



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II

245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

August 30, 2016

Mr. Steven D. Capps
Site Vice President
Duke Energy Carolinas, LLC
McGuire Nuclear Station
MG01VP/12700 Hagers Ferry Road
Huntersville, NC 28078

**SUBJECT: MCGUIRE NUCLEAR STATION - NRC TEAM INSPECTION REPORT
05000369/2016009 AND 05000370/2016009**

Dear Mr. Capps:

On July 28, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your McGuire Nuclear Station Units 1 and 2. The enclosed report documents the inspection results, which were discussed on July 28, 2016, with you and other members of your staff. A re-exit was conducted with Mr. G. Murphy via telephone on August 19, 2016, to discuss the final results of the inspection.

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.

No NRC-identified or self-revealing findings were identified during this inspection.

S. Capps

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Sincerely,

/RA/

Anthony D. Masters, Chief
Reactor Projects Branch 7
Division of Reactor Projects

Docket No.: 50-369, 50-370
License No.: NPF-9, NPF-17

Enclosure:
IR 05000369/2016009, 05000370/2016009
w/Attachment: Supplemental Information

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S. Capps

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R. Glover

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Letter to Steven D. Capps from Anthony D. Masters dated August 30, 2016

SUBJECT: MCGUIRE NUCLEAR STATION - NRC TEAM INSPECTION REPORT
05000369/2016009 AND 05000370/2016009

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 50-369, 50-370

License No.: NPF-9, NPF-17

Report No.: 05000369/2016001, 05000370/2016001

Licensee: Duke Energy Carolinas, LLC

Facility: McGuire Nuclear Station, Units 1 and 2

Location: Huntersville, NC 28078

Dates: July 25 – 28, 2016

Inspectors: J. Hanna, Senior Reactor Analyst (Team Leader)
R. Rodriguez, Senior Project Engineer
A. Hutto, Senior Resident Inspector
R. Alexander, RIV Senior Project Engineer

Approved by: Anthony D. Masters, Chief
Reactor Projects Branch 7
Division of Reactor Projects

Enclosure

SUMMARY

IR 05000369/2016009 and 05000370/2016009; 7/25/2016 – 7/28/2016; McGuire Nuclear Station, Units 1 and 2; Temporary Instruction 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 issued December 23, 2015.

The inspection covered a one week inspection by one senior reactor analyst, one senior resident inspector and two senior project engineers. No NRC-identified or self-revealing findings were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5.

A. NRC-Identified and Self-Revealing Findings

None

B. Licensee-Identified Violations

None

REPORT DETAILS

4. Other Activities

4OA5 Other Activities (TI 2515/191)

The objective of Temporary Instruction (TI) 2015/191 “Inspection of the Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans” is to verify that licensees have adequately implemented the mitigation strategies as described in the licensee’s Final Integrated Plan (ADAMS ML15343A010) and the NRC’s plant safety evaluation (ADAMS Accession No. ML16104A078) and to verify that the licensees installed reliable water-level measurement instrumentation in their spent fuel pools. The purpose of this TI is also to verify the licensees have implemented Emergency Preparedness (EP) enhancements as described in their site-specific submittals and NRC safety assessments, including multi-unit dose assessment capability and enhancements to ensure that staffing is sufficient and communications can be maintained during such an event.

The inspection verifies that 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 (ADAMS Accession No. ML12229A174) and EA-12-051, Order Modifying Licenses With Regard to Reliable Spent Fuel Pool Instrumentation (ADAMS Accession No. ML12056A044) are in place and are being implemented by the licensee. Additionally, the inspection verifies implementation of staffing and communications information provided in response to the March 12, 2012 request for information letter and multiunit 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 (ADAMS Accession No. ML12339A262).

The team discussed the plans and strategies with plant staff, reviewed documentation, and where appropriate, performed plant walk downs to verify that the strategies could be implemented as stated in the licensee’s submittals and the NRC staff prepared safety evaluation. For most strategies, this included verification that the strategy was feasible, procedures and/or guidance had been developed, training had been provided to plant staff, and required equipment had been identified and staged. Specific details of the team’s inspection activities are described in the following sections.

1. Mitigation Strategies for Beyond-Design Basis External Events

a. Inspection Scope

The team examined the licensee’s established guidelines and implementing procedures for the beyond-design basis mitigation strategies. The team assessed how the licensee coordinated and documented the interface/transition between existing off-normal and Emergency Operating Procedures with the newly developed mitigation strategies. The team selected a number of mitigation strategies and conducted plant walk downs with licensed operators and responsible plant staff to assess: the adequacy and

completeness of the procedures; familiarity of operators with the procedure objectives and specific guidance; staging and compatibility of equipment; and the practicality of the operator actions prescribed by the procedures, consistent with the postulated scenarios.

The team verified that a preventive maintenance program had been established for the FLEX portable equipment and that periodic equipment inventories were in place and being conducted. Additionally, the team examined the introductory and planned periodic/refresher training provided to the Operations and Security staffs most likely to be tasked with implementation of the FLEX mitigation strategies. The team also reviewed the introductory and planned periodic training provided to the Emergency Response Organization personnel. Documents reviewed are listed in the attachment.

b. Assessment

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 submittal(s) and the associated safety evaluation and determined that the licensee is generally in compliance with NRC Order EA-12-049. The inspectors verified that the licensee satisfactorily:

- developed and issued FLEX Support Guidelines (FSG) to implement the FLEX strategies for postulated external events
- integrated their FSGs into their existing plant procedures such that entry into and departure from the FSGs are clear when using existing plant procedures.
- protected FLEX equipment from site-specific hazards.
- developed and implemented adequate testing and maintenance of FLEX equipment to ensure their availability and capability.
- trained their staff to assure personnel proficiency in the mitigation of beyond-design-basis events.
- developed means to ensure that the necessary off-site FLEX equipment will be available from off-site locations.

The inspectors verified that noncompliances with current licensing requirements, and other issues identified during the inspection were entered into the licensee's corrective action program.

c. Findings

No findings identified.

2. Spent Fuel Pool Instrumentation

a. Inspection Scope

The team examined the licensee's newly installed spent fuel pool instrumentation. Specifically, the inspectors verified the sensors were installed as described in the plant specific submittals and the associated safety evaluation and that the cabling for the

power supplies and the indications for each channel are physically and electrically separated. Additionally, environmental conditions and accessibility of the instruments were evaluated. Documents reviewed are listed in the Attachment.

b. Assessment

Based on samples selected for review, the inspectors determined that the licensee satisfactorily installed and established control of the SFP instrumentation as described in the plant specific submittal(s) and the associated safety evaluation and determined that the licensee is generally in compliance with NRC Order EA-12-051. The inspectors verified that the licensee satisfactorily:

- installed the SFP instrumentation sensors, cabling and power supplies to provide physical and electrical separation as described in the plant specific submittal(s) and safety evaluation.
- installed the SFP instrumentation display in the location, environmental conditions and accessibility as described in the plant specific submittal(s)
- trained their staff to assure personnel proficiency with the maintenance, testing, and use of the SFP instrumentation.

The inspectors verified that noncompliances with current licensing requirements, and other issues identified during the inspection were entered into the licensee's corrective action program.

c. Findings

No findings identified.

3. Staffing and Communication Request for Information

a. Inspection Scope

Through discussions with plant staff, review of documentation and plant walk downs, the team verified that the licensee has implemented required changes to staffing, communications equipment and facilities to support an ELAP scenario as described in the licensee's staffing assessment and the NRC safety assessment. The team also verified that the licensee has implemented dose assessment (including releases from spent fuel pools) capability using the licensee's site-specific dose assessment software and approach as described in the licensee's dose assessment submittal. Documents reviewed are listed in the attachment.

b. Assessment

The inspectors reviewed information provided in the licensee's multi-unit dose submittal and in response to the NRC's March 12, 2012, request for information letter and verified that the licensee satisfactorily implemented enhancements pertaining to Near-Term Task Force Recommendation 9.3 response to a large scale natural emergency event that

results in an extended loss of all ac power to the site and impedes access to the site. The inspectors verified the following:

- Licensee satisfactorily implemented required staffing change(s) to support an ELAP scenario.
- EP communications equipment and facilities are sufficient for dealing with an ELAP scenario.
- Implemented dose assessment capabilities (including releases from spent fuel pools) using the licensee's site-specific dose assessment software and approach.

The inspectors verified that noncompliances with current licensing requirements, and other issues identified during the inspection were entered into the licensee's corrective action program.

c. Findings

No findings identified.

40A6 Exit

Exit Meeting Summary

On July 28, 2016, the inspectors presented the inspection results Mr. S. Capps and other members of the site staff. The inspectors confirmed that proprietary information was not provided or examined during the inspection. A re-exit was conducted with Mr. G. Murphy via telephone on August 19, 2016, to discuss the final results of the inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel:

K. Barrow, Site Services
J. Bradley, Duke Fukushima Response
T. Byrne, Duke Fleet Regulatory Affairs
S. Capps, Site Vice President – McGuire
B. Casey, Power Engineering
D. Davies, Catawba Fukushima Response
P. Guill, Duke Fukushima Response
M. Hunt, Civil Design Engineering
W. Killelte, Operations Training
B. Little, Operations
R. Lytton, Mechanical Design Engineering
G. Murphy, Regulatory Affairs
K. Murray, Emergency Preparedness
B. Meyer, Mechanical Design Engineering
R. Pope, Operations
B. Price, Catawba Fukushima Response
T. Rollins, Operations
J. Thomas, Duke Fukushima Response
M. Weiner, Operations Procedures

NRC personnel:

T. Brown, Project Manager, Orders Management Branch, Japan Lessons Learned Directorate
R. Cureton, Resident Inspector, Branch 1, Division of Reactor Projects
M. Shams, Deputy Director, Japan Lessons Learned Directorate

LIST OF REPORT ITEMS

Opened and Closed

None

Discussed

None

LIST OF DOCUMENTS REVIEWED

Reports:

Duke Energy Carolinas, LLC, Capability to Perform Multi-Unit Dose Assessment Capability, dated June 26, 2013

Duke Energy Carolinas, LLC, Emergency Preparedness Information Requested by NRC Letter, Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident; dated March 12, 2012, dated October 31, 2012

Final Notification of Full Compliance with Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond Design Basis External Events" and with Order EA-12-051, "Order to Modify Licenses With Regard To Reliable Spent Fuel Pool Instrumentation" for McGuire Nuclear Station, dated December 7, 2015

McGuire Nuclear Station, Units 1 and 2 – Safety Evaluation Regarding Implementation of Mitigating Strategies and Reliable Spent Fuel Pool Instrumentation Related to Orders EA-12-049 and EA-12-051 (CAC Nos. MF1160, MF1161, MF1062, and MF1063), dated June 20, 2016

Qualification Report – MC-RP-0119, Initial Response On-Shift Dose Assessment, dated July 27, 2016

Procedures:

AD-EP-ALL-0202, "Emergency Response Offsite Dose Assessment," Revision 1

AP/1/A/5500/19, "Loss of ND or ND System Leakage," Revision 30

EP-1(2)-A-5000-ECA 0.0, "Loss of All AC Power," Revisions 38, 39 and 42

FG/0/A/FLEX/FSG-04, "ELAP DC Bus Management," Revision 1

FG-0-A-FLEX-FSG-05, "Initial Assessment and FLEX Equipment Staging," Revision 1

FG/0/A/FLEX/FSG-07, "Loss of Vital Instrumentation or Control Power," Revision 1

FG/0/A/FLEX/FSG-20, "FLEX Electrical Distribution," Revision 1

FG-0-A-FLEX-FSG-21, "FLEX Raw Water Distribution," Revision 1

FG-1(2)-A-FLEX-FSG-11, "Alternate Spent Fuel Pool Makeup and Cooling," Revisions 1 and 0

FG-1(2)-A-FLEX-FSG-23, "Long Term Flex Strategies," Revisions 1 and 0

IP-0-A-3250-007, "Westinghouse and Weschler Model 252 Electric Indicator Calibration," Revision 8

IP-0-B-3201-003, "Ashcroft Duragauge Pressure Gauge Calibration," Revision 11

IP-1-B-3261-002, "Inspection and Calibration of 1KFLP5350," Revision 0

OP/1/A/6100/SD-7, "Cooldown to 200 Degrees F," Revision 44

OP/0/A/6500/015, "Operator Rounds Configuration Control," Revision 49

OP/0/B/6400/025, "FLEX 600 VAC D/G Operation," Revision 2

OP/0/B/6400/002D, "FLEX Hale Pump (Low Pressure) Operation," Revision 9

OP/0/B/6400/023, "FLEX Hale Pump (Medium Pressure) Operation," Revision 2

OP/0/B/6400/024, "FLEX Hale Pump (High Pressure) Operation," Revision 2

OP/0/B/6400/019, "FLEX Godwin Sump Pump Operation," Revision 8

OP/0/B/6400/021, "FLEX Air Compressor Operation," Revision 3

PT-0-A-4600-113B, "Monthly Surveillance of Emergency Related Response Equipment," Revision 2

PT-0-B-4600-128, "Surveillance of Emergency Equipment for Backup Communications," Revision 2

SSPD-137, "Snow and Ice Removal Plan," dated October 1, 2014
 TT-2-EC109074, "Post Modification Testing for EC109074 – Unit 2 Spent Fuel Pool Primary and Backup Level – FLEX," dated October 4, 2015

Training Documents/Lesson Plans:

FLEX Strategies for IAE [PowerPoint Training Presentation], dated June 1, 2015
 MCM079-N, "Overview of FLEX and MNS FLEX (Fukushima) Modifications [Maintenance Shift Training September 2015, PowerPoint Presentation]," Revision 00
 NANTeL Generic Advanced FLEX Training, dated October 4, 2013
 NANTeL Generic Basic FLEX Training, dated October 17, 2013
 OP-MC-EP-ECA-0, "ECA-0.0 Loss of All AC Power Lesson Plan," Revision 26
 TSC-PSG-COM-203, "TSC Dose Assessor," Revision 4
 TTC1426-N, "FLEX ERO-Specific Training," Revision 3 (November 5, 2015)

Calculations:

MCC-1223.31-00-0012, "Determination of A and B WZ Sump Flood-Out Times," Attachment 1, Revision 1

Other Documents:

MC-1330-01.00, "Condenser Cooling Water Intake Discharge and Low Level Intake Pipes General Layout," Revision 14
 FGB-FSG-05, "Basis Document for FG/0/A/FLEX/FSG-05 (Initial Assessment and FLEX Equipment Staging)," Revision 0
 FGB-FSG-11, "Basis Document for FG/1-2/A/FLEX/FSG-11 (Alternate SFP Makeup and Cooling)," Revision 0
 File 1499.02, "McGuire Nuclear Station FLEX Timing Study," dated May 31, 2016
 McGuire Operations Event Priorities Document, Revision 2 (August 20, 2015)
 Response to NRC Follow-up Letter on Technical Issues for Resolution Regarding Licensee Communication Submittals Associated with Near-Term Task Force Recommendation 9.3, dated January 23, 2013 (TAC No. ME7951), dated February 22, 2013
 WO 20010741, Pre-stage FLEX Equipment During Outage Prior to Mode 5
 NRC Order EA-12-049, "FLEX Final Integrated Plan, McGuire Nuclear Station," Units 1 & 2 Operating Agreement Between Duke Energy's Lincoln Combustion Turbine Facility & McGuire Nuclear Station Nuclear Supply Chain Concerning an Emergency Supply of Diesel Fuel
 TO/1/B/EC109070/001, "Unit 1 FLEX Assured Air Functional Test," Revision 0
 McGuire FLEX PM Templates
 Quarterly PM Inspection/Maintenance Checklist Building #1 2/08/16
 Quarterly PM Inspection/Maintenance Checklist Building #2 3/14/16
 Quarterly PM Inspection/Maintenance Checklist Building #3 1/11/16
 SSPD-134, "Site Services: FLEX Equipment Guidelines," dated 10/09/2014
 SSPD-142, "Site Services: FLEX Equipment Inventory (Building #1, #2, #3, Salisbury)," dated 06/08/2015

Action Requests/Nuclear Condition Reports:

1349117, PMAD-1NVP6530-10Y-SFP Level Backup Channel – M13-8906
1349118, PMAD-1KFLP5350-10Y-SFP Level Primary Channel AS 01901395-06
1701654, Faulty door locks
1703025, McGuire PIP to address any action related to Harris CR#73444
1902335, VI system deficiencies for seismic ruggedness requiring resolution
1902456, Two EC's that clear RN OBDN condition need to be added to 1EOC24
1902764, Review of first implementation of Fukushima FLEX Mode 5
1903029, SLC 16.7.13 test requirements for the wide range SFP level
2035577, Battery Replacement PM not created for SFP primary WR level
2042922, FG/1/A/FLEX/FSG-23 phase rotations
2044519, PMAD - Replace Batteries SFP Primary WR Level
2048857, U1 FLEX Connection Isolation to 1A and 1D S/G