



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II  
SAM NUNN ATLANTA FEDERAL CENTER  
61 FORSYTH STREET, SW, SUITE 23T85  
ATLANTA, GEORGIA 30303-8931

January 29, 2009

EA-08-268

Mr. Bruce H. Hamilton  
Site Vice President  
Duke Power Company, LLC d/b/a Duke Energy Carolinas, LLC  
McGuire Nuclear Station  
12700 Hagers Ferry Road  
Huntersville, NC 28078-8985

SUBJECT: MCGUIRE NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT  
05000369/2008005, 05000370/2008005, 05000369/2008501, AND  
05000370/2008501

Dear Mr. Hamilton:

On December 31, 2008, the US Nuclear Regulatory Commission (NRC) completed an inspection at your McGuire Nuclear Station. The enclosed report documents the inspection findings which were discussed on January 13, 2009, with you and 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.

This report documents one finding of very low safety significance (Green) which was determined to be a violation of NRC requirements and one finding categorized as a Severity Level IV violation under traditional enforcement. However, because of the very low safety significance and categorization at Severity Level IV, and because they were entered into your corrective action program, the NRC is treating these NRC-identified findings as non-cited violations (NCVs) consistent with Section VI.A of the NRC 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, 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 the McGuire facility

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document

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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 05000369/2008005, 05000370/2008005,  
05000369/2008501, and 05000370/2008501 w/Attachments: (1) Supplemental Information,  
(2) OI Synopsis

cc w/encl: (See page 3)

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cc w/encl: (See page 3)

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4

Letter to Bruce H. Hamilton from Jonathan H. Bartley dated January 29, 2009.

SUBJECT: WILLIAM B. MCGUIRE NUCLEAR STATION - NRC INTEGRATED INSPECTION  
REPORT 05000369/2008005, 05000370/2008005, 05000369/2008501, AND  
05000370/2008501

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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: 05000369/2008005, 05000370/2008005,  
05000369/2008501, 05000370/2008501

Licensee: Duke Power Company, LLC

Facility: McGuire Nuclear Station, Units 1 and 2

Location: 12700 Hagers Ferry Road  
Huntersville, NC 28078

Dates: October 1, 2008 through December 31, 2008

Inspectors: J. Brady, Senior Resident Inspector  
R. Eul, Resident Inspector  
R. Chou, Reactor Inspector (Section 1R08)  
J. Fuller, Senior Reactor/Construction Inspector (Section  
1R08)  
H. Gepford, Senior Health Physicist (Section 4OA5.2)  
L. Miller, Senior Emergency Preparedness Inspector  
(Sections 1EP 2, 1EP3, 1EP4, 1EP5, 4OA1.2, 4OA5.3)  
D. Harmon, Nuclear Safety Professional Development  
Program (NSPDP) Engineer

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

Enclosure

## SUMMARY OF FINDINGS

IR05000369/2008005, IR05000370/2008005, IR05000369/2008501, IR05000370/2008501; 9/1/2008 - 12/31/2008; McGuire Nuclear Station, Units 1 and 2; Maintenance Risk Assessments and Emergent Work Evaluation, Other

The report covered a three month period of inspection by two resident inspectors and an announced inspection by four region based inspectors and one NSPDP engineer. One Green non-cited violation (NCV) and one Severity Level (SL) IV NCV were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609, "Significance Determination Process" (SDP). 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 (ROP), Revision 4, dated December 2006.

### A. NRC-Identified and Self-Revealing Findings

#### Cornerstone: Initiating Events

- Green. The inspectors identified a NCV of 10CFR50.65(a)(4) for failure to perform an adequate risk assessment for Unit 1 when the performance of switchyard activities affected both units, and were categorized as risk significant for Unit 2. This finding was documented in the licensee's corrective action program as Problem Investigation Process report (PIP) M-08-6297. No immediate corrective action was taken because the work was almost completed by the time the licensee confirmed their error. Long term corrective actions include training personnel on performing shutdown risk assessments.

This finding is greater than minor because the Unit 1 risk assessment failed to consider maintenance activities that were occurring in the switchyard that affected both units and would have resulted in a higher risk category if properly assessed and could increase the likelihood of initiating events such as loss of offsite power. The finding was determined to be of very low safety significance because the time to boil in the spent fuel pool was slightly over 10 hours, which would have allowed sufficient time such that upon a loss of offsite power there would have been a reasonable likelihood for success of actions taken to recover off-site power. This finding has a cross-cutting aspect of decision making in the area of human performance [H.1.a]. (Section 1R13)

#### Cornerstone: Occupational Radiation Safety

- SL IV. The inspectors identified a NCV of Technical Specification (TS) 5.7.2 for the licensee's failure to control access to a locked-high radiation area (LHRA). Specifically, on September 30, 2006, a contract radiation protection technician (RPT) left the reactor head inspection stand LHRA barrier unlocked and unguarded from approximately 5:05 to 5:21 a.m. Dose rates as high as 10 rad/hr at 30 cm and 4 rad/hr general area were present inside the reactor head stand LHRA.

Enclosure

The significance of the violation was assessed using traditional enforcement because it involved willfulness [EA-08-268]. The safety significance of this violation was determined to be SL IV because the finding did not involve a situation with a substantial potential for exposure in excess of applicable limits and was a matter with more than a minor safety, health, or environmental significance. Although this violation involved willfulness, it was dispositioned as an NCV in accordance with Section IV.A.1 of the Enforcement Policy because the licensee identified the violation and promptly discussed it with regional health physics inspectors, the violation involved the acts of a low-level individual, the violation appears to be the isolated action of the employee without management involvement, and significant remedial action commensurate with the circumstances was taken by the licensee. The finding was documented in the licensee's corrective action program as PIP M-06-4479. (Section 40A5.2)

B. Licensee Identified Violations

None

## Report Details

### Summary of Plant Status:

Unit 1 began the inspection period in the end-of-cycle (EOC) 19 refueling outage, with refueling in progress. The reactor achieved criticality on October 31, 2008, but was shutdown hours later to perform emergent maintenance on the control rod system. The reactor was subsequently taken critical and went on-line on November 12, 2008. It reached 100 percent rated thermal power on November 17, 2008, and remained there for the rest of the period.

Unit 2 began the inspection period at approximately 100 percent rated thermal power and remained there for the rest of the period.

#### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

#### 1R01 Adverse Weather Protection

##### .1 Severe Weather Condition (Seasonal)

###### a. Inspection Scope

After the licensee completed preparations for seasonal cold temperature, the inspectors discussed with the licensee their Cold Weather Program and cold weather performance test. The inspectors reviewed the completed test results for PT/0/B/4700/038, Verification of Freeze Protection Equipment and Systems, dated October 28, 2008. The inspectors walked down the Auxiliary Feedwater (CA) system and the Fueling Water Storage Tank. This equipment was selected because their safety related functions could be affected by adverse weather (freezing conditions). The inspectors reviewed documents listed in Attachment 1 of this report, observed plant conditions, and evaluated those conditions using criteria documented in procedure IP/1/B/3250/059 and IP/2/B/3250/059, Monthly Check of Freeze Protection.

###### b. Findings

No findings of significance were identified.

## 1R04 Equipment Alignment

### .1 Partial Walkdown

#### a. Inspection Scope

The inspectors performed a partial walkdown of the following 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, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, walked down control system components, and determined whether selected breakers, valves, and support equipment were in the correct position to support system operation. The documents reviewed during this inspection are listed in Attachment 1 of this report.

- 1A emergency diesel generator (EDG) when 1B EDG was out of service for maintenance on November 4, 2008
- 2A EDG when 2B EDG was out of service for maintenance on November 25, 2008
- 1A Safety Injection train when the 1B Safety Injection train was out of service for maintenance on December 3, 2008

#### b. Findings

No findings of significance were identified.

### .2 Complete System Walkdown

#### a. Inspection Scope

The inspectors conducted a detailed review of the standby shutdown facility (SSF) system. To determine the correct system alignment, the inspectors reviewed procedures, drawings, and the Updated Final Safety Analysis Report (UFSAR). Items reviewed during the inspection included: (1) valves are correctly positioned, do not exhibit leakage, and are locked as required; (2) electrical power is available, (3) system components are correctly labeled, cooled, lubricated, ventilated, etc.; (4) hanger and supports are correctly installed and functional; (5) essential system support systems are functional; (6) system performance is not hindered by debris; and (7) tagging clearances are appropriate. To determine the effect of outstanding design issues on the operability of the systems the inspectors reviewed the operator workaround list, the temporary modification list, system health reports, and other outstanding items tracked by the engineering department. In addition, the inspectors reviewed outstanding maintenance work requests/work orders and deficiencies that could affect the ability of the system to perform its function. The inspectors also discussed all open issues with the licensee's system engineer. The documents reviewed during this inspection are listed in Attachment 1 of this report.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

.1 Fire Protection Walkdowns

a. Inspection Scope

The inspectors walked down accessible portions of the plant areas listed below 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, fire fighting 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. The resident inspectors inspected two Fire Areas (Fire Area 2a and 3a) to ensure that the licensee had established compensatory measures for Hemyc installations in accordance with the licensee's response to U.S. Nuclear Regulatory Commission Generic Letter 2006-003, "Potentially Nonconforming Hemyc and MT Fire Barrier Configuration," dated April 10, 2006.

The documents reviewed during this inspection are listed in Attachment 1 of this report.

- Unit 1 motor driven auxiliary feedwater pumps and auxiliary shutdown panel (Fire Area 2)
- Unit 2 motor driven auxiliary feedwater pumps and auxiliary shutdown panel (Fire Area 3)
- Unit 1 turbine driven auxiliary feedwater pump (Fire Area 2a)
- Unit 2 turbine driven auxiliary feedwater pump (Fire Area 3a)
- Standby shutdown facility (Fire Area SSF)

b. Findings

No findings of significance were identified.

1R08 Inservice Inspection (ISI) Activities – Unit 1 (71111.08P).1 Non-Destructive Examination (NDE) Activities and Welding Activitiesa. Inspection Scope

From September 29 to October 10, 2008, the inspectors reviewed the implementation of the licensee's ISI program for monitoring degradation of the reactor coolant system boundary and risk significant piping boundaries. The inspectors' activities consisted of an on-site review of NDE and welding activities 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 through 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. Documents reviewed are listed in Attachment 1 of this report.

The inspectors' observation and/or review of NDE activities specifically covered examination procedures, NDE reports, equipment and consumables certification records, personnel qualification records, and calibration reports (as applicable) for the following examinations:

- Ultrasonic Test (UT) examination of weld 1SGB-OUTLET, ASME Class 1, Steam Generator 'B' outlet nozzle to head, Section XI ISI - Direct Observation
- UT examination of weld 1SGB-INLET, ASME Class 1, Steam Generator 'B' inlet nozzle to head, Section XI ISI - Record Review
- UT examination of weld 1NV1-F12A-12, ASME Class 2, Chemical Volume Control System (CVCS), Tee to Pipe, Section XI ISI – Record Review
- Penetrant Test examination of weld 1SWIF-SUPPORT-1A, ASME Class 2, Welded Attachment, Section XI ISI – Record Review
- Penetrant Test examination of weld 1RHRHX-1A-SUPP, ASME Class 2, Welded Attachment, Section XI ISI – Record Review
- Penetrant Test examination of weld 1RHR-1A-OUTLET, ASME Class 2, Nozzle to Reinforcing pads / shell, Section XI ISI – Record Review
- Penetrant Test examination of weld 1RHR-1A-INLET, ASME Class 2, Nozzle to Reinforcing pads / shell, Section XI ISI – Record Review
- Radiographic Examination of weld 1NV-358-1, ASME Class 2, CVCS, Section XI ISI - Film Review

The inspectors also reviewed documentation for the following indications, which were accepted for continuous service:

- Visual Examination (VT) of 1FWST-SUPPORT, Report No. VT-07-089, Disposition - Problem Investigation Process (PIP) M-06-4832
- VT of 1-MCR-NV-1063, Report No. VT-07-073, Disposition – Work Order (WO) 01698701 01, 1XNAISI-INSP: ISI Hangers in Reactor Building 1EOC18

Enclosure

The inspectors' review of welding activities specifically covered the welding activity listed below in order to evaluate compliance with procedures and the ASME Code. The inspectors reviewed the work order, repair and replacement plan, weld data sheets, welding procedures, procedure qualification records, welder qualification records, and NDE reports.

- Weld Process Control for weld No. 1NS88A-10, Containment Spray, ASME Section III, Class 2, associated WO 591910-01

b. Findings

No findings of significance were identified.

.2 PWR Vessel Upper Head Penetration Inspection Activities

a. Inspection Scope

The inspectors reviewed the licensee's activities related to the Bare Metal Visual examination of the reactor pressure vessel upper head nozzles and the visual examination to identify potential boric acid leaks from pressure-retaining components above the reactor pressure vessel upper head. These activities were reviewed to verify licensee compliance with the regulatory requirements of NRC Order EA-03-009 Modifying Licenses dated February 20, 2004. Documents reviewed are listed in Attachment 1 of this report.

The inspectors reviewed the licensee's visual inspection results of leakage locations above the reactor pressure vessel upper head from the Unit 1 EOC 19 refueling outage. This visual inspection included visual inspection of the following:

- Control Rod Drive Mechanism Rod Housing vent valves,
- Mirror insulation at reactor vessel flange,
- Conoseal flanges and thermocouple fittings,
- Reactor head vent line flanges,
- Reactor level instrumentation system instrument tubing and isolation valve,
- Control Rod Drive Mechanism intermediate canopy seal welds

b. Findings

No findings of significance were identified.

.3 Boric Acid Corrosion Control (BACC) Inspection Activities

a. Inspection Scope

The inspectors reviewed the licensee's BACC program activities to ensure implementation with commitments made in response to NRC Generic Letter 88-05,

Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary, and applicable industry guidance documents. Specifically, the inspectors performed an on-site record review of procedures and the results of the licensee's containment walk-down inspections performed during the Unit 1 fall 2008 outage. The inspectors also interviewed the BACC program owner and conducted an independent walk-down of the reactor building to evaluate compliance with licensee's BACC program requirements and verify that degraded or non-conforming conditions, such as boric acid leaks identified during the containment walk-down, were properly identified and corrected in accordance with the licensee's BACC and corrective action programs. The inspectors also reviewed a recent self-assessment for the McGuire BACC program, dated November 13-15, 2007. Documents reviewed are listed in Attachment 1 of this report.

The inspectors reviewed a sample of engineering evaluations completed for evidence of boric acid found on systems containing borated water to verify that the minimum design code required section thickness had been maintained for the affected components. The inspectors selected the following evaluations for review:

- M-06-5548 – Valve 1NI-65B
- M-07-2002 – CVCS Excess Letdown Heat Exchanger 1NVHX00036
- M-08-3147 – Safety Injection Pressure Gauge 2NIPG5240

b. Findings

No findings of significance were identified.

.4 Steam Generator (SG) Tube Inservice Inspection

a. Inspection Scope

On October 6 - 10, 2008, the inspectors reviewed activities, plans, condition monitoring and operational assessments, the pre-outage degradation assessment, and procedures for the inspection and evaluation of the steam generator Inconel Alloy 690TT tubing for Unit 1 SGs A, B, C, and D to determine if the activities were being conducted in accordance with Technical Specifications (TS) and applicable industry standards. Data gathering, analysis, and evaluation activities were also reviewed. Documents reviewed are listed in Attachment 1 of this report.

The inspectors reviewed data results to verify the adequacy of the licensee's primary, secondary, and resolution analyses. The inspectors also observed and reviewed the activity of the foreign object inspection and retrieval.

The inspectors reviewed equipment, data operators, and analyst certifications and qualifications, including medical exams.

The inspectors reviewed data for the following tubes:

SG A: R88C73, R99C76, R90C69, R111C66, and R114C67

SG B: R89C72, R97C72, R96C75, R116C75, and R94C75

SG C: R110C61, R111C60, and R108C59

SG D: R88C75, R44C133, and R28C125

[Note: The tube maximum through-wall depth wear from foreign objects during the inspection period was 27 percent at SG B tube R97C72 in two refueling cycles.]

b. Findings

No findings of significance were found.

1R11 Licensed Operator Regualification

a. Inspection Scope

On November 13, 2008, 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 10CFR55.59 and the adequacy of operator performance. 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. The inspectors observed the shift crew's response to the scenarios listed below. The documents reviewed during this inspection are listed in Attachment 1 of this report.

- OP-MC-SRT-05
- OP-MC-SRT-54

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed the samples listed below for items such as: (1) appropriate work practices; (2) identifying and addressing common cause failures; (3) adequacy of corrective actions; (4) scoping in accordance with 10 CFR 50.65(b) of the maintenance rule; (4) characterizing reliability issues against performance criteria; (5) trending key parameters for condition monitoring; (6) charging unavailability for performance; (7) classification and reclassification in accordance with 10 CFR 50.65(a)(1) or (a)(2); and (8) appropriateness of performance criteria for structures, systems, and components (SSCs)/functions classified as (a)(2); and/or (9) appropriateness and adequacy of goals

and corrective actions for SSCs/functions classified as (a)(1). For each item selected, 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. The documents reviewed during this inspection are listed in Attachment 1 of this report.

- Unit 1 Component Cooling Water check valve 1KC-340 leakage
- Unit 2 Train A EDG fuel oil transfer pump did not auto-stop as required

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

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 activities listed below. The inspectors assessed whether the licensee performed adequate risk assessments, and implemented appropriate risk management actions when required by 10CFR50.65(a)(4). For emergent work, the inspectors also verified that any increase in risk was promptly assessed, and that appropriate risk management actions were promptly implemented. The documents reviewed during this inspection are listed in Attachment 1 of this report.

- Planned Unit 2 Orange risk condition for installation of 1B service water strainer during Unit 1 outage that involved work that was a risk threat to Unit 2
- Planned Unit 1 Orange risk for cold reduced inventory/mid-loop operations to remove steam generator nozzle dams
- Review of Unit 1 Defense in Depth (DID) on October 9 for adequacy of risk assessment during work in the switchyard
- Planned Operational Risk Assessment Management-Orange risk for removal of 2B Nuclear Service Water (RN) strainer backwash function from service on November 7, 2008, to install valves for upgrade of strainer differential pressure indication to safety-related.

b. Findings

Introduction: The inspectors identified a green NCV of 10CFR50.65(a)(4) for failure to perform an adequate risk assessment for Unit 1 when the performance of switchyard activities affected both units, and were categorized as risk significant for Unit 2.

Description: On October 9, 2008, the inspectors identified that there were switchyard activities being accomplished that the licensee's risk assessment considered risk significant for Unit 2, but were not considered risk significant for Unit 1, which was shutdown in a scheduled refueling outage. During the period of the switchyard work,

both Unit 1 safety buses were being powered from Unit 2. The licensee reviewed procedure NSD 403, Shutdown Risk Management (Modes 4, 5, 6, and No-Mode) per 10CFR50.65(a)(4), and concluded that the switchyard activities should have resulted in the Defense-in-Depth (DID) sheet not taking credit for "No Safety Significant Switchyard Work In Progress." With a proper DID assessment the Power Availability Key Safety Function Area would have increased in color from Green to Yellow. The licensee initiated PIP M-08-6297 to address this condition. The PIP indicated that the associated work order (WO 01822572) contained comments that the switchyard work should have been deferred until the work did not have the same risk impact on Unit 1. The PIP stated that these comments were missed during the schedule review process. This failure to adequately assess risk and consequently, potentially manage risk for October 9, 2008, is a performance deficiency.

Analysis: This finding is greater than minor when compared to Inspection Manual Chapter (IMC) 0612 Appendix B, minor question 5(e) because the Unit 1 risk assessment failed to consider maintenance activities that were occurring in the switchyard that affected both units and would have resulted in a higher risk category if properly assessed. In addition, licensee risk assessment failed to consider maintenance activities that could increase the likelihood of initiating events, such as loss of offsite power. IMC 0609, Appendix M, was used to determine the safety significance because the performance deficiency was associated with a qualitative shutdown risk assessment (DID), and because Appendix K notes that it is not applicable to qualitative risk assessments. The finding was determined to be of very low safety significance (Green) based on the IMC 0609, Appendix M evaluation. The key factor in the determination was that the reactor was defueled and time to boil in the spent fuel pool was slightly over 10 hours. This would have allowed sufficient time such that upon a loss of offsite power there would have been a reasonable likelihood for success of actions taken to recover off-site power. In addition, after boiling started there would have been sufficient makeup water sources available to makeup to the spent fuel pool to prevent uncovering fuel. This finding has a cross-cutting aspect of decision making in the area of human performance because the licensee did not use the information available in NSD 403 to assess the risk of the maintenance. [H.1.a].

Enforcement: 10 CFR 50.65(a)(4) requires, in part, that before performing maintenance activities (including, but not limited to, surveillance, post-maintenance testing, and corrective and preventive maintenance), the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities. Contrary to the above, on October 9, 2008, the licensee failed to perform an adequate risk assessment for Unit 1, in that the overall maintenance risk assessment failed to account for activities being conducted in the switchyard which increased the likelihood of loss of off-site power. Because this violation was determined to be of very low safety significance and was placed in the corrective action program as PIP M-08-6297, this violation is being treated as a NCV in accordance with Section VI.A.1 of the Enforcement Policy: NCV 05000370/2008005-01, Failure to Perform an Adequate Risk Assessment for Switchyard Activities.

1R15 Operability Evaluationsa. Inspection Scope

For the operability evaluations listed below, the inspectors evaluated the technical adequacy of the evaluations to determine whether Technical Specification (TS) operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors reviewed any compensatory measures taken for degraded SSCs to determine whether the measures were in-place and adequately compensated for the degradation, such that operability was justified. For the degraded SSCs, or those credited as part of compensatory measures, the inspectors reviewed the Updated Final Safety Report (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 10CFR 50.59. The documents reviewed during this inspection are listed in Attachment 1 of this report.

- M-08-5649, During 1A Engineered Safeguards Feature test (concurrent safety injection/phase B//blackout section), 1A diesel generator did not meet performance standards
- M-08-6661, 1A Control Area Ventilation and Chilled Water System (VC/YC) Chiller “pulsed” on during 1A Engineered Safeguards Feature test initiation, then tripped, and then restarted 15 minutes later
- M-08-6755, Pin hole leak on service water pipe down stream of valve 2RN-190B
- M-08-6352, oil leak on 1A charging pump motor
- M-08-6889, Unable to obtain acceptable RN flow to 1B centrifugal charging pump oil cooler per RN flow balance Performance Test (PT)

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testinga. Inspection Scope

For the eight 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 function(s).

- PT/1/A/4350/002B, Diesel Generator 1B Operability Test after several planned maintenance tasks completed during the 1EOC19 refueling outage on October 16, 2008
- PT/1/A/4206/15B, 1B Safety Injection Pump Head Curve Performance Test, conducted after 1EOC19 refueling outage maintenance.

- PT/1/A/4209/12A, Centrifugal Charging Pump 1A Pump Head Curve Performance Test, conducted after 1EOC19 refueling outage maintenance
- PT/1/A/4350/002A, Diesel Generator 1A Operability Test after several planned maintenance tasks completed during 1EOC19 refueling outage on October 23, 2008.
- PT/1/A/4350/024, Hydrogen Mitigation Igniter Glow Plug Test, after planned replacement of glow plugs
- PT/1/A/4252/001, Turbine Driven CA Pump Performance Test, after coupling inspection, oil change, and steam inlet valve work
- PT/1/A/4252/001B, 1B CA Pump Performance Test after high motor vibrations and replacement of motor bearings and oil change
- PT/0/A/4600/105, Rod Control Cluster Assembly Drop Timing Using Digital Rod Position Indicator System after re-installation and re-latching of control rods during 1EOC19 refueling outage

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities

a. Inspection Scope

Unit 1 began the 1EOC19 refueling outage on September 20, 2008, and remained in the outage until November 12, 2008. During this inspection period the inspectors reviewed the licensee's responses to emergent work and unexpected conditions, to determine whether resulting configuration changes were controlled in accordance with the outage risk control plan. The inspectors observed outage activities and/or the items described below, to determine whether the licensee maintained defense-in-depth commensurate with the outage risk control plan for the key safety functions listed below and applicable TS when taking equipment out of service.

- Clearance activities
- Reactor coolant system instrumentation
- Electrical power
- Decay heat removal
- Spent fuel pool cooling
- Inventory control
- Reactivity control
- Containment closure

The inspectors also observed fuel handling operations associated with core reload and other ongoing activities, to determine whether those operations and activities were being performed in accordance with TS and licensee procedures. Additionally, the inspectors observed refueling activities to determine whether the location of the fuel assemblies was tracked, including new fuel, from core offload through core reload. The inspectors observed where spent assemblies were placed to determine whether they were placed in allowable locations.

Enclosure

The inspectors assessed outage activities that were conducted during short time-to-boil periods. On October 17 and 18, 2008, the licensee chose to reduce reactor coolant level to a reduced inventory/mid-loop condition to remove steam generator nozzle dams with the new core in the reactor vessel (cold mid-loop). The inspectors reviewed the licensee's commitments to GL 88-17 to determine whether they were still in place and adequate. The inspectors observed control room operations during this period to determine whether distractions were minimized.

The inspectors reviewed the licensee's reactor vessel head load drop analysis and UFSAR to determine whether the UFSAR had been updated. Accordingly, the inspectors observed the setting of the reactor vessel head to determine whether procedures were followed. Prior to mode changes and on a sampling basis, the inspectors reviewed system lineups and/or control board indications to determine whether TS, license conditions, and other requirements, commitments, and administrative procedure prerequisites for mode changes were met prior to changing modes or plant configurations. Also, the inspectors periodically reviewed reactor coolant system boundary leakage data, and observed the setting of containment integrity, to determine whether the reactor coolant system and containment boundaries were in place and had integrity when necessary. Prior to reactor startup, the inspectors walked down containment to determine whether debris had been left which could affect performance of the containment sumps. The inspectors reviewed reactor startup and unit synchronization to the grid to verify procedure compliance and that the systems performed as designed. The inspectors reviewed reactor physics testing results to determine whether core operating limit parameters were consistent with the design.

When emergent rod control problems during low power physics testing resulted in the unit having to be cooled back down to Mode 5, the inspectors observed portions of the cooldown process to determine whether TS cooldown restrictions were followed.

Periodically, the inspectors reviewed the items that had been entered into the licensee's corrective action program, to determine whether the licensee had identified problems related to outage activities at an appropriate threshold and had entered them into the corrective action program. The documents reviewed during this inspection are listed in Attachment 1 of this report.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

For the tests 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 TSs, the UFSAR, and applicable licensee procedures, and that the tests

demonstrated that the SSCs were capable of performing their intended safety functions. The documents reviewed during this inspection are listed in Attachment 1 of this report.

#### Surveillance Tests

- PT/1/A/4600/003G, Reduced Inventory Surveillance Items
- PT/1/A/4200/009A, Engineered Safety Features Actuation Periodic Test Train A
- PT/1/A/4200/009B, Engineered Safety Features Actuation Periodic Test Train B
- PT/1/A/4252/016, #1 Turbine Driven CA Pump Automatic Recirculation Valve Bypass and Bleed Valve Leakage Verification

#### In-Service Tests

- PT/1/A/4255/03C, SM Valve (MSIV) Timing Test at Full Temperature and Pressure

#### Containment Isolation Valve Testing

- PT/1/A/4200/001A, Containment Integrated Leak Rate Test

#### Reactor Coolant System Leakage Detection

- PT/2/A/4150/001B, Reactor Coolant Leakage Calculation

#### Ice Condenser Systems Testing

- PT/0/A/4200/018, Ice Bed Analysis

### b. Findings

While reviewing Unit 1, Train A, engineering safeguard features test deficiency data on October 22, 2008, the inspectors identified that the accelerated sequencer function was not described in the UFSAR. The licensee's UFSAR commits to Regulatory Guide 1.70, Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants, Revision 1 and 3, for the format and content of the UFSAR. RG 1.70, Revision 1, Section 8.3.1.1 states to "Describe the onsite A.C. power systems with emphasis placed on those portions of the systems that are safety-related. Those portions of the onsite A.C. power system that are not related to safety need only be described in sufficient detail to permit an understanding of their interactions with the safety-related portions. The description of the safety-related portion should include: (8) automatic loading and stripping of buses." The inspectors' review concluded that the accelerated sequencer function can sequentially energize various safety equipment (partitioned into load groups) from the safety-related emergency A.C. power system during design basis accidents described in UFSAR Chapter 15. This accelerated sequencer function will automatically energize the next safety load group, after 2 seconds, if the emergency A.C. bus voltage and diesel engine speed recover to values of approximately 92.5% and 97%, respectively. If after energizing certain safety load groups, the bus voltage or diesel speed permissives are no longer met, the accelerated sequencer function will drop out the start signal and those loads will become de-energized until the permissives are met again or the separate UFSAR described load sequencer function re-energizes those loads based on a timed sequence. Pending NRC review of the enforcement aspects of this issue and review of the licensee's operability evaluation, this issue is identified as an Unresolved Item: URI 05000369,370/2008005-02, Accelerated

Enclosure

Sequencer not Described in the UFSAR. The licensee generated PIPs M-08-6767 and M-09-0063 to address this concern.

Cornerstone: Emergency Preparedness

#### 1EP2 Alert and Notification System Testing

##### a. Inspection Scope

The inspectors evaluated the adequacy of licensee's methods for testing the alert and notification system in accordance with NRC Inspection Procedure 71114, Attachment 02, Alert and Notification System Evaluation. The applicable planning standard 10 CFR Part 50.47(b) (5) and its related 10 CFR Part 50, Appendix E, Section IV.D requirements were used as reference criteria. The criteria contained in NUREG-0654, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, Revision 1, was also used as a reference.

The inspectors reviewed various documents which are listed in Attachment 1 of this report. This inspection activity satisfied one inspection sample for the alert and notification system on a biennial basis.

##### b. Findings

No findings of significance were identified.

#### 1EP3 Emergency Response Organization Augmentation

##### a. Inspection Scope

The inspectors reviewed the licensee's Emergency Response Organization (ERO) augmentation staffing requirements and process for notifying the ERO to ensure the readiness of key staff for responding to an event and timely facility activation. The qualification records of key position ERO personnel were reviewed to ensure all ERO qualifications were current. A sample of problems identified from augmentation drills or system tests performed since the last inspection were reviewed to assess the effectiveness of corrective actions.

The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 03, Emergency Response Organization Staffing and Augmentation System. The applicable planning standard, 10 CFR 50.47(b) (2) and its related 10 CFR 50, Appendix E requirements were used as reference criteria.

The inspectors reviewed various documents which are listed in Attachment 1 of this report. This inspection activity satisfied one inspection sample for the ERO staffing and augmentation system on a biennial basis.

b. Findings

No findings of significance were identified.

1EP4 Emergency Action Level and Emergency Plan Changes

a. Inspection Scope

Since the last NRC inspection of this program area, Revisions 07-02 and 08-01 of the McGuire Emergency Plan were implemented based on the licensee's determination, in accordance with 10 CFR 50.54(q), that the changes resulted in no decrease in the effectiveness of the Plan, and that the revised Plan continued to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50. The inspectors conducted a sampling review of the Plan changes and implementing procedure changes made between November 27, 2007, and September 17, 2008, to evaluate for potential decreases in effectiveness of the Plan. However, this review was not documented in a Safety Evaluation Report and does not constitute formal NRC approval of the changes. Therefore, these changes remain subject to future NRC inspection in their entirety.

The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 04, Emergency Action Level and Emergency Plan Changes. The applicable planning standard (PS), 10 CFR 50.47(b) (4) and its related 10 CFR 50, Appendix E requirements were used as reference criteria.

The inspectors reviewed various documents which are listed in Attachment 1 of this report. This inspection activity satisfied one inspection sample for the emergency action level and emergency plan changes on an annual basis.

b. Findings

No findings of significance were identified.

1EP5 Correction of Emergency Preparedness Weaknesses and Deficiencies

a. Inspection Scope

The inspectors reviewed the corrective actions identified through the Emergency Preparedness program to determine the significance of the issues and to determine if repeat problems were occurring. The facility's self-assessments and audits were reviewed to assess the licensee's ability to be self-critical. In addition, the inspectors reviewed licensee's self-assessments and audits to assess the completeness and effectiveness of all emergency preparedness related corrective actions.

The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 05, Correction of Emergency Preparedness Weaknesses. The applicable planning standard, 10 CFR 50.47(b) (14) and its related 10 CFR 50, Appendix E requirements were used as reference criteria.

The inspectors reviewed various documents which are listed in Attachment 1 of this report. This inspection activity satisfied one inspection sample for the correction of emergency preparedness weaknesses on a biennial basis.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

.1 Mitigating Systems Cornerstone

a. Inspection Scope

The inspectors sampled licensee data to confirm the accuracy of reported PI data for the indicators on Unit 1 and Unit 2 during the periods listed below. To determine the accuracy of the PI data reported during that period, the inspectors compared the licensee's basis in reporting each data element to the PI definitions and guidance contained in NEI 99-02, Regulatory Assessment Indicator Guideline, Rev. 5.

- Safety System Unavailability, Emergency AC Power
- Safety System Unavailability, High Pressure Safety Injection
- Safety System Unavailability, Residual Heat Removal
- Safety System Unavailability, Auxiliary Feedwater
- Safety System Unavailability, Cooling Water Systems

The inspectors reviewed Licensee Event Reports, records of inoperable equipment, and Maintenance Rule records, to determine whether the licensee had adequately accounted for unavailability hours that the subject systems had experienced during the previous four quarters (October 1, 2007 – September 30, 2008). The inspectors also reviewed the number of hours those systems were required to be available and the licensee's basis for identifying unavailability hours. In addition, the inspectors interviewed licensee personnel associated with the PI data collection, evaluation, and distribution.

- Safety System Functional Failures

The inspectors reviewed Licensee Event Reports and Maintenance Rule records, to determine whether the licensee had adequately accounted for functional failures that the subject systems had experienced during the previous four quarters (October 1, 2007 – September 30, 2008).

b. Findings

No findings of significance were identified.

## .2 Emergency Preparedness Cornerstone

### a. Inspection Scope

The inspectors sampled licensee submittals for the three PIs listed below. For each of the submittals reviewed, the inspectors reviewed the period from July 1, 2007, through June 30, 2008. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in Nuclear Energy Institute (NEI) 99-02, Regulatory Assessment Indicator Guideline, Revision 5, were used to verify the basis in reporting for each data element.

- Emergency Response Organization Drill/Exercise Performance (DEP)
- Emergency Response Organization Readiness (ERO)
- Alert and Notification System Reliability (ANS)

The inspectors reviewed portions of the raw PI data developed from monthly performance indicator reports and discussed the methods for compiling and reporting the PIs with cognizant emergency preparedness personnel. The inspectors also independently screened drill and exercise opportunity evaluations, drill participation reports, and drill evaluations. Selected reported values were calculated to verify their accuracy. The inspectors compared graphical representations from the most recent PI report to the raw data to verify that the data was correctly reflected in the report. Reviewed documents are listed in Attachment 1 of this report.

### b. Findings

No findings of significance were identified.

## 4OA2 Identification and Resolution of Problems

### .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-Operator Workaround

#### a. Inspection Scope

The inspectors selected PIP M-08-4774 associated with the 2A emergency diesel generator failing to start during surveillance testing for detailed review. The inspectors reviewed this 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

Enclosure

requirements of the licensee's corrective action program and 10 CFR 50, Appendix B. The documents reviewed during this inspection are listed in Attachment 1 of this report.

The inspectors also performed a review of the 14 priority 1-3 operator workarounds (OWAs) listed in the licensee's December 2008 OWA report to determine whether the OWAs were identified in the corrective action program and whether corrective actions have been properly identified and dates established for completion. In some cases the review included the PIPs associated with the OWA and a review of the system health report for the associated system. A review of selected workarounds closed in the last 2 years was conducted to determine whether the closed OWAs were corrected.

b. Findings

No findings of significance were identified.

.3 Semi-Annual Review to Identify Trends

a. Inspection Scope

The inspectors performed a trend review to determine if trends were identified outside the corrective action program that could indicate the existence of a more significant safety issue. The inspector's review was focused on repetitive equipment issues, but also considered the results of daily inspector corrective action program item screening discussed above, licensee trending efforts, and licensee human performance results. The review also included issues documented outside the normal Corrective Action Program in major equipment problem lists, plant health team vulnerability lists, focus area reports, system health reports, self-assessment reports, maintenance rule reports, and Safety Review Group Monthly Reports. The inspectors compared and contrasted their results with the results contained in the licensee's latest quarterly trend reports. Corrective actions associated with a sample of the issues identified in the licensee's trend report were reviewed for adequacy. The documents reviewed during this inspection are listed in Attachment 1 of this report.

b. Findings and Observations

Update of previously identified trends

The inspectors previously identified a trend associated with numerous violations for failing to update the FSAR in accordance with regulations outlined in 10 CFR Part 50.71(e). The licensee initiated PIP M-06-2889 to address the UFSAR accuracy trend and performed a sample review of the UFSAR. In addition, the licensee identified a number of UFSAR problems from their UFSAR review program during this inspection period. During the 6 month period, an additional example of UFSAR inaccuracies was identified by the NRC. NRC identified that the UFSAR had not been updated to reflect the fact that an additional load sequencer function, the accelerated sequencer function, was not described in the UFSAR as discussed in section 1R22 of this report. This example was outside the scope of the licensee's UFSAR review process, because it was

due to an inaccuracy of the FSAR at the time of licensing. PIP M-08-4383 (RN sharing violation) also evaluated the corrective action for previous UFSAR PIPs associated with violations and whether the corrective actions were effective and adequate. Additional programmatic changes are being recommended from the apparent cause identified in PIP M-08-4383.

#### New trends

No new trends were identified this period that had not already been identified by the licensee.

#### 4OA3 Event Follow-up

##### 1. Rod Control Urgent Failure Alarm

###### a. Inspection Scope

On October 31, 2008, the inspectors reviewed the licensee's actions associated with a rod control urgent failure alarm while testing control bank B during reactor startup physics testing (procedure PT/0/A/4150/028, Initial Criticality and Zero Power Physics Testing). The reactor was at  $10^{-8}$  amps on the intermediate range nuclear instrumentation. The licensee entered AP/1/A/5500/ 012, Rod Control Malfunction, and during actions in the Abnormal Procedure (AP), control rod K-2 dropped (control bank B, Group II). The licensee shutdown the reactor as required by the AP in accordance with procedure OP/1/A/6100/003, Controlling Procedure for Unit Operation, which required a shutdown by manual reactor trip. The inspectors observed and evaluated performance of the plant systems and the operators including the proper use and adherence to plant procedures. The inspectors also reviewed the licensee's classification and reporting of the event. The event was reported on December 30, 2008, as Licensee Event Report 05000369/2008-03.

On November 3, 2008, as part of post-maintenance testing for the previous control rod concern conducted with the plant in a cold shutdown condition, another control rod urgent failure alarm was received and operators opened the reactor trip breakers to insert all remaining control rods. The inspectors reviewed the licensee's initial notification of the event and subsequent retraction of that notification. Documents reviewed during this inspection are listed in Attachment 1 of this report.

###### b. Findings

No findings of significance were identified.

.2 Unit 1 startup after refueling

a. Inspection Scope

The inspectors also reviewed the licensee's actions associated with the Unit 1 approach to criticality on October 31, 2008, and November 12, 2008, as well as power escalation on November 13, 2008. The inspectors evaluated the performance of the operators and assessed procedural compliance.

b. Findings

No findings of significance were identified.

4OA5 Other Activities

.1 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

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

b. Findings

No findings of significance were identified.

.2 (Closed) URI 05000370/2007005-02, Failure to Control a Locked-High Radiation Area (LHRA) Barrier

a. Inspection Scope

Following an investigation by NRC's Office of Investigations (OI) to determine willfulness, the inspectors performed an in-office review to appropriately disposition URI 05000370/ 2007005-02. Documents reviewed are listed in Attachment 1 of this report.

b. Findings

Introduction: A Severity Level (SL) IV NCV of TS 5.7.2 was identified for failure to control access to a LHRA when the Unit 2 reactor head inspection stand LHRA barrier was left unlocked and unguarded.

Description: On September 30, 2006, two AREVA technicians were tasked with moving the reactor head inspection manipulator out from under the reactor head (the LHRA) to outside of the reactor head inspection stand shield and replacing the dummy sleeve on the manipulator. The work area was located inside a highly contaminated area (HCA) which encompassed the reactor head inspection stand.

During a pre-job brief for the work, a contract RPT was assigned to have the LHRA key and procedure SH/0/B/2000/012, Enclosure 5.8 (Accessing Extra High Radiation Area < 10 R/hr) and work outside of the HCA.

Step 10 in procedure SH/0/B/2000/012, Enclosure 5.8, requires double verification that the padlock is secured by pushing/pulling on the padlock and double verification that the access (e.g., door, gate, etc.) is secure. A second radiation protection technician was assigned to work inside the HCA and monitor the AREVA technicians' activities.

Upon beginning work, the AREVA technicians drove the manipulator out from under the reactor head inspection stand into the HCA to setup for the work. The technician providing job coverage inside the HCA closed the upper and lower doors to the reactor head inspection stand barrier, but could not completely close or lock the doors because the manipulator physically prevented the lower doors from completely closing. A lead blanket was placed against the upper doors to provide additional shielding covering the upper and lower doors' latching and locking mechanisms.

Prior to completion of the work, both AREVA technicians and the job coverage technician were required to leave containment. The work was left with the reactor head inspection stand LHRA barrier upper doors pushed closed, but neither latched nor locked. The status/configuration of the barrier (including the lock) could not be verified from where the RPT responsible for controlling the barrier was located outside of the HCA. The doors to the reactor head inspection stand appeared to be closed, although in a configuration contrary to what was discussed during the pre-job brief, the scaffold pin was through the handles, and a lead blanket was over the area where the lock would have been.

The RPT assumed that the job coverage technician had locked the LHRA. The RPT then notified the RP Lead Technician that he needed to use the restroom. While in the restroom, the RPT realized the LHRA door may not have been locked. Furthermore, he realized that he had not tested the lock (pushed and pulled the locking mechanism) as written in the procedure. As a consequence, from approximately 5:05 am to 5:21 am, the Unit 2 reactor head inspection stand LHRA was left unlocked and unguarded subsequent to workers leaving the area.

Analysis: The significance of the violation was assessed using traditional enforcement, because it involved willfulness (see OI Synopsis in Attachment 2 of this report). In accordance with Supplement IV, Health Physics, of the NRC Enforcement Policy, the NRC determined that the safety significance of this violation was SL IV because the situation described in example 7 of a SL III violation (the finding involves a situation with a substantial potential for exposure in excess of applicable limits) did not exist and, per example 9 of a SL IV violation, was a matter with more than a minor safety, health, or

environmental significance. Although this violation involved willfulness, it was dispositioned as an NCV in accordance with Section IV.A.1 of the Enforcement Policy because the licensee identified the violation and promptly discussed it with regional health physics inspectors, the violation involved the acts of a low-level individual, the violation appears to be the isolated action of the employee without management involvement, and significant remedial action commensurate with the circumstances was taken by the licensee.

Enforcement: TS 5.7.2 requires, in part, that areas with radiation levels greater than 1000 mrem/hr at 30 cm (12 in.) from the radiation source or from any surface which the radiation penetrates shall be provided with locked or continuously guarded doors to prevent unauthorized entry. Contrary to the above, the Unit 2 reactor head inspection stand locked high radiation area barrier was left unlocked and unguarded for approximately 16 minutes on September 30, 2006, when the RPT responsible for guarding/locking the barrier left containment to use the restroom.

The finding was documented in the licensee's corrective action program as PIP M-06-4479. Because this violation was of very low safety significance and was entered into the licensee's corrective action program, it is being treated as an NCV, consistent with Section IV.A of the NRC Enforcement Policy: NCV 05000370/2008005-03, Failure to Control a Locked-High Radiation Area Barrier [EA-08-268]. As such, URI 05000370/2007005-02 is considered closed.

.3 (Closed) NRC Temporary Instruction (TI) 2515/175, Emergency Response Organization, Drill/Exercise Performance Indicator, Program Review

The inspectors completed Temporary Instruction TI 2515/175, Emergency Response Organization, Drill/Exercise Performance Indicator, Program Review. Appropriate documentation of the results was provided to NRC, HQ, as required by the TI. This completes the Region II inspection requirements for this TI for McGuire Nuclear Station.

4OA6 Meetings, Including Exit

On January 13, 2009, the resident inspectors presented the inspection results to Mr. B. Hamilton, Oconee Site Vice President, and other members of his staff. The inspectors confirmed that proprietary information was not provided or examined during the inspection. No proprietary information is included in this report.

4OA7 Licensee-Identified Violations

None

ATTACHMENTS: (1) SUPPLEMENTAL INFORMATION  
(2) OI SYNOPSIS

Enclosure



Opened and Closed

05000370/2008005-01	NCV	Failure to Perform an Adequate Risk Assessment for Switchyard Activities (Section 1R13)
05000370/2008005-03	NCV	Failure to Control a Locked-High Radiation Area Barrier [EA-08-268] (Section 4OA5.2)

Closed

05000370/2007005-02	URI	Failure to Control a Locked-High Radiation Area Barrier (Section 4OA5.2)
2515/175	TI	Emergency Response Organization, Drill/Exercise Performance Indicator, Program Review (Section 4OA5.3)

**DOCUMENTS REVIEWED****Section 1R01: Adverse Weather Protection**

IP/1/B/3250/059B, Monthly Check of Freeze Protection  
 IP/2/B/3250/059B, Monthly Check of Freeze Protection  
 IP/0/B/3250/059C, Preventative Maintenance and Operational Check of Freeze Protection for Intake  
 PT/0/B/4700/038, Verification of Freeze Protection Equipment and Systems  
 PT/0/B/4700/070, On Demand Freeze Protection Verification Checklist

**Section 1R04: Equipment Alignment**Partial System Walkdown

[Emergency Diesel Generator 1A]

Drawing MCFD-1609-04.00, Flow Diagram of the Diesel Generator Starting Air System  
 Drawing MCFD-1609-03.00, Flow Diagram of the Diesel Generator Engine 1A Fuel Oil System  
 Drawing MCFD-1609-02.00, Flow Diagram of the Diesel Generator Engine Lube Oil System  
 Drawing MCFD-1609-01.00, Flow Diagram of the Diesel Generator Engine Cooling Water System

[Emergency Diesel Generator 2A]

Drawing MCFD-2609-04.00, Flow Diagram of the Diesel Generator Starting Air System  
 Drawing MCFD-2609-03.00, Flow Diagram of the Diesel Generator Engine 2A 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

[Safety Injection System 1A]

Drawing MCFD-1562-03.00, "Flow Diagram of Safety Injection System (NI)

Drawing MCFD-1562-03.01, "Flow Diagram of Safety Injection System (NI)

Complete Walkdown (SSF):

OP/0/B/6350/004, Standby Shutdown Facility Diesel Operation

PT/0/A/4200/002, Standby Shutdown Facility Operability Test

UFSAR sections: 8.4 & 9.5.1

NUREG-0422 and supplements, Safety Evaluation Report related to operation of McGuire Nuclear Station, Units 1 and 2

MCS-1223.SS-00-0001, Design Basis Specification for the Standby Shutdown System  
SSF System Health Report

Auxiliary Feedwater System Health Report

Nuclear Service Water System Health Report

PIPs: M-06-2284, M-07-6044, M-07-6079, M-08-7600

PIPs initiated from this inspection: M-09-00103, Evaluate UFSAR content for 10CFR50.63 with respect to valve 0RN-4AC

**Section 1R05: Fire Protection**

McGuire Nuclear Station IPEEE Submittal Report dated June 1, 1994

McGuire Nuclear Station Supplemental IPEEE Fire Analysis Report dated August 1, 1996

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

**Section 1R08 Inservice Inspection (ISI) Activities**

Procedures and Specifications

SGMEP 105, McGuire Unit 1 CFR-80 Specific Assessment of Potential Degradation

Mechanisms for 1EOC19, Rev. 7

Brook Associate Procedure 83-0095, Remote Examination & Removal of Foreign Objects from  
Steam Generator Secondary Side, Rev. 0

Areva Procedure 03-1246524, Instruction for Plug Inspection, Rev. 009

Areva Procedure 03-1275114, Eddy Current Data Management Guidelines, Rev. 012

Areva Procedure 03-1277368-012, System Administration Guidelines for Eddy Current  
Assignments

Areva Procedure 03-6037041, Standalone Steam Generator Machine Vision System Field  
Instructions, Rev. 004

Areva Procedure 54-ISI-400-16, Multi-Frequency Eddy Current Examination of Tubing, April 1,  
2008

Areva Procedure 03-9072867, Eddy Current Guidelines for Duke Energy Company's CFR-80  
Steam Generators, Rev. 003

MP/1/A/7150/042 A, Rx Vessel Head Removal, Rev. 16 (Sections 11.4.2-11.4.7, 11.13.1-  
11.13.7)

MP/0/A/7700/080, Inspection and Cleanup of Boric Acid on Plant Materials, Rev. 11

MP/0/A/7650/034, Fabrication and Erection of Structural and Miscellaneous Steel, Rev. 23

PT/0/A/4150/046, Containment Walkdown, Rev. 3

NDE 12, General Radiography Procedure for Preservice and Inservice Inspection, Rev. 12

NDE 35, Liquid Penetrant Examination, Rev. 21  
 NDE 680, Ultrasonic Examination of Nozzle Inner Radii in Ferritic Pressure Vessels, Rev. 5  
 NGD Welding Manual, Functional Area Manual, Guidelines for Controlling Station Welding and Associated Processes, Rev. 12  
 NSD 300, ASME Section XI Program, Rev. 7  
 NSD 322, Boric Acid Corrosion Program, Rev. 1  
 NSD 400, Nuclear Generation Welding Program, Rev. 5  
 NSD 603, Special Processes, Rev. 5  
 NSD 702, Document Control, Rev. 20  
 NSD 703, Administrative Instruction for Technical Procedures, Rev. 20  
 Duke Energy Carolinas Topical Report, Quality Assurance Program, Amendment 36  
 ASME Section IX Welding Program – Program Manual, Rev. 10  
 Welding Procedure Specification GTSM0808-01, Rev. 0 – Rev. 6  
 Procedure Qualification Records: L-110D, L-112, L-108, L-148C, L-138, L-109  
 Weld Process Control for weld 1NS88A-10

#### PIPs

C-03-5744, C-06-0874, C-08-3199, G-08-0152, M-01-3731, M-02-3415, M-06-3438, M-06-3772, M-06-4832, M-06-5169, M-06-5548, M-07-158, M-07-2002, M-07-2747, M-07-4405, M-07-5327, M-08-3147, M-08-5901, M-08-5924, M-08-5928, M-08-5938, M-08-5990

#### Other Records

Duke, CFR-80 Steam Generator Site Technique Validation for Catawba Unit 1 and McGuire Units 1 and 2, Rev. 7  
 Eddy Current Examination Technique Specification Sheets  
 Work Order 589722, Foreign Objects Inspection and Retrieval for SG A  
 Personnel Qualification and Certification Records  
 Equipment and Calibration Certification Records  
 Tube Data Acquisition and Analysis Records  
 Process Control Sheets for Foreign Object Log  
 Work Order (WO) 01714760 01, Unit 1 Refueling Water Storage Tank  
 WO 01714760 03, Unit 1 Refueling Water Storage Tank  
 WO 01698701 01, Hanger 1-MCR-NC-0579  
 WO 01698687, UT examination  
 CAL-07-014  
 CAL-07-015  
 Inservice Inspection Report, McGuire Unit 1, 2007 Refueling Outage, EOC 18  
 Third Interval Inservice Inspection Plan, McGuire Nuclear Station Units 1 and 2, General Requirements, Rev. 2  
 Boric Acid Corrosion Control Program Assessment, November 13-15, 2007  
 Meeting Minutes from Welding B.E.S.T., February 27, 2008  
 Minor Modification, ME100776, Cut out and Replace 8", Schedule 10 piping with 8" Schedule 40

#### **Section 1R11: Licensed Operator Requalification**

AP/1/A/5500/06, Loss of Feedwater  
 AP/1/A/5500/05, Generator Voltage and Electrical Grid Disturbances

AP/1/A/5500/03, Load Rejection  
 AP/1/A/5500/10, NC System Leakage within the Capacity of Both NV Pumps  
 AP/1/A/5500/014, Rod Control Malfunction  
 EP/1/A/5500/E-0, Reactor Trip or Safety Injection  
 EP/1/A/5500/E-3, Steam Generator Tube Rupture  
 EP/1/A/5500/F-0, Critical Safety Function Status Trees  
 EP/1/A/5500/ES-0.1, Reactor Trip Response,

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

M-08-4781  
 M-08-5757  
 M-07-00877  
 M-07-04953  
 McGuire Work Order #1833494  
 PT/2/A/4350/002A, Diesel Generator 2A Operability Test

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

Nuclear System Directive 403, Shutdown Risk Management (Modes 4, 5, 6, and No-Mode) per  
 10 CFR 50.65(a)(4)  
 MD201629, upgrade of 2B RN strainer dP instrumentation

### **Section 1R15: Operability Evaluations**

IP/1/A/3250/012A, Diesel Load Sequencer 1A Timer Calibration, performed on 3/29/07  
 UFSAR Section 8  
 PT/1/A/4350/019A, 1A D/G /Governor and Voltage Regulator Benchmark Comparison Test,  
 performed on 10/4/2008  
 TS 3.8.1 and 3.8.2  
 PT/1/A/4200/009A, Engineered Safety Features Actuation Periodic Test Train A  
 PT/1/A/4350/002A 1A D/G Operability Test  
 PIP M-08-5672  
 NRC RIS 2005-20  
 NSD 203, Operability, Functionality  
 TS 3.7.9 and 3.7.10, and their bases  
 UFSAR sections 8, 7.6.10, and 9.4  
 PT/1/A/4200/009A, Engineered Safety Features Actuation Periodic Test Train A  
 MCS-1578.VC-00-001, Design Basis Specification for the VC/YC System  
 PIP M-08-5632  
 RG 1.70  
 10CFR50.59 evaluation for MD500739 and MD500740  
 PIPs generated from this IP: M-08-6767  
 ASME Code Case N-513-2  
 PIP M-08-6775  
 RIS 2005-20. R1  
 NSD 203, Operability, Functionality

RG 1.147  
 UFSAR section 9.2.2, and Table 9-8  
 TS 3.7.7 and bases  
 SLC 16.5-9  
 PM 1784692  
 PIPs M-07-4758 and M-08-1080

### **Section1R20: Refueling and Outage Activities**

MP/1/A/7150/042B, Reactor Vessel Head Installation  
 IP/0/B/3262/001, Overhead Cranes and Hoists Electrical Inspection and Maintenance  
 MP/0/A/7700/096, Quarterly/Annual Inspection and Servicing of Overhead and Gantry Cranes  
 MP/0/A/7150/136, Inspection of Reactor Vessel Head and Internals Lift Rigs  
 MP/0/A/7150/110, Control Rod Drive Mechanism Missile Shield Lifting Rig Inspection  
 MP/1/A/7650/060, Operation of Polar crane in Unit 1 Upper Containment  
 Calculation MCC-1134.02-00-0043, Reactor Vessel Head Drop Analysis  
 UFSAR section 9.1.5  
 PIPs related to Rx head lift: M-07-3099, M-07-4759, and M-07-5268  
 OP/1/A/6100/SU-2, Refueling and Replacing Reactor Vessel Head  
 OP/1/A/6100/SO-1, Maintaining NC System Level  
 OP/1/A/6100/SO-3, Draining the Refueling Cavity  
 Generic Letter 88-17, Loss of Decay Heat Removal  
 Licensee responses to GL 88-17 dated 1/3/1989, 2/2/1989,3/10/1989, 9/12/1991, and  
 10/16/1991,  
 SLCs 16.5.1, 16.5.2,, 16.5.3, 16.5.4, 16.5.5; Associated with Reduced Inventory Operation  
 OP/1/A/6100/SU-3, Mode 5 Checklist  
 MP/0/A/7150/076 Ice Basket Weight Determination  
 OP/1/A/6100/003, Controlling Procedure for Unit Operation  
 PT/0/A/4150/021, Post Refueling Controlling Procedure for Criticality, Zero Power Physics, &  
 Power Escalation Testing  
 PT/0/A/4150/028, Initial Criticality and Zero Power Physics Testing  
 OP/1/A/6100/SD-1, Prepare for Cooldown  
 OP/1/A/6100/SD-2, Cooldown to 400 Degrees F  
 OP/1/A/6100/SD-4, Cooldown to 240 Degrees F  
 OP/1/A/6100/SD-6A, Placing Train A Residual Heat Removal in Service  
 OP/1/A/6100/SD-6B, Placing Train B Residual Heat Removal in Service  
 OP/1/A/6100/SD-7, Cooldown to 200 Degrees F  
 OP/1/A/6100/SO-10, Controlling Procedure for LTOP Operation

### **Section1R22: Surveillance Testing**

10 CFR Part 50, Appendix J  
 PT/1/A/4200/044, Containment Structural Integrity Inspection  
 Regulatory Guide 1.163, Performance-Based Containment Leak-Test Program  
 NEI 94-01, Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50,  
 Appendix J  
 ANSI/ANS-56.8-1994, Containment System Leakage Testing Requirements

## **Section 1EP2: Alert and Notification System Testing**

### Procedures and Documentation

McGuire Nuclear Station Site-Specific Offsite Radiological Emergency Preparedness Alert and Notification System Quality Assurance Verification, September 12, 1986  
 Report to FEMA – McGuire Alert & Notification System, September 10, 1984  
 PT/0/A/4600/103C, Siren System Annual Preventive Maintenance Review, Rev. 2  
 EPFAM (Emergency Planning Functional Area Manual) 3.3, Alert and Notification System (Siren Program), Rev. 9  
 255232M1, 2001 Siren Federal Signal Corporation - Installation and operating instructions, Rev. M1

### Records and Data

Siren system availability test records for October 2006 to June 2008  
 Annual Preventive maintenance documentation for 2006, 2007, 2008

### PIPs

M-08-6260, Siren ground values  
 M-08-6250, Siren test October 8, 2008

## **Section 1EP3: Emergency Response Organization Augmentation**

### Procedures

PT/0/A/4600/97, Procedure for Preparing and Conducting Emergency Exercises/Drills, Rev. 8  
 MTP 7111.0, Emergency Response (ER) Training Program, Rev. 8

### Records and Data

McGuire Emergency Response Organization Chart, October 7, 2008  
 Drill package for 2007 Augmentation Drill, August 15, 2007 at 1855 hrs  
 Drill package for 2008 Augmentation Drill, August 6, 2008 at 1901 hrs  
 Summary Data on failures in weekly functional test of ERO pagers, September 2007 - September 2008  
 Training records for multiple personnel were reviewed

## **Section 1EP4: Emergency Action Level and Emergency Plan Changes**

### Plans and Changes packages

Emergency Plan 07-02, December 12, 2007  
 Emergency Plan 08-01, September 25, 2008  
 HP/0/B/1009/029, Initial Response On-Shift Dose Assessment, Rev. 009  
 Notification to the State and Counties from the, Rev. 15, and Rev. 16  
 RP/0/A/5700/011, Conducting a Site Assembly, Site Evacuation or Containment Evacuation, Rev. 011  
 RP/0/A/5700/018, Notification to the State and Counties from the Technical Support Center, Rev. 019  
 SR/0/B/2000/004, Notification to the State and Counties from the Emergency Response Facility for Catawba, McGuire, and Oconee, Rev. 13

## **Section 1EP5: Correction of Emergency Preparedness Weaknesses and Deficiencies**

### Procedures

NSD 208, Problem Investigation Process, Rev. 30

### Audits and Self-Assessments

Self-Assessment No. EP-SA06-04, Emergency Planning Corrective Action Effectiveness Review

Self-Assessment No. EP-SA07-01, Siren Remote Controller (RC) Preventive Maintenance (PM) Effectiveness

Self-Assessment No. EMP-SA08-01, Assessment Title: 50.54(q) Quality and Spartanburg Training Effectiveness

Self-Assessment No. EMP-SA08-02, Emergency Notification Forms

Self-Assessment No. EP-SA07-03, Current EAL Scheme Compliance with RIS 2007-01(Clarification of NRC Guidance for Maintaining A Standard Emergency Action Level Scheme

GO-06-019(NPA) (EP) (ALL), 2006 Emergency Planning Functional Area Assessment, December 5, 2006

GO-07-20(NPA) (EP) (ALL), 2007 Emergency Planning Functional Area Assessment, November 12, 2007

08-08(INOS) (EP) (MNS), 2008 Emergency Planning Regulatory Program Audit

### Records and Data

Emergency Medical Drill, November 9, 2006 at 0430 hours

2007-03-D2, Training Drill for Team D, August 29, 2007

2007-06-C1, Training Drill for Team C, December 5, 2007

2008-02-E3, Training Drill for Team E, May 7, 2008

2008-03-B4, Training Drill for Team B, August 27, 2008

### PIPs

M-06-05436, 2006 Annual Contaminated Injury Drill

M-06-05679, ERO Training Drill 2006-05-E3

M-06-05830, TSC elevated temperatures

M-06-05830, TSC Ventilation Work Order Priority

M-07-00012, ANS lost communication

M-07-01509, ANS Radio frequency Interference (RFI) noise

M-07-02603, ANS Lincoln County Siren Activation

M-07-03471, ERO Training Drill 2007-02-A5

M-07-04330, ANS Interference

M-08-00083, Job Performance Measures used for Performance Indicator Data

## **Section 4OA1.2: PI Verification - EP**

### Procedures

Emergency Planning Functional Area Manual Section 3.7 – NRC Regulatory Assessment Performance Indicator Guideline – Emergency Preparedness Cornerstone, Rev. 14

Records and DataANS data from 3<sup>rd</sup> Qtr 2007 to 2<sup>nd</sup> Qtr 2008DEP data from 3<sup>rd</sup> Qtr 2007 to 2<sup>nd</sup> Qtr 2008ERO data from 3<sup>rd</sup> Qtr 2007 to 2<sup>nd</sup> Qtr 2008**Section 40A2: Identification and Resolution of Problems**

McGuire Work Order #1779566

MCID-2499-ZD.01 instrument detail for diesel crankcase vacuum pressure switch

PT/2/A/4350/002A, Diesel Generator 2A Operability Test

PIP M-08-7400

PIP M-08-7385

PIP M-08-2639

PIP M-08-2765

PIP M-08-4153

PIP M-08-5507

PIP M-08-7180

UFSAR violation history

2004003-02 2 examples, SSF and FW isolation valve stroke timing

2004005-02 RN Train A swap to pond procedure not described (50.59)

2004005-03 Changed # of required trains of AFW in UFSAR to less than TS (50.59)

2005004-01 Inadequate corrective action (XVI) for not updating UFSAR for SSF

2005004-02 UFSAR not updated for CAPRM amendment

2006004-02 Failure to adequately update UFSAR for SSF

2006004-03 UFSAR not updated for station blackout

2006005-02 XVI for U2 sump debris/Throttle Valves (2007008 AV, 010 NCV)

2007003-01 XVI for U1 sump debris/Throttle Valves (2007005-04 NCV)

2007003-02 Reactor vessel head lift analysis not in UFSAR (enforcement discretion)

2007004-01 Removing Ice fusion from UFSAR (50.59)

2008003-02 UFSAR not updated for RN sharing between units amendment

**Section 40A3: Event Follow-up**

E-0, Reactor Trip or Safety Injection

ES-0.1, Reactor Trip Response

AP/1/A/5500/14 Rod Control Malfunction

PT/1/A/4600/001 RCCA Movement Test

**Section 40A5.2: URI 05000370/2007005-02**Procedures, Instructions, Guidance Documents, and Operating Manuals

SH/0/B/2000/003, Preparation of a Radiation Work Permit, Rev. 7

SH/0/B/2000/012, Access Controls for High, Extra High, and Very High Radiation Areas, Rev. 7

Records and Data

Radiation Work Permit 2060, U2 Reactor Building, UT and Volumetric Testing Under the Reactor Head, Rev. 2

Survey # M-100306-30, U2 Rx Head Inspection Staging Area

Survey # M-093006-28, U2 Rx Head Inspection Staging Area

Corrective Action Program Documents

PIP M-06-4479, Loss of control of EHRA barrier, 10/2/06

Root Cause Failure Analysis Report, PIP M-06-4479

**LIST OF ACRONYMS**

ANS	-	Alert and Notification System
AP	-	Abnormal Procedure
ASME	-	American Society of Mechanical Engineers
BACC	-	Boric Acid Corrosion Control
CA	-	Auxiliary Feedwater
CVCS	-	Chemical Volume Control System
DEP	-	Drill/Exercise Performance
DID	-	Defense-in-Depth
EDG	-	Emergency Diesel Generator
EOC	-	End-of-Cycle
ERO	-	Emergency Response Organization
IMC	-	Inspection Manual Chapter
ISI	-	In-Service Inspection
HCA	-	Highly Contaminated Area
LHRA	-	Locked High Radiation Area
NCV	-	Non-Cited Violation
NDE	-	Non-Destructive Examination
NEI	-	Nuclear Energy Institute
OI	-	Office of Investigations
OP	-	Operating Procedure
OWA	-	Operator Workaround
PI	-	Performance Indicator
PIP	-	Problem Investigation Process report
PS	-	Planning Standard
PT	-	Performance Test
RN	-	Nuclear Service Water
RPT	-	Radiation Protection Technician
SG	-	Steam Generator
SSC	-	Structures, Systems and Components
SSF	-	Standby Shutdown Facility
TI	-	Temporary Instruction
TS	-	Technical Specifications
UFSAR	-	Updated Final Safety Analysis Report
UT	-	Ultrasonic Test
VC/YC	-	Control Area Ventilation and Chilled Water System
VT	-	Visual Examination
WO	-	Work Order

## OI SYNOPSIS

This investigation was initiated by the U.S. Nuclear Regulatory Commission, Office of Investigations, Region II, on December 19, 2007, to determine whether a Radiation Protection Technician employed by Bartlett Nuclear Services at the McGuire Nuclear Station willfully failed to ensure that a Locked High Radiation Area was properly locked and controlled prior to leaving containment.

A separate element of the concern involved the inability of Duke Energy Corporation to locate and provide the pre-job brief form and procedure steps with double verification sign-off of the LHRA barrier to the NRC. Information related to this issue is addressed in the supplemental section of the OI report.

Based on the evidence developed during this investigation, OI: Region II substantiated that the RPT for Bartlett willfully failed to follow the procedural requirements for a Locked High Radiation Area contained in the McGuire Technical Specification 5.7.2 (failure to control a LHRA barrier) and ensure that a LHRA was properly locked and controlled prior to leaving containment.