



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

October 28, 2011

EA-11-245

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  
AND EXERCISE OF ENFORCEMENT DISCRETION - 05000369/2011004 AND  
05000370/2011004**

Dear Mr. Repko:

On September 30, 2011, 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 October 13, 2011, with you and other members of your staff.

The inspection examined activities conducted under your licenses 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. Additionally, one licensee-identified violation, which was determined to be of very low safety significance, is listed in this report. However, because of the very low safety significance and because they were entered into your corrective action program, the NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest any NCV in this report, 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, D.C. 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at McGuire. In addition, if you disagree with the characterization of any finding 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.

The enclosed inspection report also documents one noncompliance for which the NRC is exercising enforcement discretion. The noncompliance involved a failure to ensure that fire protection features were capable of limiting fire damage so that systems necessary to achieve and maintain cold shutdown could be repaired within 72 hours. The NRC is not taking enforcement action for this noncompliance because it meets the criteria of the NRC's Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues (10 CFR 50.48). In this case, the NRC concluded that: (1) Duke Energy Carolinas, LLC, entered the noncompliance into its corrective action program and implemented appropriate compensatory measures; (2) the noncompliance was not associated with a finding that the reactor oversight process significance determination process would evaluate as Red, or it would not be categorized at Severity Level I; (3) it was not willful; and (4) Duke Energy Carolinas, LLC, submitted a letter before December 31, 2005, stating its intent to transition to 10 CFR 50.48(c), which includes approaches in National Fire Protection Association Standard 805-2000 Edition. The NRC will refrain from including the noncompliance in the Agency Action Matrix in accordance with NRC Inspection Manual Chapter 0305, Section 11.05.b, "Violations in Specified Areas of Interest Qualifying for Enforcement Discretion."

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 document system (ADAMS). ADAMS is accessible from the NRC Website 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 and Exercise of Enforcement Discretion -  
05000369/2011004 and 05000370/2011004  
w/Attachment - Supplemental Information

cc w/encl: (See page 3)

The enclosed inspection report also documents one noncompliance for which the NRC is exercising enforcement discretion. The noncompliance involved a failure to ensure that fire protection features were capable of limiting fire damage so that systems necessary to achieve and maintain cold shutdown could be repaired within 72 hours. The NRC is not taking enforcement action for this noncompliance because it meets the criteria of the NRC's Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues (10 CFR 50.48). In this case, the NRC concluded that: (1) Duke Energy Carolinas, LLC, entered the noncompliance into its corrective action program and implemented appropriate compensatory measures; (2) the noncompliance was not associated with a finding that the reactor oversight process significance determination process would evaluate as Red, or it would not be categorized at Severity Level I; (3) it was not willful; and (4) Duke Energy Carolinas, LLC, submitted a letter before December 31, 2005, stating its intent to transition to 10 CFR 50.48(c), which includes approaches in National Fire Protection Association Standard 805-2000 Edition. The NRC will refrain from including the noncompliance in the Agency Action Matrix in accordance with NRC Inspection Manual Chapter 0305, Section 11.05.b, "Violations in Specified Areas of Interest Qualifying for Enforcement Discretion."

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Sincerely,

/RA/

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

Docket Nos.: 50-369, 50-370  
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cc w/encl: (See page 3)

X PUBLICLY AVAILABLE       NON-PUBLICLY AVAILABLE       SENSITIVE      X NON-SENSITIVE  
ADAMS:  Yes      ACCESSION NUMBER: ML113010501      X SUNSI REVIEW COMPLETE

OFFICE	Rii:DRP	Rii:DRP	Rii:DRP	Rii:DRP	Rii:DRP	Rii:DRS	Rii:DRS	Rii:EICS
SIGNATURE	JXZ /RA/	JXH /RA/	EJS /RA/	JHB /RA/		AXA /RA/	Via email	SES /RA/
NAME	JZeiler	JHeath	EStamm	JBartley		AAlen	MCoursey	SSparks
DATE	10/24/2011	10/24/2011	10/21/2011	10/28/2011		10/21/2011	10/27/2011	10/24/2011
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
OFFICE	Rii:DRS	Rii:DRS	Rii:DRS	Rii:DRS	Rii:DRS	Rii:DRS	Rii:DRS	Rii:DRS
SIGNATURE	RKH /RA for/	Via email	Via email	GBK /RA/	WTL /RA/	ADN /RA/	RKH /RA for/	RLN /RA/
NAME	CDykes	JEargle	PHiggins	GKuzo	WLo	ANielsen	JRivera	RNease
DATE	10/27/2011	10/26/2011	10/26/2011	10/23/2011	10/24/2011	10/24/2011	10/23/2011	10/27/2011
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

DEC

3

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Letter to Regis T. Repko from Jonathan H. Bartley dated October 28, 2011

SUBJECT: MCGUIRE NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT  
AND EXERCISE OF ENFORCEMENT DISCRETION - 05000369/2011004 AND  
05000370/2011004

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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.: 05000369/2011004, 05000370/2011004

Licensee: Duke Energy Carolinas, LLC

Facility: McGuire Nuclear Station, Units 1 and 2

Location: Huntersville, NC 28078

Dates: July 1, 2011, through September 30, 2011

Inspectors: J. Zeiler, Senior Resident Inspector  
J. Heath, Resident Inspector  
A. Alan, Reactor Inspector (Section 4OA5.4)  
M. Coursey, Reactor Inspector (Section 1R08)  
C. Dykes, Health Physicist (Section 2RS7)  
J. Eargle, Reactor Inspector (Section 4OA5.4)  
P. Higgins, Senior Reactor Inspector (Section 4OA5.4)  
G. Kuzo, Senior Health Physicist (Sections 2RS6, 2RS7, 4OA1)  
W. Loo, Senior Health Physicist (Sections 2RS5, 2RS6)  
A. Nielsen, Senior Health Physicist (Sections 2RS1, 4OA1, 4OA5)  
J. Rivera, Health Physicist (Section 2RS5)

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

Enclosure

## SUMMARY OF FINDINGS

IR05000369/2011-004, IR05000370/2011-004; 7/1/2011 – 9/30/2011; McGuire Nuclear Station; Other Activities

The report covered a three month period of inspection by two resident inspectors and nine region based inspectors. One Green finding, which was determined to involve a violation of NRC requirements, was identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Cross-cutting aspects are determined using IMC 0310, "Components Within The Cross-Cutting Areas." Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, Reactor Oversight Process.

### **Cornerstone: Mitigating Systems**

- **Green.** The inspectors identified a NCV of 10 CFR 50, Appendix B, Criterion V, Instructions, Procedures and Drawings, for the failure to establish acceptance criteria to determine operability in surveillance procedures used to vent the decay heat removal (ND) system in Modes 5, 6, and No-Mode in preparation for Mode 6. The issue was entered into the licensee's corrective action program as PIP M-11-04745

The licensee's failure to establish adequate acceptance criteria for ND venting surveillance procedures PT/1/A/4200/036 and PT/2/A/4200/036 was a performance deficiency (PD). The PD was determined to be more than minor because if left uncorrected, the failure to establish acceptance criteria for surveillance tests which establish the basis for the ND system operability in modes 5 and 6 would have the potential to lead to a more significant safety concern in that conditions which could impact system operability could remain undetected. In addition, the finding adversely affected the equipment performance attribute of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using IMC 0609, Appendix G, Shutdown Operations Significance Determination Process, Attachment 1, the finding was determined to be of very low safety significance (Green) because a quantitative assessment was not required based on the criteria in Attachment 1. The finding had a cross-cutting aspect of implementation of operating experience in the Operating Experience component in the area of Problem Identification and Resolution because the licensee failed to implement operating experience from Generic Letter (GL) 2008-01 into station procedures [P.2(b)]. (Section 4OA5.4)

One violation of very low safety significance (Green), which was identified by the licensee, has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and corrective action tracking number are listed in Section 4OA7 of this report.

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## REPORT DETAILS

### Summary of Plant Status

Unit 1 began the inspection period at approximately 100 percent rated thermal power (RTP) and shut down for end-of-cycle refueling outage 21 (1EOC21) on September 17, 2011, and remained there for the rest of the period.

Unit 2 began the inspection period at approximately 100 percent RTP and remained there for the entire period.

#### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

#### 1R01 Adverse Weather Protection

##### a. Inspection Scope

Readiness for Seasonal Extreme Weather Conditions: The inspectors reviewed the effectiveness of the licensee's hot weather protection program pertaining to the hot weather conditions experienced during the period July 1 to September 30, 2011. This included field walkdowns to assess the equipment that might be susceptible to hot weather conditions including the Unit 1 and 2 control room area ventilation (VC) and control room area chilled water (YC) systems. The inspectors discussed specific hot weather preparation measures with the responsible system engineer to determine the scope of the preparations and to determine the effectiveness during hot weather periods. The inspectors reviewed control room alarms and annunciators during this period to see how these may pertain to hot weather conditions. The inspectors reviewed the station warm weather alignment procedure and verified various actions were completed as required by the procedure. The inspectors attended plant management meetings and a biweekly Hot Weather Interface Meeting where potential hot weather condition equipment challenges were discussed. In addition, the inspectors reviewed selected Problem Investigation Program (PIP) reports in the licensee's corrective action program related to 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.

Impending Adverse Weather Condition: The inspectors performed an impending adverse weather inspection between August 25 – 26, 2011, to review the licensee's overall preparations and protection of employees and risk-significant systems in response to potential impact from Hurricane Irene. The inspectors verified the licensee had implemented applicable actions in accordance with emergency response procedures. The inspectors walked down the site including the station switchyard to ensure preparations for potential high winds and rain from the hurricane were appropriate. The inspectors monitored the licensee's preparations and weather report updates until the adverse weather conditions were over. Documents reviewed are listed in the Attachment.

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b. Findings

No findings were identified.

1R04 Equipment Alignmenta. Inspection Scope

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

- 2B motor driven auxiliary feedwater (MDCA) pump with 2A MDCA Pump out of service for planned preventative maintenance
- 2B diesel generator (DG) with 2A DG out of service for planned preventive maintenance

b. Findings

No findings were identified.

1R05 Fire Protectiona. 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 ETA switchgear room (Fire Area 11)
- Unit 1 ETB switchgear room (Fire Area 17)
- Auxiliary building 767 elevation (Fire Area 25)
- Auxiliary building 733 elevation (Fire Area 14)
- Auxiliary building 695 elevation (Fire Area 1)

b. Findings

No findings were identified.

1R08 Inservice Inspection Activities

a. Inspection Scope

Non-Destructive Examination (NDE) Activities and Welding Activities: The inspectors reviewed the implementation of the licensee's In-service Inspection (ISI) program for monitoring degradation of the reactor coolant system (RCS) boundary and risk significant piping boundaries of Unit 1. The inspectors' activities consisted of an on-site review of NDEs to evaluate compliance with the applicable edition of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI (Code of record: 1998 Edition with 2000 Addenda), and to verify that indications and defects (if present) were appropriately evaluated and dispositioned in accordance with the requirements of the ASME Code, Section XI acceptance standards. The inspectors observed and reviewed portions of the NDE activities listed below. The review included examination procedures, NDE reports, video of the inspection, equipment and personnel qualification records, and calibration reports (as applicable).

Bare Metal Visual (BMV) examination

- Reactor vessel upper head (direct observation)
- Reactor vessel control rod drive mechanism (CRDM), Penetrations No. 66, 42, 22, 10, 2, 14, 30, and 54 (document review)

Liquid Penetrant Testing

- 1NV-237-2 seat ring insert to valve body weld (document review)

Ultrasonic Testing

- 1NI1F1154 pipe to elbow weld, safety injection system, ASME Class 2 (document review)
- 1NV1FW175-31 reducer to pipe weld, chemical and volume control system, ASME Class 2 (direct observation)

The licensee did not identify any relevant indications that were analytically evaluated and accepted for continued service during non-destructive surface and volumetric examinations performed since the previous refueling outage.

The inspectors reviewed the following pressure boundary welds completed for risk-significant systems during the Unit 1 refueling outage to evaluate if the licensee applied the preservice non-destructive examinations and acceptance criteria required by the ASME Code Section XI. In addition, the inspectors reviewed the welding procedure specification, welder qualifications, welding material certification and supporting weld procedure qualification records, to evaluate if the weld procedure(s) were qualified in accordance with the requirements of Construction Code and the ASME Code Section IX.

- 1NI-157 Safety Injection Class A Weld for WO 01749636
- 1NI-17 Safety Injection Class A Weld for WO 1810887

PWR Vessel Upper Head Penetration Inspection Activities: A BMV examination of the Unit 1 vessel head was required this outage pursuant to 10 CFR 50.55a(g)(6)(ii)(D). The inspectors observed portions of the Unit 1 BMV examination and reviewed NDE reports for CRDM Penetrations No. 66, 42, 22, 10, 2, 14, 30, and 54 to determine if the activities, including the disposition of indications and defects, were conducted in accordance with the requirements of ASME Code Case N-729-1 and 10 CFR 50.55a(g)(6)(ii)(D). The inspectors evaluated if the required BMV scope/coverage was achieved and if any limitations were recorded in accordance with the licensee procedures. Additionally, the inspectors evaluated if the licensee's criteria for BMV quality and instructions for resolving interference and masking issues were consistent with 10 CFR 50.55a.

The licensee did not identify any relevant indications that were accepted for continued service during the BMV examination. Additionally, the licensee did not perform any welding repairs to vessel head penetrations since the beginning of the last Unit 1 refueling outage.

Boric Acid Corrosion Control (BACC) Inspection Activities: The inspectors performed an independent walkdown of the Unit 1 containment, which had received a recent licensee boric acid walkdown, to determine if the licensee's BACC visual examinations emphasized locations where boric acid leaks can cause degradation of safety significant components. The inspectors reviewed the following licensee evaluations of reactor coolant system components with boric acid deposits to determine if degraded components were documented in the corrective action system.

- PIP M-11-05967, 2-NM-PP-PIPING Excessive Boron at 3 Fittings Downstream of 2-NM-VA-0010
- PIP M-11-06194, Excessive Boron at Packing Gland and Discoloration of Boron
- PIP M-11-06385, Active Boron Leak on Valve 1WS-176

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

- PIP M-11-06757, 1EOC21 Mode 3 Engineering Walkdown
- PIP M-11-06849, Engineering Mode 5 1EOC21 Findings

Steam Generator (SG) Tube Inspection Activities: No SG eddy current testing or secondary side visual exams were scheduled for this outage. The inspectors reviewed the licensee's Degradation Assessment, including the technical justification for not performing primary or secondary inspections of the Unit 1 steam generators, to verify compliance with the Steam Generator Program requirements in the plant Technical Specifications (TS).

Problem Identification and Resolution: The inspectors performed a review of ISI-related problems which were identified by the licensee and entered into the CAP. The inspectors reviewed the PIPs to confirm the licensee had appropriately described the scope of the problem, and had initiated corrective actions. The review also included the licensee's consideration and assessment of operating experience events applicable to the plant. The inspectors performed this review to ensure compliance with 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, requirements. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program

a. Inspection Scope

On September 8, the inspectors observed operators in the plant's simulator during licensed operator requalification training to determine the effectiveness of licensed operator requalification training required by 10 CFR 55.59 and the adequacy of operator performance. The simulator scenario involved a turbine impulse pressure control system malfunction, inadvertent feedwater isolation, an Anticipated Transient Without Scram event, followed by the failure of all auxiliary feedwater pumps. The inspectors focused on clarity and formality of communication, 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 training. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed the activity 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 also performed a detailed review of the problem history and surrounding circumstances, evaluated the

Enclosure

extent of condition reviews as required, and reviewed the generic implications of the equipment problem. Documents reviewed are listed in the Attachment.

- 'A' VC/YC system chiller hot gas bypass valve actuator failed during preventive maintenance activity (PIP M-11-3527)

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 four 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.

- Planned Orange risk for 2B Nuclear Service water (RN) system strainer modification (backwash pipe to groundwater sump tie-in)
- Unit 2 unplanned extension of Yellow risk condition for turbine-driven auxiliary feedwater (TDCA) pump inoperability/unavailability due to anomalous turbine bearing oil level
- Unplanned Yellow risk condition for 2B DG inoperability/unavailability due to surveillance testing deficiencies above full power conditions
- Planned Yellow risk for Unit 1 RN cooling water valve work, switchyard work activities, TDCA complex work plan, and Standby Shutdown Facility (SSF) complex work plan

b. Findings

No findings were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the five technical evaluations listed below to determine whether 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.

- M-11-4895, Transportability of 4-way valve seal failure and leakage associated with feedwater isolation valves in response to 10 CFR Part 21 notification
- M-11-5042, Unit 2 TDCA pump manual trip due to anomalous turbine bearing oil level
- M-11-5285, Hot spot identified on lower cubicle of normal incoming breaker 1ETB-1 to 4.16 kilo-volt safety-related switchgear
- M-11-5354, 1A DG room scaffold erection over safety-related equipment issues
- M-11-6618, Air gap discovered in 1A DG room ventilation system access door

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing

a. Inspection Scope

For the five maintenance tests listed below, the inspectors determined the safety functions described in the UFSAR and TS that were affected by the maintenance activity. The inspectors witnessed the post-maintenance tests listed and/or reviewed the test data to determine whether the test results adequately demonstrated restoration of the affected safety functions. Documents reviewed are listed in the Attachment.

- 1B MDCA pump post-maintenance testing following oil change
- 1B DG post-maintenance testing following preventive maintenance activities
- 2B DG post-maintenance testing following preventive and corrective maintenance activities
- Retest of 2RN-114A, 'A' Safety Injection Pump Cooler Supply Isolation valve, following solenoid replacement
- 1A DG post-maintenance testing following hot web deflection and fluid checks

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities

a. Inspection Scope

Unit 1 began a refueling outage on September 17, 2011. Prior to the refueling outage, the inspectors reviewed the licensee's outage risk control plan to determine if the licensee had adequately considered risk in developing the outage schedule. The

inspectors reviewed the licensee procedures listed in the attachment to determine if they contained mitigation/response strategies for losses of decay heat removal, inventory control, power availability, and containment. During the outage, the inspectors observed portions of the following activities when Unit 1 entered the refueling outage. Documents reviewed are listed in the Attachment.

- Observed portions of the cooldown process to determine if TS cooldown restrictions were followed
- Walked down containment shortly after the shutdown to determine if there was indication of previously unidentified leakage from components containing reactor coolant
- Reviewed the licensee's responses to emergent work and unexpected conditions to determine if configuration changes were controlled in accordance with the outage risk control plan
- Observed outage activities to determine if the licensee maintained defense-in-depth commensurate with the outage risk control plan for the key safety functions and applicable TS
- Assessed outage activities that were conducted during short time-to-boil periods
- During lowered reactor coolant system inventory conditions, the inspectors reviewed the licensee's commitments to NRC Generic Letter 88-17 to determine if they were still in place and adequate
- Observed fuel handling operations (offload) and other ongoing fuel handling activities to determine if those operations and activities were being performed in accordance with TS and licensee procedures.
- Prior to mode changes, the inspectors reviewed selected system lineups and/or control board indications to determine if TS, license conditions, and other requirements, commitments, and administrative procedure prerequisites for mode changes were met prior to changing modes or plant configurations
- Reviewed reactor coolant system boundary leakage data and observed/reviewed controls for establishing containment closure to determine whether the reactor coolant system and containment boundaries were in place when necessary.
- Reviewed items that had been entered into the licensee's corrective action program to determine if the licensee had identified problems related to outage activities at an appropriate threshold and had entered them into the corrective action program. The inspectors reviewed the results of the licensee's investigations to determine if the licensee had determined the root cause and implemented appropriate corrective actions for the significant problems.

b. Finding

No findings were identified.

1R22 Surveillance Testinga. Inspection Scope

For the six surveillances identified below, the inspectors witnessed testing and/or 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, and 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/4600/003B, Daily Surveillance Items (Standby Nuclear Service Water Pond Temperature), Revision (Rev.) 139
- PT/1/A/4350/036A, DG 1A 24 Hour Run, Rev. 39
- PT/0/A/4200/002, Standby Shutdown Facility Operability Test, Rev. 57
- PT/0/A/4250/037, Main Steam Safety Valve Setpoint Test Using Set Pressure Verification Device (SPVD), Rev. 11

In-Service Tests

- PT/2/A/4252/001, #2 TD CA Pump Performance Test, Rev. 110

Reactor Coolant System Leakage

- PT/1/A/4150/001A, Reactor Coolant System Leakage Calculation, Rev. 71

b. Findings

No findings were identified.

## 2. RADIATION SAFETY

Cornerstones: Occupational Radiation Safety and Public Radiation Safety

2RS1 Radiological Hazard Assessment and Exposure Controlsa. Inspection Scope

Hazard Assessment and Instructions to Workers: The inspectors observed labeling of radioactive material and postings for radiation areas, high radiation areas (HRAs), and contaminated areas established within the radiologically controlled area (RCA) of the Unit 1 and Unit 2 auxiliary buildings, and radioactive waste (radwaste) processing and storage locations. The inspectors independently measured radiation dose rates or observed licensee radiation surveys for selected RCA areas including the Independent Spent Fuel Storage Installation. The inspectors reviewed survey records for several plant areas including surveys for alpha emitters, hot particles, airborne radioactivity, gamma surveys with a range of dose rate gradients, and pre-job surveys for upcoming tasks. The inspectors also discussed changes to plant operations that could contribute to changing radiological conditions since the last inspection. The inspectors attended

selected pre-job briefings and reviewed the radiation work permit (RWP) details to assess communication of radiological control requirements and current radiological conditions to workers.

Hazard Control and Work Practices: The inspectors evaluated access barrier effectiveness for selected locked high radiation area (LHRA) and very high radiation area (VHRA) locations. Changes to procedural guidance for LHRA and VHRA controls were discussed with health physics (HP) supervisors. Controls and their implementation for storage of irradiated material within the spent fuel pool were reviewed and discussed in detail. Established radiological controls (including airborne controls) were evaluated for selected tasks including fuel transfer cart maintenance and entry into LHRAs. In addition, licensee controls for areas where dose rates could change significantly as a result of refueling operations were reviewed and discussed.

Worker adherence to RWPs and HP technician (HPT) proficiency in providing job coverage was evaluated through direct observations and interviews with licensee staff. Electronic dosimeter (ED) alarm set points and worker stay times were evaluated against area radiation survey results for fuel transfer cart maintenance. ED alarm logs were reviewed and worker response to dose and dose rate alarms was evaluated. For HRA tasks involving significant dose rates, (e.g. valve maintenance activities), the inspectors evaluated the use and placement of whole body and extremity dosimetry to monitor worker exposure.

Control of Radioactive Material: The inspectors observed surveys of material and personnel being released from the RCA using small article monitor, personnel contamination monitor, and portal monitor instruments. The inspectors reviewed the last two calibration records for selected release point survey instruments and discussed equipment sensitivity, alarm setpoints, and release program guidance with licensee staff. The inspectors also reviewed records of leak tests on selected sealed sources and discussed nationally tracked source transactions with licensee staff.

Problem Identification and Resolution: PIPs associated with radiological hazard assessment and control were reviewed and assessed to evaluate the licensee's ability to identify and resolve the issues. The inspectors also evaluated the scope of the licensee's internal audit program and reviewed recent assessment results. Radiation protection activities were evaluated against the requirements of UFSAR Section 12; TS Section 5.7; 10 CFR 19 and 20; and approved licensee procedures. Licensee programs for monitoring materials and personnel released from the RCA were evaluated against 10 CFR 20 and IE Circular 81-07, Control of Radioactively Contaminated Material.

Documents reviewed are listed in the Attachment. The inspectors completed one sample.

b. Findings

No findings were identified.

## 2RS5 Radiation Monitoring Instrumentation

### a. Inspection Scope

Radiation Monitoring Instrumentation: The inspectors observed installed radiation detection equipment during walk-downs of the auxiliary building and the RCA exit point including area radiation monitors (ARMs), liquid and gaseous effluent monitors, personnel contamination monitors (PCMs), small article monitors (SAMs), and portal monitors (PMs). The inspectors observed the physical location of the components and noted their material condition. The inspectors also observed source checks of various portable and fixed detection instruments, including ion chambers, telepoles, PCMs, SAMs, PMs, and a whole body counter (WBC). For the portable instruments, the inspectors observed the use of a high-range calibrator and discussed periodic output value testing with the licensee. The inspectors also observed the performance of a process monitor channel operational test. The inspectors reviewed calibration records and evaluated alarm setpoint values for PCMs, PMs, effluent monitors, an ARM, a SAM, and a WBC. This included a sampling of instruments used for post-accident monitoring such as a containment high-range radiation monitor and effluent monitors for noble gas and iodine. The radioactive source used to calibrate an effluent monitor was evaluated for traceability to national standards. Calibration stickers on portable survey instruments were noted during inspection of the storage area for ready-to-use equipment. The inspectors reviewed the most recent 10 CFR 61 analysis for dry active waste to determine if calibration and check sources are representative of the plant source term. The inspectors also reviewed countroom calibration records for a gamma spectroscopy germanium detector and a liquid scintillation detector. The inspectors reviewed effectiveness and reliability of selected radiation detection instruments against details documented in 10 CFR 20; NUREG-0737, Clarification of TMI Action Plan Requirements; UFSAR Chapters 11 and 12; and applicable licensee procedures.

Problem Identification and Resolution: The inspectors reviewed selected PIPs in the area of radiological instrumentation to evaluate the licensee's ability to identify and resolve the issues.

Documents reviewed are listed in the Attachment. The inspectors completed one sample.

### b. Findings

No findings were identified.

## 2RS6 Radioactive Gaseous and Liquid Effluent Treatment

### a. Inspection Scope

Event and Effluent Program Reviews: The inspectors reviewed the 2009 and 2010 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

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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 components of the gaseous and liquid discharge systems to ascertain material condition, configuration and alignment. Walkdowns included visual inspections of 0EMF-49, Waste Liquid Radiation Monitor; 1EMF-35, Unit Vent Particulate Radiation Monitor; 1EMF-36, Unit Vent Gaseous Radiation Monitor; and 1EMF-37, Unit Vent Iodine Radiation Monitor. To the extent practical, 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. The inspectors also observed the collection and analysis of a liquid effluent sample from the waste monitor tank (WMT).

Sampling and Analyses: The inspector observed the preparation of the samples from the WMT for counting, administrative processing, and implementation of the liquid effluent release permit. The inspector noted independent verification of the permit results and concurrent verification of equipment manipulations performed to allow the release. The results of the chemistry count room's inter-laboratory comparison program were reviewed and discussed with the licensee.

Dose Calculations: The inspectors discussed recent changes in reported dose values relative to previous ARERR reporting periods with an emphasis placed on Carbon-14 radionuclide source term quantities and resultant doses. The inspectors reviewed and evaluated a waste gas decay tank (WGDT) release and a liquid effluent release. The evaluations included review and discussion of set point 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) 2009 and 2010.

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, 5.5, and 5.6; the ODCM; 10 CFR 20; 10 CFR 50, Appendix I; 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.

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.

Problem Identification and Resolution: The inspectors reviewed selected PIPs in the areas of effluent processing and groundwater protection to evaluate the licensee's ability to identify, characterize, prioritize, and resolve the identified issues.

Documents reviewed are listed in the Attachment. The inspectors completed one sample.

b. Findings

No findings were identified.

2RS7 Radiological Environmental Monitoring Program (REMP)

a. Inspection Scope

REMP Status and Results: The inspectors reviewed and discussed recent and proposed 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 2009 and 2010 were reviewed and discussed. REMP vendor laboratory cross-check program results and select procedural guidance for collection, processing and analysis of airborne particulate and iodine, and broadleaf vegetation were reviewed and discussed with knowledgeable personnel. Detection level sensitivities as documented within the AREOR for selected environmental media analyzed by the offsite environmental laboratory were reviewed. The AREOR environmental measurement results were reviewed for consistency with licensee ARERR data and evaluated for radionuclide concentration trends. Licensee actions for missed airborne monitoring samples were reviewed and discussed in detail.

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 equipment material condition and evaluated operability, including a review of flow rates and total sample volume results for the weekly airborne particulate filter and iodine cartridge change-outs at seven atmospheric sampling stations. Justification for changing a site air monitoring station was reviewed against ODCM criteria. 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. Material condition and placement of selected environmental thermo-luminescent dosimeters were observed. Actions for missed samples including compensatory measures and/or availability of replacement equipment were discussed with vendor technicians and knowledgeable licensee staff. In addition, sample pump calibration and maintenance records for the installed environmental air monitoring equipment were reviewed.

The inspectors toured the primary meteorological tower and compared local data readouts with control room data. The inspectors observed the physical condition of the tower and associated instruments and discussed equipment operability, maintenance history, and backup power supplies 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 2009 and 2010.

The inspectors discussed previous leaks and spills, corrective actions, and reviewed monitoring results associated with the conventional waste water (WC) initial holdup pond, liquid waste recycle trench, and the reactor make-up water storage tank. Licensee monitoring and proposed testing activities for associated buried piping for the WC holdup pond were discussed with responsible licensee representatives. Proposed changes to the licensee groundwater monitoring program based on recent investigations of groundwater intrusion into the ground water drainage A, B, and C sumps were discussed in detail. Current status and completeness of the licensee's 10 CFR 50.75(g) decommissioning files were reviewed and discussed.

Procedural guidance, program implementation, quantitative analysis sensitivities, and environmental monitoring results were reviewed against 10 CFR 20; 10 CFR 50, and Appendix I; TS Sections 5.4.1 Procedures, 5.5 Programs and Manuals, and 5.6 Reporting Requirements; ODCM, Rev. 51 & 52; RG 4.15, Quality Assurance for Radiological Monitoring Programs (Normal Operation) - Effluent Streams and the Environment; and the Branch Technical Position, An Acceptable Radiological Environmental Monitoring Program - 1979. Licensee procedures and activities related to meteorological monitoring were evaluated against: ODCM; RG 1.23, Meteorological Monitoring Programs for Nuclear Power Plants, and ANSI/ANS-2.5-1984, Standard for Determining Meteorological Information at Nuclear Power Sites.

Documents reviewed are listed in the Attachment. The inspectors completed one sample.

b. Findings

No findings were identified.

4OA1 Performance Indicator (PI) Verification

a. Inspection Scope

To determine the accuracy of the PI data reported, 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. For the specified review period, the inspector examined data reported to the NRC, procedural guidance for reporting PI information, and records used by the licensee to identify potential PI occurrences. Documents reviewed are listed in the Attachment.

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#### Mitigating Systems Cornerstone

- Mitigating Systems Performance Index (MSPI) – Emergency Power (Units 1 and 2)
- MSPI – High Pressure Injection (Units 1 and 2)
- MSPI – Secondary Heat Removal (Units 1 and 2)
- MSPI – Residual Heat Removal (Units 1 and 2)
- MSPI – Cooling Water (Units 1 and 2)

The inspectors sampled licensee submittals for the period July 1, 2010 to June 30, 2011. The inspectors reviewed the documents listed in the Attachment to determine if the licensee had correctly calculated and reported the data for the above PIs. In addition, the inspectors reviewed any changes made in MSPI risk coefficients that were greater than 25% since the last review.

#### Occupational Radiation Safety Cornerstone

- Occupational Exposure Control Effectiveness

The inspectors reviewed the PI results from July 2010 through March 2011. The inspectors reviewed ED alarm logs and PIPs related to controls for exposure significant areas. The inspectors also evaluated licensee procedural guidance for identifying and reporting PI occurrences.

#### Public Radiation Safety Cornerstone

- Radiological Control Effluent Release Occurrences

For the assessment period from January 1, 2009, through June 30, 2011, the inspectors reviewed cumulative and projected doses to the public and PIP documents related to Radiological Effluent Technical Specifications/ODCM issues including abnormal effluent releases.

#### b. Findings

No findings were identified.

### 4OA2 Problem Identification and Resolution

#### .1 Routine Review

As required by Inspection Procedure 71152, Identification and Resolution of Problems, 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 database.

.2 Selected Issue Follow-Up Inspection

a. Inspection Scope

The inspectors selected PIP M-11-2532 associated with the failure to open the Unit 2 sight glass isolation valve during reactor coolant system draindown on March 25, 2011. The inspectors reviewed the report to determine whether the licensee identified the full extent of the issue, performed an appropriate evaluation, and specified and prioritized appropriate corrective actions. The inspectors evaluated the licensee documents against the requirements of the licensee's corrective action program and implementing procedures, and 10 CFR 50, Appendix B. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

4OA3 Follow-up of Events and Notices of Enforcement Discretion

.1 Event Follow-Up

a. Inspection Scope

The inspectors reviewed the licensee's actions associated with the earthquake that occurred on August 23, 2011. The inspectors observed plant parameters for mitigating systems, evaluated performance of systems and operators, and confirmed proper classification and reporting of the event.

b. Findings

No findings were identified.

.2 (Closed) Licensee Event Report (LER) 05000370/2010-002-00 and -01, Unit 2 Nuclear Service Water System 'A' Train Past Inoperable Due to Failed Strainer Differential Pressure Instrument

On September 15, 2010, the licensee identified an anomaly during the performance of a periodic high flow flush test on the 'A' Train RN standby nuclear service water pond (SNSWP) header. While performing the test, the 2A RN strainer differential pressure (dP) instrument showed an unexpected decrease in flow as RN system flow was being increased. The licensee's investigation showed that a leaking fitting on the low pressure side of the dP instrument caused differential pressure to drop below zero at high system flow. The licensee determined that the causes of the dP instrument failure were improper reassembly of an impulse line fitting during a preventative maintenance activity and an inadequate post-maintenance test. A subsequent evaluation determined that operability of the 2A RN strainer could not be assured for the period from July 24, 2010, until September 15, 2010, which exceeded TS Limiting Condition for Operation (LCO) 3.7.7 allowed outage time for a single inoperable RN train. The inspectors reviewed the

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LER, the licensee's root cause analysis, and corrective action documents to verify accuracy of the LER and that the corrective actions were appropriate. No additional findings were identified. This LER is in the licensee's corrective action program as PIP M-10-5982. The enforcement aspects of the event are discussed in Section 4OA7.

.3 (Closed) LER 05000369/2011-001-01, Shutdown of Two Units Due to Entry into LCO 3.0.3 Caused By the Inoperability of All Four Trains of the Nuclear Service Water System Due to Strainer Macro-Fouling

The inspectors reviewed the subject LER revision and PIP M-11-00329 to verify the LER accuracy and appropriateness of corrective actions. The supplement to this LER provided additional details by the licensee regarding the dates of vulnerability of the RN system macro-fouling. Based on the licensee's subsequent evaluation of the environmental, fish behavior patterns, and operational conditions in the area of the RN intake structure and suction strainers, the licensee believed the fish macro-fouling conditions existed no earlier than January 7, 2011, which decreased the period of vulnerability to a strainer fouling event from that which was initially believed to exist. This information further supported the basis for the NRC's previous determination that this issue was of very low safety significance (Green) as originally documented in NRC Inspection Report 05000369, 370/2011-002 as a Non-Cited Violation (NCV) of 10 CFR 50, Appendix B, Criterion XVI, for inadequate corrective actions to prevent macro-fouling of the RN pump suction strainers. No new findings were identified. Documents reviewed are listed in the Attachment.

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 (Closed) Unresolved Item (URI) 05000369, 370/2000009-03, Availability of the Charging Pumps for Fire Damage to the Volume Control Tank Outlet Valves.

a. Inspection Scope

The inspectors reviewed the facts of the URI as well as evaluations and corrective actions taken by the licensee.

b. Findings

Introduction: The NRC-identified a noncompliance of 10 CFR 50, Appendix R, Section III.G for failure to ensure that fire protection features were capable of limiting fire damage so that systems necessary to achieve and maintain cold shutdown could be repaired

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within 72 hours. This noncompliance was applicable to fires in fire area (FA) 14 (733' Aux Building) and FA 20 (Unit 2 Cable Room). The NRC is not taking any enforcement action for this noncompliance because it meets the criteria of the NRC's Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues.

Description: This issue was previously documented in NRC Inspection Report (IR) 05000369, 370/2000009 pending further review. As described in IR 05000369, 370/2000009, cables associated with Unit 1 Volume Control Tank (VCT) outlet valves 1NV141A and 1NV142B, and Unit 2 VCT outlet valves 2NV141A and 2NV142B, could be damaged as a result of a fire in FA 14. The power and control cables for both Unit 2 VCT outlet valves were also unprotected and could be damaged as a result of a fire in FA 20. These valves were arranged in series to ensure the VCT was isolated during a safety injection. As a result, spurious closure of a VCT outlet valve would damage the running charging pump due to loss of suction. A subsequent total loss of offsite power would result in automatic starting of the opposite train charging pump with the VCT isolated, damaging the second charging pump. During the baseline triennial fire protection inspection in 2009, the inspectors reviewed the URI, associated evaluations, and corrective actions by the licensee. As discussed in IR 05000369, 370/2009007, a charging pump was needed to achieve and maintain cold shutdown in the event of a fire in FA 14 or FA 20 because the SSF standby makeup pump does not have sufficient flow capacity to make up for the contraction of RCS coolant associated with RCS cooldown and meet the 72 hour requirement. The licensee entered this issue into their CAP as PIPs M-00-04481 and M-09-05990, and established compensatory measures consisting of hourly fire watches in FA 14 and FA 20. The licensee plans to evaluate additional potential corrective actions and plant modifications as part of their transition to NFPA 805 in accordance with 10 CFR 50.48(c).

Analysis: The failure to ensure that fire protection features were capable of limiting fire damage so that systems necessary to achieve and maintain cold shutdown can be repaired within 72 hours, as required by 10 CFR Part 50, Appendix R, Section III.G., was a PD. The PD was more than minor because it was associated with the protection against external factors (i.e., fire) attribute and adversely affected the Mitigating Systems cornerstone objective because there would be insufficient make up capacity associated with RCS cooldown. The inspectors assessed the finding using the Fire Protection Phase 1 Worksheet contained in NRC Inspection Manual Chapter 0609, Appendix F, Attachment 1, and concluded that the finding was of very low safety significance (Green), because it only affected the ability to reach and maintain cold shutdown conditions. A cross-cutting aspect was not assigned because the finding did not represent current licensee performance.

Enforcement: McGuire Unit 1 Operating License Condition 2.C.(4) and Unit 2 Operating License Condition 2.C.(4) required the licensee to implement and maintain in effect all provisions of the approved Fire Protection Program as described in the Final Safety Analysis Report, as updated, for the facility and as approved in the NRC Safety Evaluation Report dated March 1978, and Supplements 2, 5, and 6 dated March 1979, April 1981, and February 1983, respectively, and the NRC Safety Evaluation Report dated May 15, 1989. The licensee's approved fire protection program committed to 10

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CFR 50, Appendix R, Section III.G. Section III.G specified that fire protection features shall be capable of limiting fire damage so that systems necessary to achieve and maintain cold shutdown from either the control room or emergency shutdown stations can be repaired within 72 hours. Contrary to the above, since the Safety Evaluation Report issued in 1978, the licensee failed to have fire protection features capable of limiting fire damage so that systems necessary to achieve and maintain cold shutdown conditions could be repaired within 72 hours. These conditions have existed since original plant construction and were applicable to both Unit 1 and Unit 2. The NRC is exercising enforcement discretion for this nonconformance in accordance with the NRC Enforcement Policy, "Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues (10 CFR 50.48)," because the licensee documented their commitment to adopt NFPA 805 and change their fire protection licensing basis to comply with 10 CFR 50.48(c) prior to December 31, 2005, and it was likely this issue would have been identified and addressed during the licensee's transition to NFPA 805, it was entered into the licensee's corrective action program, immediate corrective action and compensatory measures were taken, it was not likely to have been previously identified by routine licensee efforts, it was not willful, and it was not associated with a finding of high safety significance (Red).

.3 (Closed) NRC Temporary Instruction (TI) 2515/179 - Verification of Licensee Responses to NRC Requirement for Inventories of Materials Tracked in the National Source Tracking System (NSTS) Pursuant to Title 10, Code of Federal Regulations, Part 20.2207 (10 CFR 20.2207)

a. Inspection Scope

The inspectors reviewed the licensee's source inventory records and identified a source (contained in a shielded calibration system) that met the criteria for reporting to the NSTS. The inspectors determined the presence of the source by radiation measurement using a portable radiation survey instrument. The inspectors reviewed the physical condition of the source container and discussed container locking mechanisms with the licensee. The inspectors reviewed source transaction records and information obtained from the NSTS database. Documents reviewed are listed in the Attachment. This completes the Region II inspection requirements.

b. Findings

No findings were identified.

.4 (Closed) NRC TI 2515/177, Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems (NRC Generic Letter (GL) 2008-01)

a. Inspection Scope

The inspectors reviewed the implementation of the licensee's actions in response to GL 2008-01, Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems. The systems reviewed included the

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emergency core cooling system (ECCS), decay heat removal system (ND), and containment spray system (NS). The inspectors reviewed the following:

- the licensing basis to verify that actions to address gas accumulation were consistent with the operability requirements of the subject systems
- the design of the subject systems to verify that actions taken to address gas accumulation were appropriate given the specifics of the functions, configurations, and capabilities of these systems
- the design and operation of the ND system to determine if flashing in ND suction lines would challenge system operability
- selected analyses performed by the licensee to verify that methodologies for predicting gas void accumulation, movement, and impact were appropriate
- testing implemented by the licensee to address gas accumulation in subject systems
- test procedures and completed test results to verify that test procedures were appropriate to detect gas accumulations that could challenge subject systems
- the specified testing frequencies to verify that the testing intervals had appropriately taken historical gas accumulation events as well as susceptibility to gas accumulation into account
- the test programs and processes to verify that they were sensitive to pre-cursors to gas accumulation
- corrective actions associated with gas accumulation in subject systems to verify that identified issues were being appropriately identified and corrected
- locations of selected vent valve installations to verify that the locations selected were appropriate based on piping configuration and pipe slopes

The inspectors also walked down selected systems to verify that the reviews and design verifications conducted by the licensee had drawn appropriate conclusions with respect to piping configurations and pipe slope which could be result susceptible to gas accumulation. Documents reviewed are listed in the Attachment.

b. Findings

Introduction: The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion V, Instructions, Procedures and Drawings, for the failure to establish acceptance criteria to determine operability in surveillance procedures used to vent the ND system in Modes 5, 6, and No-Mode in preparation for Mode 6.

Description: Surveillance procedures PT/1/A/4200/036, Rev 10 (Unit 1) and PT/2/A/4200/036, Rev 10 (Unit 2), Periodic Venting of ND System, were used to ensure ND system suction piping and interconnected piping was water solid by venting piping using accessible high point vents. The procedure was used in Modes 5, 6, and No-Mode in preparation for Mode 6. The ND system was required to be operable in Modes 5 and 6. Operators performed this procedure by venting accessible high points and verifying a solid water condition in the piping. If gas was detected, the procedure called for recording the gas vent time duration. The procedure was considered satisfactory as long as the as-left condition of the system was water solid. No acceptance criteria was contained in the procedure to determine if the amount of gas vented represented

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operability impact on the ND system and no provision was contained in the procedure to enter the corrective action program to determine if such operability impacts existed, or could reoccur following venting.

Operating experience provided by GL 2008-01 stated that surveillance requirements procedures should ensure that gas has not affected system operability and will not likely accumulate in sufficient quantity to jeopardize system operability before the next surveillance. Therefore, the inspectors determined that the licensee's surveillance procedures PT/1(2)/A/4200/036 were inadequate in that they failed to establish a basis for system operability relative to gas accumulation in the ND system.

Analysis: The licensee's failure to establish adequate acceptance criteria for ND venting surveillance procedures PT/1/A/4200/036 and PT/2/A/4200/036 which are used to maintain continued operability and performance capability of the system in Modes 5 and 6 was a PD. The PD was determined to be more than minor because if left uncorrected, the failure to establish acceptance criteria for surveillance tests, which established the basis for the ND system operability in modes 5 and 6, would have the potential to lead to a more significant safety concern in that conditions which impact system operability could remain undetected. In addition, the finding adversely affected the Equipment Performance attribute of the Mitigating Systems cornerstone and adversely affected the objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences in that gas intrusion could result in a loss of decay heat removal capability. Using IMC 0609, Appendix G, Shutdown Operations Significance Determination Process, Attachment 1, Phase 1, the finding was determined to be of very low safety significance (Green) because a quantitative assessment was not required based on the criteria in Attachment 1. The finding had a cross-cutting aspect of implementation of operating experience in the Operating Experience component in the area of Problem Identification and Resolution because the licensee failed to implement operating experience from GL 2008-01 into station procedures [P.2(b)].

Enforcement: 10 CFR 50, Appendix B, Criterion V, Instructions, Procedures and Drawings, required, in part, that instructions, procedures or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished. Contrary to the above, as of June 30, 2011, the licensee failed to include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished. Specifically, procedures PT/1(2)/A/4200/036, Periodic Venting of ND System, provided no acceptance criteria to determine if the amount of gas vented represented operability impacts on the ND system and no provision was contained in the procedure to enter the corrective action program to determine if such operability impacts existed, or could reoccur following venting. Because this violation was determined to be of very low safety significance and has been entered into the licensee's corrective action program as PIP M-11-04745, it is being treated as an NCV consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000369, 370/2011004-01, Failure to Establish Adequate ND Venting Procedures.

#### 4OA6 Meetings, Including Exit

On October 13, 2011, the resident inspectors presented the inspection results to Mr. Regis T. 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.

- 10 CFR 50, Appendix B, Criterion V, required, in part, that procedures for performing maintenance that can affect the performance of safety-related equipment should be properly preplanned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances. This requirement included written procedures for post-maintenance testing of the RN system. Contrary to the above, written procedures for post-maintenance testing of the RN system were not appropriate to the circumstances. On July 24, 2010, following maintenance on the 2A RN strainer dP instrument loop, the licensee failed to include adequate post-maintenance instructions which would have included testing the 2A RN strainer dP instrument loop during high flow conditions experienced on the RN SNSWP supply and return header. This violation was determined not to be greater than very low safety significance (Green) because it did not represent a loss of safety function of the 2A RN train. This condition was placed in the licensee's corrective action program as PIP M-10-05982.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee

K. Ashe, Safety Assurance Manager (Acting)  
R. Branch, Inspection Services Manager (ISI/Welding/MRP-139)  
D. Brenton, Plant Operations Superintendent  
S. Capps, Station Manager  
G. Cutri, BACCP Backup  
S. Franklin, BACCP Program Owner  
J. Hicks, Maintenance Superintendent  
G. Houser, NDE Supervisor  
G. Johnson, Corporate Health Physics  
N. Kunkel, Work Control Superintendent  
S. Manning, System Engineering Supervisor  
B. Meyer, Principal Engineer - Design  
S. Mooneyhan, Radiation Protection Manager  
T. Moore, RPVH Inspection Program Owner  
J. Nolin, Mechanical and Civil Engineering Manager  
R. Repko, Vice President - McGuire Nuclear Station  
S. Russ, Security Manager  
P. Schuerger, Training Manager  
W. Scott, Chemistry Manager  
S. Snider, Engineering Manager (Acting)

### **LIST OF REPORT ITEMS**

#### Opened and Closed

05000369, 370/2011004-01	NCV	Failure to Establish Adequate ND Venting Procedures (Section 4OA5.4)
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#### Closed

05000370/2010-002-00	LER	Unit 2 Nuclear Service Water System 'A' Train Past Inoperable Due to Failed Strainer Differential Pressure Instrument (Section 4OA3.2)
05000370/2010-002-01	LER	Unit 2 Nuclear Service Water System 'A' Train Past Inoperable Due to Failed Strainer Differential Pressure Instrument (Section 4OA3.2)
05000369/2011-001-01	LER	Shutdown of Two Units Due to Entry into LCO 3.0.3 Caused By the Inoperability of All Four Trains of the Nuclear Service Water System Due to Strainer Macro-Fouling (Section 4OA3.3)

05000369, 370/2000009-03	URI	Availability of the Charging Pumps for Fire Damage to the Volume Control Tank Outlet Valves (Section 4OA5.2)
2515/179	TI	Verification of Licensee Responses to NRC Requirement for Inventories of Materials Tracked in the National Source Tracking System (NSTS) Pursuant to Title 10, Code of Federal Regulations, Part 20.2207 (10 CFR 20.2207) (Section 4OA5.3)
2515/177	TI	Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems (NRC Generic Letter (GL) 2008-01) (Section 4OA5.4)

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##### Readiness for Seasonal Extreme Weather Conditions

PT/0/B/4700/039, Warm Weather Equipment Checkout, Rev. 15

VC/YC System Health Reports

PIP M-11-5284, Average temperature of SNSWP approaching limit

PIP M-11-5352, 1ATC Transformer high temperature alarm

PIP M-11-5383, Isophase bus trouble alarm due to 1B transformer Z-phase high temperature

PIP M-11-5703, 'E' Instrument Air compressor inboard bearing temperature high

PIP M-11-5718, ELXD Transformer (temperature) alarm

##### Impeding Adverse Weather Condition

RP/0/A/5700/006, Natural Disasters, Rev. 23

RP/0/B/5700/027, High Winds or Hurricane Preparations, Rev. 6

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

OP/2/A/6250/002, Auxiliary Feedwater System, Rev. 82

MCFD-2592-01.00, Flow Diagram of Unit 2 Auxiliary Feedwater System (CA)

MCFD-2592-01.01, Flow Diagram of Unit 2 Auxiliary Feedwater System (CA)

Drawing MCFD-2609-04.00, Flow Diagram of the Diesel Generator Starting Air System

Drawing MCFD-2609-03.01, Flow Diagram of the Diesel Generator Engine 2B Fuel Oil System

Drawing MCFD-2609-02.00, Flow Diagram of the Diesel Generator Engine Lube Oil System

Drawing MCFD-2609-01.00, Flow Diagram of the Diesel Generator Engine Cooling Water System

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

MCS-1465.00-00-0008 Design Basis Specification for Fire Protection

NSD 313, Control of Combustible and Flammable Material, Rev. 10

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NSD 104, Material Condition/Housekeeping, Foreign Material Exclusion and Seismic Concerns, Rev. 32

**Section 1R08: Inservice Inspection Activities**Procedures

McGuire Engineering Support Document: Boric Acid Corrosion Program, Rev. 004  
 MP-0-A-7700-080, Inspection and Cleanup of Boric Acid on Plant Materials, Rev. 012  
 NDEMAN-NDE-35, Liquid Penetrant Examination, Rev. 022  
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 NDEMAN-NDE-62, Visual Examination (VT-1 and VT-3) of Bolting, Rev. 001  
 NDEMAN-NDE-68, Visual Examination for Leakage and Boric Acid Corrosion Control, Rev. 002  
 NDEMAN-PDI-UT-1-FC08-05, Generic Procedure for the Ultrasonic Examination of Ferritic Pipe Welds PDI-UT-1 Revision D Field Change 08-05, Rev. 0  
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 NDEMAN-NDE-70 Visual Examination of Reactor Pressure Vessel Upper Head Penetrations, Rev. 0

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PIP M-11-06962, Water and boric acid deposits near U1 fuel transfer tube area - 1EOC21  
 PIP M-11-07086, Difficulties in performing Rx Head Auxiliary Head Adapters (AHAs)  
 PIP M-11-07242, Ground place found on NV piping that needs to be address  
 PIP M-10-02471, Lack of welding resources  
 PIP M-10-02755, Mod restoration activities  
 PIP M-10-03806, Thru-wall (pin hole) leak in Unit 1 RL piping  
 PIP M-10-06107, Welds broken on stiffener rings inside tank  
 PIP M-11-01822, Errors on weld isometric and weld documents  
 PIP M-11-01992, Underwater welders job specific proficiency test  
 PIP M-11-06651, 2-NM-VA-0037 valve was actively leaking

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PT Exam for 1NV-237-2, Seat Ring Insert to Valve Body  
 UT Exam for 1NI1F1154, Pipe to Elbow  
 UT Exam for 1NV1FW175-31, Reducer to Pipe  
 NDE Personnel Certification Records for PT Exam for 1NV-237-2, Seat Ring Insert to Valve Body  
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**Section 1R12: Maintenance Effectiveness**

Maintenance Rule SSC Summary Reports for VC/YC  
 2<sup>nd</sup> Quarter 2011 VC/YC System Health Report

**Section 1R13: Maintenance Risk Assessments and Emergent Work Evaluation**

NSD 403, Shutdown Risk Management, Rev. 22 and Rev. 23  
 NSD 213, Risk Management Process, Rev. 10  
 2B RN Critical Plan (11W28)  
 EC 101550/Install 2B RN strainer backwash pipe to WZ sump

**Section 1R15: Operability Evaluations**

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 PT/1/A/4350/055B, 1B D/G Slave Start Test, Rev. 22  
 PT/2/A/4350/002B, Diesel Generator 2B Operability Test, Rev. 84  
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**Section 1R20: Refueling and Other Outage Activities**

McGuire 1EOC21 Outage Plan, update 9/11/11  
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 NSD 403, Shutdown Risk Management, Rev. 22 and Rev. 23  
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 AP/1/A/5500/015, Loss of Vital or Aux Control Power, Rev. 24  
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 OP/1/A/6100/SD-2, Cooldown to 400 degrees F, Rev. 41  
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 OP/1/A/6100/SO-8, ND Pump Operation in No Mode or Mode 6, Rev. 27  
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 OP/1/A/6100/SD-21, Mode 6 Checklist, Rev. 19  
 OP/1/A/6100/SD-22, Removal of Reactor Vessel Head, Rev. 19  
 OP/1/A/6100/SD-25, Core Alterations Checklist, Rev. 13  
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**Section 2RS5: Radiation Monitoring Instrumentation**Procedures and Guidance Documents

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#### **Section 2RS6: Radioactive Gases and Liquid Effluent Treatment**

##### Procedures, Guidance Documents, and Manuals

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 IP/0/B/3260/003, Met One Series 21 Wind Speed Module Channel Calibration, Rev. 20  
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 McGuire Nuclear Station Offsite Dose Calculation Manual (ODCM), 2011 Rev. 52  
 SH/0/B/2000/006, Control of Radioactive Material and Use of Radioactive Material Tags, Rev. 6  
 SH/0/B/2000/013, Removal of Items from RCA/RCZs, Rev. 1  
 SH/0/B/2007/001, Radiological Environmental Monitoring Program Data, Rev. 1  
 SH/0/B/2008/001, Calibration and Quality Assurance of Canberra ARGOS-4AB Contamination Monitors, Rev. 1  
 SRPMP 8-2, Investigation of Unusual Radiological Occurrence, Rev 005

Records and Data Reviewed

2009 Annual Land Use Census, Dated 10/27/09  
 2009 and 2010 Annual Radiological Environmental Operating Reports  
 2010 Quarterly Environmental TLD Data  
 Annual Radioactive Effluent Report, 2010  
 Calibrations of PT 1EEBLP9110, Replacement/Calibrate Transmitter: Lower wind speed loop, Dated 12/06/10 and 06/13/11; PM 1EEBLP9160, Calibrate Precipitation Processor: Precipitation processor rain gauge loop, Dated 06/07/10; PT 1EEBLP9140, Calibrate Loop (Air Temp): Air temperature loop, Dated 06/08/10; and PM 1EEBPY9170, 40VAC Power Supply Instruments  
 Calibrations of REMP Air Sampler F and J Model LV-1D, # 03097, Dated 01/06/11; #00330, Dated 10/08/10; and #03091, Dated 02/01/11  
 MNS 50.75(g) Files: CY 2004 – April 2011  
 X/Q & D/Q Comparison to ODCM EAB Values for 2009 Annual Effluent Release Report, Dated 03/15/10

CAP Documents

Independent Nuclear Oversight- Audit MNS Radiological Effluent Control Program Audit 10-15(NOS)(REC)(MNS)  
 PIPs G-11-00043, G-11-00740, M-09-04044, M-10-06597, M-11-05058, M-11-05059

**Section 40A1: Performance Indicator (PI) Verification**

NSD 225, NRC Performance Indicators, Rev. 4  
 NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Rev. 6

Procedures, Guidance Documents and Manuals

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

Records and Data Reviewed

ED Alarm Logs, Dated 06/01/10 – 06/30/11

CAP Documents

PIPs M-10-05229, M-10-05451, M-11-00141, M-11-01946, M-11-03695, M-11-03864, M-11-04574

Unplanned Release to Unit 1 Vent, Reference PIP M-11-0141, Memorandum 01/25/11  
 Unplanned Release to Unit 1 Vent, Reference PIP M-11-1946, Memorandum 03/28/11  
 Unplanned Release to Unit 1 Vent, Reference PIP M-11-3864, Memorandum 05/17/11  
 Unplanned Release to Unit 1 Vent, Reference PIP M-11-3965, Memorandum 06/01/11

**Section 40A2: Problem Identification and Resolution**

NSD 201, Reporting Requirements, Rev. 21  
 NSD 202, Reportability, Rev. 21  
 NSD 208, Problem Investigation Process (PIP), Rev. 32 and Rev. 33  
 NSD 212, Cause Analysis, Rev. 20  
 PIP M-11-2532, Failure to open the Unit 2 sight glass isolation valve during RCS draindown

**Section 40A3: Follow-up of Events and Notices of Enforcement Discretion**

IP/2/A/3090/022A, RN Pump Strainer A Pressure Calibration, Rev. 7  
 WO 0408293, 2A 2RNLP5000 model work order  
 WO 01895751, RN pump strainer functional verification  
 PT/0/A/4200/047, Train A SNSWP Supply and Return Header Flush, Rev. 20  
 MCC-1535.00-00-0136, Risk Analysis for 2A RN Strainer Differential Pressure Failure LER  
 PIP M-10-5982, Unit 2 'A' RN train failed strainer differential pressure instrument

**Section 40A5: Other Activities**

Units 1 and 2 Safety Evaluation Report, Supplement 6, Appendix C, Standby Shutdown System

Licensing Bases Documents

ML08133403120, Duke Energy Carolinas, LLC (Duke), Generic Letter 2008-01, 3-Month Response, May 5, 2008  
 ML0829004901, Duke Energy Carolinas, LLC (Duke), Generic Letter 2008-01, 9-Month Response, October 13, 2008

- ML1035001330, Duke Energy Carolinas, LLC, Response to Request for Additional Information Related to Generic Letter (GL) 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems", May 17, 2010
- ML1035011330, Duke Energy Carolinas, LLC, Response to Request for Additional Information Related to Generic Letter (GL) 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems", December 14, 2011
- ML11122A117, McGuire Nuclear Station, Units 1 And 2, Request For Additional Information (RAI) Related To Generic letter (GL) 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems", May 9, 2011
- ML093310403, Closure Letter for the McGuire Response to Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems", May 24, 2011

#### Procedures

- SOMP 02-01, Safety Tagging and Configuration Control, Rev 9
- PT/1/A/4200/019, ECCS pumps and piping vent, Rev 63
- PT/2/A/4200/019, ECCS pumps and piping vent, Rev 53
- PT/1/A/4200/036, Periodic Venting of ND System, Rev 10
- PT/2/A/4200/036, Periodic Venting of ND System, Rev 10
- PT/2/A/4600/003 A, Semi-Daily Surveillance Items, Rev 124
- OP/1/A/6100/SU-14, Removing ND from Service, Rev 26
- OP/1/A/6100/SU-6, Venting the NC System, Rev 26

#### Miscellaneous

- MCC-1223.12-00-0030, Technical Input For Response To NRC Generic Letter 2008-01: Managing Gas Accumulation In Emergency Core Cooling, Decay Heat Removal, And Containment Spray Systems, Rev. 4
- Gas Management Program Engineering Support Document, Rev. 0
- EDM 601, Engineering Directives Manual, Rev. 14
- Unit 1 and 2 ND System Discharge pressure graphical trend (2008-2011)

#### Drawings

- 2ND-350, MCSRD-ND System Auxiliary Building (Sheet 6 of 7), Rev 3
- 2ND-362, MCSRD-ND System Auxiliary Building (Sheet 2 of 2), Rev 3
- 2NS-352, MCSRD-NS System Auxiliary Building Sheet 2 of 2, Rev. 4
- MC-1414-04.42-00, Piping Layout System-ND, Rev. 23
- MC-1414-19.20-00, Piping Layout NS System, Rev. 12
- MC-1414-19.20-01, Piping Layout NS System, Rev. 11
- MC-1414-19.20-02, Piping Layout NS System, Rev. 8
- MC-1414-19.20-03, Piping Layout NS System, Rev. 4
- MC-1414-19.21-00, Piping Layout NS System, Rev. 5
- MC-2414-04.41-00, Piping Layout System ND-Plan Elevation 733'-0" Auxiliary Building, Rev 17
- MC-2414-04.42-00, Piping Layout System ND-Plan Elevation 733'-0" Auxiliary Building, Rev 14
- MC-2414-04.42-00, Piping Layout System-ND, Rev. 14
- MC-2414-04.42-01, Piping Layout System ND-Plan Elevation 733'-0" Auxiliary Building, Rev 23
- MCFD-1571-01.00, Flow Diagram of Refueling Water System (FW), Rev 22

MCFD-2554-03.00, Flow Diagram of Chemical and Volume Control System (NV), Rev 12  
 MCFD-2554-03.01, Flow Diagram of Chemical and Volume Control System (NV), Rev 21  
 MCFD-2561-01.00, Flow Diagram of Residual Heat Removal System (ND), Rev 15  
 MCFD-2562-01.00, Flow Diagram of Safety Injection System (NI), Rev 2  
 MCFD-2562-02.00, Flow Diagram of Safety Injection System (NI), Rev 7  
 MCFD-2562-02.01, Flow Diagram of Safety Injection System (NI), Rev 4  
 MCFD-2562-03.00, Flow Diagram of Safety Injection System (NI), Rev 13  
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 MCFD-2563-01.00, Flow Diagram of Containment Spray System (NS), Rev 14  
 MCFD-2571-01.00, Flow Diagram of Refueling Water System (FW), Rev 25  
 MCSRD-NDA, Auxiliary Building – Unit 1 S/R Isometric System ND Sheet 1 of 8, Rev. 3  
 MCSRD-NIA, Auxiliary Building Unit-1 S/R Isometric – FW, ND, & NI System (AREVA Survey Measurements), Rev 2

#### Calculations

MCC-1206.02-83-2006, Piping Analysis NS-1; 8" CS Line From PN To AZ 211°, Rev. 5  
 MCC-1223.04-00-0041, VCT NPSH And Low-Low Level Auto-Swap Setpoint, Rev. 1  
 MCC-1223.11-00-0032, Evaluation of air at 2ND-77, Rev 1  
 MCC-1223.12.00-0030, Technical Input for response to NRC Generic Letter 2008-01: Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems, Rev 5  
 MCC-1223.12.00-0010, Verification Of Minimum Available NPSH For ECCS Pumps, Rev. 7  
 MCC-1223.13-00-0018, Evaluation Of NS System Water Hammer Potential, Rev. 3

#### PIPs Reviewed During Inspection

M-05-02222, Air was vented out of various unit 2 ND and NV vents during performance of ECCS pump and piping vent, 4/28/2005  
 M-08-00198, PIP initiated to track McGuire response and CAs associated with the NRC's issuance of Generic Letter 2008-01, 1/14/2008  
 M-09-06301, While Performing Post Outage Checklist, Operator Noted That Valve Took 21 Seconds To Vent At 1/4 turn open, 10/09/2010  
 M-10-04743, 1ND-96 Took 120 Seconds To Fully Vent, 07/17/2010  
 M-11-00083, Readiness Review For NRC Inspection Of Generic Letter 08-01  
 M-11-03971, UT At 2NV-1056 Did Not Indicate Water Solid, 05/21/2011

#### Completed Procedures

PT/2/A/4208/002A, NS Train A Valve Stroke Timing – Quarterly, 05/01/2011  
 PT/2/A/4208/002B, NS Train B Valve Stroke Timing – Quarterly, 06/13/2011  
 PT/2/A/4208/001B, 1B NS Pump Performance Test, 05/10/2011  
 PT/2/A/4208/001A, 2A NS Pump Performance Test, 05/01/2011  
 PT/2/A/4208/001B, 2B NS Pump Performance Test, 06/13/2011  
 PT/1/A/4208/002A, NS Train B Valve Stroke Timing – Quarterly, 05/01/2011  
 PT/1/A/4208/002B, NS Train B Valve Stroke Timing – Quarterly, 05/12/2011  
 PT/1/A/4208/001A, 1A NS Pump Performance Test, 05/01/2011  
 PT/1/A/4208/001B, 1A NS Pump Performance Test, 05/12/2011  
 PT/2/A/4200/019, ECCS Pumps And Piping Vent, 05/21/2011  
 PT/2/A/4200/019, ECCS Pumps And Piping Vent, 04/22/2011  
 PT/1/A/4200/019, ECCS Pumps And Piping Vent, 05/21/11

OP/2/A/6100/SU-6A, NV And NI Post Outage Vent Procedure, 03/02/2011  
OP/1/A/6100/SU-6A, NV And NI Post Outage Vent Procedure, 04/11/2010

**PIP Reports Initiated for NRC Resident Inspector Identified Issues**

- M-11-5354, Upper walk platforms not secured on scaffolding erected in 1A DG room
- M-11-5892, Maintenance plans to drill and inject sealant of pressurized feedwater drain cap not covered by current operability evaluation of condition
- M-11-5892, Impact of installing pest traps in SSF cabinet not formally evaluated for proper configuration control
- M-11-5973, NFPA 805 hourly fire watch signed off prematurely and prior to conduct
- M-11-6023, SSF complex work plan incorrectly included protection of CA pumps
- M-11-6530, Concerns raised regarding potential interactions of seismic and non-seismic FWST piping during FWST recirculation/cleanup configurations
- M-11-6638, Concerns raised whether interim actions to address near term vulnerability following CARB rejection of root cause evaluation of PIP M-11-2532 was appropriately conducted
- M-11-6811, 1B RHR pump motor bearing noise identified during refueling outage walkdown
- M-11-7055, Large size loose paint chips observed on Unit 1 polar crane and other metal surfaces inside containment during outage walkdown inspections
- M-11-7180, Weaknesses in outage risk management procedure (NSD-403) regarding reference to NRC commitments to prevent procedure changes from unintended commitment deviations
- M-11-7190, Inadequate review of switchyard maintenance results in underestimation of Unit 1 outage risk assessment for power availability
- M-11-7417, Numerous material control accountability errors identified in spent fuel pool FME logs