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

October 28, 2013

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

SUBJECT: MCGUIRE NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT 05000369/2013004, 05000370/2013004, AND 07200038/2013001

Dear Mr. Capps:

On September 30, 2013, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your McGuire Nuclear Station Units 1 and 2. On October 10, 2013, 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. The NRC inspectors did not identify any findings or violations of more than minor significance.

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/

Jonathan H. Bartley, Chief
Reactor Projects Branch 1
Division of Reactor Projects

Docket Nos.: 50-369, 50-370, and 72-0038
License Nos.: NPF-9, NPF-17

Enclosure: NRC Integrated Inspection Report
05000369/2013004, 05000370/2013004, and
07200038/2013001 w/Attachment –
Supplemental Information

cc: via ListServ distribution

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Letter to Steven D. Capps from Jonathan H. Bartley dated October 28, 2013

SUBJECT: MCGUIRE NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT 05000369/2013004, 05000370/2013004, AND 07200038/2013001

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.:	50-369, 50-370, 72-0038
License Nos.:	NPF-9, NPF-17
Report Nos.:	05000369/2013004, 05000370/2013004, 07200038/2013001
Licensee:	Duke Energy Carolinas, LLC
Facility:	McGuire Nuclear Station, Units 1 and 2
Location:	Huntersville, NC 28078
Dates:	July 1, 2013, through September 30, 2013
Inspectors:	J. Zeiler, Senior Resident Inspector J. Heath, Resident Inspector A. Butcavage, Reactor Inspector (4OA5.2) R. Carrion, Senior Reactor Inspector (4OA5.2) W. Loo, Senior Health Physicist (2RS6 and 4OA1) J. Rivera, Health Physicist (2RS7 and 4OA1) R. Williams, Reactor Inspector (Section 4OA5.4)
Approved by:	Jonathan Bartley, Chief Reactor Projects Branch 1 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR05000369/2013-004, IR05000370/2013-004, 07200038/2013001; 07/01/2013 – 09/30/2013; McGuire Nuclear Station, Units 1 and 2; Routine Integrated Inspection Report and Independent Spent Fuel Storage Installation (ISFSI).

The report covered a three month period of inspection by the resident inspectors and five regional inspectors. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, “Reactor Oversight Process” revision 4. No findings were identified.

REPORT DETAILS

Summary of Plant Status

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

Unit 2 operated at essentially 100 percent RTP for the entire inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

a. Inspection Scope

Flood Protection Measures – External: The inspectors evaluated aspects the licensee's external flood protection features. This included a walkdown of the northern earthen dike extension of the Cowans Ford Dam and rooftops of the Unit 1 and Unit 2 auxiliary, service, and fuel handling buildings. The inspectors assessed the structural integrity and general condition of the earthen dike which is designed to protect safety-related facilities from flooding by Lake Norman. The inspectors verified that building roof drains and parapets, which protect safety-related buildings from flooding during rain storms, were intact and free of debris to ensure proper drainage functionality, and appropriate rooftop housekeeping was being implemented to prevent potential drain blockage. The inspectors reviewed the licensee's corrective action program (CAP) database to ensure that the licensee was identifying flood protection issues and resolving them commensurate with their significance. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R04 Equipment Alignment

a. Inspection Scope

Partial Walkdowns: The inspectors performed a partial walkdown of the following four systems to assess the operability of redundant or diverse trains and components when safety equipment was inoperable. The inspectors focused on discrepancies that could impact the function of the system and potentially increase risk. The inspectors reviewed applicable operating procedures and walked down control systems components to verify selected breakers, valves, and support equipment were in the correct position to support system operation. Documents reviewed are listed in the Attachment.

- 2A motor driven auxiliary feedwater (MDCA) pump and Unit 2 turbine driven auxiliary feedwater (TDCA) pump while the 2B MDCA pump was out of service for motor cooler maintenance

- 2A residual heat removal (ND) system while the 2B ND system was out of service for preventive maintenance
- 1B nuclear service water (RN) system while the 1A RN pump was out of service for preventive maintenance
- 1A emergency diesel generator (EDG) while the 1B EDG out of service for battery charger maintenance

1R05 Fire Protection

a. Inspection Scope

Fire Protection Walkdowns: The inspectors walked down accessible portions of the following five plant areas to determine if they were consistent with the Updated Final Safety Analysis Report (UFSAR) and the fire protection program for defense in depth features. The features assessed included the licensee's control of transient combustible material and ignition sources, fire detection and suppression capabilities, firefighting equipment, and passive fire features such as fire barriers. The inspectors also reviewed the licensee's compensatory measures for fire deficiencies to determine if they were commensurate with the significance of the deficiency. The inspectors reviewed the fire plans for the areas selected to determine if it was consistent with the fire protection program and presented an adequate fire fighting strategy. Documents reviewed are listed in the Attachment.

- Unit 1 and Unit 2 auxiliary building 750 foot elevation, common area (Fire Area 21)
- Unit 1 and Unit 2 vital battery rooms (Fire Area 13)
- Unit 2 auxiliary feedwater pump rooms (Fire Areas 3 and 3A)
- Unit 2 spent fuel pool area (Fire Area 25)
- Unit 1 and Unit 2 auxiliary building 716 foot elevation (Fire Area 4)

b. Findings

No findings were identified.

1R06 Flood Protection Measures

a. Inspection Scope

Annual Review of Electrical Manholes: The inspectors conducted a visual examination of the majority of the Protected Area plant underground electrical cable manholes, including; CMHPH-1, CMHP-1A, CMHP-2, CMHP-3, CMHP-22, CMHPH-28, CMHP-T1, CMHP-T2, TR-2, TR-3, TR-5, TR-8, TR-11, TR-12, and TR-21. The inspectors assessed the condition of the electrical cables located inside these manholes by verifying the cables, splices, support structures, and sump pumps were not being adversely impacted by standing water. In addition, the inspectors reviewed the licensee's CAP database and outstanding sump pump work requests to verify that

electrical manhole related problems were being identified at the appropriate level, entered into the CAP and work repair system, and appropriately resolved. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R07 Heat Sink Performance - Annual Resident Inspection

a. Inspection Scope

The inspectors selected the 2B MDCA pump motor cooler based on its risk significance and observed the inspections and/or performance tests, or reviewed the results, to determine whether the heat exchangers were ready and available to perform their intended functions as described in the UFSAR. The inspectors evaluated whether the frequency of inspection was sufficient to detect degradation prior to loss of heat removal capabilities below design requirements; that the inspection results were appropriately categorized against pre-established engineering acceptance criteria, including the impact of tubes plugged on the heat exchanger performance; that the licensee had developed adequate acceptance criteria for bio-fouling controls; and that the heat exchanger was properly reassembled with regard to end-bell orientation. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

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

a. Inspection Scope

Quarterly Resident Inspector LOR Activity Review: On September 10, 2013, the inspectors observed operators in the plant's simulator during licensed operator NRC annual requalification examinations. The simulator examination scenarios involved a loss of heat sink and a steam generator tube rupture event. The inspectors assessed overall crew performance, clarity and formality of communications, use of procedures, alarm response, control board manipulations, group dynamics and supervisory oversight. The inspectors observed the post-exercise critique to determine whether the licensee identified deficiencies and discrepancies that occurred during the simulator examinations. Documents reviewed are listed in the Attachment.

Quarterly Resident Inspector Licensed Operator Performance Review: On September 4, 2013, the inspectors observed operators in the main control room and assessed their performance during a heightened plant risk period (i.e., "Orange" risk condition) involving the concurrent removal of the 1B RN pump, 1B EDG, and 1B MDCA pump from service for planned maintenance activities. The inspectors verified that operator specific risk mitigation measures as delineated in the associated Complex and Critical Work Plans

were properly implemented. These measures included protection of opposite train equipment utilizing barrier postings/signs, operator reviews of abnormal operating procedures involving loss of electrical power and nuclear service water cooling, and preparations to immediately stop work and restore equipment to service should the need arise. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed the three activities listed below for items such as: 1) appropriate work practices; 2) identifying and addressing common cause failures; 3) scoping in accordance with 10 CFR 50.65(b) of the Maintenance Rule; 4) characterizing reliability issues for performance; 5) charging unavailability for performance; 6) balancing reliability and unavailability; 7) trending key parameters for condition monitoring; 8) classification and reclassification in accordance with 10 CFR 50.65(a)(1) or (a)(2); and 9) appropriateness of performance criteria for structures, systems, and components (SSCs)/functions classified as (a)(2) and/or appropriateness and adequacy of goals and corrective actions for SSCs/functions classified as (a)(1). The inspectors performed a detailed review of the problem history and surrounding circumstances, evaluated the extent of condition reviews as required, and reviewed the generic implications of the equipment and/or work practice problem. Documents reviewed are listed in the Attachment.

- PIP M-13-06059, Mechanical failure during restoration of 120 volt alternating current (AC) safety related inverter 2EVIB
- PIP M-13-07746, 1B EDG lube oil temperature 1LDTS5050 switch failed during performance test
- PIPs M-13-08222, 2B chemical and volume control system (NV) pump motor cooler inlet isolation valve 2RN-204B failed to meet stroke time requirements following tagout restoration

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors reviewed the licensee's risk assessments and the risk management actions used to manage risk for the plant configurations associated with the five activities listed below. The inspectors assessed whether the licensee performed adequate risk assessments, and implemented appropriate risk management actions when required by

10 CFR 50.65(a)(4). For emergent work, the inspectors verified that any increase in risk was promptly assessed, that appropriate risk management actions were promptly implemented, and that work activities did not place the plant in unacceptable configurations. Documents reviewed are listed in the Attachment.

- Yellow risk on Unit 2 for the 2B EDG and 2B MDCA pump out of service for planned complex maintenance plan
- Yellow risk on Unit 2 for 525 kilo-volt AC Yellow bus out of service for power circuit breaker 52 current transformer planned testing
- Yellow risk on Units 1 and 2 for planned standby nuclear service water pond (SNSWP) macro-fouling elimination complex plan
- Orange risk on Unit 1 for the 1B RN pump, 1B EDG, and 1B MDCA pump out of service for planned critical maintenance plan
- Yellow risk on Unit 1 for the TDCA pump and standby shutdown facility (SSF) out of service for planned complex maintenance plan

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments

a. Inspection Scope

The inspectors reviewed the six technical evaluations listed below to determine whether Technical Specification (TS) operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors reviewed any compensatory measures taken for degraded SSCs to determine whether the measures were in-place and adequately compensated for the degradation. For the degraded SSCs, or those credited as part of compensatory measures, the inspectors reviewed the UFSAR to determine whether the measures resulted in changes to the licensing basis functions, as described in the UFSAR, and whether a license amendment was required per 10 CFR 50.59. Documents reviewed are listed in the Attachment.

- PIP M-13-07106, Senior reactor operator decision-making process for work on 1B/2B RN supply isolation valve from condenser cooling water (0RN-4AC)
- PIP M-13-07480, Incorrect ampere micro-switches installed in EDG Halon fire protection circuitry
- PIP M-13-07617, Electrical noise on source range nuclear instrument 1N32
- PIP M-13-07874, NV pump casings exceed design pressures under certain accident conditions
- PIP M-13-08414, Intermittent electrical ground on 600 volt AC normal auxiliary power transformer 1LXF
- PIP M-13-09076, 2B EDG failed to synchronize to electrical bus during testing

b. Findings

No findings were identified.

1R18 Plant Modifications

a. Inspection Scope

The inspectors reviewed the following two plant modifications to verify the adequacy of the modification packages and 10 CFR 50.59 screenings. Each modification was evaluated against the TS, UFSAR, and licensee design bases documents for the systems affected to ensure the modification did not adversely affect the availability, reliability, and functional capability of important SSCs. Documents reviewed are listed in the Attachment.

Permanent Modification

- EC 10150, Rewiring of 1A MDCA pump suction isolation valve 1CA-11A close torque bypass switch

Temporary Modification

- EC 111178, Temporary setpoint change to Unit 1 Distributed Control System pressurizer pressure deviation

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing

a. Inspection Scope

The inspectors reviewed the six post-maintenance tests listed below to determine if procedures and test activities ensured system operability and functional capability. The inspectors reviewed the licensee's test procedures to determine if the procedures adequately tested the safety function(s) that may have been affected by the maintenance activities, that the acceptance criteria in the procedures were consistent with information in the applicable licensing basis and/or design basis documents, and that the procedures had been properly reviewed and approved. The inspectors also witnessed the tests and/or reviewed the test data to determine if test results adequately demonstrated restoration of the affected safety function(s). Documents reviewed are listed in the Attachment.

- 1B RN supply valve 0RN-4AC functional testing following planned maintenance activities
- 1A MDCA pump suction isolation valve 1CA-11A functional testing following planned electrical/mechanical inspection and engineering change

- 2A component cooling water valve 2KC-50A functional testing following planned actuator maintenance
- 2A ND pump functional testing following planned preventive maintenance
- 2A EDG 125 volt direct current battery charger functional testing following planned replacement of ground detection sensing boards
- 2B EDG functional testing following emergent repair to replace bus synchronization transducer that prevented paralleling EDG to bus

b. Findings

No findings were identified.

1R22 Surveillance Testing

a. Inspection Scope

For the six surveillance tests identified below, the inspectors witnessed testing and reviewed the test data, to determine if the SSCs involved in these tests satisfied the requirements described in the Technical Specifications, the Updated Final Safety Analysis Report, and applicable licensee procedures. In addition, the inspectors verified that the tests demonstrated that the SSCs were capable of performing their intended safety functions.

Surveillance Tests
- PT/1/A/4403/001B, 1B RN Pump Performance Test, Revision (Rev.) 66
- TT/1/A/9100/631, Unit 1 TDCA Pump Speed Test Using Governor Controls, Rev. 1
- PT/2/A/4350/002A, Diesel Generator 2A Operability Test, Rev. 92
- PT/1/A/4450/003I, Train B VE System Performance Test, Rev. 9
- PT/2/A/4204/001A, 2A ND Pump Performance Test, Rev. 62

In-Service Tests
- PT/1/A/4252/002B, CA Valve Stroke Timing - Quarterly 1B Motor Driven Pump Flowpath, Rev. 44

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation

a. Inspection Scope

Licensed Operator Simulator Emergency Preparedness Training: On September 10, 2013, the inspectors observed the performance of two simulator-based licensed operator NRC annual requalification exams that required implementation of emergency

preparedness actions for the declaration of a Site Area Emergency. The simulator exam scenarios involved a loss of heat sink and a steam generator tube rupture event. The inspectors assessed emergency procedure usage, emergency plan classifications, notifications, and protective action recommendation development. The inspectors evaluated the adequacy of the licensee's conduct of the simulator examination and critique performance and verified that, as appropriate, performance weaknesses were captured in the licensee's operator training program or CAP.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstones: Occupational Radiation Safety and Public Radiation Safety

2RS6 Radioactive Gaseous and Liquid Effluent Treatment

a. Inspection Scope

Event and Effluent Program Reviews: The inspectors reviewed the 2011 and 2012 Annual Radiological Effluent Release Report (ARERR) documents for consistency with the requirements in the Offsite Dose Calculation Manual (ODCM) and TS details. Routine and abnormal effluent release results and reports, as applicable, were reviewed and discussed with responsible licensee representatives. Status of the radioactive gaseous and liquid effluent processing and monitoring equipment and activities, and changes thereto, as applicable, described in the UFSAR and current ODCM were discussed with responsible staff.

Walk-Downs and Observations: The inspectors walked-down selected gaseous and liquid discharge system components to ascertain material condition, configuration, and alignment. Walkdowns included visual inspections of 0 EMF-49 Waste Liquid Radiation Monitor, 1 and 2 EMF-35, Unit Vent Particulate Radiation Monitors, 1 and 2 EMF-36, Unit Vent Gaseous Radiation Monitors, and 1 and 2 EMF-37, Unit Vent Iodine Radiation Monitors. The inspectors observed the material condition of abandoned in place liquid waste processing equipment for indications of degradation or leakage that could constitute a possible release pathway to the environment to the extent practical.

Sampling and Analyses: There were no opportunities to observe sampling and analysis for liquid or gaseous effluent releases. However, the inspector reviewed the results of the count room's inter-laboratory comparison program and discussed with the licensee.

Dose Calculations: The inspectors discussed recent changes in reported dose values relative to previous ARERR reporting periods. The inspectors reviewed and evaluated selected waste gas decay tank (WGDT) and liquid effluent releases. The evaluations included review and discussion of setpoint determinations and dose calculation summaries. Dose calculations associated with potential WGDT releases were reviewed and discussed in detail. Updated results for the most recent land use census data were

evaluated against assumptions used to calculate offsite dose results. In addition, the inspectors reviewed selected abnormal release data and resultant dose calculations for Calendar Years (CYs) 2011 and 2012.

Ground Water Protection Implementation: The licensee's implementation of the Industry Ground Water Protection Initiative was reviewed for changes since the last inspection. Groundwater sampling results obtained since the last inspection were reviewed. Licensee response, evaluation, and follow-up to spills and leaks since the last inspection were reviewed in detail. In addition, entries made into the 10 CFR 50.75(g) records for identified leakage and spills were reviewed.

Problem Identification and Resolution: The inspectors reviewed selected CAP documents in the areas of effluent processing and groundwater protection. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with NSD 208, Problem Investigation Process, Rev. 38.

Effluent process and monitoring activities were evaluated against details and requirements documented in the UFSAR Sections 11 and 12; Selected Licensee Commitment Section 16, TS Sections 5.4.1 Procedures, 5.5 Programs and Manuals, and 5.6 Reporting Requirements; ODCM; 10 CFR Part 20; 10 CFR, Appendix I to Part 50; and approved licensee procedures. In addition, ODCM and UFSAR changes since the last onsite inspection were reviewed against the guidance in NUREG-1301 and Regulatory Guide (RG) 1.109, RG 1.21, and RG 4.1. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

2RS7 Radiological Environmental Monitoring Program (REMP)

a. Inspection Scope

REMP Status and Results: The inspectors reviewed recent changes applicable to Radiological Environmental and Meteorological Monitoring program activities detailed in the UFSAR, and ODCM. Environmental monitoring sample results presented in the Annual Radiological Environmental Operating Report (AREOR) documents issued for CYs 2011 and 2012 were reviewed. The REMP vendor laboratory cross-check program results and select procedural guidance for collection, processing and analysis of airborne particulate and iodine, broadleaf vegetation, fish, food products, milk, shoreline sediment, and surface/drinking water were reviewed. Detection level sensitivities as document within the AREOR for selected environmental media analyzed by the vendor environmental laboratory were reviewed. The AREOR environmental measurement results were reviewed for consistency with licensee ARERR data and evaluated for radionuclide concentration trends.

Site Inspection: The inspectors observed and discussed implementation of selected REMP monitoring and sample collection activities for atmospheric particulates and iodine, and observed locations of direct radiation measurements, and broadleaf vegetation samples sites as specified in the current ODCM and applicable procedures. The inspectors observed airborne equipment and thermoluminescent dosimeter material conditions and evaluated operability for the weekly airborne particulate filter and iodine cartridge change-outs at seven atmospheric sampling stations. In addition, the inspectors discussed broadleaf vegetation and surface water sampling for selected ODCM locations. Monitoring and impact of licensee routine releases on offsite doses based on meteorological dispersion parameters and gardens locations identified in the most current land use census were reviewed in detail. Actions for missed environmental samples, including compensatory measures and/or availability of replacement equipment, were reviewed and discussed with knowledgeable staff. In addition, sample pump calibration and maintenance records for selected environmental air monitoring equipment and composite water samplers were reviewed.

The inspectors toured the primary meteorological tower and observed the weekly channel verification, and a delta temperature channel calibration on the meteorological instrumentation. The inspectors observed the physical condition of the tower and associated instruments and discussed equipment operability and maintenance history with responsible licensee staff. For the meteorological measurements of wind speed, wind direction, and temperature, the inspectors reviewed applicable meteorological tower instrumentation semi-annual calibration records and evaluated meteorological measurement data recovery for CYs 2011 and 2012.

Problem Identification and Resolution: The inspectors reviewed selected CAP documents in the area of radiological environmental monitoring. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with NSD 208.

Procedural guidance, program implementation, quantitative analysis sensitivities, and environmental monitoring results were reviewed against 10 CFR Part 20; 10 CFR Part 50; TS Sections 5.4.1 - Procedures, 5.5 - Programs and Manuals, and 5.6 - Reporting Requirements; ODCM, Rev. 54; RG 4.15, Quality Assurance for Radiological Monitoring Programs (Normal Operation) - Effluent Streams and the Environment; Selected Licensee Commitment (SLC) 16.11.3, Radiological Environmental Monitoring Program; and the Branch Technical Position, An Acceptable Radiological Environmental Monitoring Program - 1979. Licensee procedures and activities related to meteorological monitoring were evaluated against ODCM; Safety Guide 1.23, Onsite Meteorological Programs; and SLC 16.7.3, Meteorological Instrumentation. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

a. Inspection Scope

The inspectors sampled licensee data to confirm the accuracy of reported PI data for the following six indicators. To determine the accuracy of the PI data reported for the specified review period, the inspectors compared the licensee's basis in reporting each data element to the PI definitions and guidance contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Indicator Guideline," Rev. 6, as well as the licensee's procedural guidance for reporting PI information. Documents reviewed are listed in the Attachment.

Mitigating Systems Cornerstone

- Mitigating Systems Performance Index (MSPI) – Secondary Heat Removal (Unit 1 and Unit 2)
- MSPI – Residual Heat Removal (Unit 1 and Unit 2)

The inspectors reviewed the PI results for July 2012 through June 2013. The inspectors independently screened TS Action Item Logs, selected control room logs, and maintenance rule failure data, to determine if unavailability/unreliability hours were properly reported.

Occupational Radiation Safety Cornerstone

- Occupational Exposure Control Effectiveness

The inspectors reviewed the PI results for July 2012 through March 2013. The inspectors reviewed electronic dosimeter alarm logs and selected CAP documents related to controls for exposure significant areas.

Public Radiation Safety Cornerstone

- Radiological Control Effluent Release Occurrences

The inspectors reviewed the PI results for June 2012 through March 2013. The inspectors reviewed cumulative and projected doses to the public and CAP documents related to Radiological Effluent TSs/ODCM issues including abnormal effluent releases.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution

a. Inspection Scope

Daily Review of Items Entered into the Corrective Action Program: As required by Inspection Procedure 71152, "Problem Identification and Resolution," and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed screening of items entered into the licensee's corrective action program. This was accomplished by reviewing copies of condition reports, attending some daily screening meetings, and accessing the licensee's computerized CAP database.

Annual Sample Reviews: The inspectors reviewed the two issues listed below in detail to evaluate the effectiveness of the licensee's corrective actions for important safety issues.

- Periodic assessment of Senior Reactor Operator (SRO) decision-making process entries for selected PIPs identifying degraded equipment conditions, generated between January 1, 2013, and September 30, 2013
- PIP M-13-00502, Explosion and fire of current transformer associated with switchyard 525 kilo-volt AC power circuit breaker 55

The inspectors assessed whether the issues were properly identified; documented accurately and completely; properly classified and prioritized; adequately considered extent of condition, generic implications, common cause, and previous occurrences; adequately identified root causes/apparent causes; and identified appropriate and timely corrective actions. The inspectors evaluated the licensee documents against the requirements of the licensee's CAP and implementing procedures, and 10 CFR 50, Appendix B. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

4OA5 Other Activities

.1 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

During the inspection period, the inspectors conducted observations of security force personnel and activities to ensure that the activities were consistent with licensee security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours. These quarterly resident inspector observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status review and inspection activities.

b. Findings

No findings were identified.

.2 On-Site Operation of an Independent Spent Fuel Storage Installation (ISFSI)

a. Inspection Scope

The inspectors conducted a review of licensee and vendor activities as they related to the initial loading of the NAC Modular Advanced Generation Nuclear All-purpose STORage (MAGNASTOR®) System Transportable Storage Canister (TSC) and its placement on the ISFSI pad. The inspectors observed and independently evaluated the activities to determine if the licensee operated the ISFSI in conformance with the commitments and requirements contained in the Final Safety Analysis Report (FSAR), the NRC's Safety Evaluation Report (SER), the Certificate of Compliance (CoC) for the MAGNASTOR® system, the licensee's Quality Assurance (QA) Program, and 10 CFR Part 72. The inspectors observed selected activities to verify that the licensee performed cask loading activities in a safe manner and in compliance with approved procedures. The inspectors observed that the licensee identified each fuel assembly placed in the MAGNASTOR® TSC and maintained a record of each fuel assembly as a controlled document. The inspectors evaluated the effectiveness of the licensee's management oversight and QA assessments of ISFSI loading activities by observing supervisory involvement and oversight and reviewing subsequent deficiencies and corrective actions.

b. Findings

No findings were identified.

.3 ISFSI Campaign Loading and Transfer Operations

a. Inspection Scope

Using NRC Inspection Procedure 60855.1, the inspectors reviewed the licensee's procedures and observed activities associated with the loading of the following three Unit 2 casks and transportation to the ISFSI storage pad. The casks were loaded on July 23, August 14, and August 31, 2013, respectively.

- NAC-MAGNASTOR TSC-MNZ-26
- NAC-MAGNASTOR TSC-MNZ-29
- NAC-MAGNASTOR TSC-MNZ-31

The inspectors reviewed the cask loading documentation and spent fuel pool inventory for each of the above casks to verify that each fuel assembly was placed in its intended cask location. The inspectors confirmed that each fuel assembly loaded met the TS and NAC-MAGNASTOR FSAR requirements for dry storage. The inspectors reviewed selected licensee activities involving the cask loading, hydrostatic testing, drying/draining, helium testing, and transfer as specified in procedure MP/0/A/7650/227,

Loading Spent Fuel Assemblies into MAGNASTOR Casks, Rev 3. The inspectors verified that these activities were being accomplished in a safe manner and in accordance with procedural requirements. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.4 (Closed) Temporary Instruction (TI) 2515/182, Review of the Industry Initiative to Control Degradation of Underground Piping and Tanks (Phase II)

a. Inspection Scope

The inspectors conducted a review of records and procedures related to the licensee's program for buried pipe, underground pipe and tanks in accordance with Phase II of the TI to confirm that the licensee's program contained attributes consistent with Sections 3.3.A and 3.3.B of NEI 09-14, Guideline for the Management of Buried Piping Integrity, and that these attributes were scheduled and/or completed by the NEI 09-14, Rev. 3 deadlines. The inspectors interviewed licensee staff responsible for the buried pipe program and reviewed buried pipe program related activities to determine if the program attribute was accomplished in a manner which reflected good or poor practices in program management.

The licensee's buried piping and underground piping and tanks program was inspected in accordance with Paragraph 03.02.a and 03.02.b of the TI. The inspectors confirmed that activities which corresponded to completion dates specified in the program since the Phase I inspection was conducted, had been completed. Responses to specific questions found in http://www.nrc.gov/reactors/operating/ops-experience/buried-pipe-ti-phase-2-insp-req-2011-11-16.pdf were submitted by the inspectors to the NRC headquarters staff. Phase II of TI 2515/182 was completed based upon the scope of the review described above. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exits

On October 10, 2013, the resident inspectors presented the inspection results to Mr. Steven Capps and other members of his staff. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee
D. Black, Security Manager
S. Capps, Vice President, McGuire Nuclear
K. Crane, Senior Licensing Specialist
J. Gabbert, Chemistry Manager
J. Hicks, Maintenance Superintendent
M. Kelly, Outage and Scheduling Manager
S. Mooneyhan, Radiation Protection Manager
C. Morris, Station Manager
J. Nolin, Engineering Manager
J. Robertson, Regulatory Compliance Manager
P. Schuerger, Training Manager
S. Snider, Superintendent of Operations

LIST OF REPORT ITEMS

Closed

2515/182	TI	Review of the Industry Initiative to Control Degradation of Underground Piping and Tanks (Phase II) (Section 4OA5.4)

DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Flood Protection Measures - External
UFSAR Section 2.4, Hydrology
MCS-1465.00-00-0012, Design Basis Specification for Flooding from External Sources, Rev. 2
MCC-1100.00-00-0002, McGuire Probable Maximum Precipitation Flood Analysis, Rev. 0
MCM-1100.00-0001.001, McKim & Creed Probable Maximum Precipitation Flood Analysis
MCM-1100.00-0002.001, McGuire Nuclear Station Plant Yard Topographic Survey
Drawing No. MC-1022-01.00, Grading Plan, Plant Area, Rev. 51
Drawing No. MC-1040-7.1, General Arrangement Roof Plan, Rev. 9

Section 1R04: Equipment Alignment

Partial System Walkdown
OP/2/A/6250/002, Auxiliary Feedwater System, Rev. 85
MCFD-2592.01.00, Flow Diagram of Auxiliary Feedwater System, Rev. 10
OP/2/A/6200/004, Residual Heat Removal System, Rev. 87
MCFD-2561.01.00, Flow Diagram of Residual Heat Removal System, Rev. 22
OP/1/A/6400/006, Nuclear Service Water System, Rev. 230
MCFD-2574.01.01, Flow Diagram of Nuclear Service Water System, Rev. 30
OP/1/A/6350/002, Diesel Generator, Rev. 119

Section 1R05: Fire Protection

MCS-1465.00-00-0008, Design Basis Specification for Fire Protection, Rev. 16
NSD 104, Material Condition/Housekeeping, Foreign Material Exclusion and Seismic Concerns, Rev. 33
NSD 313, Control of Transient Fire Loads, Rev. 14
RP/0/A/5700/025, Fire Brigade Response, Rev. 19
FS/0/B/9000/021, Aux 750, Rev. 0
FS/0/B/9000/013, Vital Battery Room, Rev. 0
MFSD-013, Vital Battery Room, Rev. 0
MFSD-021, Aux 750, Rev. 0
MFSD-003, Unit 2 CA Pump Room, Rev. 0
MFSD-025, Auxiliary Building 767, Rev. 0
FS/0/B/9000/004, (Aux 716) Fire Strategy #4, Rev. 0

Section 1R06: Flood Protection Measures

MC-1768-01.01, Miscellaneous Sump Pump System Controls, Rev. 6
MC-1948-01.00, Electrical Equipment Layout Outdoor Area, Rev. 71
MC-1948-01.03, Electrical Equipment Layout Outdoor Area, General Plan Conduit, Cables & Trenches Composite Drawing, Rev. 10
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
PIPs M-11-03307, M-11-09334, M-12-00901, and M-13-01218
Work Request # 108734

Section 1R07: Heat Sink Performance

MCC-1223.24-00-0073, RN Supplied Integral Essential Motor Cooler Tube Plugging Analysis, Rev. 2
MCC-1223.24-00-0106, System Parameters for Various RN Motor Cooler and AHU Air-Operated Valves, Rev. 0
MP/0/A/7700/043, Westinghouse Large Motor Cooler Hx Maintenance, Rev. 25

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

Quarterly Resident Inspector LOR Activity Review

NSD 509, Site Standards in Support of Operational Focus, Rev. 6
SOMP 01-07, Control Room Oversight, Rev. 1
Active Simulator Exam-35 and -42
AP/1/A/5500/020, Loss of RN, Rev. 31
AP/1/A/5500/023, Loss of Main Condenser Vacuum, Rev. 7
EP/1/A/5000/E-0, Reactor Trip or Safety Injection, Rev. 33
EP/1/A/5000/E-3, Steam Generator Tube Rupture, Rev. 23
EP/1/A/5000/ES-0.1, Reactor Trip Response, Rev. 36
EP/1/A/5000/FR-H.1, Loss of Secondary Heat Sink, Rev. 17

Quarterly Resident Inspector Licensed Operator Performance Review

Critical Activity Plan for 1B RN Work
AP/1/A/5500/007, Loss of Electrical Power, Rev. 32

Work Orders 2094551, 20888760, 2048609 for RN work activities related to Orange risk status
NSD 415, Risk Management Plan Development, Rev. 8

Section 1R12: Maintenance Effectiveness
NSD 310, Requirements for the Maintenance Rule, Rev. 12
EDM 201, Risk Category Scoping, Health Grouping and ER Strategy, Rev. 15
EDM 210, Engineering Responsibilities for the Maintenance Rule, Rev. 26
SSC Function Scoping Database

Section 1R13: Maintenance Risk Assessments and Emergent Work Control
NSD 213, Risk Management Process, Rev. 11
NSD 415, Operational Risk Management (Modes 1–3) per 10 CFR 50.65(a)(4), Rev. 7
SOMP 02-02, Operations Roles in the Risk Management Process, Rev. 13
NSD 213 Complex Plan 13W28, Testing new PCB 52 CTs with 525 kV Yellow Bus out of service
PIP M-13-06996, PRA coding associated with Unit 2 switchyard work

Section1R15: Operability Determinations and Functionality Assessments
NSD 203, Operability/Functionality, Rev. 26
NSD 515, Operational Decision Making, Rev. 8
MCTC-1574-RN.V002-01, Testing and Acceptance Criteria for 0RN4AC and 0RN5B, Rev. 4
WO 0200343112

Section1R18: Plant Modifications
NSD 301, Engineering Change Program, Rev. 41
EDM 601, Engineering Change Manual, Rev. 19
OMP 10-2, Temporary Engineering Changes, Rev. 13
SOMP 02-04, Engineering Change Implementation Process, Rev. 0

Section 1R19: Post-Maintenance Testing
NSD 408, Testing, Rev. 16
WO 0200343112, 0RN-4AC valve actuator maintenance
PT/1/A/4403/002A, RN Train A Valve Stroke Timing Quarterly, Rev. 62
IP/0/A/3066/013, Testing Butterfly Valve using VIPER, Rev. 9
WO 02073904, 1CA-11A actuator maintenance work
WO 02057531, 1CA-11A actuator maintenance work
PT/1/A/4252/007A, CA System Train 1A Performance Test, Rev. 29
EC 101501, 1CA-11A Close-torque bypass switch wiring modification, Rev. 0
WO 01883351, 2EPQBCEDGA Replacement of X311 & X312 ground detection boards
IP/0/A/3061/017A, 125 VDC SCI D/G Battery Ground Detector Calibration, Rev. 3

Section1R22: Surveillance Testing
WO 02098030, 1A CA pump slave start
WO 02094438, 1A CA pump test
WO 02025765, U1 TDCA pump speed control testing

Section 2RS6: Radioactive Gases and Liquid Effluent Treatment

Procedures, Guidance Documents, and Manuals

HP/0/B/1003/001, Unit Vent Calculations, Rev. 8
HP/0/B/1003/008, Determination of Radiation Monitor Setpoints (EMFs), Rev. 41
HP/0/B/1003/036, Unit Vent, Rev. 25
HP/0/B/1003/039Q, VQ Release Procedure, Rev. 22
HP/0/B/1003/041, Auxiliary Building Ventilation (EMF41), Rev. 5
HP/0/B/1003/042, Spent Fuel Building Ventilation (EMF42), Rev. 5
HP/0/B/1003/044, Containment Ventilation Unit Condensate Drain Tank (CVUCDT) Release to the RC System, Rev.12
HP/0/B/1003/049, WMT Release, Rev.13
HP/0/B/1003/050, Waste Gas Decay Tank Sampling and Release, Rev. 15
HP/0/B/1003/070, Liquid and Gaseous Composite Preparation, Effluent Sampling and Analysis Documentation, Rev. 13
NSD-208, Problem Investigation Process (PIP), Rev. 38
NSD 517, Radiological Ground Water Protection Program, Rev. 2
NSD 607, Self Assessments and Benchmarking, Rev. 17
PT/1/A/4450/001B, VA HEPA/Damper and Carbon Adsorber Filters In-Place Leak Test, Rev. 17
PT/1/A/4450/001D, VF HEPA/Damper and Carbon Adsorber Filters In-Place Leak Test, Rev. 17
PT/1/A/4450/012B, Auxiliary Building Filter Train Air Flow Measurement, Rev. 14
PT/2/A/4450/001B, VA HEPA/Damper and Carbon Adsorber Filters In-Place Leak Test, Rev. 15
PT/2/A/4450/001D, VF HEPA/Damper and Carbon Adsorber Filters In-Place Leak Test, Rev. 16
PT/2/A/4450/012B, Auxiliary Building Filter Train Air Flow Measurement, Rev. 16
RP Policy V-01, Interlaboratory Cross Check Program, Rev. 2
SH/0/B/2007/003, Determination of Cumulative and Projected Offsite Dose from Effluents, Rev. 0
SRPMP 8-2, Investigation of Unusual Occurrence, Rev. 8
SRPMP 9-1, Groundwater Well Sampling Protocol, Rev. 7

Records and Data Reviewed

2011 Annual Radioactive Effluent Release Report, April 30, 2012
2012 Annual Radioactive Effluent Release Report, April 25, 2013
Duke Power Company, Interlaboratory Cross Check Program, Sample Analysis Forms from 2011 to 2012
HP/0/B/1003/036, Unit Vent, Rev. 25, Unit 1, Dated 07/08/13
HP/0/B/1003/036, Unit Vent, Rev. 25, Unit 2, Dated 07/08/13
HP/0/B/1003/039Q, VQ Release Procedure, Rev. No. 22, Unit 1, Gaseous Waste Release No. 2013009, Dated 03/04/13
HP/0/B/1003/044, Containment Ventilation Unit Condensate Drain Tank (CVUCDT) Release to the RC System, Rev. 12, Unit 2, Liquid Waste Release No. 2013069, Dated 03/16/13
HP/0/B/1003/049, WMT Release, Rev. 13, WMT A, Liquid Waste Release No. 2013025, Dated 02/22/13
HP/0/B/1003/050, Waste Gas Decay Tank Sampling and Release, Rev. 15, Gaseous Waste Release Report No. 2013019, Dated 03/11/13
McGuire Nuclear Station Decommissioning Files
McGuire Nuclear Station, Units 1 and 2, Offsite Dose Calculation Manual (ODCM), Rev. 54

PT/1/A/4450/001B, VA HEPA/Damper and Carbon Adsorber Filters In-Place Leak Test, Rev. 14 and 17
PT/1/A/4450/001D, VF HEPA/Damper and Carbon Adsorber Filters In-Place Leak Test, Rev. 17
PT/1/A/4450/012B, Auxiliary Building Filter Train Air Flow Measurement, Rev. 14
PT/2/A/4450/001B, VA HEPA/Damper and Carbon Adsorber Filters In-Place Leak Test, Rev. 14 and 15
PT/2/A/4450/001D, VF HEPA/Damper and Carbon Adsorber Filters In-Place Leak Test, Rev. 16
PT/2/A/4450/012B, Auxiliary Building Filter Train Air Flow Measurement, Rev. 16
SRPMP 9-1, Groundwater Well Sampling Protocol, Rev. No. 007, Dated 03/05/13 and 06/04/13

CAP Documents
Nuclear Oversight – Audit, McGuire Radiological Effluents Control Audit, 12-20(NOS)(REC)(MNS), Dated 12/12/12
M-RPS-SA-12-04, NSD-516, Tritium Management Program, Dated 01/29/13
PIPs M-11-01837, M-11-02444, M-11 04945, M-11-05218, M-12-01537, M-12-01666, M-13-00259

Section 2RS07: Radiological Environmental Monitoring Program (REMP)

Procedures and Guidance Documents
ENRAD-PROC-106, Calculation and Determination of Lower Limit of Detection for Radiological Laboratory Instrumentation, Rev. 4
ENRAD-PROC-111, Routine QC Using the Countroom Analysis System (CAS), Rev. 4
ENRAD-PROC-112, Routine Quality Control on Tennelec Series 5 Low Background Counting Instruments Using Eclipse Software, Rev. 6
ENRAD-PROC-506, Calculation and Set-up of Control Charts Using the Countroom Analysis System, Rev. 2
ENRAD-PROC-508, Cross-Check Management in the Enrad Laboratory, Rev. 1
ENRAD-PROC-717, Annual Land Use Census for McGuire Nuclear Station, Rev. 2
ENRAD-PROC-729, Milk Sampling at McGuire Nuclear Station, Rev. 2
ENRAD-PROC-730, Airborne Radioiodine and Airborne Particulate Sampling at McGuire Nuclear Station, Rev. 5
ENRAD-PROC-731, Water Sampling at McGuire Nuclear Station, Rev. 3
ENRAD-PROC-732, Broadleaf Vegetation Sampling at McGuire Nuclear Station, Rev. 5
ENRAD-PROC-733, Food Products Sampling at McGuire Nuclear Station, Rev. 2
ENRAD-PROC-734, Shoreline Sediment Sampling at McGuire Nuclear Station, Rev. 3
ENRAD-PROC-735, Fish Sampling at McGuire Nuclear Station, Rev. 1
ENRAD-PROC-736, Direct Radiation Measurement (TLDs) at Mcguire Nuclear Station, Rev. 5
ENRAD-PROC-850, Calibration of REMP Air Sampling Equipment, Rev. 0
IP/0/B/3260/001, Met One Series 21 Wind Direction Module Channel Calibration, Rev. 20
IP/0/B/3260/003, Met One Series 21 Wind Speed Module Channel Calibration, Rev. 20
IP/0/B/3260/019, Met One Platinum RTD Model 21.32 Temperature and Delta Temperature Calibrations, Rev. 22
IP/0/B/3260/032, Meteorological Monitoring (EEB) System Weekly Channel Verification, Rev. 31

Records and Data Reviewed
AREORs, 2011 and 2012
ARERRs, 2011 and 2012

DAW Analysis Reports, 10/13/12 and 02/15/13
EnRad Instrument Control Chart and Balance Logbook Review – Through May 2013
EnRad Calibration Certificates for Air Samplers (EnRad ID and Dates): 00312, 11/02/11 and 08/23/12; 00315, 11/03/11 and 01/21/13; 00326, 03/20/12 and 06/21/13; 00393, 10/24/12; 03090, 01/12/12 and 10/24/12; 03099, 01/10/12 and 10/11/12; 03101, 02/09/12 and 01/04/13; 03103, 01/22/12 and 12/11/12; 03104, 02/09/12 and 03/25/13 ; 03389, 02/09/12 and 04/22/13; 03397, 08/03/11 and 08/16/12; 03447, 08/16/12; 03458, 01/18/12 and 10/24/12; 03460, 01/18/12 and 12/20/12
McGuire MET Data Recovery, 2011 and 2012
Meteorological Monitoring (EEB) System Weekly Channel Verification, 07/09/13
Met One Platinum RTD Model 21.32 Temperature and Delta Temperature Calibrations, 06/14/12, 11/14/12, and 07/09/13
Met One Series 21 Wind Direction Module Channel Calibrations, Lower – 06/13/12 and 11/13/12; Upper – 06/13/12 and 11/14/12
Met One Series 21 Wind Speed Module Channel Calibrations, Lower - 06/13/12 and 11/13/12; Upper – 06/13/12 and 11/14/12
ODCM, Rev. 54

CAP Documents
Nuclear Oversight - Audit, Nuclear General Office, Radiological Effluents Control Audit 12-21(INOS, REC, NGO), 10/04/12
PIPs G-11-00043, G-11-01461, G-12-01129, G-12-01551, G-12-01584, G-12-01634, G-12-01648, G-12-01780, G-12-01876, G-13-00522, G-13-00534

Section 4OA1: Performance Indicator Verification
NSD 225, NRC Performance Indicators, Rev. 6
SRPMP 10-1, "NRC Performance Indicator Data Collection, Validation, Review and Approval", Rev. 6
ED Alarm Logs, July 2012 – March 2013
PIP M-13-04801

Section 4OA2: Problem Identification and Resolution
NSD 515, Operational Decision-Making, Rev. 8
SOMP 02-02, Operations Roles in the Risk Management Process, Rev. 13
PIPs M-13-00244, M-13-00377, M-13-05676, M-13-05783, M-13-07467, M-13-08587, M-13-05823, M-13-06001

Section 4OA5: Other Activities
On-Site Operation of an Independent Spent Fuel Storage Installation (ISFSI)
American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section III, Subsection NB, 2001 Edition through 2003 Addenda
MP/0/A/7650/227, Rev. 2 and 3
MP/0/A/7650/204, Spent Fuel Dry Storage Cask Troubleshooting, Rev. 6
MP/0/A/7650/234, MAGNASTOR Spent Fuel Cask Loading Contingencies, Rev. 1
MP/0/A/7700/131, MAGNASTOR Transportable Storage Canister Welding, Rev. 2
PIPs M-13-07294 and M-13-07274
Certificate of Compliance 1031, Amendment 2
MAGNASTOR Final Safety Analysis Report (FSAR), Rev. 4

Weld Document #131328 to weld closure lid to TSC per Work Order 2009981/ 0FCTNK026/Dry Cask #26
Welder Qualification Records

ISFSI Campaign Loading and Transfer Operations
NSD 213 91-01 Risk Management Plans for dry cask storage loading campaigns
MP/0/A/7650/148, Operation of Fuel Building Manipulator Crane, Rev. 46
MP/0/A/7650/161, Fuel Handling and Core Alteration Prerequisites Procedure, Rev. 14
MP/0/A/7650/231, Operation of Dry Cask Transporter (MAGNASTOR Spent Fuel Casks), Rev. 3
HP/2/B/1006/045, Radiation Protection Controls for Loading Spent Fuel Assemblies Into NAC Magnastor Dry Storage Casks, Rev. 1
WOs 02009981, 01922147, and 02010171 for loading dry storage casks
MCC-1553.12-00-0037, Selection of Spent Fuel Assemblies and Non-Fuel Hardware for Storage in NAC-MAGNASTOR Transportable Storage Canister MNZ-057, Rev. 0
MCC-1553.12-00-0039, Selection of Spent Fuel Assemblies and Non-Fuel Hardware for Storage in NAC-MAGNASTOR Transportable Storage Canister MNZ-073, Rev. 1
MCC-1553.12-00-0040, Selection of Spent Fuel Assemblies and Non-Fuel Hardware for Storage in NAC-MAGNASTOR Transportable Storage Canister MNZ-065, Rev. 0
MCC-1553.12-00-0017, Assembly Specifications for Fuel Qualification for Dry Storage Canisters at McGuire Nuclear Station, Rev. 5
MCC-1553.12-00-0036, Determination of Requirements for Selecting Spent Fuel for use of NAC-MAGNASTOR Storage System at McGuire, Rev. 0
DPC-1553.12-00-0011, Duke TSC Drop Reactivity Evaluation, Rev. 1

TI 2515/182, Review of the Industry Initiative to Control Degradation of Underground Piping and Tanks (Phase II)
PIPs M-09-03937, M-10-03154, M-11-00564, M-11-02472, M-11-07360, M-13-06412
MC-1425-13.43-00, Piping Layout System-YM Plan Elevation 750'-0" Auxiliary Building, Rev. 17
MC-1518-12.00-00, Piping Layout RL/YM System Piping Outside Powerhouse, Rev. 1
MC-1525-13.85-00, Piping Layout Exterior Demineralized Water (YM) Plan, Rev. 0
MCFD-1506-04.85-00, Piping Layout Exterior Miscellaneous Piping Plans, Sections and Details, Rev. 53
MCFD-1506-04.85-04, Piping Layout Exterior Miscellaneous Piping Plans, Sections and Details, Rev. 17
MCFD-1506-04.85-06, Piping Layout Exterior Miscellaneous Piping Plans, Sections and Details, Rev. 35
MCFD-1583-01.00, Flow Diagram of Conventional Waste Water Treatment Center (WC), Rev.17
MCFD-1583-02.00, Flow Diagram of Conventional Waste Water Treatment Center (WC), Rev. 8
MCFD-1601-02.05, Flow Diagram of Makeup Demineralized Water System (YM), Rev. 13
MCFD-1601-02.07, Flow Diagram of Makeup Demineralized Water System (YM), Rev. 1
Buried Piping Integrity Program System Health Reports for: 04/2011 – 06/2011, 07/2011 09/2011, 10/2011 – 12/2011, 1/2012 – 3/2012, 4/2012 – 6/2012, 7/2012 – 12/2012, 1/2013 – 3/2013
EPRI Technical Report 1016456, Recommendations for an Effective Program to Control the Degradation of Buried and Underground Piping and Tanks, Rev. 1

McGuire Nuclear Station Engineering Support Document Underground Piping and Tank Integrity Program, Rev. 4
M-ENG-SA-11-20, Self Assessment for Buried Pipe Program Gap Analysis to NRC Inspection Manual
M-ENG-SA-13-09, Self Assessment for the Buried Pipe Program NRC TI 2515/182 Phase II Inspection
Report of Field Soil Resistivity Measurements by Wenner Four Pin Method McGuire Nuclear Station, June 3, 2008