



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

July 30, 2009

Mr. Bruce H. Hamilton  
Vice President  
Duke Energy Carolinas, LLC  
McGuire Nuclear Station  
12700 Hagers Ferry Road  
Huntersville, NC 28078-8985

SUBJECT: MCGUIRE NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT  
05000369/2009003 AND 05000370/2009003

Dear Mr. Hamilton:

On June 30, 2009, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your McGuire Nuclear Station. The enclosed report documents the inspection findings which were discussed on July 9, 2009, with Steven Capps 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 three findings of very low safety significance (Green) which were determined to be violations of NRC requirements. The NRC has also determined that one Severity Level IV violation of NRC requirements occurred. 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 VI.A.1 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 the McGuire facility. Additionally, 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 the McGuire facility. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

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2

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 Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

*/RA/*

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

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

Enclosure: NRC Integrated Inspection Report 05000369/2009003 and 05000370/2009003  
w/Attachment - Supplemental Information

cc w/encl: (See page 3)

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Sincerely,

**/RA/**

Jonathan H. Bartley, Chief,  
Reactor Projects Branch 1  
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3

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4

Letter to Bruce H. Hamilton from Jonathan H. Bartley dated July 30, 2009

SUBJECT: MCGUIRE NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT  
05000369/2009003 AND 05000370/2009003

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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: 05000369/2009003, 05000370/2009003

Licensee: Duke Power Company, LLC

Facility: McGuire Nuclear Station, Units 1 and 2

Location: 12700 Hagers Ferry Road  
Huntersville, NC 28078

Dates: April 1, 2009 through June 30, 2009

Inspectors: J. Brady, Senior Resident Inspector  
R. Eul, Resident Inspector  
E. Stamm, Project Engineer (Sections 1R04, 1R13, and  
1R19)  
A. Vargas Mendez, Reactor Inspector (Section  
1R07)

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

Enclosure

## SUMMARY OF FINDINGS

IR05000369/2009-003, IR05000370/2009-003; 4/1/2009 – 6/30/2009; McGuire Nuclear Station, Fire Protection, Emergent Work, Operability Evaluations, Event Follow-up.

The report covered a three month period of inspection by the resident inspectors, a project engineer and a reactor inspector. Three Green non-cited violations (NCVs) and one Severity Level 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). The cross cutting aspects were determined using IMC 0305. 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 July 2006.

### Cornerstone: Mitigating Systems

- Green: A non-cited violation of License Condition 2.C.4, Fire Protection Program (FPP), was identified for inadequate design control measures associated with the downgrading of a 3-hour rated fire barrier between the electrical penetration room and essential switchgear room for each train in both Units. The licensee failed to update the fire strategy plans and the design basis documents, including the fire protection program plan, the fire hazards analysis, and the safe shutdown analysis, to reflect the new fire confinement configurations. The licensee intends to perform the fire hazards analysis and revise the design documents and the fire strategy plans.

This finding is more than minor because it affected the Mitigating Systems Cornerstone objective of availability, reliability, and capability of the fire confinement and fire suppression systems and was associated with the design control and protection against external factors (fire) attribute in that this failure could affect the ability to respond to a fire. The issue was determined to be of very low safety significance (Green) based on the fact that the categories of Fire Prevention and Administrative Controls, and Fire Confinement, were evaluated as having low degradation because the failure to adequately perform design control measures in support of the modification was mitigated by the fact that the fire barrier was not actually removed; would likely have performed its intended function; and that the inspectors' review of the equipment and actions for each of the combined areas indicated that safe shutdown for a fire in the combined areas could be accomplished from either the other redundant train or the alternate safe shutdown facility (both located in other fire areas). There is no cross cutting aspect with this performance deficiency because it was not representative of current licensee performance in that it was a human performance error that occurred 10 years ago. (Section 1R05)

- Green: A self-revealing non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings, was identified for the failure to provide procedures appropriate to the circumstances. The temporary test procedure for flow testing the A Train of nuclear service water (RN) failed to provide adequate pump suction strainer backwash capability resulting in the macrofouling of the 2A RN pump suction strainer. This issue has been entered into the licensee's corrective action program as Problem Investigation Process (PIP) report M-09-02216.

Enclosure

This finding is more than minor because it rendered the 2A RN pump unavailable and affected the availability, reliability, and capability of the RN system (ultimate heat sink), and was related to the external events, configuration control, equipment performance and procedure quality attributes of the Mitigating Systems cornerstone. The finding was determined to be of very low safety significance (Green) because it did not result in a loss of a single train of RN for greater than its Technical Specification (TS) allowed outage time. This finding has a cross-cutting aspect of conservative assumptions [H.1(b)] as described in the Decision-Making component of the Human Performance cross-cutting area, because the licensee's assumption, that macrofouling of the RN pump suction strainers was not a concern while aligned to the standby nuclear service water pond, was non-conservative. (Section 1R13)

- SLIV: A non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action, was identified for failing to adequately identify and correct ultimate heat sink licensing basis document inaccuracies.

The finding is more than minor because the failure to have an accurate description of the ultimate heat sink (UHS) in the licensing basis documents had a material impact on licensed activities. In addition, an accurately defined UHS is necessary to adequately assess plant modifications, operability determinations, and technical specification entry conditions. This issue was treated as traditional enforcement because it had the potential for impacting the NRC's ability to perform its regulatory function. This finding was characterized as a Severity Level IV violation because the NRC determined the standby nuclear service water pond met the requirements of Regulatory Guide (RG) 1.27 in the Safety Evaluation Report (SER) and it does not result in a condition evaluated as having low to moderate, or greater safety significance (i.e., white, yellow, or red). This finding has a cross-cutting aspect of corrective action [P.1(c)] in the Corrective Action Program component of the Problem Identification and Resolution cross-cutting area because the licensee failed to thoroughly evaluate this issue such that the resolutions addressed all the causes and extent of conditions, as necessary. (Section 1R15)

Cornerstone: Barrier Integrity

- Green: A self-revealing non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action, was identified for untimely corrective action for containment isolation valves (CIVs) which could spuriously open during an event requiring containment isolation. Specifically, the licensee had not completed an extent of condition review, from a previously reported event, to identify other CIVs which could spuriously open. The licensee immediately declared the Unit 1 CIVs inoperable and took actions through plant modifications and procedural alignment changes necessary to restore operability. CIV operability was not required because Unit 2 was in Mode 5, but similar changes were made on Unit 2 CIVs prior to Unit 2 re-entering Mode 4 when CIV operability was required.

This finding is more than minor because it affects the availability, reliability, and capability of the containment in that CIVs may not remain closed when required during design basis accidents and is related to the containment isolation attribute of the Barrier Integrity cornerstone. Because the 2008 CIV deficiency revealed itself through a change in functionality of equipment, this issue is considered self-revealing. The violation was

Enclosure



determined to be of very low safety significance (Green) in IMC 0609 SDP Phase 1 screening based on the penetrations involved closed piping within containment such that even if both the inboard and outboard CIVs were to open, a significant breach in the piping would need to occur to provide a viable release pathway. This finding has a cross-cutting aspect of procedures [H.2(c)] in the Resources component of the Human Performance cross-cutting area because the licensee's corrective action program procedures failed to establish timeliness criteria for the reviews. (Section 4OA3).

## Report Details

### Summary of Plant Status:

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

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

1. REACTOR SAFETY  
Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

#### 1R01 Adverse Weather Protection

##### a. Inspection Scope

Adverse Weather Conditions: For the following two weather related conditions, the inspectors reviewed the plant response to the event, toured the plant site, assessed the readiness of risk significant systems and reviewed work activity changes resulting from the adverse weather condition. The inspectors interviewed Operations and Work Control personnel regarding preparations and inspections performed prior to the arrival of the severe weather, adequacy of the operations procedures, and additional actions to be taken following the period of adverse weather. The inspectors reviewed any actions taken by the licensee to restore systems, which were out of service for maintenance, to reduce risk prior to the arrival of the adverse weather. Documents reviewed are listed in the Attachment.

- April 21<sup>st</sup> severe thunderstorm warning
- May 6<sup>th</sup> tornado warning

Summer Readiness of Offsite & Alternate AC Power Systems: The inspectors evaluated plant features, procedures for operation, and continued availability of offsite and alternate AC power systems to determine whether they were appropriate for the circumstances. The inspectors reviewed the licensee's procedures affecting these areas and the communications protocols between the transmission system operator and the plant to determine whether the appropriate information is exchanged when issues arise that could impact the offsite power system. Documents reviewed are listed in the Attachment.

##### b. Findings

No findings of significance were identified.

#### 1R04 Equipment Alignment

##### a. Inspection Scope

Partial Walkdown: The inspectors performed a partial walkdown of the following six systems to assess the operability of redundant or diverse trains and components when

Enclosure

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 systems components, and determined whether selected breakers, valves, and support equipment were in the correct position to support system operation. Documents reviewed are listed in the Attachment.

- 1B emergency diesel generator (EDG) with 1A EDG out of service for planned maintenance on April 7
- 2A EDG with 2B EDG out of service for planned maintenance on April 14
- 1A EDG with 1B EDG out of service for planned maintenance on April 21
- 2A nuclear service water (RN) with 2B RN out of service for standby nuclear service water pond (SNSWP) intake piping inspection on April 23
- 1A RN with 1B RN out of service for SNSWP intake piping inspection on April 24
- 2B RN with 2A RN inoperable on April 28

Complete System Walkdown: The inspectors conducted a detailed review of the following system using the guidance listed in Operating Experience Smart Sample FY2009-02. The inspectors reviewed the procedures, drawings, and the Updated Final Safety Analysis Report (UFSAR) to determine the correct system alignment. 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. The inspectors reviewed the operator workaround list, the temporary modification list, system health reports, and other outstanding items tracked by the engineering department to determine the effect of outstanding design issues on the operability of the systems. In addition, the inspectors reviewed outstanding maintenance work requests/work orders and deficiencies that could affect the ability of the system to perform its function. Documents reviewed are listed in the Attachment.

- Unit 1 auxiliary feedwater (CA) system

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

Fire Protection Walkdowns: The inspectors walked down accessible portions of the following six plant areas to determine if they were consistent with the UFSAR and the fire protection program for defense in depth features. The features assessed included the licensee's control of transient combustible material and ignition sources, fire detection and suppression capabilities, fire fighting equipment, and passive fire features such as fire barriers. The inspectors also reviewed the licensee's compensatory

Enclosure

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 1 750 elevation electrical penetration room (Fire Area 15)
- Unit 2 750 elevation electrical penetration room (Fire Area 16)
- Unit 1 Exterior doghouse (Fire Area 30)
- Unit 2 Exterior doghouse (Fire Area 31)
- Unit 1 Exterior doghouse (Fire Area 28)
- Unit 2 Exterior doghouse (Fire Area 29)

b. Findings

Introduction: A Green NRC-identified non-cited violation of License Condition 2.C.4, Fire Protection Program (FPP), was identified for inadequate design control measures associated with the downgrading of a 3-hour rated fire barrier between the electrical penetration room and essential switchgear room for each train in both Units. The licensee failed to update the fire strategy plans and the design basis documents, including the fire protection program plan, the fire hazards analysis, and the safe shutdown analysis, to reflect the new fire confinement configurations.

Description: The inspectors found, on May 24<sup>th</sup>, that the licensee's FPP and Fire Hazards Analysis (FHA), contained in MCS-1465.00-0008, Design Basis Specification (DBD) for Fire Protection, described a fire barrier between the electrical penetration room and essential switchgear room for each train in both Units as having been downgraded from a 3-hour NRC committed fire wall to a non-committed fire barrier. This change was made using Minor Modification MM10966, approved in January 2001, to fire areas 9 and 11, 10 and 12, 15 and 17, and 16 and 18. The modification did not include revising the FHA for the change. The licensing basis for fire barriers contained in the FPP, the FHA, and NUREG -0422, Safety Evaluation Report, related to operation of McGuire Nuclear Station Units 1 and 2, section 3.1, and collectively identified that all fire areas were surrounded by 3-hour rated fire barriers. The 10 CFR 50.59 evaluation described that the removal of the fire barrier essentially combined two rooms into a single fire area. The licensee failed to adequately reflect this change in the FPP and FHA (MCS-1465.00-0008), in the Appendix R Safe Shutdown Analysis DBD (MCS-1465.00-00-0022), and in the fire strategy plans used by the fire brigade to fight fires in the affected areas. The inspectors reviewed the licensee's design control program contained in Nuclear Station Directive (NSD) 301, Nuclear Station Modifications, section 301.5 and McGuire Modifications Manual Section 5.0, Minor Modifications and found that the program required that all affected documents be identified and updated. The licensee initiated PIP M-09-2822 and PIP M-09-2965 to perform the fire hazards analysis and revise the design documents and the fire strategy plans.

Analysis: The licensee's failure to adequately update the design documents and fire strategy plans to adequately reflect the modification as required by the operating license (condition 2.C.4.) and the FPP, was considered a performance deficiency. This finding is more than minor because it affected the Mitigating Systems Cornerstone objective of

Enclosure

availability, reliability, and capability of the fire confinement and fire suppression systems and was associated with the design control and protection against external factors (fire) attribute in that this failure could affect the ability to respond to a fire. The issue was determined to be of very low safety significance (Green) using IMC 0609, Appendix F, Attachment 1, based on the fact that the categories of Fire Prevention and Administrative Controls, and Fire Confinement, were evaluated as having low degradation because the failure to adequately perform design control measures in support of the modification was mitigated by the fact that the fire barrier was not actually removed; would likely have performed it's intended function; and that the inspectors' review of the equipment and actions for each of the combined areas indicated that safe shutdown for a fire in the combined areas could be accomplished from either the other redundant train or the alternate safe shutdown facility (both located in other fire areas). There is no cross cutting aspect with this performance deficiency because it was not representative of current licensee performance in that it was a human performance error that occurred 10 years ago.

Enforcement: 10 CFR 50.48 states that each operating nuclear power plant must have a fire protection plan that satisfies Criterion 3 of Appendix A of this part. McGuire operating license condition 2.C.4, for Unit 1 and 2, stated that the licensee shall maintain in effect and fully implement all provisions of the approved FPP as described in the Final Safety Analysis Report, as updated, for the facility and as approved in the NRC McGuire Safety Evaluation Report (NUREG-0422) and its supplements. McGuire UFSAR section 9.5.1 stated that the FPP was contained in DBD MCS-1465.00-00-0008. The FPP, Section C, Quality Assurance, addressed measures for Design Control and Instructions, Procedures, and Drawings. The FPP stated that the administrative controls were contained in Station Directives. NSD 301, Nuclear Station Modifications, section 301.5 addressed design control for minor modifications. Sections 301.5.3.2 and 301.5.4.1 required that affected documents be identified and updated. McGuire Modifications Manual Section 5.0, Minor Modifications, required that all affected documents be identified (5.10) and updated (5.11). Contrary to the above, from January 2001, until June 2, 2009, the licensee had not adequately implemented the FPP design control measures specified in NSD 301 and the McGuire Modification Manual for modification MM-10966 in that the licensee failed to update the affected fire strategy plans and the design basis documents, including the fire protection program plan, the fire hazards analysis, and the safe shutdown analysis, to reflect the new fire confinement configurations. Because the failure to adequately implement the fire protection program design control measures is of very low safety significance and was entered into the licensee's corrective action program as PIP M-09-2822 and PIP M-09-2965, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy and is identified as NCV 05000369,370/2009003-01: Failure To Adequately Implement Design Control Measures For Fire Protection.

#### 1R07 Triennial Heat Sink Performance

##### a. Inspection Scope

The inspectors reviewed inspection records, test results, and other documentation to ensure that heat exchanger (HX) deficiencies that could mask or degrade performance

Enclosure

were identified and corrected. The test procedures and records were also reviewed to verify that these were consistent with Generic Letter 89-13 licensee commitments, and industry guidelines. Risk significant heat exchangers reviewed included the: (1) Safety Injection and CA Motor Coolers, (2) EDG HXs, and the (3) Component Cooling System (KC) HXs.

The inspectors reviewed site and corporate HX program procedures, testing and cleaning frequencies, PIP documents, system health reports, and conducted interviews with system engineers for all selected HXs. The inspectors reviewed visual inspection records, differential pressure trends, inspection and cleaning procedures, system walkdown inspection results, and eddy current testing reports for the KC HXs. For the EDG cooling water HXs inspection and cleaning procedures, tube plugging acceptance criteria, eddy current testing, differential pressure (DP) test data, flushing procedures and visual inspection records were reviewed. The inspectors also reviewed engineering evaluations, visual inspection records, and inspection and cleaning procedures. These documents were reviewed to verify inspection methods were consistent with industry standards, to verify HX design margins were being maintained, and to verify performance of the HXs under the current maintenance frequency was adequate. In addition, the inspectors conducted a walk down of selected HXs to assess general material condition and to identify any degraded conditions of selected components.

The inspectors also reviewed general health of RN via review of design basis documents, system health reports, intake structure diver inspections, corrosion monitoring procedures, procedures for dead leg flushes, pipe wall thickness measurements, and discussions with the service water system engineer. These documents were reviewed to verify design basis were being maintained and to verify adequate service water system performance under current preventive maintenance, inspections and frequencies.

The inspectors reviewed Federal Energy Regulatory Commission and State of North Carolina inspection reports for the McGuire Nuclear Station Pond Dam and SNSWP earthen embankment. The inspectors also performed a walkdown of those structures and reviewed reports for testing the presence of macroscopic bio-fouling such as Asiatic Clams and Zebra Mussels.

PIP documents were reviewed for potential common cause problems and problems which could affect system performance, and to confirm that the licensee was entering issues into the corrective action program and initiating appropriate corrective actions. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalificationa. Inspection Scope

On May 27, 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 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 scenario listed below. Documents reviewed are listed in the Attachment.

- Failure of Pressurizer Pressure master potentiometer control and Loss of coolant accident outside containment

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectivenessa. Inspection Scope

The inspectors reviewed the two 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. Documents reviewed are listed in the Attachment.

- 2B CA Pump discharge check valve failure during turbine driven auxiliary feedwater pump run
- Standby shutdown facility day tank pump failed to start

b. Findings

No findings of significance 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 six 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 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. The inspectors also reviewed corrective action document PIP M-09-2216, 2A RN Strainer fouled [high Differential Pressure (DP) alarm] during high RN flow testing per a temporary test procedure to determine whether the licensee identified and implemented appropriate corrective actions. Documents reviewed are listed in the Attachment.

- Emergent work (April 16) when 2RN-190B pinhole leak was discovered which forced work delays associated with planned movement of retired steam generators across the SNSWP dam
- Planned ORAM Orange (April 20 to 24) for dive operations in the B train RN piping suction and discharge in the SNSWP
- Emergent ORAM Orange (April 27 to 30) for 2A RN inoperable due to strainer fouling during high flow testing per temporary test procedure
- Emergent work (May 6) completion of the maintenance on safe shutdown facility when pending adverse weather would have resulted in an ORAM Orange risk condition
- Planned ORAM Orange (June 2) for preventive maintenance on the 1A RN strainer and replacement of solenoid valves for auto backwash on 1A strainer
- Planned ORAM Orange (June 22) for 2A RN strainer preventive maintenance and 2A EDG planned maintenance

### b. Findings

Introduction: A self-revealing Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings, was identified for the failure to provide procedures appropriate to the circumstances. The temporary test procedure for flow testing the A Train of RN failed to provide adequate pump suction strainer backwash capability resulting in the macrofouling of the 2A RN pump suction strainer.

Description: On April 27, 2009, temporary testing procedure TT/0/A/9100/619, Data Collection for A Train RN Aligned to SNSWP, was used to conduct flow testing on both units' A Train of RN while it was aligned to the SNSWP. The purpose of the testing was to gather benchmarking data for the common A Train RN hydraulic models while aligned to the SNSWP. In order to improve the accuracy of the test the automatic backwash feature of both 1A and 2A RN pump suction strainers was disabled. Both the 1A RN and 2A RN pumps were running at a combined 20,000 gpm through the common suction header when the 2A strainer DP increased from approximately 1 psid to greater than 10

Enclosure



psid over a 20 minute time period and caused a high DP alarm due to macrofouling of the pump suction strainer. Operators reduced the 2A RN Train flow rate to approximately 4,000 gpm, but the 2A RN pump suction strainer differential pressure remained elevated above 9 psid. Audible cavitation of the 2A RN pump was confirmed by field observation and the 2A RN pump was stopped. The B Train of RN was in service providing cooling to both units' safety-related loads during the event.

The licensee disabled the automatic backwash feature without providing the credited safety-related manual backwash function due to the belief that macrofouling of the RN pump suction strainers was not a concern while aligned to the SNSWP. However, the licensee had previous knowledge that the common suction header contained a general corrosion layer (PIP M-06-00727) and had performed an environmental study that showed the SNSWP contained biofouling agents as early as 1995. Following the event, the licensee's laboratory metallurgical analysis showed that the debris in the strainer was composed of corrosion products, believed to be released from the RN common suction header pipe walls, as well as some Asiatic clam shells. The licensee's decisions related to disabling the automatic backwash feature resulted in the unavailability of the 2A Train of RN for an additional 53 hours over what was planned for the test. The common header for the A Train of RN was subsequently flushed and retested satisfactorily with backwash available.

Analysis: The inspectors determined that the licensee's failure to include adequate backwash capability to the 1A and 2A RN pump suction strainers was a performance deficiency. This finding is more than minor because it rendered the 2A RN pump unavailable and affected the availability, reliability, and capability of the RN system (ultimate heat sink), and was related to the external events, configuration control, equipment performance and procedure quality attributes of the Mitigating Systems cornerstone. This finding was considered self-revealing because the macrofouling and pump cavitation became self-evident during testing. The finding was determined to be of very low safety significance (Green) using IMC 0609, Attachment 4, Phase 1 Initial Screening and Characterization of Findings, because it did not result in a loss of a single train of RN for greater than its TS allowed outage time. This finding has a cross-cutting aspect of conservative assumptions [H.1(b)] as described in the Decision-Making component of the Human Performance cross-cutting area, because the licensee's assumption, that macrofouling of the RN pump suction strainers was not a concern while aligned to the SNSWP, was non-conservative.

Enforcement: 10 CFR Part 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings, requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances. Contrary to the above, on April 27, 2009, the licensee's procedure TT/0/A/9100/619, Data Collection for A Train RN Aligned to SNSWP, was not appropriate to the circumstances in that disabling the automatic backwash function of the 1A and 2A RN pump suction strainers without having provided timely backwash capability resulted in fouling of the 2A RN strainer and cavitation of the 2A RN pump. Because this violation was of very low safety significance and it was entered into the licensee's corrective action program as PIP M-09-02216, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV

Enclosure

0500369,370/2009003-02, Procedures Not Appropriate to the Circumstances for A Train RN Temporary Testing.

1R15 Operability Evaluations

a. Inspection Scope

For the five operability evaluations listed below, the inspectors evaluated the technical adequacy of the evaluations to determine whether Technical Specification 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 SSC's to determine if the measures were in-place and adequately compensated for the degradation to justify operability. The inspectors reviewed the UFSAR to determine if the measures resulted in changes to the licensing basis functions and if a license amendment was required per 10CFR 50.59. Documents reviewed are listed in the Attachment. The inspectors also reviewed corrective action document PIP M-08-0627 associated with the UFSAR description of ultimate heat sink to determine if the licensee identified and implemented appropriate corrective actions.

- M-09-789, white substance on 1D containment air handling unit inlet
- M-09-695, piping calculations do not account for the lift thrust force on the valve discharge outlet
- M-09-2270, O-rings were not replaced for 2RNPT5000 after calibration
- M-09-2168, 2B Containment Spray pump did not start when test potentiometer BD was adjusted in CPCC4, but started six minutes later without any other action
- M-09-0695, piping analysis calculations for cold leg accumulator safety relief valve did not account for the valve opening thrust on the valve discharge outlet

b. Findings

Introduction: The inspectors identified a Severity Level IV non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action, for failing to adequately identify and correct ultimate heat sink licensing basis document inaccuracies.

Description: On February 5, 2008, the licensee wrote PIP M-08-0627 to address the inspector's concern in assessing if Lake Norman and the Cowan's Ford Dam were properly evaluated and met the requirements of Regulatory Guide (RG) 1.27 to be included as part of the ultimate heat sink (UHS). The inspectors noted the inconsistent licensing basis documents for the defined UHS. The approved fire protection program contained in MCS-1465.00-00-0008, Design Basis Specification for Fire Protection, stated that the UHS for McGuire is the SNSWP. The original SER section 2.4.6 stated that the SNSWP is the UHS for the plant and that the pond meets the criteria specified in RG 1.27, Ultimate Heat Sink for Nuclear Power Plants. However, the licensee's current UFSAR, TS bases document, and licensed operator training materials described the UHS as consisting of both the SNSWP and Lake Norman.

Enclosure

The licensee closed the PIP in December 2008 and determined that no corrective actions were necessary. The inspectors questioned the determination by noting that the licensee's documents, as described above, still conflicted with each other. In response, the licensee reopened the PIP and has begun an additional evaluation to determine the required design and licensing basis corrective actions.

Analysis: The failure to correct deficiencies in licensing basis documents associated with the safety related UHS is considered a performance deficiency. The finding is more than minor because the failure to have an accurate description of the UHS in the licensing basis documents had a material impact on licensed activities. In addition, an accurately defined UHS is necessary to adequately assess plant modifications, operability determinations, and technical specification entry conditions. This issue was treated as traditional enforcement because it had the potential for impacting the NRC's ability to perform its regulatory function. This finding was characterized as a Severity Level IV violation in accordance with the NRC Enforcement Policy, Supplement 1, because the NRC determined the SNSWP met the requirements of RG 1.27 in the SER and it does not result in a condition evaluated as having low to moderate, or greater safety significance (i.e., white, yellow, or red). This finding has a cross-cutting aspect of corrective action [P.1(c)] in the Corrective Action Program component of the Problem Identification and Resolution cross-cutting area because the licensee failed to thoroughly evaluate this issue such that the resolutions addressed all the causes and extent of conditions, as necessary.

Enforcement: 10 CFR 50 Appendix B, Criterion XVI, Corrective Action, stated that measures shall be established to assure that conditions adverse to quality, such as deficiencies, deviations, and nonconformances are promptly identified and corrected. This requirement was implemented through the Duke Quality Assurance Program Topical Report and procedure NSD 208, Problem Identification Process. Contrary to the above, in December 2008, the licensee failed to correct conflicts in the description of the UHS in various licensing basis documents. Because this violation was of very low safety significance, was not repetitive or willful, and was entered into the licensee's corrective action program as PIP M-08-0627, it is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 0500369,370/2009003-03, Failure to Correct Ultimate Heat Sink Licensing Basis Document Inaccuracies.

## 1R18 Plant Modifications

### a. Inspection Scope

The inspectors reviewed one temporary and one permanent modification listed below and the associated 10 CFR 50.59 review to determine whether the modifications satisfied the requirements of 10CFR50, Appendix B, and compared each against the UFSAR and TS to determine if the operability or availability of SSCs were affected by completion of the modification. The inspectors reviewed each modification to ensure that it was installed in accordance with the modification documents and reviewed post-installation (and/or removal testing for temporary modifications) to verify that the actual impact on permanent systems was adequately verified by the tests. In addition, the inspectors determined whether the appropriate procedures, design documents, and

Enclosure

licensing documents were updated to reflect the installation of the modification. Documents reviewed are listed in the Attachment.

- MD100014, Revise Motor Control Center Aux Contact for valve 1RN134A
- MD100938, Drain Piping Modifications at the 1B CA Pump (Temporary Modification)

b. Findings

No findings of significance were identified. However, see section 1R05 for an NCV related to an inadequately implemented modification.

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 test 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.

- PT/2/A/4403/001A, 2A RN Pump Performance Test, and PT/0/A/4200/047, Train A SNSWP Supply and Return Header Flush, following inoperability of 2A RN due to strainer fouling, on April 29, 2009
- PT/1/A/4350/024, Hydrogen Mitigation Igniter Glow Plug Test, following replacement of TB 55 and TB-57 glow plugs
- PT/2/A/4252/001B, 2B CA Pump Performance Test, following cleaning of the motor cooler, replacement of start/stop switch on the auxiliary shutdown panel and various valve maintenance
- PT/2/A/4350/002B, Diesel Generator 2B Operability Test, following various maintenance items
- OP/2/A/6350/002, Diesel Generator, following replacement of the 2VGSV5171 run/shutdown cylinder solenoid valve on the 2B EDG

The inspectors also reviewed PIP M-09-2216 and PIP M-09-2259 the following corrective action documents to determine whether the licensee identified and implemented appropriate corrective actions.

- PIP M-09-2216, 2A RN Strainer fouled (high DP alarm) during high RN flow testing per TT procedure
- PIP M-09-2259, Document performance of 1A and 2A RN pumps at high flows

b. Findings

No findings of significance were identified.

1R22 Surveillance Testinga. Inspection Scope

For the five surveillance tests identified below, the inspectors witnessed testing and/or reviewed the test data, to determine if the systems, structures, and components (SSCs) involved in these tests satisfied the requirements described in the Technical Specifications, the Final Safety Analysis Report, 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.

Routine Surveillance Tests

- PT/1/A/4350/002A, Diesel Generator 1A Operability Test using PT/1/A/4350/055A, 1A Diesel Generator Slave Start Test, to start the diesel generator
- PT/1/A/4200/028A, Train A Slave Relay Test
- PT/0/A/4601/008B, Solid State Protection System Train B Periodic Test With Reactor Coolant System Pressure >1955 psig
- PT/2/A/4350/002B, Diesel Generator 2B Operability Test using PT/2/A/4350/055BA, 2B Diesel Generator Slave Start Test, to start the diesel generator

In-Service Tests

- PT/1/A/4252/001, #1 Turbine Driven CA Pump Performance Test

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluationa. Inspection Scope

The inspectors evaluated the conduct of licensee emergency drills to identify any weaknesses or deficiencies in classification, notification, dose assessment and protective action recommendation development activities in accordance with 10 CFR 50, Appendix E. The inspectors also attended the licensee critique of the drill to compare any inspector observations with those identified by the licensee in order to determine if the licensee was properly identifying failures. The inspectors reviewed the licensee's performance indicator determinations for this drill to determine if they were in conformance with the criteria contained in Nuclear Energy Institute 99-02.

- Routine emergency drill on May 6
- Unannounced emergency drill on June 2

b. Findings

No findings of significance were identified.

Enclosure

#### 4OA1 Performance Indicator (PI) Verification

##### a. Inspection Scope

The inspectors sampled licensee data to confirm the accuracy of reported performance indicator (PI) data for the six indicators 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 Nuclear Energy Institute 99-02, Regulatory Assessment Indicator Guideline, Rev. 4.

##### Initiating Events Cornerstone

- Unplanned Scrams per 7000 Critical Hours (Units 1 and 2)
- Unplanned Scrams with Complications (Units 1 and 2)
- Unplanned Power Changes per 7000 Critical Hours (Units 1 and 2)

The inspectors reviewed a selection of licensee event reports, operator log entries, daily reports, monthly operating reports, and PI data sheets to determine whether the licensee had adequately identified the number of scrams and unplanned power changes greater than 20 percent that occurred during the previous four quarters. The inspectors compared this number to the number reported for the PI during the current quarter. The inspectors also reviewed the accuracy of the number of critical hours reported and the licensee's basis for determining that there were not complications for each of the reported reactor scrams. In addition, the inspectors interviewed licensee personnel associated with the PI data collection, evaluation, and distribution.

##### 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. The documents reviewed during this inspection are listed in the Attachment.

##### .2 Selected Issue Follow-Up Inspection

##### a. Inspection Scope

The inspectors performed a review of the four priority 1 operator workarounds (OWAs) listed in the licensee's May 2009 OWA report to determine whether the OWAs were

Enclosure

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.

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 existed which were not contained in 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. Documents reviewed are listed in the Attachment.

b. Findings

No new trends were identified. The inspectors previously identified a trend associated with numerous violations for failing to update the UFSAR 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. Two NRC identified issues that deal with UFSAR accuracy were identified during the 6 month period, but both were issues with the original licensing basis. The first was NCV 05000369,370/2009002-02, issued for not having the accelerated load sequencer function described in the UFSAR, and the second was associated with the definition of the ultimate heat sink in licensing basis documents, including the UFSAR (section 1R15).

4OA3 Event Follow-up

(Closed) LER 05000369/2008-001-00, Potential Failure of Containment Isolation Valves (CIV) to Remain Fully Closed: On May 19, 2008, the licensee reported that a violation of TS 3.6.3 occurred when it was discovered that inadequate bleed paths during thermal pressurization could cause actuator closing margins to be exceeded and cause a CIV to open during an event requiring containment isolation. The licensee immediately declared all applicable CIVs inoperable and took actions to restore operability through plant modifications and procedural alignment changes necessary to restore adequate

Enclosure

closing margins. The licensee's root cause for this event was a lack of formal expectations or guidelines relative to timely completion of corrective actions having significant regulatory impact from a 2006 LER on a similar pressurization concern on a different CIV (LER 05000369/2006-001-00).

### Findings

Introduction: A self-revealing Green non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, was identified for untimely corrective action for CIVs which could spuriously open during an event requiring containment isolation. Specifically, the licensee had not completed an extent of condition review, from a previously reported event, to identify other CIVs which could spuriously open.

Description: The inspectors reviewed the LER and associated PIPs which identified that on March 4, 2008 two CIVs were found open during the performance of PT/2/A/4200/002C, Containment Closure, on Unit 2 while in Mode 5. The licensee determined that these spurious openings were due to the thermal pressurization of water trapped in the cooling header. This same failure mechanism was documented in LER 369/2006-001. One of the corrective actions in LER 2006-001 was to perform an extent of condition review to identify other CIVs of concern. However, the extent of condition for the 2006 LER was not completed prior to this 2008 event. The inspectors determined that the licensee's corrective action to perform an extent of condition for the 2006 LER was untimely. The inspectors reviewed the licensee's subsequent operability determination and extent of condition which determined a total of nine penetrations per unit had CIVs that would be susceptible to this design deficiency. The licensee immediately declared the Unit 1 CIVs inoperable and took actions through plant modifications and procedural alignment changes necessary to restore operability. CIV operability was not required because Unit 2 was in Mode 5, but similar changes were made on Unit 2 CIVs prior to Unit 2 re-entering Mode 4 when CIV operability was required.

Analysis: The failure to timely complete an extent of condition review as a corrective action for a previously identified condition is a performance deficiency. This finding is more than minor because it affects the availability, reliability, and capability of the containment in that CIVs may not remain closed when required during design basis accidents and is related to the containment isolation attribute of the Barrier Integrity cornerstone. Because the 2008 CIV deficiency revealed itself through a change in functionality of equipment this issue is considered self-revealing. The violation was determined to be of very low safety significance (Green) based on the penetrations involved closed piping within containment such that even if both the inboard and outboard CIVs were to open, a significant breach in the piping would need to occur to provide a viable release pathway. This finding has a cross-cutting aspect of procedures [H.2(c)] in the Resources component of the Human Performance cross-cutting area because the licensee's corrective action program procedures failed to establish timeliness criteria for the reviews.



Enforcement: 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, requires, in part, that conditions adverse to quality are promptly identified and corrected. This requirement is implemented through the Duke Quality Assurance Program Topical Report and procedure NSD 208, Problem Identification Process. Contrary to the above, from June 19, 2006, to March 20, 2008, the licensee failed to promptly identify all CIVs with inadequate closing margins during thermal pressurization associated with Grinnell air-operated CIVs. LER 369/2006-001 identified that an extent of condition review to identify other valves of concern was to be completed, and the licensee failed to promptly perform this extent of condition review prior to the spurious openings of two CIVs in 2008. This issue is in the licensee's corrective action program as PIP M-08-1541. The failure to identify and correct deficient air-operated CIVs is being treated as an NCV, consistent with the NRC Enforcement Policy: NCV 0500369,370/2009003-04, Untimely Corrective Actions for Containment Isolation Valve Inadequate Closing Margins.

#### 40A5 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 Independent Spent Fuel Storage Installations IP 60855.1

###### a. Inspection Scope

The inspectors reviewed the Unit 1 documentation package for the casks listed below that were created using procedure XSM-006, Workplace Procedure for Selecting Spent Fuel for Use of NAC-UMS System at McGuire and Regulatory Guide 3.54, Spent Fuel Heat Generation to verify that the selected fuel assemblies and burnable poison inserts met the requirements for insertion in dry cask storage. The inspectors reviewed the cask loading verification video for each of the above casks to verify that the alpha-numeric identification numbers stamped on the loaded fuel assemblies and burnable poison assemblies matched the identification numbers used in the documentation package as required by procedure OP/0/A/6550/028, NAC UMS Fuel Assembly Loading/Unloading Procedure. The casks were loaded on March 17, March 30, April 20, and May 4, 2009, respectively. The inspectors reviewed selected licensee activities as

Enclosure

specified in procedure MP/0/A/7650/212, Loading Spent Fuel Assemblies into NAC-UMS casks, to verify that activities were being accomplished in accordance with procedural requirements. Documents reviewed are listed in the Attachment.

- NAC-UMS TSC-MNI-050 (Document Control NO MCEI 0400-216)
- NAC-UMS TSC-MNI-051 (Document Control NO MCEI 0400-215)
- NAC-UMS TSC-MNI-052 (Document Control NO MCEI 0400-217)
- NAC-UMS TSC-MNI-049 (Document Control NO MCEI 0400-218)

b. Findings

No findings of significance were identified

4OA6 Meetings, Including Exit

.1 Quarterly Exit Meeting Summary

On July 9, the resident inspectors presented the inspection results to Mr. S. Capps and other members of the licensee's staff. The inspectors confirmed proprietary information obtained during the inspection was returned to the licensee and would not be included in this report.

.2 Annual Assessment Meeting Summary

On May 6, the NRC's Chief of Reactor Projects Branch 1 and the resident inspectors met with Mr. Steven Capps and other members of the licensee staff to discuss the NRC's annual assessment of McGuire's safety performance for the period of January 1 through December 31, 2008. The annual assessment results were previously provided to the licensee by a letter dated March 4, 2009.

On May 5, the NRC's Chief of Reactor Projects Branch 1 and the resident inspectors held a Category 3 meeting for members of the public and local officials. This Category 3 public meeting provided an open house public forum to fully engage the public in a discussion of regulatory issues related to the NRC's ROP and annual assessment of the McGuire Nuclear Station safety performance for the period January 1 through December 31, 2008. The presentation material used for discussions and the list of attendees is available from the NRC's document system (ADAMS) as accession number ML091280317. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee

K. Ashe, Manager, Regulatory Compliance  
D. Black, Security Manager  
S. Bradshaw, Training Manager  
D. Brewer, Manager, Safety Assurance  
J. Bryant, Regulatory Compliance  
S. Capps, Manager, Engineering  
K. Crane, Regulatory Compliance  
B. Hamilton, Site Vice President, McGuire Nuclear Station  
J. Hicks, Superintendent, Maintenance  
S. Mooneyhan, Radiation Protection Manager  
J. Nolin, Manager, Mechanical and Civil Engineering  
R. Parker, Superintendent, Work Control  
C. Pattison, Heat Exchanger Engineer  
R. Repko, Station Manager, McGuire Nuclear Station  
W. Scott, Chemistry Manager  
T. Simril, Superintendent, Plant Operations  
S. Snider, Manager, Reactor and Electrical Systems Engineering

#### NRC personnel

R. Carroll, Senior Project Engineer, RII  
E. Stamm, Project Engineer, RII  
J. Thompson, Project Manager, NRR

### **LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

#### Opened and Closed

05000369,370/2009003-01	NCV	Failure to adequately implement design control measures for fire protection (Section 1R05)
05000369,370/2009003-02	NCV	Procedures Not Appropriate to the Circumstances for A Train RN Temporary Testing (Section 1R13)
05000369,370/2009003-03	NCV	Failure to Correct Ultimate Heat Sink Licensing Basis Document Inaccuracies (Section 1R15)
05000369,370/2009003-04	NCV	Untimely Corrective Actions for Containment Isolation Valve Inadequate Closing Margins (Section 4OA3)

#### Closed

05000369/2008-001-00	LER	Potential Failure of Containment Isolation Valves (CIV) to Remain Fully Closed. (Section 4OA3)
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## DOCUMENTS REVIEWED

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

Nuclear System Directive (NSD) 417, Nuclear Facilities/Generation Status Communications RP/0/A/5700/006, Natural Disasters, Rev. 020

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

#### Complete Alignment

Drawing MCFD-1592-01.00, Flow Diagram of Auxiliary Feedwater System

Drawing MCFD-1592-01.01, Flow Diagram of Auxiliary Feedwater System

Drawing MCFD-1592-02.00, Flow Diagram of Auxiliary Feedwater System

UFSAR Section 10.4.10

OP/1/A/6250/002, Auxiliary Feedwater

NRC Information Notice 2008-13: Main Feedwater System Issues and Related 2007 Reactor Trip Data

NRC NUREG/CR-5830: Auxiliary Feedwater System Risk-Based Inspection Guide for the McGuire Nuclear Power Plant

#### Partial System Walkdown

##### Emergency Diesel Generator 1B:

Drawing MCFD-1609-04.00, Flow Diagram of the Diesel Generator Starting Air System

Drawing MCFD-1609-03.01, Flow Diagram of the Diesel Generator Engine 1B Fuel Oil System

Drawing MCFD-1609-02.01, Flow Diagram of the Diesel Generator Engine Lube Oil System

Drawing MCFD-1609-01.01, 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

##### 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

##### Nuclear Service Water 2A:

Drawing MCFD-2574-01.01, 02.00, and 02.01; Flow Diagram of Nuclear Service Water System, Unit 2

Drawing MCFD-1574-01.00; Flow Diagram of Nuclear Service Water System, for shared portion of system

##### Nuclear Service Water 1A:

Drawing MCFD-1574-01.00, 01.01, 02.00, and 02.01; Flow Diagram of Nuclear Service Water System

Nuclear Service Water 2B:

Drawing MCFD-2574-01.01, 03.00, and 03.01; Flow Diagram of Nuclear Service Water System, Unit 2

Drawing MCFD-1574-01.00; Flow Diagram of Nuclear Service Water System, for shared portion of system

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

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

MCS-1465.00-00-0022, Design Basis Specification for the Appendix R Safe Shutdown Analysis

MM 10966, Modification to eliminate fire barrier walls between the switchgear rooms and electrical penetration rooms for both U1 and U2

NRC Generic Letter 86-10, Implementation of Fire Protection Requirements

NRC Generic Letter 88-12, Removal of Fire Protection Requirements from Technical Specification

Duke responses to Generic Letter 88-12 dated March 20, 1989 and May 19, 1989

AP/0/A/5500/045, Plant Fire

NSD 301, Nuclear Station Modifications

PIPs initiated from this inspection: M-09-2789, M-09-2809, M-09-2822, M-09-2853

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

#### **Procedures**

PT/1/A/4403/008, RN Train 1B Flow Balance, Revision 052

OP/1/A/6400/006, Nuclear Service Water, Revision 195

PT/1/A/4350/032 B, 1B KD Heat Exchanger RN DP Test, Revision 020

OP/1/A/6800/011, 1A RN Train Block Tagout, Revision 020

PT/1/A/4200/039, Venting of RN System Following Maintenance, Revision 018

EP/1/A/5000/FR-H.1, Response to Loss of Secondary Heat Sink, Revision 13

AP/1/A/5500/20, Loss of RN, Revision 27

#### **Problem Investigation Process**

M-07-02511, 1A YC Chiller found after starting to have high RN flow and low condenser pressure

M-07-06207, NRC questioned acceptability of using operable train of RN to feed opposite unit during beyond design basis loss of all RN event

M-07-04313, Inability to manually backwash RN strainers during post-accident conditions.

M-08-00514, Foreign material found during boroscope inspection of 2A RN strainer.

M-09-01431, 1RN-25B failed its 1<sup>st</sup> and 2<sup>nd</sup> valve stroke timings

#### **Miscellaneous**

CA- Auxiliary Feedwater Health Report, 2008Q1

CA- Auxiliary Feedwater Health Report, 2008Q2

CA- Auxiliary Feedwater Health Report, 2008Q3

RN- Nuclear Service Water Health Report, 2008Q1

RN- Nuclear Service Water Health Report, 2008Q2

RN- Nuclear Service Water Health Report, 2008Q3

VC- Control Room and Area Ventilation Health Report, 2008Q1

VC- Control Room and Area Ventilation Health Report, 2008Q2

VC- Control Room and Area Ventilation Health Report, 2008Q4

EDG- Emergency Diesel Generator Health Report, 2008Q1  
 NS- Containment Spray Health Report, 2008Q4  
 Balance of Plant Eddy Current Inspection, KC-HX-1A, 10/3/2005  
 Balance of Plant Eddy Current Inspection, KC-HX-1A, 10/2/2008  
 Balance of Plant Eddy Current Inspection, KC-HX-1B, 3/24/2007  
 Balance of Plant Eddy Current Inspection, KC-HX-2A, 10/3/2006  
 Balance of Plant Eddy Current Inspection, KC-HX-2B, 3/20/2005  
 Balance of Plant Eddy Current Inspection, KC-HX-2B, 3/11/2008  
 Balance of Plant Eddy Current Inspection, KC-HX-2B, 3/11/2008  
 Eddy Current Testing Inspection Results for KD-2A, 2EOC15, 09/03  
 McGuire Nuclear Station, Units 1 and 2 Generic Letter 88-20 Response, June 30, 1992  
 McGuire Nuclear Station, Units 1 and 2 Supplemental Response #5 to Generic Letter 89-13, September 30, 1996  
 McGuire Nuclear Station, Units 1 and 2 Supplemental Response #3 to Generic Letter 89-13, July 14, 1993  
 Service Water Profile Data, Chemical Data Memorandum, March 9, 2009  
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 MCC-1223.24-00-0072, RN/KD Heat Exchanger Tube Plugging Analysis, Revision 14  
 MCC-1223.24-00-0073, RN Supplied Integral Essential Motor Cooler Tube Plugging Analysis  
 MCC-1223.24-00-0075, RN/KD Heat Exchanger Tube Plugging Analysis

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

PIP M-03-1992  
 PIP M-02-247  
 PIP M-06-3558  
 OP/1/A/6100/003, Controlling Procedure for Unit Operation  
 OP/1/A/6100/010, Annunciator Response Procedures  
 AP/1/A/5500/011, Pressurizer Pressure Anomalies  
 AP/1/A/5500/010, Reactor Coolant System Leakage within Capacity of Both NV Pumps  
 EP/1/A/5000/E-0, Reactor Trip or Safety Injection  
 EP/1/A/5000/ECA-1.2, Loss of Coolant Accident outside Containment  
 McGuire Technical Specifications:  
     3.3.1.8 PZR Pressure  
     3.3.2.8 ESFAS Interlocks

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

PIP M-09-2002  
 Critical activity plan for April 20 to 24 SNSWP diving operations  
 PIPs initiated from this inspection: M-09-2077, fuel movement not addressed in ORAM;  
 M-09-2171, RV not modeled in ORAM  
 PIP M-09-2216, 2A RN Strainer fouled (high differential pressure alarm) during high RN flow testing per TT procedure

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

TS 3.5.2 and TS 3.6.5  
 TS 3.5.1  
 UFSAR 3.9, 6.2, 6.3, 15.6.5  
 TS 3.3.2 and TS 3.6.6

UFSAR 6.5.  
DBD MCS-1563.NS-00-0001

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

PIP M-09-2216, 2A RN Strainer fouled (high DP alarm) during high RN flow testing per TT procedure  
 PIP M-09-2259, Document performance of 1A and 2A RN pumps at high flows  
 PIPs initiated from this inspection: M-09-2263, Evaluate unnecessary actions related to loss of instrument air events that may reduce RN pump discharge pressure less than the current low setpoint  
 MCS-1609.VG-00-0001, Design Basis Specification for the VG System  
 OP-MC-DG-DGA, VG system operations lesson plan  
 Dwg MCID-2499-VG.03, Instrument Detail, D.G. Pneumatic/Hydraulic Control Schematic  
 MCEE-0220-09.07, Elementary Diagram Diesel Generator 2B Start Circuit  
 WO 01875092  
 WO 01868771 01 and WO 01858896 01  
 PT/1/A/4350/023A, Hydrogen Mitigation Igniter Current Verification, Train A  
 PIP M-09-2419  
 TS 3.6.9

**Section 1R22: Surveillance Testing**

TS 3.8.1 and 3.8.3  
 TS 3.3.1  
 License Amendments No. 230 and No. 250

**Section 1EP6: Drill Evaluation**

PIP M-09-2521, May 6 EP drill Critique  
 PIP M-09-2973, June 2 EP drill Critique  
 Emergency Plan Implementing Procedure RP/0/A/5700/000: Classification of Emergency.

**Section 4OA2: Identification and Resolution of Problems**

OWA Y04-06: PIP M-06-2284  
 OWA Y05-08: PIP M-04-5115, M-04-907, & M-06-3499  
 OWA Y07-04: PIP M-06-4985  
 OWA Y09-01: PIP M-09-2216  
 6-MO: The most current System Health Reports, 4<sup>th</sup> quarter 2008 and 1<sup>st</sup> quarter 2009 PIP trend reports, review of all trend PIPs since 1/1/2008.

**Section 4OA5: Other**

NAC-UMS Technical Specifications  
 NAC-UMS FSAR  
 Procedure OP/0/A/6550/028, NAC UMS Assembly Loading/Unloading Procedure  
 MCEI 0400-216, McGuire Nuclear Station, Cask MNI-050, Load 1-16(36)  
 MCEI 0400-215, McGuire Nuclear Station, Cask MNI-051, Load 1-15(35)  
 MCEI 0400-217, McGuire Nuclear Station, Cask MNI-052, Load 1-17(37)  
 MCEI 0400-218, McGuire Nuclear Station, Cask MNI-049, Load 1-18(38)

## LIST OF ACRONYMS

CA	-	Auxiliary Feedwater
CIV	-	Containment Isolation Valve
DBD	-	Design Basis Document
DP	-	Differential Pressure
EDG	-	Emergency Diesel Generator
FHA	-	Fire Hazards Analysis
FPP	-	Fire Protection Program
FSAR	-	Final Safety Analysis Report
HX	-	Heat Exchanger
KC	-	Component Cooling System
LER	-	Licensee Event Report
NCV	-	Non-Cited Violation
NSD	-	Nuclear Station Directive
OWA	-	Operator Workaround
PI	-	Performance Indicator
PIP	-	Problem Investigation Process Report
RG	-	Regulatory Guide
RN	-	Nuclear Service Water
SDP	-	Significance Determination Process
SER	-	Safety Evaluation Report
SL	-	Severity Level
SNSWP	-	Standby Nuclear Service Water Pond
SSC	-	Structures, Systems and Components
TS	-	Technical Specifications
UFSAR	-	Updated Final Safety Analysis Report
UHS	-	Ultimate Heat Sink