Identified SSCs

This inspection requirement is scheduled to be completed during the Phase 2 implementation of inspection procedure 71003.

(4) <u>Review of the Description of AMPs and Time-Limited Aging Analyses (TLAAs) in the</u> <u>UFSAR Supplement</u>

The review of the description of AMPs and TLAAs in the UFSAR supplement submitted pursuant 10 CFR 54.21(d) is scheduled to be completed during the Phase 2 implementation of inspection procedure 71003.

b. Findings and Observations

No findings were identified.

The following observations were made:

The License Renewal Inspection effort was supported by a Fleet Lead and Contractors knowledgeable about the license renewal process. These team members are currently doing nearly all of the work for license renewal implementation. However, the station is currently in the process of turning over the license renewal program to a station License Renewal Program Coordinator (LRC). The LRC is currently reviewing Design Change Packages (DCPs) for license renewal requirements. The current procedures do not provide the necessary information required to perform these DCP reviews. Currently,

the LRC is required to perform this function, but the staff member holding this position does not have sufficient knowledge of license renewal to perform these responsibilities.

4OA6 Management Meetings

.2 Exit Meeting Summary

On November 04, 2011, the inspectors presented the inspection results to members of the licensee management staff. The licensee acknowledged the inspection results. The inspectors confirmed that all proprietary information reviewed during the inspection was returned to the licensee and that none of the potential report input discussed was considered proprietary.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

A. Ginn, Engineering

D. Peltola, Principal Engineer

E. Swanson, Supervisor Oconee Major Projects - License Renewal

J. Smith, Licensing

L. Hekking, License Renewal Fleet Program Owner

T. Brown, Programs Engineering Supervisor

<u>NRC</u>

A. Sabisch, Senior Resident Inspector

LIST OF REPORT ITEMS

None

LIST OF DOCUMENTS REVIEWED

Procedures

EDM - 410: Inspection Program for Civil Engineering Structures and Components, Rev. 14

- Oconee Nuclear Station License Renewal Technical Information New Programs and Activities Section 4.3.7
- EDM 229, Rev. 4, Engineering Oversight of License Renewal Aging Management Programs and Activities

EDM – 601, Rev. 14, Engineering Change Manual

NSD 703, Rev. 20, Administrative Instructions for Technical Procedures

NSD 214, Rev. 9, Regulatory Commitment Management Program

NSD 220, Rev. 12, UFSAR Revision Process

OSS-0274.00-00-0017, Rev. 1, Oconee Commitment Management Specification for License Renewal Aging Management Programs

OSS-0274.00-00-0016, Rev. 1, Oconee License Renewal Commitments

Design/Engineering Changes

EC 0000103110, Dated 10/20/2011, Replace 1" Class B Vent 2HP-149

- EC 0000102933, Dated 7/12/2011, Unit 2 West Penetration Room Masonry Wing Wall Seismic Barrier
- EC 0000102464, Dated 10/24/2011, Replace 3' and 4" Class F LPSW Piping (RCPS) and Valves 2LPS-562, 664, 665, 706
- EC 0000102457, Dated 10/03/2011, Replace Unit 3 RBAC Piping and Vent, Drain, and Pressure Control Valves

UFSAR Changes

Package No/PIP 08-105/G-08-1118, Dated 12/16/2008, Incorporation of ASME Code Case N-729-1 into their ISI Program in accordance with 10CFR50a(g)(6)(ii)(D)(1).

Package No/PIP 10-007/O-88-6106, Dated 8/3/2010, Changes to Alloy 600 Aging Management Program Corrective Action Documents

- A/R 00308431 10 CFR 50.59 Evaluation License Amendment Request for UFSAR change to allow an extension on portion of Pressurizer VT-2 examinations.
- A/R 00308430 10 CFR 50.59 Evaluation License Amendment Request for UFSAR change to allow elimination of Pressurizer Heater Bundle Penetration Welds' surface and VT-3 examinations.
- PIP O-11-05863 License Renewal Inspection Report 05000269/2011013 contains wording at variance with Oconee Nuclear Station's future inspection plans 05/12/2011
- PIP O-08-05500 Establish inspections plan for one Pressurizer to meet the requirements of license renewal commitment dated 09/09/2008
- PIP O-08-06108 License Renewal Commitment Insulated Cable Aging Management Program
- PIP O-08-06111 License Renewal Commitment Reactor Building Spray System Inspection
- PIP O-11-12145 Cable Walk Downs for Cable Aging Management
- PIP O-11-11491 Cable Walk Downs in Units 1, 2, and 3 spent fuel pools.
- PIP O-11-11663 Cable walk downs in support of cable aging management
- PIP O-11-11935 Cable walk downs in support of cable aging management
- PIP O-11-12023 (License renewal) Identification of license renewal work
- PIP O-11-11233 (License renewal) Missed or inadequate license renewal inspections
- PIP O-10-04651 A central focused project organization for ONS LRI does not exist
- PIP G-11-01621 EDM-601 Appendix K requires additional guidance
- PIP G-09-01119 Documentation of Informal License Renewal Benchmark at H. B. Robinson Nuclear Plant
- PIP O-08-01395 Documentation of Containment Integrity Assessment results from PIP G-06-00465
- *PIP O-11-13258 U2 EDM-410 Civil/Structural inspection of outage accessible areas 11/03/2011
- *PIP O-11-13154 OEDB 55553 (OE31490 "Bulges" in RB liner require further evaluation Crystal River 3)). 11/02/2011
- *PIP 0-11-13260 NRC Comments on AR 308430 11/03/2011
- *PIP O-11-13196 Documentation of results from License Renewal Phase 1 IP-71003 Inspection containment walk down 11/02/2011

*Indicates this PIP was generated as a result of the License Renewal Inspection efforts.

Other Documents

Selective Leaching Inspections at the Oconee Nuclear Station: Low Pressure Service Water Pump – C dated August 25, 2011

Safety Evaluation Report - Oconee Nuclear Station License Renewal Application Comments and Responses to Open Items and Confirmatory Items Docket Nos. 50-269, -270, -287 Oconee Nuclear Station UFSAR Chapter 18

NUREG-1723, Aging Management Programs for the Pressurizer

NRC Memorandum dated March 6, 2007 (ML070640041)

Work Order 01896937 Prep/Inspect Pressurizer Heater Bundles

Work Order 01974714 Prep/Inspect Pressurizer Heater Bundles

QA Condition 1 Coatings Inspection Form (CIF-1/Rev. 5) dated 4/27/2010

Oconee Nuclear Station Unit 1- NRC Post-Approval Site Inspection for License Renewal, Inspection Report 05000269/2011013 dated May 5, 2011

Balance of Plant Eddy Current Inspection Report for MC 2C1S dated 11/01/2011

Balance of Plant Eddy Current Inspection Report for MC 2C1N dated 11/01/2011