



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

October 30, 2015

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 INTEGRATED INSPECTION REPORT
05000369/2015003 AND 05000370/2015003**

Dear Mr. Capps:

On September 30, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your McGuire Nuclear Station Units 1 and 2. On October 15, 2015, the NRC inspectors discussed the results of this inspection with you and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

NRC inspectors documented one finding of very low safety significance (Green) in this report. The finding did not involve a violation of NRC requirements. Further, inspectors documented a licensee-identified violation which was determined to be of very low safety significance. The NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2.a of the Enforcement Policy. If you contest the violation or significance of the NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC resident inspector at the McGuire Nuclear Station. Also, if you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region II; and the NRC resident inspector at the McGuire Nuclear Station.

S. Capps

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In accordance with Title 10 of the Code of Federal Regulations 2.390, "Public Inspections, Exemptions, Requests for Withholding," 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 Agencywide Document Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Frank Ehrhardt, Chief
Reactor Projects Branch 1
Division of Reactor Projects

Docket Nos.: 50-369, 50-370
License Nos.: NPF-9, NPF-17

Enclosure: NRC Integrated Inspection Report 05000369/2015003
and 05000370/2015003
w/Attachment - Supplemental Information

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Letter to Steven D. Capps from Frank Ehrhardt dated October 30, 2015

SUBJECT: MCGUIRE NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT
05000369/2015003 AND 05000370/2015003

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-369, 50-370

License Nos.: NPF-9, NPF-17

Report No.: 05000369/2015003, 05000370/2015003

Licensee: Duke Energy Carolinas, LLC

Facility: McGuire Nuclear Station, Units 1 and 2

Location: Huntersville, NC 28078

Dates: July 1, 2015, through September 30, 2015

Inspectors: J. Zeiler, Senior Resident Inspector
R. Cureton, Resident Inspector
P. Cooper, Reactor Inspector (Section 1R07.2)
E. Crowe, Senior Resident Inspector Oconee (Section 1R12)
C. Dykes, Senior Health Physicist (Section 2RS1)
R. Kellner, Health Physicist (Section 2RS8)
R. Williams, Senior Reactor Inspector (Section 1R08)

Approved by: Frank Ehrhardt, Chief
Reactor Projects Branch 1
Division of Reactor Projects

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SUMMARY OF FINDINGS

IR05000369/2015003 and IR05000370/2015003; 07/01/2015 – 09/30/2015; McGuire Nuclear Station, Units 1 and 2; Problem Identification and Resolution

The report covered a 3-month period of inspection by resident inspectors and regional inspectors. There was one self-revealing finding documented in this report. The significance of inspection findings are indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," (SDP) dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects Within The Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated February 4, 2015. The NRC's program for overseeing the safe operations of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process, Revision," Revision (Rev.) 5.

Cornerstone: Initiating Events

- Green: A self-revealing Green finding (FIN) was identified for failure to adequately implement the modification procedural requirements of engineering directives manual (EDM)-601, "Engineering Change Manual," for a temporary modification that installed a valve leak seal enclosure on main steam drain valve 2SM-27. Specifically, EDM-601 required the weight and vibration response of the enclosure to be evaluated as part of the installation. The failure to consider this resulted in vibration induced piping failure upstream of the valve and an unexpected rapid plant down power.

The failure to adequately implement a temporary modification in accordance with EDM-601 was a performance deficiency (PD). The PD was more than minor because it was associated with the design control attribute of the initiating events cornerstone and adversely affected the cornerstone objective of limiting the likelihood of events that upset plant stability during power operations. Specifically, the performance deficiency resulted in a rapid down power to approximately 20 percent and subsequent actions to take the Unit 2 turbine generator offline to repair the leak. Using NRC IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the finding was determined to be of very low safety significance because the it did not contribute to both the cause of a reactor trip and affect mitigation equipment. The finding had a cross cutting aspect of consistent process, as described in the human performance cross-cutting area because the licensee failed to use a consistent, systematic approach to make decisions during implementation of a temporary modification [H.13]. (Section 4OA2)

A violation of very low safety significance that was identified by the licensee has been reviewed by the NRC. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. The violation and corrective action tracking number are listed in Section 4OA7 of this report.

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REPORT DETAILS

Summary of Plant Status

Unit 1 operated at approximately 100 percent rated thermal power (RTP) for the entire inspection period.

Unit 2 operated at approximately 100 percent RTP until July 29, 2015, when the licensee initiated a power reduction to 45 percent power following the identification of a small pin-hole steam leak from piping upstream of a 14-inch check valve 2HA-8 in the turbine building. Following piping repairs, power was returned to 100 percent on July 31. On August 6, power was reduced to 95 percent following a seal leak from the 2C1 low pressure heater drain tank pump. Later that same day, a rapid power reduction to 20 percent power was initiated due to a non-isolable steam leak from a failed 3/4 inch steam drain line, located between the high pressure turbine and turbine governor valve 2GV-2. The turbine generator was taken offline to conduct the piping repairs. The unit was placed back online on August 8 and was returned to 100 percent power on August 10. On September 12, the unit was shutdown for a scheduled refueling outage.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R04 Equipment Alignment (71111.04)

a. Inspection Scope

Partial Walkdown

The inspectors verified that critical portions of the selected systems were correctly aligned by performing partial walkdowns. The inspectors selected systems for assessment because they were a redundant or backup system or train, were important for mitigating risk for the current plant conditions, had been recently realigned, or were a single-train system. The inspectors determined the correct system lineup by reviewing plant procedures and drawings. Documents reviewed are listed in the attachment.

The inspectors selected the following four systems or trains to inspect:

- 1A emergency diesel generator (EDG) while the 1B EDG was out of service for planned maintenance
- 1A chemical and volume control (NV) centrifugal charging pump while 1B NV charging pump was out of service for pump/motor cooler cleaning
- 2B residual heat removal (ND) system while 2A ND system was out of service for planned maintenance
- 2B1 and 2B2 component cooling water (KC) pumps while the 2A1 and 2A2 KC pumps were out of service for motor cooler cleaning

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b. Findings

No findings were identified.

1R05 Fire Protection (71111.05A)a. Inspection ScopeQuarterly Inspection

The inspectors evaluated the adequacy of selected fire plans by comparing the fire plans to the defined hazards and defense-in-depth features specified in the fire protection program. In evaluating the fire plans, the inspectors assessed the following items:

- control of transient combustibles and ignition sources
- fire detection systems
- fire suppression systems
- manual firefighting equipment and capability
- passive fire protection features
- compensatory measures and fire watches
- issues related to fire protection contained in the licensee's corrective action program

The inspectors toured the following five fire areas to assess material condition and operational status of fire protection equipment. Documents reviewed are listed in the attachment.

- Unit 1 and Unit 2 auxiliary building 695 elevation (fire area 1)
- Unit 1 auxiliary building 716 elevation (fire area 4)
- Unit 2 motor driven auxiliary feedwater (MDCA) and turbine driven auxiliary feedwater (TDCA) pump rooms (fire areas 3 and 3A)
- Unit 1 essential switchgear room 1ETB and auxiliary building 733 elevation electrical penetration room (fire areas 9 and 11)
- Unit 1 MDCA and TDCA pump rooms (fire areas 2 and 2A)

1R06 Flood Protection Measures (71111.06)a. Inspection ScopeUnderground Cables

The inspectors reviewed related flood analysis documents and inspected the underground electrical cable manholes and trenches listed below containing cables whose failure could adversely impact risk-significant equipment. The inspectors directly observed the condition of cables and cable support structures and, as applicable, verified that dewatering devices and drainage systems were functioning properly. In addition, the inspectors verified the licensee was identifying and properly addressing

issues using the corrective action program. Documents reviewed are listed in the attachment.

- CMHP-1
- CMHP-1A
- CMHP-2
- CMHP-3
- CMHP-22
- CMHP-28
- CMHP-T1
- CMHP-T2
- TR-3
- MHA-3

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07AT)

a. Inspection Scope

.1 Annual Review

The inspectors verified the readiness and availability of the 2B KC heat exchanger to perform its design function by observing eddy current performance testing and reviewing reports of those tests, reviewing the licensee's implementation of biofouling controls, and observing the licensee's heat exchanger inspections. Additionally, the inspectors verified that the licensee had entered any significant heat exchanger performance problems into the corrective action program and that the licensee's corrective actions were appropriate. Documents reviewed are listed in the attachment.

.2 Triennial Review

The inspectors interviewed plant personnel, conducted plant walkdowns, and reviewed records for a sample of heat exchangers that were directly or indirectly cooled by the nuclear service water (RN) system, to verify that heat exchanger deficiencies or potential common cause problems that could result in initiating events, or affect multiple heat exchangers in mitigating systems, were being identified, evaluated, and resolved. The inspectors selected the following heat exchangers for review based on their risk-significance in the licensee's probabilistic risk analysis, and their safety-related mitigating functions.

- 1B containment spray (NS) system heat exchanger
- 1A MDCA pump motor cooler

- 1A spent fuel cooling heat exchanger
- EDG Lube Oil Cooler 1B

For the 1B NS heat exchanger, the inspectors reviewed the results of heat exchanger heat balance tests performed to monitor the effects of fouling and establish the inspection/cleaning frequency. The inspectors reviewed documents to verify that the test methodology, conditions, and acceptance criteria, were consistent with accepted industry practices. The inspectors also reviewed documents to verify that the performance test results were correctly applied to the evaluation of heat transfer capability under design basis conditions. The inspectors also reviewed records for recent inspection/cleaning activities, and post-cleaning testing, to verify these were adequate to maintain thermal performance in accordance with the system design basis. The inspectors reviewed the system health reports to determine the overall system performance. Additionally, the inspectors reviewed recent eddy current examination reports to verify that tube integrity was being assessed, and that the number of tubes plugged were within the plugging limits in design basis calculations.

For the 1A MDCA pump motor cooler and 1A spent fuel cooling heat exchanger, the inspectors reviewed flow diagrams, records for recent inspection/cleaning activities, and post-cleaning testing, to verify these were adequate to maintain thermal performance in accordance with the system design basis.

For the 1B EDG lube oil cooler, the inspectors reviewed flow diagrams, records for recent inspection/cleaning activities, and post-cleaning testing, to verify these were adequate to maintain thermal performance in accordance with the system design basis. Additionally, the inspectors reviewed recent eddy current examination reports to verify that tube integrity was being assessed, and that the number of tubes plugged were within the plugging limits in design basis calculations.

For all of the heat exchangers selected, the inspectors reviewed inspection/cleaning methodologies to verify licensee's activities were adequate to detect degradation prior to loss of heat removal capabilities below design basis values, and were consistent with the licensee's regulatory commitments in response to Generic Letter 89-13. The inspectors' review included periodic flow testing records at or near maximum design flow, to verify flow through each heat exchanger was consistent with the system design basis. The inspectors also reviewed system health reports to determine whether the licensee's chemical treatment programs for corrosion, and fouling control, were effective in preventing system degradation. The inspectors reviewed documents to verify whether the licensee evaluated the potential for water hammer and established adequate controls, and operational limits to prevent heat exchanger degradation due to excessive flow induced vibration during operation.

The inspectors reviewed the performance of the standby nuclear service water pond and dam to determine whether the performance of ultimate heat sinks (UHS), and their subcomponents such as piping, intake screens, pumps, valves, etc., were appropriately evaluated by tests or other equivalent methods, to ensure availability and accessibility to the in-plant cooling water systems.

The inspectors conducted a walkdown and reviewed documentation to determine whether the licensee's inspection of the UHS was thorough, and of sufficient depth to identify degradation of the shoreline protection and/or loss of structural integrity. This included a visual inspection to determine whether vegetation present along the slopes were trimmed, maintained, and was not adversely impacting the embankment. In addition, the inspectors reviewed survey drawings and documentation to determine whether the licensee ensured sufficient reservoir capacity by trending and removing debris, or sediment buildup, in the UHS.

The inspectors performed a system walkdown on service water systems to determine whether the licensee's assessment on structural integrity was adequate. In addition, the inspectors reviewed available licensee's testing and inspections results, licensee's disposition of any active thru wall pipe leaks, and the history of thru wall pipe leakage, to identify any adverse trends since the last NRC inspection. For buried or inaccessible piping, the inspectors reviewed the licensee's inspection and monitoring program to determine whether structural integrity was ensured, and that any leakage or degradation was appropriately identified and dispositioned by the licensee.

In addition, the inspectors reviewed condition reports related to the heat exchangers/coolers and heat sink performance issues, to determine whether the licensee had an appropriate threshold for identifying issues, and to evaluate the effectiveness of the corrective actions. The documents that were reviewed are included in the attachment to this report.

These inspection activities constituted six heat sink inspection samples as defined in Inspection Procedure 71111.07-05.

b. Findings

No findings were identified.

1R08 Inservice Inspection (ISI) Activities (71111.08)

a. Inspection Scope

Non-Destructive Examination Activities and Welding Activities

From September 21–25, 2015, the inspectors conducted an onsite review of the implementation of the licensee's inservice inspection (ISI) program for monitoring degradation of the reactor coolant system boundary, risk-significant piping and component boundaries, and containment boundaries in Unit 2.

The inspectors either directly observed or reviewed the following non-destructive examinations (NDEs) mandated by the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code of Record: 2007 Edition with 2008 Addenda), to evaluate compliance with the ASME Code, Section XI and Section V requirements, and if any indications or defects were detected, to evaluate if they were dispositioned in accordance with the ASME Code, or an NRC-approved alternative

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requirement. The inspectors also reviewed the qualifications of the NDE technicians performing the examinations to determine whether they were current, and in compliance with the ASME Code requirements.

- liquid penetrant (PT) of RN1FW11-9, nozzle to pipe weld, Class 3 (reviewed)
- magnetic particle (MT) of M2.C2.21.0001, nozzle to steam drum weld, Class 2 (reviewed)
- ultrasonic examination (UT) of M2.C2.21.0001, nozzle to steam drum weld, Class 2 (observed)
- visual examination (VT-3) of the lower air lock barrel supports 2-SUPT-0002, Class MC (observed)
- visual examination (VE) of the reactor pressure vessel bottom-mounted instrument penetrations (reviewed)

The inspectors either directly observed or reviewed the following welding activities, qualification records, and associated documents in order to evaluate compliance with procedures and the ASME Code, Section XI and Section IX requirements. Specifically, the inspectors reviewed the work order, repair and replacement plan, weld data sheets, welding procedures, procedure qualification records, welder performance qualification records, and NDE reports.

- work order (WO) 2097603, Valve to Tee Weld, Class 2 (observed)
- WO 2088931-03, Replace RN Nozzle on 'B' VC/YC Chiller, Class 3 (reviewed)
- WO 2097603, 2RN Piping Replace Pipe/Flange/Reducer/Elbow Near 2RN-174B, Class 2 (reviewed)

During non-destructive surface and volumetric examinations performed since the previous refueling outage, the licensee did not identify any relevant indications that were analytically evaluated and accepted for continued service; therefore, no NRC review was completed for this inspection procedure attribute.

Pressurized Water Reactor Vessel Upper Head Penetration Inspection Activities

The inspectors verified that for the Unit 2 vessel head, a bare metal visual (BMV) examination was required during this outage, in accordance with the requirements of ASME Code Case N-729-1 and 10 CFR 50.55a(g)(6)(ii)(D). The inspectors reviewed the calculation of effective degradation years, the previous examination history, and reviewed portions of the BMV examination of the reactor vessel upper head penetrations to determine if the examinations were performed in accordance with the requirements of ASME Code Case N-729-1 and 10 CFR 50.55a(g)(6)(ii)(D). Additionally, the inspectors reviewed examination reports to determine if the required examination coverage was achieved, and if limitations were recorded in accordance with the licensee procedures.

The licensee did not identify any relevant indications that were accepted for continued service. Additionally, the licensee did not perform any welding repairs to the vessel head penetrations since the beginning of the last Unit 2 refueling outage; therefore, no NRC review was completed for these inspection procedure attributes.

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Boric Acid Corrosion Control Inspection Activities

The inspectors reviewed the licensee's boric acid corrosion control (BACC) program activities to determine if the activities were implemented in accordance with the commitments made in response to NRC Generic Letter 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants," and applicable industry guidance documents. Specifically, the inspectors performed an onsite records review of procedures, and the results of the licensee's containment walkdown inspections performed during the current refueling outage. The inspectors also interviewed the BACC program owner, conducted an independent walkdown of containment to evaluate compliance with licensee's BACC program requirements, and verified that degraded or non-conforming conditions such as boric acid leaks, were properly identified and corrected in accordance with the licensee's BACC and corrective action program.

The inspectors reviewed the following engineering evaluations, completed for evidence of boric acid leakage, to determine if the licensee properly applied applicable corrosion rates to the affected components; and properly assessed the effects of corrosion induced wastage on structural or pressure boundary integrity in accordance with the licensee procedures.

- WR 1125601, A drop falling every 5 + minutes
- WR 1131191, Evidence of a small inactive leak
- WR 1125867, Evidence of a small inactive leak
- WR 1124728, Evidence of a small inactive leak

The inspectors reviewed the following condition reports and associated corrective actions related to evidence of boric acid leakage to evaluate if the corrective actions completed were consistent with the requirements of the ASME Code and 10 CFR Part 50, Appendix B, Criterion XVI.

- WR 1135347, Steady stream of drops (about 0.02 gpm)
- WR 1121479, A drop falling every minute or less
- WR 1133697, Stationary film or stationary drop
- WR 20003105, Stationary film or stationary drop

Steam Generator Tube Inspection Activities

The inspectors verified that for the Unit 2 steam generator tubes, no inspection activities were required this refueling outage, in accordance with the requirements of the ASME Code, the licensee's Technical Specifications, and Nuclear Energy Institute 97-06, "Steam Generator Program Guidelines."

Identification and Resolution of Problems

The inspectors reviewed a sample of ISI-related issues entered into the CAP to determine if the licensee had appropriately described the scope of the problem and had

initiated corrective actions. The review also included the licensee's consideration and assessment of operating experience events applicable to the plant. The inspectors performed this review to ensure compliance with 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requirements.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification (LOR) Program and Licensed Operator Performance (71111.11)

a. Inspection Scope

.1 Resident Inspector Quarterly Review of Licensed Operator Requalification

On August 20, 2015, the inspectors observed an evaluated simulator scenario administered to an operating crew conducted in accordance with the licensee's accredited requalification training program. The simulator scenario involved a 50 percent turbine runback, misaligned control rod, and single control rod ejection loss-of-coolant accident complicated by a failure of the reactor to automatically trip. The inspectors assessed the following:

- licensed operator performance
- the ability of the licensee to administer the scenario and evaluate the operators
- the quality of the post-scenario critique
- simulator performance

Documents reviewed are listed in the attachment.

.2 Resident Inspector Quarterly Review of Licensed Operator Performance in the Actual Plant/Main Control Room

The inspectors observed licensed operator performance in the main control room during the following non-routine activities:

- Unit 2 rod cluster control assembly (RCCA) movement testing and RCCA bank full out repositioning on July 23, 2015
- Unit 2 power ascension from 45 percent following secondary steam leakage repair on August 2, 2015
- Unit 2 turbine generator startup, synchronization to electrical grid, and reactor power ascension following secondary steam leakage repairs on August 8, 2015
- Unit 2 shutdown for scheduled refueling outage 2EOC23 on September 12, 2015

The inspectors assessed the following:

- use of plant procedures
- control board manipulations
- communications between crew members
- use and interpretation of instruments, indications, and alarms
- use of human error prevention techniques
- documentation of activities
- management and supervision

Documents reviewed are listed in the attachment.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors assessed the licensee's treatment of the three issues documented in the Action Requests (ARs) listed below to verify the licensee appropriately addressed equipment problems within the scope of the maintenance rule (10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants"). The inspectors reviewed procedures and records to evaluate the licensee's identification, assessment, and characterization of the problems as well as their corrective actions for returning the equipment to a satisfactory condition. The inspectors also interviewed system engineers to assess the accuracy of performance deficiencies and extent of condition. Documents reviewed are listed in the attachment.

- AR 01698341, 1RN-187B experienced overload condition during testing
- AR 01903138, 1A containment air return fan failure to start
- AR 01941186, Steam leak from failed drain piping upstream turbine governor valve 2GV-2

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

a. Inspection Scope

The inspectors reviewed the five maintenance activities listed below to verify that the licensee assessed and managed plant risk as required by 10 CFR 50.65(a)(4) and licensee procedures. The inspectors assessed the adequacy of the licensee's risk assessments and implementation of risk management actions. The inspectors also

verified that the licensee was identifying and resolving problems with assessing and managing maintenance-related risk using the corrective action program. Additionally, for maintenance resulting from unforeseen situations, the inspectors assessed the effectiveness of the licensee's planning and control of emergent work activities. Documents reviewed are listed in the attachment.

- Yellow risk on Unit 1 during planned maintenance on the 1B EDG
- Complex Activity Plan for planned maintenance on the standby shutdown facility (SSF) diesel generator
- Yellow risk on Unit 2 due to emergent repair activities repair activities of a failed pump seal on the 2C1 heater drain tank pump
- Yellow risk on Unit 2 during planned maintenance on the 2A EDG
- Yellow risk on Unit 2 for planned reactor coolant system (RCS) draindown to lowered inventory conditions for refueling outage activities

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15)

a. Inspection Scope

Operability and Functionality Review

The inspectors selected the six operability determinations or functionality evaluations listed below for review based on the risk-significance of the associated components and systems. The inspectors reviewed the technical adequacy of the determinations to ensure that technical specification operability was properly justified and the components or systems remained capable of performing their design functions. To verify whether components or systems were operable, the inspectors compared the operability and design criteria in the appropriate sections of the technical specification and updated final safety analysis report to the licensee's evaluations. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. Additionally, the inspectors reviewed a sample of corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with operability evaluations. Documents reviewed are listed in the attachment.

- AR 01936816 and 01936820, Air leak from solenoid control valve associated with feedwater isolation valve 1CF-35AB
- AR 01942303, Shutdown bank "B" rod group position indication failure
- AR 01947979, 2A RN pump strainer piping expansion joint not installed correctly
- AR 01948743, 1A ND pump room air handling unit fan elevated vibration
- AR 01950299, SSF diesel coolant leak while running
- AR 01957605 and 01957641, 2B EDG air start solenoid 2VG-66 failure to actuate

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors either observed post-maintenance testing or reviewed the test results for the maintenance activities listed below to verify the work performed was completed correctly and the test activities were adequate to verify system operability and functional capability.

- 1B NV pump following scheduled pump/motor cooler heat exchanger cleaning
- 2A ND pump and valves following planned maintenance
- Unit 2 standby makeup pump following planned maintenance
- 2A1 and 2A2 KC motor coolers following planned cleaning
- 1B ND pump and air handling unit fan following planned maintenance
- 2B EDG following voltage regulator replacement

The inspectors evaluated these activities for the following:

- acceptance criteria were clear and demonstrated operational readiness
- effects of testing on the plant were adequately addressed
- test instrumentation was appropriate
- tests were performed in accordance with approved procedures
- equipment was returned to its operational status following testing
- test documentation was properly evaluated

Additionally, the inspectors reviewed a sample of corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with post-maintenance testing. Documents reviewed are listed in the attachment.

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20)

a. Inspection Scope

For the Unit 2 refueling outage starting September 12, 2015, through the remainder of the inspection period, the inspectors evaluated the following outage activities:

- outage planning
- shutdown, cooldown, and refueling
- reactor coolant system instrumentation and electrical power configuration

- reactivity and inventory control
- decay heat removal and spent fuel pool cooling system operation
- containment closure during fuel handling operations

The inspectors verified that the licensee:

- considered risk in developing the outage schedule
- controlled plant configuration per administrative risk reduction methodologies
- developed work schedules to manage fatigue
- developed mitigation strategies for loss of key safety functions
- adhered to operating license and technical specification requirements

The inspectors verified that safety-related and risk-significant structures, systems, and components not accessible during power operations were maintained in an operable condition. The inspectors also reviewed a sample of related corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with outage activities. Documents reviewed are listed in the attachment.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed the five surveillance tests listed below and either observed the test or reviewed test results to verify testing adequately demonstrated equipment operability and met technical specification and current licensing basis. The inspectors evaluated the test activities to assess for preconditioning of equipment, procedure adherence, and equipment alignment following completion of the surveillance. Additionally, the inspectors reviewed a sample of related corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with surveillance testing.

Routine Surveillance Tests

- PT/1/A/4450/006 B, VX System Train 1B Performance Test, Rev. 47
- PT/2/A/4600/001, RCCA Movement Test, Rev. 43
- PT2/A/4200/009B, Engineered Safety Features Actuation Periodic Test Train B, Rev. 14

In-Service Tests (IST)

- PT/2/A/4204/001A, 2B ND Pump Performance Test, Rev. 84

Ice Condenser System Tests

- PT/0/A/4200/032, Periodic Inspection of Ice Condenser Lower Inlet Doors, Rev. 21

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06)a. Inspection Scope

The inspectors observed the licensed operator simulator training conducted on August 20, 2015, that required implementation of emergency preparedness actions for the declaration of a Site Area Emergency. The inspectors observed licensee activities in the simulator to evaluate implementation of the emergency plan, including event classification, and notification. The simulator scenario involved a 50 percent turbine runback, misaligned control rod, and single control rod ejection loss-of-coolant accident complicated by a failure of the reactor to automatically trip. The inspectors evaluated the licensee's performance against criteria established in the licensee's procedures. Additionally, the inspectors attended the post-training critique to assess the licensee's effectiveness in identifying emergency preparedness weaknesses and verified the identified weaknesses were entered in the corrective action program. Documents reviewed are listed in the attachment.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstones: Occupational Radiation Safety and Public Radiation Safety

2RS1 Radiological Hazard Assessment and Exposure Controlsa. Inspection Scope

Hazard Assessment and Instructions to workers: During facility tours, the inspectors observed labeling of radioactive material and postings for radiation areas, high radiation areas (HRA), locked HRAs (LHRA), very HRAs, radioactive material storage areas, and contaminated areas established within the radiologically controlled area (RCA) of the Unit 1 (U1) and Unit 2 (U2) auxiliary buildings, U2 lower containment, and radioactive waste processing and storage locations. The inspectors independently measured radiation dose rates or directly observed conduct of licensee radiation surveys for selected RCA areas including U2 lower containment. The inspectors reviewed survey records for several plant areas including surveys for alpha emitters, airborne radioactivity, and pre-job surveys for selected U2 end-of-cycle 23 (2EOC23) tasks. The inspectors also discussed changes to plant operations that could contribute to changing radiological conditions since the last inspection. For selected U2EOC23 outage jobs, the inspectors attended pre-job briefings and reviewed radiation work permit (RWP)

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details to assess communication of radiological control requirements and current radiological conditions to workers. Selected U2EOC23 work activities included reactor head lift and fuel cleaning.

Hazard Control and Work Practices: The inspectors observed and evaluated access barrier effectiveness for selected LHRA and VHRA locations to include the U1 and U2 auxiliary buildings and U2 lower containment. Changes to procedural guidance for LHRA and VHRA controls were discussed with radiation protection (RP) supervisors. Controls and their implementation for storage of irradiated material within the spent fuel pool were reviewed and discussed. Established radiological controls (including airborne controls) were evaluated for selected tasks, including the reactor head lift, reactor head bare metal inspection, and incore thimble work. In addition, licensee controls for areas where dose rates could change significantly as a result of refueling operations were reviewed, observed, and discussed to include access to the fuel transfer canal in U2 lower containment.

Occupational workers' adherence to selected RWPs and RP technician proficiency in providing job coverage were evaluated through direct observations and interviews with cognizant licensee staff. Electronic dosimeter (ED) alarm set points and worker stay times were evaluated against area radiation survey results. Worker response to select ED dose rate alarms were evaluated. For selected U2EOC23 HRA and LHRA tasks involving significant dose rate gradients, the use and placement of whole body and extremity dosimetry to monitor worker exposure was discussed with cognizant licensee staff.

Control of Radioactive Material: The inspectors observed surveys of material and personnel being released from the RCA and U2 lower containment using portable radiation survey instruments, hand and foot monitors, small article monitors, personnel contamination monitors, and portal monitor instruments. The inspectors reviewed calibration records for selected release point survey instruments and discussed equipment sensitivity, source check requirements, alarm setpoints, and release program guidance with cognizant RP staff. The inspectors also reviewed records of leak tests on selected sealed sources and discussed nationally tracked source transactions with cognizant RP staff.

Problem Identification and Resolution: Problem Investigation Program (PIP) documents associated with radiological hazard assessment and control were reviewed and assessed. The inspectors evaluated the licensee's ability to identify and resolve the issues in accordance with procedure AD-PI-ALL-0100, "Corrective Action Program," Revision (Rev.) 3. The inspectors also evaluated the scope of the licensee's internal audit program and reviewed recent assessment results.

RP activities were evaluated against the requirements of Updated Final Safety Analysis Report (UFSAR) Section 12; Technical Specifications Section 5.7; 10 Code of Federal Regulations (CFR) Parts 19 and 20; and approved licensee procedures. Licensee programs for monitoring materials and personnel released from the RCA were evaluated against 10 CFR Part 20 and IE Circular 81-07, "Control of Radioactively Contaminated Material." Documents reviewed are listed in the attachment.

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b. Findings

No findings were identified.

2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation

a. Inspection Scope

Radioactive Material Storage: Inspectors performed walk-downs of indoor and outdoor radioactive material storage areas, and observed the physical condition and labeling of storage containers and the posting of radioactive material areas. The inspectors also reviewed licensee procedural guidance for storage and monitoring of radioactive material.

Radioactive Waste Processing and Characterization: While inspectors performed walk-downs of accessible sections of the liquid and solid radioactive waste (radwaste) processing systems they assessed material condition and conformance with system design diagrams. Some of the inspected equipment included radwaste storage tanks; resin transfer piping, and abandoned evaporator equipment. The inspectors discussed processing system changes and radwaste program implementation and changes with licensee staff.

The inspectors reviewed the 2014 Annual Radiological Effluent Release Reports and radionuclide characterizations for 2014-2015 for selected waste streams. For primary resin, reactor coolant system filters, and dry active waste the inspectors evaluated analyses for hard-to-detect nuclides, reviewed the use of scaling factors, and examined quality assurance comparison results between licensee waste stream characterizations and outside laboratory data. Waste stream mixing, sampling and tank recirculation were reviewed and discussed with staff. The inspectors also reviewed the licensee's procedural guidance for monitoring changes in waste stream isotopic mixtures.

Transportation: Inspectors were able to observe loading of two shipments during the week of inspection, however were not able to observe the preparation of the shipment. The inspectors did review shipping procedure requirements and discussed preparation of shipping documents, package marking and labeling, and interviewed shipping technicians regarding Department of Transportation (DOT) regulations.

Inspectors reviewed selected shipping records for consistency with licensee procedures and compliance with NRC and DOT regulations to include emergency response information, DOT shipping package classification, waste classification and radiation survey results. Licensee procedures for handling shipping containers were compared to Certificate of Compliance requirements and manufacturer recommendations. Training records for selected individuals qualified to ship radioactive material were also reviewed.

Radwaste processing activities and equipment configuration were reviewed for compliance with the licensee's process control program and UFSAR, Chapter 11. Waste stream characterization analyses were reviewed against regulations detailed in

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10 CFR Part 20, 10 CFR Part 61, and guidance provided in the Branch Technical Position on Waste Classification (1983). Radioactive material and waste storage activities were reviewed against the requirements of 10 CFR Part 20. Transportation program implementation was reviewed against regulations detailed in 10 CFR Part 20, 10 CFR Part 71, 49 CFR Parts 172-178, as well as the guidance provided in NUREG-1608. Training activities were assessed against 49 CFR Part 172 Subpart H. Documents reviewed during the inspection are listed in the attachment.

Problem Identification and Resolution: The inspectors reviewed ARs/PIPs in the area of radwaste processing and transportation. The inspectors evaluated the licensee's ability to identify and resolve the issues in accordance with procedure AD-PI-ALL-0100, "Corrective Action Program." The inspectors also evaluated the scope of the licensee's internal audit program and reviewed recent assessment results. Licensee corrective action program documents reviewed are listed in the attachment.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

40A1 Performance Indicator Verification (71151)

a. Inspection Scope

The inspectors reviewed a sample of the performance indicator (PI) data, submitted by the licensee, for the Unit 1 and Unit 2 PIs listed below. The inspectors reviewed plant records compiled between July 2014 and June 2015 to verify the accuracy and completeness of the data reported for the station. The inspectors verified that the PI data complied with guidance contained in Nuclear Energy Institute 99-02, "Regulatory Assessment Performance Indicator Guideline," and licensee procedures. The inspectors verified the accuracy of reported data that were used to calculate the value of each PI. In addition, the inspectors reviewed a sample of related corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with PI data. Documents reviewed are listed in the attachment.

Cornerstone: Mitigating Systems

- residual heat removal system
- heat removal system
- cooling water system

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152)

.1 Routine Review

The inspectors screened items entered into the licensee's corrective action program to identify repetitive equipment failures or specific human performance issues for follow-up. The inspectors reviewed problem identification program reports, attended screening meetings, or accessed the licensee's computerized corrective action database.

.2 Annual Followup of Selected Issues

a. Inspection Scope

The inspectors conducted a detailed review of AR 01941186 associated with a Unit 2 steam leak from a broken 3/4 inch drain line upstream of turbine governor valve 2GV-2. The inspectors evaluated the following attributes of the licensee's actions:

- complete and accurate identification of the problem in a timely manner
- evaluation and disposition of operability and reportability issues
- consideration of extent of condition, generic implications, common cause, and previous occurrences
- classification and prioritization of the problem
- identification of root and contributing causes of the problem
- identification of any additional condition reports
- completion of corrective actions in a timely manner

Documents reviewed are listed in the attachment.

b. Findings and observations

Introduction: A self-revealing finding of very low safety significance (Green) was identified for the licensee's failure to adequately implement procedural requirements for a temporary modification to install a valve leak seal enclosure on main steam drain valve 2SM-27. This resulted in a vibration induced piping failure upstream of the valve and an unexpected rapid plant down power.

Description: On April 27, 2015, a 125 pound leak seal enclosure was installed on 2SM-27, which was previously identified to have an active steam leak from its bonnet area. The enclosure was installed in accordance with procedure MP/0/A/7650/077, "On-Line Leak Sealing Initial Injection and ReInjection," which states in part, "have engineer to evaluate the need for an engineering change (EC) per EDM-601." The evaluation was performed and the engineer determined that there was a need for an EC to compensate for the additional load on the pipe. On April 29, 2015, a spring can was installed, in accordance with EC 114906, under the leak enclosure to control gravity loading of the pipe nozzle and allow thermal movement. However, the licensee failed to notice or evaluate the resulting pipe vibration, which was induced by the additional weight of the enclosure. On August 6, 2015, due to excessive vibration, a 3/4 inch pipe attached to a

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drain pot off the turbine governor valve 2GV-2, upstream of 2SM-27, fractured resulting in a non-isolable steam leak. The operators entered the abnormal procedure for a steam leak and commenced a rapid power reduction due to degrading leak conditions. Unit 2 power was reduced to approximately 20 percent and the unit was eventually taken offline to repair the leak. The licensee performed an apparent cause evaluation in AR 01941186. The evaluation determined that the engineer responsible for developing the temporary modification did not consider the effects of vibration during the EC process for modifying a piping configuration that can be susceptible to mechanical fatigue.

Analysis: The inspectors determined that the failure to adequately implement procedural requirements for a temporary modification to install a valve leak seal enclosure on main steam drain valve 2SM-27 in accordance with EDM-601 was a PD. Specifically, EDM-601, Appendix K.1, "Equipment Qualification Sub-Screen" states in part that the reviewing engineer take into account if "the change affects the weight, support stiffness, rotating speed, or fluid flow characteristics of rotating equipment such that the vibration/resonance response of the equipment could change." Contrary to this, the licensee failed to evaluate how the additional weight of the valve enclosure could affect the loads and stresses of the piping caused by additional vibration.

The finding was more than minor because it was associated with the design control attribute of the initiating events cornerstone and adversely affected the cornerstone objective of limiting the likelihood of events that upset plant stability during power operations. Specifically, the performance deficiency resulted in a rapid power reduction to approximately 20 percent and eventually taking the Unit 2 offline to repair the leak. Using NRC Manual Chapter 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the finding was determined to be of very low safety significance because the finding did not contribute to both the cause of a reactor trip and affect mitigation equipment. The finding had a cross cutting aspect of consistent process, as described in the human performance cross-cutting area because the licensee failed to use a consistent, systematic approach to make decisions during implementation of a temporary modification [H.13].

Enforcement: This finding does not involve enforcement action because no violation of a regulatory requirement was identified. The licensee entered this issue into the corrective action program as AR 01941186. Because this finding does not involve a violation and is of low safety significance, it is identified as finding: FIN 05000370/2015003-01, "Failure to Adequately Implement a Temporary Modification for a Leak Enclosure."

4OA5 Other Activities

Institute of Nuclear Power Operations Report Review

In accordance with Executive Director of Operations Procedure 0220, "Coordination with the Institute of Nuclear Power Operations," the inspectors reviewed the most recent INPO evaluation (interim) report dated April 2015 to determine if the report identified safety or training issues not previously identified by NRC evaluations. The report contained no issues that were not already known by the NRC.

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4OA6 Meetings, Including Exit

On October 15, 2015, the resident inspectors presented the inspection results to Mr. Steven Capps and other members of the licensee's staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of the NRC Enforcement Policy, for being dispositioned as a non-cited violation.

- McGuire administrative Technical Specification (TS) 5.4.1 "Procedures" requires, in part, that procedures for certain activities recommended in RG 1.33, Rev. 2, Appendix A be established, implemented and maintained. Radiation Protection procedures for access control of radiation areas is one of the identified activities. Procedure PD-RP-ALL-0001, Radiation Worker Responsibilities, contains requirements for individual rad workers to comply with all radiological postings when within the Radiologically Controlled area, and procedure AD-RP-ALL-2017, Access Controls for High, Locked High, and Very High Radiation Areas, contains guidance for controlling access to LHRAs. Contrary to the above, on June 11, 2015 an operator inadvertently violated the LHRA posting and entered an area (the Spent Fuel Pool), which was being controlled as a LHRA, without meeting the access control requirements (RWP, high radiation area briefing, etc.). This violation is characterized as licensee identified because the LHRA conditions did not yet exist in the area and the individual was stopped by other workers prior to entering an elevated dose rate area. This violation was entered into the licensee's corrective action program as AR 1931366 and AR 1936206.

ATTACHMENT: SUPPLEMENTAL INFORMATION

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SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

B. Adenhold, ISI Coordinator
B. Anderson, Superintendent of Operations
D. Black, Security Manager
D. Brenton, Maintenance Superintendent
S. Capps, Vice President, McGuire Nuclear
K. Crane, Senior Licensing Specialist
J. Gabbert, Chemistry Manager
J. Glenn, Organizational Effectiveness Manager
G. Houser, NDE-ISI
M. Kelly, Outage and Scheduling Manager
T. Matheny, Staff Scientist, RP
S. Mooneyhan, Radiation Protection Manager
C. Morris, Station Manager
G. Murphy, Licensing Engineer
C. Peterson, RP Shipping Supervisor
J. Robertson, Regulatory Affairs Manager
P. Schuerger, Training Manager
S. Snider, Engineering Manager
W. Osburn, General Supervisor, RP

LIST OF REPORT ITEMS

Opened and Closed

05000370/2015003-01	FIN	Failure to Adequately Implement a Temporary Modification for a Leak Enclosure (Section 4OA2.2)
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DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

Partial Walkdown

OP/1/A/6200/001B, Chemical and Volume Control System Charging, Rev. 71
OP/1/A/6200/001E, Chemical and Volume Control System Valve Checklists, Rev. 36
MCFD-1554-03.01, Flow Diagram of Chemical and Volume Control System (NV), Rev. 24
OP/2/A/6200/004, Residual Heat Removal System, Rev. 97
MCFD-2561-01.00, Flow Diagram of Residual Heat Removal System (ND), Rev. 25
OP/2/A/6400/005, Component Cooling Water System, Rev. 62
OP/2/A/6400/005 A, Component Cooling Water System Valve and Power Supply Checklists
Rev. 20

Attachment

Section 1R05: Fire ProtectionQuarterly Inspection

MCS-1465.00-00-0008, Design Basis Specification for Fire Protection, Rev. 19
 MCS-1465.00-00-0022, Appendix R Safe Shutdown Analysis, Rev. 14
 MCC-1435.00-00-0059, NFPA 805 – Appendix R Safe Shutdown Deterministic Analysis, Rev. 2
 AD-EG-ALL-1520, Transient Combustible Control, Rev. 3
 NSD-104, Material Condition/Housekeeping, Foreign Material Exclusion and Seismic Concerns,
 Rev. 37
 NSD-316, Fire Protection Impairment and Surveillance, Rev. 16
 MFSD-001, Aux 695, Rev. 0
 FS/0/B/9000/001, (Aux 695) Fire Strategy #1, Rev. 0
 MFSD-004, Aux 716, Rev. 0
 FS/0/B/9000/004, (Aux 716) Fire Strategy #4, Rev. 0
 MFSD-003, Unit 2 CA Pump Room, Rev. 0
 FS/1/B/9000/001, 1ETB Room (Fire Strategy #11), Rev. 1

Section 1R06: Flood Protection MeasuresUnderground Cables

MC-1768-01.01, Miscellaneous Sump Pump System Controls, Rev. 7
 MC-1948-01.00, Electrical Equipment Layout Outdoor Area, Rev. 72
 MC-1948-01.03, Electrical Equipment Layout Outdoor Area, General Plan Conduit, Cables &
 Trenches Composite Drawing, Rev. 11
 MC-1948-02, Electrical Equipment Layout General Plan Section & Details, Rev. 13
 MC-1948-03, Electrical Equipment Layout Outdoor Area General Plan Section & Details, Rev. 9
 UFSAR Chapter 18.2.15, Inaccessible Non-EQ Medium Voltage Cables Aging Management

Section 1R07: Heat Sink PerformanceAnnual Review

WO 02176540, 2B KC Heat Exchanger Clean/Inspect Eddy Current Test
 MP/0/A/7700/013 Component Cooling System (KC) Heat Exchanger Maintenance, Rev. 17
 2B KC Heat Exchanger Eddy Current Report, 9/21/2015

Triennial ReviewDrawings

MAP: 002251-392315, Survey of McGuire Nuclear Station SNSW Pond, 1/27/2014
 MCFD-1574-01.00, Flow Diagram of Nuclear Service Water System (RN), Rev. 26A
 MCFD-1574-01.00, Flow Diagram of Nuclear Service Water System (RN), Rev. 30
 MCFD-1574-01.01, Flow Diagram of Nuclear Service Water System (RN), Rev. 33
 MCFD-1574-02.00, Flow Diagram of Nuclear Service Water System (RN), Rev. 33
 MCFD-1574-02.01, Flow Diagram of Nuclear Service Water System (RN), Rev. 11
 MCFD-1574-03.00, Flow Diagram of Nuclear Service Water System (RN), Rev. 37
 MCFD-1574-03.01, Flow Diagram of Nuclear Service Water System (RN), Rev. 11
 MCFD-1574-04.00, Flow Diagram of Nuclear Service Water System (RN), Rev. 20
 MCFD-1574-05.00, Flow Diagram of Nuclear Service Water System (RN), Rev. 6

Procedures

AD-EG-ALL-1613, Buried Piping Integrity Program Implementation, Rev. 1

MNS, Underground Piping and Tanks Integrity Initiative (UPTII) Condition Assessments and Asset Management Plan, 12/4/2014

MP/0/A/7150/069, 1A, 1B, 2A Containment Spray (NS) Hx Corrective Maintenance, Rev. 5

MP/0/A/7150/087, Containment Spray (NS) Heat Exchanger Chemical Cleaning, Rev. 4

MP/0/A/7700/043, Westinghouse Large Motor Cooler Hx Corrective Maintenance, Rev. 24

PD-EG-ALL-1613, Buried Piping Integrity Program, Rev. 0

PT/1/A/4208/010B, NS 1B Heat Exchanger Heat Balance Test, Rev. 52

PT/1/A/4208/010A, NS 1A Heat Exchanger Heat Balance Test, Rev. 40

Other

1EOC23 Outage, Eddy Current Inspection Report, 10/5/2014

2014Q4, System Health Report, Containment Spray System

2014Q4, System Health Report, Nuclear Service Water System

2015Q1, System Health Report, Nuclear Service Water System

2015Q1, System Health Report, Containment Spray System

MCC-1124.05-00-0005, Verification of Standby Nuclear Service Water Pond Volume, Rev. 4

MCS-1154.00-00-0002, Design Basis Specification for Nuclear Service Water Structures, Rev. 3

MCS-1574.RN-00-0001, Design Basis Specification for the RN System, Rev. 48

MNS1EOC21 Final Report, Balance of Plant Eddy Current Testing Services, 9/16/2011–9/30/2011

AMEC Foster Wheeler Project No. 6234-15-0210, Standby Nuclear Service Water Dam and Waste Water Collection Basin Dams, July 2, 2015

Section 1R08: Inservice Inspection (ISI) Activities

Procedures:

AD-EG-PWR-1611, Boric Acid Corrosion Control Program - Implementation, Rev. 0

AD-MN-ALL-0006, Fluid Leak Management, Rev. 0

MP/0/A/7700/080, Inspection, Assessment, and Cleanup of Boric Acid on Plant Materials, Rev. 21

NDE-25, Magnetic Particle Examination, Rev. 27

NDE-35, Liquid Penetrant Examination, Rev. 25

NDE-640, Ultrasonic Examination Using Longitudinal Wave and Shear Wave, Straight Beam Techniques, Rev. 5

NDE-66, Visual Examination (VT-3) of Hangers, Restraints, Supports, and Snubbers, Rev. 3

NDE-70, Visual Examination of the Reactor Pressure Vessel Upper Head Penetrations, Rev. 2

NDE-820, Ultrasonic Examination of Welds in Ferritic Pressure Vessels, Support Skirts and Austenitic Valve Bodies Greater Than 2 Inches in Thickness, Rev. 7

PD-EG-PWR-1611, Boric Acid Corrosion Control Program, Rev. 0

Calculations:

MCC-1201.01-00-0064, EDY and RIY Calculation to Determine Reactor Vessel Head Inspection Requirements, Rev. 6

Drawings:

MC-1418-14.44-00, C ASME Section III Level II Auxiliary Building, Rev. 19

MC-1070-33, Personnel Air Lock Supports Plans, Sections, and Details, Rev. 5

MCFD-1574-03.00, Flow Diagram of Nuclear Service Water System (RN), Rev. 37

MC-ISIC2-2042-0012, Steel Containment Vessel Penetrations Inservice Inspection Areas Lower Personnel Air Lock Details, Rev. 2

Self-Assessments:

AD-PI-ALL-0300, Fleet Welding Program Quality Assessment

G-ENG-SA-14-15, Boric Acid Corrosion Control Program - Effectiveness of Selected Program Elements

G-ENG-SA-15-01, Augmented Inservice Inspection

MISI-1462.10-0040-DUKE-005-001, McGuire Nuclear Station Unit 1 Inservice Inspection Classification Basis Interval 4

Work Orders/Work Requests:

WO 2088931-03, EC109235 0YCCD006/Replace RN Nozzle on 'B' VC/YC Chiller Cond

WO 2097603, 2RN Piping Replace Pipe/Flange/Reducer/Elbow Near 2RN-174B

WO 2178484-01, Containment ISI Exam (VT-3) on Lower Air Lock Support

WR 20007588, 2FW-6, Minor Boric Acid Vent Cap Leak

WR 20007589, 2NI-65B, Boric Acid Leak At Leak-off Fitting

WR 20007590, 2NI-163, Crimped Leak Off Line

WR 20007592, 2NI-827, Minor Boric Acid Packing Leak

WR 20007593, 2NI-835, Minor Boric Acid Leak At Vent Cap

WR 20007595, 2WL-1494, Boric Acid Leak At Upstream Fitting

WR 20007597, 2WL-1495, Minor Packing Leak, Clean Only

WR 20007601, 2NCFT5000, Minor Boron On Test Fitting

WR 20007602, 2NCFT5090, Minor Dry Boron At Fitting Upstream Of Transmitter

WR 20007603, 2NCFT5110, Minor Dry Boron At Right Side Handle

WR 20007604, 2NCFT5130, Minor Dry Boron At Fitting Upstream

WR 20007631, 2NVVA0854, Minor Dry Boron At Threaded Pipe Cap

WR 20007632, 2A Reactor Coolant Pump – Dry Boron On Seal Bolting And Bowl Area

Condition Reports:

01668892, UT data shows piping to be less than code allowable

01669051, NDE group to evaluate UT volumetric exams results and lab results

01670301, Penetration into BAT Tank from 1NVIV6070 has dry boron crystal buildup

01670309, An extent of condition review of M14-3153 2D Cold Leg flaw

01945707, Scope of 10-year NDE Inspection on RX head Lift Rig

01957565, NRC identified NDE procedure deficiencies

M-14-03054, WO 02088931 to replace piping near valve 2RN-174B will not be completed during 2EOC22 as planned

NDE Examiner Quals:

Day & Zimmermann Certificate of Qualification: M. Hill and M. Sanders

Duke Energy Certificate Method Qualification: C. Goldsmith, K. Regan Jr., C. Alexander, and E. Adamson

Miscellaneous Documents:

ASME Section IX Welding Procedure Specification: GTSM0101-01

Certificate of Compliance Record Nos: 1931135, 2002436, 2005946, 2030498, 2033348, 2033808, 2035090, 2040815, 2041917

McGuire Unit 2 Steam Generator 2EOC23 Skipped Inspection Cycle Outage Review, Rev. 0
 MISI-1462.10-0030, McGuire Nuclear Station - Unit 2 EOC21 Reactor Vessel Inservice
 Inspection Report – Areva
 MISI-1462.10-0040, Gen Req Unit 1 Second and Third Periods Unit 2
 MISISG-0269.030.0040, Fourth Interval Steam Generator Inservice Inspection Plan McGuire
 Nuclear Station Unit 2, Rev. 0
 NGD Welding Manual Guidelines For Controlling Station Welding And Associated Processes,
 Rev. 16
 SGMEP 103 and 104, Condition Monitoring and Operational Assessment, Rev. 8
 UT Calibration Examination Report UT-15-522
 Visual Examination for Boric Acid Detection Reports: VT-11-531, VT-14-946, VT-15-1032
 Visual Examination Report: BOP-VT-15-1088
 Welder Performance Qualification Test Records: J. Austin, C. Irby, C. Payseur, J. Raynor
 Welding Procedure Qualification Records: L-102ER0, L-104R3, L-133R1, L-146DR0

Section 1R11: Licensed Operator Requalification Program and Licensed Operator Performance

Resident Inspector Quarterly Review of Licensed Operator Requalification

AD-OP-ALL-1000, Conduct of Operations, Rev. 4
 NSD-509, Site Standards in Support of Operational Focus, Rev. 6
 SOMP 01-07, Control Room Oversight, Rev. 2
 Active Simulator Examination Package (for described scenario)
 AP/1/A/5000/03, Load Rejection, Rev. 30
 AP/1/A/5000/14, Rod Control Malfunction, Rev. 16
 AP/1/A/5000/10, NC System Leakage Within the Capacity of Both NV Pumps, Rev. 23
 EP/1/A/5000/E-0, Reactor Trip or Safety Injection, Rev. 34
 EP/1/A/5000/FR-S.1, Response to Nuclear Power Generation/ATWS, Rev. 15
 EP/1/A/5000/E-1, Loss of Reactor or Secondary Coolant, Rev. 16
 RP/0/A/5700/000, Classification of Emergency, Rev. 23

Resident Inspector Quarterly Review of Licensed Operator Performance in the Actual Plant/Main Control Room

AD-OP-ALL-1000, Conduct of Operations, Rev. 4
 NSD-509, Site Standards in Support of Operational Focus, Rev. 6
 SOMP 01-07, Control Room Oversight, Rev. 2
 OP/2/A/6100/003, Controlling Procedure for Unit Operation, Rev. 168
 OP/2/A/6300/001, Turbine Generator Startup/Shutdown, Rev. 95
 PT/2/A/4250/004I, Pre-Startup Turbine Testing, Rev. 14

Section 1R12: Maintenance Effectiveness

AD-EG-ALL-1210, Maintenance Rule Program, Rev. 0
 EDM-210, Engineering Responsibilities for the Maintenance Rule, Rev. 29
 AD-EG-ALL-1204, Single Point Vulnerability Identification, Elimination and Mitigation, Rev. 1
 AD-EG-ALL-1206, Equipment Reliability Classification, Rev. 2
 AD-EG-ALL-1209, System, Component, and Program Health Reports and Notebooks, Rev. 3
 AD-EG-ALL-1211, System Performance Monitoring and Trending, Rev. 3
 SSC Function Scoping Database
 AR 01902474

Section1R13: Maintenance Risk Assessments and Emergent Work Control

AD-WC-ALL-0410, Work Activity Integrated Risk Management, Rev. 1
 NSD-415, Operational Risk Management (Modes 1–3) per 10 CFR 50.65(a)(4), Rev. 8
 SOMP 02-02, Operations Roles in the Risk Management Process, Rev. 17
 OMP 13-7, Operational Control of Protected Equipment, Rev. 7
 AD-OP-ALL-0201, Protected Equipment, Rev. 1
 91-01 risk management plan for lowered inventory

Section1R15: Operability Determinations and Functionality Assessments

NSD-203, Operability/Functionality, Rev. 26
 AD-OP-ALL-0102, Operational Decision Making, Rev. 0
 PIP M-10-6132, SSF Diesel Generator has a four drop/minute coolant leak

Section 1R19: Post-Maintenance Testing

NSD-408, Testing, Rev. 18
 AD-EG-ALL-1155, Post Modification Testing, Rev. 1
 PT/2/A/4209/001 C, Standby Makeup Pump Flow Periodic Test, Rev. 40
 TT/2/A/EC104506/000, Post Modification Testing for EC 104506 – EDG 2B Voltage Regulator Replacement, Rev. 4

Section1R20: Refueling and Other Outage Activities

McGuire 2EOC23 Refueling Outage Schedule, dated 9/3/15
 McGuire 2EOC23 Independent Review Team Assessment
 NSD 403, Shutdown Risk Management (Modes 4, 5, 6, and No-Mode) Per 10CFR50.65 (a)(4), Rev. 34
 Reactor Engineering Guidance for 2EOC23 Shutdown, dated 9/9/15
 OP/2/A/6100/002, Controlling Procedure for Unit Shutdown, Rev. 121
 OP/2/A/6100/003, Controlling Procedure for Unit Operation, Rev. 168
 OP/2/A/6100/SD-1, Prepare for Cooldown, Rev. 43
 OP/2/A/6100/SD-2, Cooldown to 400 degrees F, Rev. 54
 OP/2/A/6100/SD-4, Cooldown to 240 degrees F, Rev. 70
 OP/2/A/6100/SD-6A, Placing Train A ND in Service, Rev. 45
 OP/2/A/6100/SD-6B, Placing Train B ND in Service, Rev. 47
 OP/2/A/6100/SD-7, Cooldown to 200 Degrees F, Rev. 38
 OP/2/A/6100/SD-8, Water Solid Operations, Rev. 28
 OP/2/A/6100/SD-11, Mode 5 Checklist, Rev. 17
 OP/2/A/6100/SD-12, Cooldown to 100 Degrees F, Rev. 58
 OP/2/A/6100/SD-16, Preparing for NC System Drain, Rev. 22
 OP/2/A/6100/SD-20, Draining the NC System, Rev. 63
 OP/2/A/6100/SD-21, Mode 6 Checklist, Rev. 21
 OP/2/A/6100/SD-22, Removal of Reactor Vessel Head, Rev. 19
 OP/2/A/6100/SD-25, Core Alterations Checklist, Rev. 16
 OP/2/A/6100/SO-1, Maintaining NC System Level, Rev. 50
 OP/2/A/6100/SO-10, Controlling Procedure for LTOP Operation, Rev. 39
 PT/0/A/4150/037, Total Core Unloading, Rev. 48
 PT/2/A/4200/002C, Containment Closure, Rev. 83
 PT/2/A/4600/100, Surveillance Requirements for Shutdown Conditions, Rev. 22

MP/0/A/7650/146, Operation of Rx Building Manipulator Crane, Rev. 41
 MSD-585, Reactor Building Personnel Access and Material Control, Rev. 16
 MCC-1201.30-00-0030, McGuire Spent Fuel Pool Decay Heat for Cycle Specific Reloads - Unit
 2, Rev. 5
 MCC-1701.30-00-0009, Two Region Storage Rack Expanded Heat Load, Rev. 2

Section 1EP6: Drill Evaluation

RP/0/A/5700/000, Classification of Emergency, Rev. 23
 RP/0/A/5800/010, NRC Immediate Notification Requirements, Rev. 27
 RP/0/B/5700/029, Notification to Offsite Agencies from the Control Room, Rev. 17

Section 2RS1: Radiological Hazard Assessment and Exposure Controls

Procedures, Guidance Documents, and Manuals

HP/2/B/1006/024, Outage Controls and Surveillance, Rev. 21
 AD-RP-ALL-2000, Sentinel Radiation Work Permit (RWP) Management, Rev 0
 AD-RP-ALL-2001, Taking, Counting and Recording Surveys, Rev. 1
 AD-RP-ALL-2005, Posting of Radiological Hazards, Rev. 1
 AD-RP-ALL-2009, Personnel Contamination Monitoring and Reporting, Rev. 0
 AD-RP-ALL-2014, Work in Alpha Environments, Rev. 2
 AD-RP-ALL-2017, Access Controls for High, Locked High and Very High Radiation Areas,
 Rev. 1
 AD-RP-ALL-3001, Control of Radioactive Material and Use of Radioactive Material Labels,
 Rev. 1
 AD-RP-ALL-3002, Unconditional Release of Material, Rev. 0
 RPMP 7-1, Radiological Key Control, Rev. No. 012
 RPMP 7-9, Management's Expectations for Single Point Access (SPA) Duties and Investigation
 of Portal and Whole Body Monitor Alarms, Rev. 5
 RPMP 7-11, Contamination Controls, Rev. No. 014
 RPMP 7-15, Supplemental Guidelines for Establishing High, Locked High and Very High
 Radiation Areas, Rev. 8
 PD-RP A-ALL-0001, Radiation Worker Responsibilities, Rev. 3

Records and Data

2014 (1 EOC23) Alpha Characterization
 ALARA Exposure Summary, McGuire Nuclear Station, 9/12/2015 to 9/24/2015, 9/24/15
 Radioactive Source Inventory and Leak Test Data Package [HP/0/B/1004/034, Radioactive
 Sources, Rev. 11 and associated Source inventory Report], 6/25/15
 Sentinel Database Report of Highest 10 Exposure Significant Areas based on Highest 10 Dose
 On-Line RWPs and last Unit 2 Outage (2EOC22), 9/2/15
 Air Sample Database Report for the Period 9/2/15 to 9/24/2015
 Air Sample Results [Personal Air Sample (PAS) and Air Sample Data]: Sample ID #
 MN15090300003, 9/3/15; MN15092100008, 9/21/15; MN15092200046, 9/22/15;
 MN15092200045, 9/22/15; and MN 15092300032, 9/23/15
 RP Supervisor Turnover Package, 9/22/15
 Personnel Contamination Event Records for Event Nos. 15-009, 9/15/15; 15-010, 9/15/15; 15-
 014, 9/19/15; 15-015, 9/19/15; 15-016, 9/19/15
 RWP No. 19, Miscellaneous Pump Maintenance, Rev. 19

RWP No. 2016, U2 RX Bldg; [U2EOC22] Investigate and Repair Fuel Mast Actuator Tube / Gripper Assembly, Rev. 1
 RWP No. 2136, U2 Rx Bldg: RP Entry Into VHRA's to Perform Downgrade Survey in Incore Sump Room, Transfer Canal Enclosure Areas in Lower Containment and Annulus, Rev. 7
 RWP No. 2202, U-2 Dry Cask Loading and ISFSI Work, Rev. 21
 RWP No. 2728, U2 Rx Bldg: Rx head; R & R Rx Head and Replace Rx Head O-rings, Rev. 13
 RWP No. 2874, U2 Rx Bldg: Retract and Insert Incore Thimbles, Rev. 11
 HP/2/B/1006/045, Enclosure 5.1, NAC-Magnastor Cask Loading Survey Documentation, 6/11/15
 Spreadsheets, Unit Lower Containment General Area Dose Rate Comparison Data, Pre-shielding and Post-shielding, [2EOC16 thru 2EOC23], 9/14/15
 Unusual Dosimetry Occurrence Investigation Form, UDO No: 14-12, 3/4/2014
 U.S. NRC, National Source Tracking System, Annual Inventory Reconciliation Report, License ID 5797, Dated 01/19/15
 VSIDS Standard Map Survey Reports, McGuire Nuclear Station:

- 1) U2 Containment Initial Entry Survey Nos. MNS-M-20150912-2, MNS-M-20150912-3, MNS-M-20150912-4, MNS-M-20150912-5, MNS-M-20150912-6, MNS-M-20150912-7, MNS-M-20150912-8, MNS-M-20150912-9, MNS-M-20150912-10, MNS-M-20150912-13, MNS-M-20150912-14, MNS-M-20150912-15, MNS-M-20150912-16, MNS-M-20150912-17, MNS-M-20150912-26, MNS-M-20150912-27, Dated 09/12/15
- 2) Survey No. MNS-M-20140306-9, U-2 Deep End Refueling Canal, 3/4/14
- 3) Survey No. MNS-M-20150922-33, Rx Head, 9/22/15
- 4) Routine Auxiliary Building Surveys: MNS-M-20140421-13, NS Pump 2B; MNS-M-20150126-5, ND Pump 2B; MNS-M-20150126-6, ND Pump 2A; MNS-M-20150507-11, ND-NS Hx Room B; MNS-M-20150907-22, ND-NS Hx Room B; MNS-M-20150907-23, ND-NS HX Room A; MNS-M-20150909-7, KF Pumps and Hx; MNS-M-20150909-8, Room 815 Mechanical Pen Room; MNS-M-20150909-21, NS Pump 1A; MNS-M-20150919-41, ND Pump 1A; MNS-M-20150919-43, ND Pump 1B

Corrective Action Program (CAP) Documents

PIPs M-14-001870, M-14-081834, and M-14-10000
 ARs 1687354, 1693673, 1902855, 1903044, 1904486, 1931366, 1936206, 1937222, 1948210, 1953656, 1955210 and
 AD-PI-ALL-0100, Corrective Action Program, Rev. 3
 2015 MNS Program Assessment - Surveillance & Control / Contamination Control / Radworker Practices Assessment, Assessment dates 7/20/15 - 7/23/15

Section 2RS8: Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation

Procedures, Manuals, and Guides

HP/0/B/1004/026, "Waste Handling and Segregation", Rev. 013
 OP/0/A/6200/032, "Solid Waste System Operation", Rev. 036
 OP/0/B/6200/064, "Transfer and Dewatering Media", Rev. 029
 AD-RP-ALL-3003, "Outside Radioactive Material Container Inventory and Controls", Rev. 0
 SH/0/B/2004/002, "Preparation and Shipment of Radioactive Waste", Rev. 011
 SH/0/B/2004/001, "Preparation and Shipment of Radioactive Material", Rev. 008

SH/0/B/2004/004, "Preparation and Shipment of Radioactive Material Excepted Package", Rev. 001
 HP/0/B/1004/032, "Packaging Radioactive Filters", Rev. 016
 HP/0/B/1006/011, "Procedure for Changing, Logging, Segregating, and Storing Radioactive Filters", Rev. 016
 "Duke Energy Radioactive Waste Process Control Program Manual, Corporate Process Control Program", Rev. 19
 OP/0/B/6200/529, "WM Operation", Rev. 008
 OP/0/B/6200/083, "WM Process Skid Demineralizers Sluice, Load, and Maintenance", Rev. 019
 HP/0/1003/049, "WMT Release", Rev. 014
 Duke Energy Carolinas, LLC McGuire Nuclear Station, Units 1 and 2 Annual Radioactive Effluent Release Report for 2014.
 AD-PI-ALL-0100, "Corrective Action Program", Rev. 02

Shipping Records and Radwaste Data

Radioactive Shipment Records:

2015 RSR #MNS-15-0017, DAW, LSA-I
 2015 LQS #15-0045, Excepted Package, Limited Quantity
 2015 RSR #MNS 15-0004, Fuel Cleaning Components, Type A package
 2015 RSR #MNS 15-0010, Primary Bead Resin, Type B package
 2013 RSR #MNS 13-0008, DAW, LSA-II
 2014 RSR #MNS 14-0022, DAW, LSA
 2014 RSR #MNS 14-0018, Resin, Type B package
 2014 RSR #MNS 14-0037, Primary Bead Resin, Type B package
 10 CFR Part 61 Analyses, DAW, Primary Bead Resin, Filters, Dated 3/11/15
 Spreadsheet, Radwaste Inventory, 09/04/15
 McGuire Nuclear Station, 2015 10CFR61 Manual [waste stream characterization], 03/11/15
 Training Records –for selected Radioactive Material shipping staff

CAP Documents

AR 01679064
 AR 01904130
 AR 01686147
 AR 01675488
 AR 01681383
 AR 01699905

Section 40A1: Performance Indicator (PI) Verification

NSD-225, NRC Performance Indicators, Rev. 8
 SRPMP 10-1, NRC Performance Indicator Data Collection, Validation, Review and Approval, Rev. 6
 Technical Specification Action Item Logs

Control Room Operator Logs
Corrective Action Program Database
Maintenance Rule Database

Section 40A2: Problem Identification and Resolution

AD-PI-ALL-0100, Corrective Action Program, Rev. 2 and Rev. 3
AD-PI-ALL-0101, Root Cause Evaluation, Rev. 1
AD-PI-ALL-0102, Apparent Cause Evaluation, Rev. 1
AD-PI-ALL-0103, Quick Cause Evaluation, Rev. 1
AD-PI-ALL-0104, Prompt Investigation Response Team, Rev. 1
AD-PI-ALL-0105, Effectiveness Reviews, Rev. 1
AD-LS-ALL-0006, Notification/Reportability Evaluation, Rev. 0
EDM 601 Engineering Change Manual, Rev. 29
AD-EG-ALL-1132, Preparation and Control of Design Change Engineering Changes, Rev. 1
and Rev. 2
MP/0/A/7650/007 On-line Leak Sealing Initial Injection and ReInjection, Rev. 17
AR 01941186, Steam leak from broken 1 inch drain line upstream of 2SM-27
EC 114906, Fabricate a temporary support enclosure for valve 2SM-27