



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

August 28, 2018

Mr. J. Ed Burchfield, Jr.  
Site Vice President  
Duke Energy Corporation  
Oconee Nuclear Station  
7800 Rochester Highway  
Seneca, SC 29672

**SUBJECT: OCONEE NUCLEAR STATION – NUCLEAR REGULATORY COMMISSION  
TEAM INSPECTION REPORT 05000269/2018012, 050000270/2018012, AND  
05000287/2018012**

Dear Mr. Burchfield:

On July 26, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Oconee Nuclear Station Units 1, 2, and 3. The NRC inspectors discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

The inspection examined activities conducted under your license as they relate to the implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders (EA-12-049 and EA-12-051) and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans, your compliance with the Commission's rules and regulations, and with the conditions of your operating license. Within these areas, the inspection involved examination of selected procedures and records, observation of activities, and interviews with station personnel.

The NRC inspectors did not identify any finding or violation of more than minor significance. This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

E. Burchfield

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If you have any questions, please contact me at 404-997-4513.

Sincerely,

*/RA/*

Shane Sandal, Chief  
Reactor Projects Branch 6  
Division of Reactor Projects

Docket Nos.: 50-269, 50-270, 50-287  
License Nos.: DPR-38, DPR-47, DPR-55

Enclosure:  
IR 05000269/2018012, 05000270/2018012,  
and 05000287/2018012

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TEAM INSPECTION REPORT 05000269/2018012, 050000270/2018012, AND  
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**ADAMS Accession No. ML18240A355**

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DATE	8/27/2018	8/23/2018	8/22/2018	8/22/2018	8/27/2018	8/27/2018

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**U.S. NUCLEAR REGULATORY COMMISSION**  
**Inspection Report**

Docket Numbers: 50-269, 50-270, 50-287

License Numbers: DPR-38, DPR-47, DPR-55

Report Numbers: 05000269/2018012, 05000270/2018012, 05000287/2018012

Enterprise Identifier: I-2018-012-0011

Licensee: Duke Energy Carolinas, LLC

Facility: Oconee Nuclear Station, Units 1, 2, and 3

Location: Seneca, SC

Inspection Dates: July 23 - 26, 2018

Inspectors: R. Rodriguez, Senior Project Engineer (Team Leader)  
S. Freeman, Senior Reactor Analyst  
A. Ruh, Resident Inspector  
S. Seaton, Project Engineer

Approved By: S. Sandal, Chief  
Reactor Projects Branch 6  
Division of Reactor Projects

Enclosure

## SUMMARY

The NRC continued monitoring licensee's performance by conducting Temporary Instruction (TI) 2515/191, "Implementation of Mitigation Strategies and Spent Fuel Pool (SFP) Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans," inspection (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18191B074) at Oconee Nuclear Station, Units 1, 2, and 3, in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information.

### List of Findings and Violations

No findings or violations of more than minor significance were identified.

### Additional Tracking Items

Type	Issue number	Title	Report Section	Status
TI	TI 2515/191	Inspection of the Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans	Other Activities	Closed

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## INSPECTION SCOPE

Inspections were conducted using the appropriate portions of Temporary Instruction (TI) procedure 2515/191, "Implementation of Mitigation Strategies and Spent Fuel Pool (SFP) Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans," (ADAMS Accession No. ML18191B074). Documents reviewed by inspectors are listed in the documents reviewed section of this report. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

## OTHER ACTIVITIES – TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL

### TI 2515/191 - Inspection of the Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans

Inspectors verified plans for complying with NRC Orders EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12056A045) and EA-12-051, "Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," (ML12054A679) were in place and were being implemented by the licensee. Additionally, the inspection verified implementation of staffing and communications information provided in response to the March 12, 2012, request for information letter (ML12053A340) and dose assessment information provided per COMSECY-13-0010, "Schedule and Plans for Tier 2 Order on Emergency Preparedness for Japan Lessons Learned," dated March 27, 2013 (ML12339A262).

- (1) Based on samples selected for review, the inspectors verified that the licensee satisfactorily implemented appropriate elements of the Diverse and Flexible Coping Strategies (FLEX) as described in the plant-specific submittals and the associated safety evaluation (ML17202U791) and determined that the licensee is in compliance with NRC Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" (ML12056A045). The inspectors verified the licensee satisfactorily:
  - a) developed and issued FLEX Support Guidelines (FSGs) to implement the FLEX strategies for postulated external events;
  - b) integrated their FSGs into their existing plant procedures such that entry into and departure from the FSGs were clear when using existing plant procedures;
  - c) protected FLEX equipment from site-specific hazards;
  - d) developed and implemented adequate testing and maintenance of FLEX equipment to ensure their availability and capability;
  - e) trained their staff to ensure personnel proficiency in the mitigation of beyond-design basis events; and

- f) developed the means to ensure the necessary off-site FLEX equipment would be available from off-site locations.
- (2) Based on samples selected for review, the inspectors verified that the licensee satisfactorily implemented appropriate elements of the FLEX strategy as described in the plant specific submittals and the associated safety evaluation (ML17202U791) and determined that the licensee was in compliance with NRC Order EA-12-051, "Order Modifying Licenses With Regard to Reliable Spent Fuel Pool Instrumentation" (ML12054A679). The inspectors verified that the licensee satisfactorily:
- a) installed the spent fuel pool (SFP) instrumentation sensors, cabling and power supplies to provide physical and electrical separation as described in the plant specific submittals and safety evaluation;
  - b) installed the SFP instrumentation display in the location, environmental conditions and accessibility as described in the plant specific submittals;
  - c) trained their staff to assure personnel proficiency with the maintenance, testing, and use of the SFP instrumentation; and
  - d) developed and issued procedures for maintenance, testing and use of the reliable SFP instrumentation.
- (3) The inspectors reviewed information provided in the licensee's dose submittal and in response to the NRC's March 12, 2012, request for information letter (ML12053A340), and verified that the licensee satisfactorily implemented enhancements pertaining to Near-Term Task Force (NTTF) Recommendation 9.3 response to a large-scale natural emergency event that results in an extended loss of all alternating current (ac) power (ELAP) to all site units and impedes access to the site. The inspectors verified the following:
- a) the licensee satisfactorily implemented required staffing changes to support a ELAP scenario;
  - b) emergency preparedness (EP) communications equipment and facilities are sufficient for dealing with a ELAP scenario; and
  - c) the licensee implemented dose assessment capabilities (including releases from SFPs) using the licensee's site-specific dose assessment software and approach.

The inspectors verified that noncompliances with requirements, and standards identified during the inspection were entered into the licensee's corrective action program as appropriate.

## **INSPECTION RESULTS**

No findings were identified.



## **EXIT MEETINGS AND DEBRIEFS**

No proprietary information was retained by the inspectors or documented in this report.

On July 26, 2018, the inspectors presented the inspection results to Mr. E. Burchfield, Site Vice President, and other members of the licensee's staff.

## DOCUMENTS REVIEWED

### Condition Reports Initiated as a Result of the Inspection

02220256, Fuel Gauge on FLEX pump 0EDM-PU-0006 Faulty  
02220506, FLEX BUILDING NRC TI-2515/191 INSPECTION  
02220517, NRC TI-191 Inspection: Low hydraulic fluid identified  
02220531, NRC TI-191 Inspection: Degraded gaskets on FLEX pumps  
02220559, NRC TI-191 Inspection: B5b boat ramp overgrowth  
02220618, NRC TI-191 Inspection Suction Strainer not secured to pump  
02220963, NRC TI-191 Inspection-Cracked grout under 3SF-PY0011 support  
02220976, Unit 3 Wide Range SFP Level Channel A Waveguide Piping  
02221141, NRC TI-191 FLEX Inspection - Shallow Concrete Anchors Found

### Procedures

AM/0/A/3009/012 A, Emergency Plan For Refilling Spent Fuel Pools, Revision 12  
AP/0/A/1700/025, Standby Shutdown Facility Emergency Operating Procedure, Revision 63  
EP/1/A/1800/001 0B, EOP Unit 1 Blackout, Revision 4  
EP/1/A/1800/001 0O, Unit 1 EOP Enclosures 5.21-5.30, Revision 1  
FG/0/A/1900/003, Alternative Low Pressure Emergency Feedwater, Revision 3  
FG/0/A/1900/005, Initial Assessment and FLEX Equipment Strategy, Revision 4  
FG/0/A/1900/011, Alternative Spent Fuel Pool Cooling, Revision 1  
FG/0/A/1900/023, Phase 3 – NSRC Equipment and Long Term Considerations, Revision 1  
FG/1/A/1900/004, Extended Loss of AC Power DC Load Management, Revision 0  
FG/1/A/1900/015, Containment Isolation and Closure, Revision 0  
FG/1/A/1900/020, FLEX Electrical Distribution, Revision 1  
FG/2/A/1900/014, Unit 2 Shutdown RCS Makeup, Revision 1  
FG/3/A/1900/020, FLEX Electrical Distribution, Revision 3

### Drawings

9239760D, Oconee Nuclear Station Unit 3 Flex Repower Primary Strategy One-Line Diagram, Revision 1  
9239761D, Oconee Nuclear Station Unit 3 Flex Repower Alternate Strategy One-Line Diagram, Revision 2  
OM-201.3512.001, Oconee Nuclear Station Auxiliary Building – Unit 3 FLEX SFPLI Electrical Equipment Floor Mounting Details, Revision 1  
OM-201.3513.001, Oconee Nuclear Station Vega Waveguide Standard Support Details, Revision 1  
OM-201.3514.001, Qualifications for a Waveguide Type “B” Horn Support and Horn End Assembly for AREVA Spent Fuel Pool Level Monitoring Instrumentation  
OM-201.3515.001, Qualifications for a Waveguide Type “A” Horn Support and Horn End Assembly for AREVA Spent Fuel Pool Level Monitoring Instrumentation  
OM-201-3508.001, Oconee Nuclear Station Unit 3 Southwest SFP Vega Waveguide Support Isometric [Primary / CH A], Revision 1  
OM-201-3517.001, ONS FLEX SFPLI – Power Control Panel and Digital Display Mounting and Anchorage Design for Units 1, 2 & 3, Revision 1  
OM-201.3518.001, ONS SFPLI – Vega Waveguide Span Criteria, Standard Pipe Support Design and Anchorage Verification for VEGA Waveguide Supports, Revision 1

Design Changes

EC 112453, FLEX Phase 2 Portable Equipment and Supplies Storage Building, Revision 3  
EC 105805, Unit 1&2 Spent Fuel Pool Instrumentation, Revision 11  
EC 105806, Unit 3 Spent Fuel Pool Instrumentation, Revision 13

Calculations

OSC-11347, ONS Permanent FLEX Storage Building Structural Analysis, Revision 1  
OSC-11349, Flex Spent Fuel Pool Makeup, Revision 1  
OSC-11232, Flow Model for Portable Pump Feeding Steam Generators Through SSF ASW Piping from CTP #1 or Intake Canal, Revision 0  
OSC-10937, Extended Loss of AC Power FLEX RELAP5 Analysis, Revision 3  
OSC-11383, Attachment 4, Fukushima Diesel Fuel Oil Analysis, Revision 0  
OSC-11670.05, Seismic Evaluation of FLEX Deployment Paths, Revision 0  
OSS-0176.00-00-0005, Design Basis Specification for the Permanent FLEX Storage Building (PFSB), Revision 0

Condition Reports

02169528	02154953	02130598
02202996	02220055	02169897
02169897	02220506	02171976
02187259	02065552	02191847
02134612	02098793	02216719

Other

OMP 1-18, Implementation Standard During Abnormal And Emergency Events, Revision 41  
CSD-EG-ONS-1619.1000, Diverse and Flexible Coping Strategies Program Document – Oconee Nuclear Station, Revision 4  
CSD-EG-ONS-1619.1004, NEI FLEX Time Validation for Oconee Nuclear Station, Revision 1  
CSD-EG-ONS-1619.1005, FLEX Electrical Repower Strategies – Deployment, Cable Routing, and Strategy Information, Revision 0  
CSD-EG-ONS-1619.1007, Select Fukushima Related Technical Evaluations, Analyses, and Position Papers for Compliance with NRC Order EA-12-049 and NRC Order EA-12-051 (OSC-11383), Revision 0  
OM-201-3543.001, FLEX Diesel Generator Vender Manual  
OSS-0176.00-00-0005, Design Basis Specification for the Permanent FLEX Storage Building (PFSB), Revision 1  
OP-OC-EAP-FG, Flex Guides, Revision 2  
OM 261.0051.001, FLEX Hale FP3000DJ-TC Pump and Engine Manual, Revision 0  
ASTM D975-15b, Standard Specification for Diesel Fuel Oils  
ONS SSF Diesel Fuel Oil Cloud Point sample results between October 5, 2011 and April 11, 2017  
TT&R LP Terminal Report Cloud Point results between July 16, 2017 and July 28, 2018  
OSS-0020.00-00-0006, Specification for the Design, Installation, and Inspection of Hilti Concrete Anchors, Revision 6  
Duke Energy Carolinas, LLC, Capability to Perform Multi-Unit Dose Assessment Capability, June 26, 2013  
AD-EP-ALL-0105, Activation And Operation Of The Technical Support Center, Revision 1  
AD-EP-ALL-0202, Emergency Response Offsite Dose Assessment, Revision 6

CSD-EG-ONS-1619.1001, SAFER Response Plan for Oconee Nuclear Station, Revision 1  
CSD-EG-ONS-1619.1007, Select Fukushima Related Technical Evaluations, Analyses, and  
Position Papers for Compliance with NRC Order EA-12-049 and NRC Order EA-12-051  
(OSC-11383) Revision 0

PT/0/A/2000/002, Periodic Test of Emergency Response Communications Equipment, Revision  
005 – Monthly Test completed 7/7/18

PT/0/A/2000/002, Periodic Test of Emergency Response Communications Equipment, Revision  
005 – Quarterly Test completed 4/2/18