



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

July 27, 2012

Mr. Regis T. Repko  
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  
05000369/2012003 AND 05000370/2012003

Dear Mr. Repko:

On June 30, 2012, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your McGuire Nuclear Station Units 1 and 2. The enclosed inspection report documents the inspection results which were discussed on July 9, 2012, with you and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your licenses. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

The enclosed inspection report documents one NRC-identified finding of very low safety significance (Green) which was determined to involve a violation of NRC requirements. One licensee-identified violation of very low safety significance is also listed in the enclosed report. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2 of the Enforcement Policy. If you contest any of these NCVs, you should provide a written response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at McGuire. If you disagree with a cross-cutting aspect assignment 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 McGuire.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's 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  
License Nos.: NPF-9, NPF-17

Enclosure: NRC Integrated Inspection Report 05000369/2012003 and 05000370/2012003  
w/Attachment - Supplemental Information

cc w/encl: (See page 3)

R. Repko

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R. Repko

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Letter to Regis T. Repko from Jonathan H. Bartley dated July 27, 2012

SUBJECT: MCGUIRE NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT  
05000369/2012003 AND 05000370/2012003

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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket Nos.: 50-369, 50-370

License Nos.: NPF-9, NPF-17

Report Nos.: 05000369/2012003, 05000370/2012003

Licensee: Duke Energy Carolinas, LLC

Facility: McGuire Nuclear Station, Units 1 and 2

Location: Huntersville, NC 28078

Dates: April 1, 2012, through June 30, 2012

Inspectors: J. Zeiler, Senior Resident Inspector  
J. Heath, Resident Inspector  
R. Williams, Reactor Inspector (Section 4OA5.2)

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

Enclosure

## SUMMARY OF FINDINGS

IR05000369/2012-003, IR05000370/2012-003; 04/01/2012 – 06/30/2012; McGuire Nuclear Station; Fire Protection.

The report covered a three month period of inspection by two resident inspectors and a reactor inspector. One Green finding, which was determined to involve a violation of NRC requirements, was identified. The significance of inspection findings is indicated by their color (Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP) dated June 2, 2011. Cross-cutting aspects are determined using IMC 0310, "Components Within The Cross-Cutting Areas," dated October 28, 2011. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated June 7, 2012. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4.

### Cornerstone: Mitigating Systems

- Green: An NRC-identified non-cited violation (NCV) of Technical Specification (TS) 5.4.1.d was identified for failure to implement adequate compensatory measures for multiple impaired manual fire hose stations (FHSs) in accordance with the approved fire protection program. Gated wye valves were not installed as required during a periodic flush of multiple auxiliary building (AB) FHSs rendering them inoperable. The licensee took actions to install the gated wye valves in the affected FHSs to restore them to operable. This violation was entered into the licensee's corrective action program (CAP) as Problem Investigation Program (PIP) M-12-2816.

The performance deficiency (PD) was more than minor because it was associated with the protection against external events attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective in that manual fire suppression capability was impaired. The finding was determined to be of very low safety significance because it represented a low degradation of the manual fire suppression function. The cause of this finding was directly related to the cross-cutting aspect of planning and coordination of work activities in the Work Control component of the Human Performance area, in that the licensee did not plan and coordinate work activities to ensure that adequate compensatory measures were established for impaired fire hose stations. [H.3(a)] (Section 1R05)

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## **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**

Summer Readiness of Offsite & Alternate AC Power Systems: The inspectors evaluated plant features, procedures for operation, and continued availability of offsite and alternate AC power systems to determine if they were appropriate for the circumstances. The inspectors reviewed the licensee's procedures affecting these areas and the communications protocols between the transmission system operator and the plant to determine whether the appropriate information was exchanged when issues arise that could impact the offsite power system. The inspectors discussed with system engineers any outstanding corrective work orders or corrective action documents with the offsite power and alternate AC power systems. The inspectors walked down the alternate AC system (standby shutdown facility) to determine system readiness for summer conditions. The inspectors walked down the offsite power system with the licensee to review system deficiencies and their impact on the ability of the system to perform its intended function. Documents reviewed are listed in the Attachment.

Readiness for Seasonal Extreme Weather Conditions: The inspectors reviewed the effectiveness of the licensee's preparations for upcoming hot weather conditions. This included field walkdowns to assess the condition of equipment that might be susceptible to hot weather conditions including the Unit 1 and Unit 2 emergency diesel generator (EDG) rooms. The inspectors reviewed control room alarms and annunciators, and the equipment work order database to verify if any equipment vulnerabilities existed that could be challenged by hot weather conditions. The inspectors reviewed the station warm weather alignment procedure and verified applicable actions were completed. The inspectors attended plant management meetings both prior to and after the onset of hot weather conditions to observe the licensee's planning and discussions related to hot weather preparations and actions to address potential equipment challenges from hot weather conditions. In addition, the inspectors reviewed the licensee's CAP for current and previous season hot weather equipment challenges to ensure that adverse conditions were being identified and appropriately addressed in a manner commensurate with their significance. Documents reviewed are listed in the Attachment.

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b. Findings

No findings were identified.

1R04 Equipment Alignment

a. Inspection Scope

Partial Walkdowns: The inspectors performed a partial walkdown of the following three 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.

- 1A nuclear service water (RN) system while 1B RN was out of service for planned pump discharge strainer modifications
- “B” train control room emergency ventilation (VC) system and chill water (YC) system while “A” train VC/YC was out-of-service for annual preventative maintenance
- 2B EDG while 2A EDG was out-of-service for emergent repair of field flash circuitry

Complete System Walkdown: The inspectors conducted a detailed review of the Unit 1 “A” and “B” train component cooling water (KC) system. The inspectors reviewed operating procedures, drawings, and the Updated Final Safety Analysis Report (UFSAR) to determine the correct system alignment. Items reviewed during the inspection included: (1) valves were correctly positioned, did not exhibit leakage, and were locked as required; (2) electrical power was available, (3) system components were correctly labeled, cooled, lubricated, ventilated, etc.; (4) hanger and supports were correctly installed and functional; (5) essential support systems were functional; (6) system performance was not hindered by debris; and (7) tagging clearances were appropriate. The inspectors reviewed the operator workaround list, the temporary modification list, system health reports, and other outstanding items tracked by the engineering department to determine the effect of outstanding design issues on the operability of the systems. In addition, the inspectors reviewed outstanding maintenance work requests and deficiencies that could affect the ability of the system to perform its function. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

## 1R05 Fire Protection

### a. Inspection Scope

Fire Protection Walkdowns: The inspectors walked down accessible portions of the following five fire areas to determine if they were consistent with the 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 they were consistent with the fire protection program and presented an adequate fire fighting strategy. Documents reviewed are listed in the Attachment.

- Unit 1 interior doghouse (Fire Area 28)
- Unit 2 interior doghouse ( Fire Area 29)
- 1A EDG room (Fire Area 6)
- Unit 1 and Unit 2 AB 716 foot elevation (Fire Area 4)
- 2B EDG room (Fire Area 7)

Annual Fire Drill Observation: The inspectors observed the performance of a licensee fire drill on April 27, 2012, to evaluate the readiness of the plant fire brigade to effectively fight fires. The fire drill involved an electrical cable fire in the Unit 2 turbine building. The inspectors verified that the licensee drill evaluation members identified performance weaknesses in a self-critical manner at the drill critique and entered the issues into the CAP. Specific attributes evaluated by the inspectors included: (1) proper wearing of turnout gear and self-contained breathing apparatus; (2) proper use and layout of fire hoses; (3) employment of appropriate fire fighting techniques; (4) sufficient firefighting equipment brought to the scene; (5) effectiveness of fire brigade leader communications, command, and control; (6) search for victims and propagation of the fire into other plant areas; (7) smoke removal operations; (8) utilization of pre-planned strategies; (9) adherence to the pre-planned drill scenario; and (10) drill objectives. Documents reviewed are listed in the Attachment.

### b. Findings

Introduction: An NRC-identified Green NCV of TS 5.4.1.d was identified for failure to implement adequate compensatory measures for multiple impaired manual FHSs in accordance with the approved fire protection program. Multiple AB FHSs were rendered inoperable when gated wye valves were not installed during a periodic flush.

Description: Procedure NSD 316, Fire Protection Impairment and Surveillance, Revision (Rev.) 11, required fire impairment plans be developed and implemented anytime plant fire protection features were impaired to ensure proper compensatory actions are taken in accordance with the plant fire protection licensing requirements. On April 15, 2012, the licensee implemented fire protection impairment plan IMP-MC-2012-01461 for the

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planned impairment of Unit 1 and Unit 2 AB manual FHSs 1RF-175, 1RF-176, 1RF-177, 1RF-178, and 1RF-179 during a routine fire system flush. Temporary hoses were installed in each affected FHS to route the flush water from the FHS to the AB sump for periodic flushing and chlorination of the AB fire system piping. Impairment IMP-MC-2012-01461 was developed which included compensatory measures to install gated wye valves in each affected FHSs to allow the temporary hoses to be installed in parallel with the existing fire hose to retain operability and functionality of the FHSs.

On April 18, 2012, the inspectors observed that the temporary hoses had been installed directly to the FHS discharge valves and the permanently installed hoses had been disconnected and left in their respective FHS cabinets. The licensee took immediate actions to install the gated wye valves. The licensee determined this condition had existed from the initial implementation of the impairment plan on April 15, 2012.

Analysis: The licensee's failure to implement prescribed compensatory measures for impaired FHSs was a PD. The PD was more than minor because it was associated with the protection against external events attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective in that it impacted the manual fire suppression (i.e., the fire brigade) capability. Using IMC 0609, Appendix F, Fire Protection Significance Determination Process, Phase 1 Worksheet, the finding was determined to be of very low safety significance (Green) because it represented a low degradation of the manual fire suppression function. The FHSs remained functional because the water supply had not been isolated and the normally supplied fire hoses were left in each station. Therefore, the extent of degradation was limited to the slight delay in disconnecting the temporary hose and reconnecting the FHS hose. The cause of this finding was directly related to the cross-cutting aspect of planning and coordination of work activities in the Work Control component of the Human Performance area, in that, the licensee did not plan and coordinate work activities to ensure that adequate compensatory measures were established for impaired fire hose stations. [H.3(a)]

Enforcement: TS 5.4.1.d, Procedures, required, in part, that applicable procedures covered by commitments contained in UFSAR Chapter 16.0, Selected Licensee Commitments (SLC), be established, implemented, and maintained. SLC 16.9.4, Fire Hose Stations, required that fire hose stations delineated in Table 16.9.4-1 shall be operable whenever equipment in the fire areas protected by the hose station is required to be operable. NSD 316 required that specific fire impairment/compensatory controls be implemented for activities that could impair required fire hose stations. On April 15, 2012, fire impairment IMP-MC-2012-01461 was developed and implemented to install gated wyes in FHSs 1RF-175, 1RF-176, 1RF-177, 1RF-178, and 1RF-179 as compensatory measures to maintain operability of the hose stations during planned fire protection piping flush activities. Contrary to the above, from April 15, 2012, to April 18, 2012, the licensee failed to adequately implement fire impairment IMP-MC-2012-01461, in that, gated wye valves were not installed as required resulting in the FHSs being inoperable. The licensee took immediate actions to install the gated wye valves. Because this violation was determined to be of very low safety significance and has been entered into the licensee's CAP as PIP M-12-2816, it is being treated as an NCV consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000369,

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370/2012003-01, Failure to Implement Planned Compensatory Measures for Impaired Auxiliary Building Fire Hose Stations.

1R06 Flood Protection Measures

a. Inspection Scope

Internal Flooding Reviews: The inspectors reviewed the UFSAR and the licensee's flooding analysis to determine which plant areas were subject to internal flooding and contained safety-related equipment. The inspectors walked down the area listed below to determine whether the area configuration and flood protection barriers and equipment were consistent with the descriptions and assumptions described in the UFSAR and licensee flooding analysis. The inspectors examined the state of functional readiness of important flood protection equipment (i.e., flood barriers, sump pumps, and sump level instrumentation) and reviewed historical maintenance records to confirm that the equipment was being properly maintained in a state of functional readiness. The inspectors reviewed the operator actions credited in the flooding analysis, and contained in the licensee's flood mitigation procedure(s), to determine whether the desired results could be achieved by the times credited in the flooding analysis. Documents reviewed are listed in the Attachment.

- Unit 1 and Unit 2 AB 695 foot elevation (residual heat removal and containment spray (NS) pump compartments)

b. Findings

No findings were identified.

1R07 Heat Sink Performance

a. Inspection Scope

Annual Resident Inspection: The inspectors selected the 1A NS system heat exchanger based on its risk significance and observed the inspections and/or performance tests, or reviewed the results, to determine if the heat exchanger was ready and available to perform its intended functions as described in the UFSAR. The inspectors evaluated if 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.

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

### a. Inspection Scope

Quarterly Resident Inspector LOR Activity Review: The inspectors observed operators in the plant's simulator during licensed operator annual requalification examination. The examination scenario involved a turbine load rejection followed by a misaligned control rod and eventual loss of reactor coolant event caused by control rod ejection. 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 reviewed the post-examination critiques to determine if the licensee identified deficiencies and discrepancies that occurred during the examination. Documents reviewed are listed in the Attachment.

Quarterly Resident Inspector Licensed Operator Performance Review: The inspectors observed operators in the main control room and assessed their performance during a turbine load reduction of five megawatts to support subsequent slave relay testing of the Unit 2 turbine driven auxiliary feedwater (TDCA) pump. The inspectors observed the reactivity management pre-job briefing conducted prior to the activity and verified the load decrease was conducted in accordance with OP/2/A/6300/001A, Turbine-Generator Load Change, Rev. 9.

### b. Findings

No findings were identified.

## 1R12 Maintenance Effectiveness

### a. Inspection Scope

The inspectors reviewed the two 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-12-1428, Two minute loss of seal injection to all Unit 2 reactor coolant pumps
- PIP M-12-0891, Failure of isolation amplifier associated with Unit 2 power range nuclear instrument channel N44 detector

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b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Controla. 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 if 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.

- Planned Orange risk for 1A RN system critical plan to implement Phase 3 pump suction strainer modifications concurrent with 1A EDG complex plan work activities
- Planned Orange risk for 1B RN system critical plan to conduct pump suction strainer preventive maintenance concurrent with 1B EDG complex plan work activities
- Planned Yellow risk for planned complex plan activities associated with cutout/removal of valve 2RN-22A, 2A RN strainer backflush automatic drain isolation
- Emergent Yellow risk for repair work affecting air-operated valve 1CA-64AB, TDCA pump discharge to "A" steam generator
- Emergent Yellow risk for repair of 2A EDG following failure to start due to relay malfunction

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessmentsa. Inspection Scope

The inspectors reviewed the four technical evaluations listed below to determine if 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 if 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 if the measures resulted in changes to the licensing basis functions, as described in the UFSAR, and if a license amendment was required per 10 CFR 50.59. Documents reviewed are listed in the Attachment.

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- M-12-2863, Evaluation of hydraulic snubber freedom of movement on Unit 1 and Unit 2 main steamlines
- M-12-3486, Through-wall pinhole leak in piping reducer downstream of valve 1RN-174B, 1B EDG cooling water heat exchanger outlet valve
- M-12-3654, 2A EDG failure to reach full voltage and frequency during slave start testing
- M-12-4055, Unit 1 containment ventilation unit condensate drain tank abnormally high level

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 95802, Replacement of motor overload for valve 2RN-235B, 2B NS heat exchanger inlet isolation

Temporary Modification

- EC 107341, Resistance temperature detector compensation for 1D reactor coolant pump #1 seal leakoff temperature indication (1NVLP5380)

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing

a. Inspection Scope

The inspectors reviewed the five 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

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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 EDG slow start testing following planned complex plan work activities
- Post-maintenance testing of motor-operated-valve 2RN-235B following motor overload replacement
- 2B EDG slow start testing following planned preventive maintenance activities
- 1A centrifugal charging pump following emergent replacement of motor breaker
- 2A EDG slow start testing following emergent repairs to replace failed start circuitry relay

b. Findings

No findings were identified.

1R22 Surveillance Testing

a. Inspection Scope

For the five 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 TS, UFSAR, and applicable licensee procedures. In addition, the inspectors verified that the tests demonstrated that the SSCs were capable of performing their intended safety functions. Documents reviewed are listed in the Attachment.

Surveillance Tests

- PT/1/A/4209/001C, Standby Makeup Pump Flow Periodic Test, Rev. 38
- PT/1A/4403/007, RN Train 1A Flow Balance, Rev. 71
- PT/2/A/4208/001B, 2B NS Pump Performance Test, Rev. 66

In-Service Tests

- PT/1/A/4252/003A, CA Train A Valve Stroke Timing – Quarterly Turbine Driven Pump Flowpath, Rev. 34

Reactor Coolant System Leakage Testing

- PT/1/A/4150/001A, Reactor Coolant System Leakage Calculation, Rev. 78

b. Findings

No findings were identified.



## Cornerstone: Emergency Preparedness

1EP6 Drill Evaluationa. Inspection Scope

Quarterly Site Emergency Preparedness Drill: On May 9, 2012, the inspectors reviewed and observed a licensee emergency preparedness drill involving an unisolable containment air release and loss of coolant accident. The inspectors assessed the licensee emergency procedure usage, emergency plan classifications, notifications, and protective action recommendation development. The inspectors evaluated the adequacy of the licensee's conduct of the drill and post-drill critique performance. The inspectors verified that the drill critique identified drill performance weaknesses and entered these items into the licensee's CAP.

b. Findings

No findings were identified.

4OA1 Performance Indicator (PI) Verificationa. 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

- Safety System Functional Failures (Unit 1 and Unit 2 for the period January 2011 to March 2012)
- Mitigating Systems Performance Index (MSPI) – Emergency Power (Unit 1 and Unit 2 for the period July 2011 to March 2012)
- MSPI – High Pressure Injection (Unit 1 and Unit 2 for the period July 2011 to March 2012)

b. Findings

No findings were identified.

#### 4OA2 Problem Identification and Resolution

##### a. Inspection Scope

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 selected daily screening meetings, and accessing the licensee's computerized CAP database.

Semi-Annual Review to Identify Trends: The inspectors performed a review of the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors review was focused on repetitive equipment issues, but also considered the results of daily inspector CAP item screenings, licensee trending efforts, and licensee human performance results. This review nominally considered the six month period of January 2012 through June 2012 although some examples expanded beyond those dates when the scope of the trend warranted. The review also included issues documented outside the normal CAP in major equipment problem lists, focus area reports, system health reports, self-assessment reports, and department PIP trending reports. The inspectors compared and contrasted their results with the results contained in the licensee's latest quarterly trend reports. Documents reviewed are listed in the Attachment.

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.

- PIP M-11-6255, Missed 10 CFR 50, Appendix J, testing on multiple Type C containment penetrations
- PIP M-12-3654, 2A EDG failure to start during slave relay start testing

The inspectors assessed if the issues were properly identified; accurately and completely documented; 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.

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#### 4OA3 Follow-Up of Events and Notices of Enforcement Discretion

##### (Closed) Licensee Event Report (LER) 05000370/2011-003, 2B Annulus Ventilation Filter Train Heater Inoperable Longer Than Allowed by Technical Specifications

On December 20, 2011, the licensee determined that the 2B annulus ventilation system (AVS) filter train pre-heater had been past inoperable from October 29, 2011, until December 10, 2011, due to the inability of the two pre-heaters to meet the minimum required combined Kilowatt (kW) output rating. The licensee determined the initial pre-heater troubleshooting activities on October 29, 2011, had been inadequate and subsequent retests should have included testing to determine the actual kW output of the pre-heaters. The inspectors reviewed the licensee's proposed corrective actions identified in the LER and associated corrective action document PIP M-11-9216, and found them to be adequate. The enforcement aspects are discussed in Section 4OA7.

#### 4OA5 Other Activities

.1 Quarterly Resident Inspector Observations of Security Personnel and Activities: 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.

.2 (Discussed) Temporary Instruction (TI) 2515/182, Review of the Implementation of the Industry Initiative to Control Degradation of Underground Piping and Tanks, Phase 1:

##### a. Inspection Scope

Leakage from buried and underground pipes has resulted in ground water contamination incidents with associated heightened NRC and public interest. The industry issued Nuclear Energy Institute (NEI) 09-14, "Guideline for the Management of Buried Piping Integrity," (ADAMS ML1030901420), to describe the goals and required actions (commitments made by the licensee) resulting from this underground piping and tank initiative. On December 31, 2010, NEI issued Revision 1 to NEI 09-14, (ADAMS ML110700122), with an expanded scope of components which included underground piping that was not in direct contact with the soil and underground tanks. On November 17, 2011, the NRC issued TI-2515/182 "Review of the Industry Initiative to Control Degradation of Underground Piping and Tanks," to gather information related to the industry's implementation of this initiative.

The inspectors reviewed the licensee's programs for buried pipe and underground piping and tanks in accordance with TI-2515/182 to determine if the program attributes and completion dates identified in Sections 3.3 A and 3.3 B of NEI 09-14, Revision 1, were contained in the licensee's program and implementing procedures. For the buried and underground piping program attributes with completion dates that had passed, the

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inspectors reviewed records to determine if the attribute was complete and to determine if the attribute was accomplished in a manner which reflected good or poor practices in program management.

b. Findings and Observations

No findings were identified. The licensee's buried piping and underground piping and tanks program was inspected in accordance with paragraphs 03.01.a through 03.01.c of TI-2515/182 and was found to meet all applicable aspects of NEI 09-14 Revision 1, as set forth in Table 1 of the TI. Based upon the scope of the review described above, Phase I of TI-2515/182 was completed.

4OA6 Meetings, Including Exits

On July 9, 2012, the resident inspectors presented the inspection results to Mr. Repko and other members of his staff. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

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 an NCV.

- TS 3.6.10 required two AVS trains to be operable in Modes 1, 2, 3 and 4. TS 3.6.10, Condition B, specified if one or more AVS train pre-heaters was inoperable, the pre-heater must be restored to operable status within 7 days or a report must be initiated within 7 days, detailing the reason for the pre-heater inoperability and corrective actions to restore the pre-heater, and submitted to the NRC within 30 days. TS 3.6.10, Condition C, specified if the required actions and completion times of Condition B were not met, the plant shall be shut down to Mode 3 within 6 hours and Mode 5 within 36 hours. Contrary to the above, from October 29, 2011, to December 10, 2011, the 2B AVS pre-heater was not operable and the licensee failed to meet either Condition B or Condition C. This violation is not greater than Green because the degraded pre-heater did not result in a loss of safety function of the 2B AVS. This violation was documented in the licensee's corrective action program as PIP M-11-9216.

ATTACHMENT: SUPPLEMENTAL INFORMATION

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## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee**

D. Brenton, Plant Operations Superintendent  
D. Brewer, Safety Assurance Manager  
S. Capps, Station Manager  
J. Gabbert, Chemistry Manager  
J. Hicks, Maintenance Superintendent  
N. Kunkel, Work Control Superintendent  
S. Mooneyhan, Radiation Protection Manager  
J. Nolin, Mechanical and Civil Engineering Manager  
R. Repko, Vice President - McGuire Nuclear Station  
S. Russ, Security Manager  
P. Schuerger, Training Manager  
S. Snider, Engineering Manager (Acting)

### **LIST OF REPORT ITEMS**

#### **Opened and Closed**

05000369, 370/2012003-01	NCV	Failure to Implement Planned Compensatory Measures for Impaired Auxiliary Building Fire Hose Stations (1R05)
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#### **Closed**

05000370/2011-003	LER	2B Annulus Ventilation Filter Train Heater Inoperable Longer Than Allowed by Technical Specifications (4OA3)
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#### **Opened**

2515/182	TI	Review of the Implementation of the Industry Initiative to Control Degradation of Underground Piping and Tanks (4OA5.2)
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### **DOCUMENTS REVIEWED**

#### **Section 1R01: Adverse Weather Protection**

PT/0/B/4700/039, Warm Weather Equipment Checkout, Rev. 17  
RP/0/A/5700/006, Natural Disasters, Rev. 23  
RP/0/B/5700/027, High Winds or Hurricane Preparations, Rev. 6  
NSD 417, Nuclear Facilities/Generation Status Communications, Rev. 14  
All open work orders for switchyard activities work orders for 12w18 to 12w23  
PIPs M-12-0156, PIP M-12-1072, PIP M-12-2615, PIP M-12-0512, PIP M-12-1726

#### **Section 1R04: Equipment Alignment**

12W18 Complex plan for "A" YC chiller work  
PIP M-11-9306, "B" YC differential pressure reading low OP/1/A/6400/005, Component Cooling Water System, Rev. 96

OP/1/A/6400/005A, Component Cooling Water System Valve and Power Supply Checklists, Rev. 24

Drawing MCFD-1573-01.00, Flow Diagram of Component Cooling Water System (KC), Rev. 8  
 Drawing MCFD-1573-01.01, Flow Diagram of Component Cooling Water System (KC), Rev. 10  
 Engineering System Reliability, System Health, and Maintenance Rule Status Reports for KC  
 KC System Related PIPs: M-11-4912, M-11-4924, M-11-4927, M-11-7336, and M-12-0203

### **Section 1R05: Fire Protection**

MCS-1465.00-00-0008, Design Basis Specification for Fire Protection, Rev. 12  
 NSD 313, Control of Transient Fire Loads, Rev. 12  
 AP/0/A/5500/045, Plant Fire, Rev. 13  
 FS/0/B/9000/004, (Aux 716) Fire Strategy #4, Rev. 0  
 FS/2/B/9000/046, Unit 2 Turbine Building Mezzanine (Fire Strategy #46), Rev. 0  
 PT/0/B/4600/121, Fire Drill, Rev. 5  
 RP/0/A/5700/025, Fire Brigade Response, Rev. 19

### **Section 1R06: Flood Protection Measures**

UFSAR Section 3.4, Water Level (Flood) Design  
 MCS-1154.00-00-0004, Design Basis Specification for the Auxiliary Building Structures, Rev. 7  
 MCS-1465.00-00-0012, Design Basis Specification for Flooding From External Sources, Rev. 1  
 MCC-1206.47-69-1001, Auxiliary Building Flooding Analysis (Section 9.2.4), Rev. 15  
 AP/0/A/5500/044, Plant Flooding, Rev. 13  
 OP/1/A/6100/010N, Annunciator Response for Panel 1AD-13, Rev. 75

### **Section 1R07: Heat Sink Performance**

PT/1/A/4208/010B, NS 1B Heat Exchanger Heat Balance Test, Rev. 36  
 WOs 02002690 and 01824037  
 PIP M-12-2019, 1B NS Heat Balance test declared invalid

### **Section 1R11: Licensed Operator Regualification Program and Licensed Operator Performance**

AP/1/A/5500/03, Load Rejection, Rev. 27  
 AP/1/A/5500/14, Rod Control Malfunction, Rev. 14  
 AP/1/A/5500/10, NC System Leakage Within Capacity of Both NV Pumps, Rev. 22  
 EP/1/A/5000/FR-S.1, Response to Nuclear Power Generation/ATWS, Rev. 14  
 EP/1/A/5000/E-0, Reactor Trip or Safety Injection, Rev. 32  
 EP/1/A/5000/E-1, Loss of Reactor or Secondary Coolant, Rev. 15  
 EP/1/A/5000/F-0, Critical Safety Function Status Trees, Rev. 5  
 EP/1/A/5000/ES-1.1, Safety Injection Termination, Rev. 25  
 RP/0/A/5700/000, Classification of Emergency, Rev. 19

### **Section 1R12: Maintenance Effectiveness**

EDM 210, Engineering Responsibilities for the Maintenance Rule, Rev. 24  
 SSC Function Scoping Database  
 PIPs M-12-1671 and M-12-1542I

### **Section 1R13: Maintenance Risk Assessments and Emergent Work Control**

NSD 213, Risk Management Process, Rev. 11

**Section 1R15: Operability Determinations and Functionality Assessments**

NSD 203, Operability/Functionality, Rev. 24

**Section 1R18: Plant Modifications**

NSD 301, Engineering Change Program, Rev. 39

NSD 601, Engineering Change Manual, Rev. 15

OMP 10-2, Temporary Engineering Changes, Rev. 13

PT/2/A/4403/002B, RN Train B Valve Stroke Timing – Quarterly, Rev. 35

WO 01876959, Replace motor overload for valve 2RN235B

**Section 1R19: Post-Maintenance Testing**

EC 95802, 2RN-235B overload maintenance

PT/2/A/4350/002B, Diesel Generator 2B Operability Test, Rev. 87

WO 1946548 (EDG)

**Section 1R22: Surveillance Testing**

PIPs M-12-02595, M-12-01052, M-11-08899

PT/2/A/4255/004A, SV Train A Valve Stroke Timing – Quarterly, Rev. 10

MCS-1593.SM-00-0001, SG PORVS, Rev. 21

ASME OMB Code 2000 Subsection ISTC

WO 02029240, U2 Standby makeup Pump testing, dated 4/12/12

WO 02013037, U1 Standby makeup Test testing, dated 2/9/12

**Section 4OA1: Performance Indicator (PI) Verification**

NSD 225, NRC Performance Indicators, Rev. 5

NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Rev. 6

SRPMP 10-1, “NRC Performance Indicator Data Collection, Validation, Review and Approval,” Rev. 4

MRFF licensee Excel datasheet dated 5/23/2012

PIPs screened for Maintenance Rule in licensee corrective action program records from January 2012 to March 2012

Control room and TS logs of equipment status conditions from July 2011 to March 2012

**Section 4OA2: Problem Identification and Resolution**

NSD 202, Reportability, Rev. 23

NSD 208, Problem Investigation Program (PIP), Rev. 35

NSD 212, Cause Analysis, Rev. 24

NSD 220, UFSAR Revision Process, Rev. 13

NSD 607, Self-Assessments and Benchmarking, Rev. 17

**Section 4OA5: Other Activities**

PIPs M-10-03154, M-11-00564, M-11-07360

Drawing\_MC-1330-8, Condenser Cooling Water Low Level Intake Pipes Cowans Ford Dam to Pumps Layout and Details, Rev. 14

McGuire Nuclear Station Engineering Support Document Buried Piping Integrity Program, Rev. 3