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

January 13, 2005

Duke Energy Corporation
ATTN: Mr. G. R. Peterson
Vice President
McGuire Nuclear Station
12700 Hagers Ferry Road
Huntersville, NC 28078-8985

SUBJECT: MCGUIRE NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT 05000369/2004006 AND 05000370/2004006

Dear Mr. Peterson:

On December 31, 2004, 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 6, 2005, 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.

Based on the results of this inspection, no findings of significance were identified. However, a licensee identified violation which was determined to be of very low safety significance is listed in section 4OA7 of this report. If you deny this non-cited violation, you should provide a response with the basis for your denial, within 30 days of the date of this inspection report, to the United States 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, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of

NRC's document system(ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Michael E. Ernstes, 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 05000369/2004006 and 05000370/2004006
w/Attachment - Supplemental Information

cc w/encl:
C. J. Thomas
Regulatory Compliance Manager (MNS)
Duke Energy Corporation
Electronic Mail Distribution

R. L. Gill, Jr., Manager
Nuclear Regulatory Issues
and Industry Affairs
Duke Energy Corporation
526 S. Church Street
Charlotte, NC 28201-0006

Lisa Vaughn
Legal Department (PB05E)
Duke Energy Corporation
422 South Church Street
P. O. Box 1244
Charlotte, NC 28201-1244

Anne Cottingham
Winston & Strawn LLP
Electronic Mail Distribution

Beverly Hall, Acting Director
Division of Radiation Protection
N. C. Department of Environmental
Health & Natural Resources
Electronic Mail Distribution

County Manager of Mecklenburg County
720 East Fourth Street
Charlotte, NC 28202

Peggy Force
Assistant Attorney General
N. C. Department of Justice
Electronic Mail Distribution

Distribution w/encl:
J. Shea, NRR
L. Slack, RII EICS
RIDSNRRDIPMLIPB
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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:	05000369/2004006, 05000370/2004006
Licensee:	Duke Energy Corporation
Facility:	McGuire Nuclear Station, Units 1 and 2
Location:	12700 Hagers Ferry Road Huntersville, NC 28078
Dates:	September 12 - December 31, 2004
Inspectors:	J. Brady, Senior Resident Inspector S. Walker, Resident Inspector M. Pribish, Project Engineer (Sections 1R11, 1R19, and 4OA1)
Approved by:	Michael E. Ernstes, Chief Reactor Projects Branch 1 Division of Reactor Projects

SUMMARY OF FINDINGS

IR05000369/2004006, IR05000370/2004006; 09/12/2004 - 12/31/2004; McGuire Nuclear Station, Units 1 and 2; Quarterly Integrated Inspection Report.

The report covered a three month period of inspection by resident inspectors and an announced inspection by a regional project engineer. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. Inspector-Identified and Self-Revealing Findings

No findings of significance

B. Licensee-Identified Violations

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

Report Details

Summary of Plant Status:

Unit 1 began the inspection period at approximately 100 percent rated thermal power (RTP). On October 18, 2004, Unit 1 was shutdown to repair a leaking steam generator (S/G) level tap. Problems with main steam isolation valve (MSIV) 1SM-1 and 1SM-3 delayed restart until November 9, 2004. Unit 1 achieved full power on November 12, 2004. The Unit remained at 100 percent RTP through the end of the period.

Unit 2 began the inspection period at approximately 100 percent RTP. The unit remained at 100 percent RTP through the end of the period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

a. Inspection Scope

Adverse Weather Preparation

After the licensee completed preparations for seasonal low temperatures, the inspectors walked down the Unit 1 and Unit 2 steam generator external doghouses and the refueling water storage tanks (FWSTs). This equipment was selected because their safety-related functions could be affected by adverse weather (freezing conditions). The inspectors reviewed documents listed in the Attachment to this report, observed plant conditions, and evaluated those conditions using criteria documented in procedure IP/0/B/3250/059, Preventive Maintenance and Operational Check of Freeze Protection.

The inspectors reviewed the following Problem Investigation Process reports (PIPs) associated with this area, to verify that the licensee identified and implemented appropriate corrective actions:

- M-04-4930, Fire Audit observation concerning no detection system in any doghouse
- M-04-5700, Determine if standby shutdown facility (SSF) Duct Heaters are needed for Freeze Protection and require preventive maintenance.
- M-04-5487, Freeze Protection for RC Strainer Building may not be adequate

Adverse Weather Actual

Hurricane Ivan was predicted for the site on September 23 and 24, 2004, and Hurricane Jeanne on September 27 and 28, 2004. The inspectors reviewed actions taken by the licensee in accordance with procedure RP/0/A/5700/006, Natural Disasters, prior to the onset of that weather, to ensure that the adverse weather conditions would neither initiate a plant event nor prevent any system, structure, or component from performing its design function.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

a. Inspection Scope

Partial System Walkdowns

During this inspection period, the inspectors performed the following four partial system walkdowns, while the indicated structures, systems, and components (SSCs) were out of service for maintenance and testing:

- Unit 1 train A high head safety injection with train B out of service on September 13 and 14, 2004
- Unit 1 train A emergency diesel generator (EDG) with train B out of service on September 14, 2004
- Unit 2 train B EDG with train A out of service on November 16, 2004
- Unit 1 train A motor-driven auxiliary feedwater pump (MDCAP) and turbine-driven auxiliary feedwater pump (TDCAP) with the Unit 1 train B MDCAP out-of-service on December 7, 2004

To evaluate the operability of the selected trains or systems under these conditions, the inspectors verified correct valve and power alignments by comparing observed positions of valves, switches, and electrical power breakers to the procedures and drawings listed in the Attachment to this report. In addition, the inspectors determined whether the system parameters on the operator aid computer matched expected conditions for the system and plant conditions.

Complete System Walkdown

The inspectors conducted a detailed review of the alignment and condition of the Unit 1 and Unit 2 intermediate head safety injection (NI) systems. To determine the proper system alignment, the inspectors reviewed the procedures, drawings, and Updated Final Safety Analysis Report (UFSAR) sections listed in the Attachment to this report. In addition, significant events data in the industry was reviewed to ascertain any similarities to McGuire SSCs. The inspectors walked down accessible portions of the system, to determine that the existing alignment of the system was consistent with the correct alignment. For the portions of the system that were inaccessible, the equipment alignment was verified using the operator aid computer. Items reviewed during the walkdown included the following:

- Valves are correctly positioned and do not exhibit leakage that would impact the function(s) of any given valve
- Electrical power is available as required
- Major system components are correctly labeled, lubricated, cooled, ventilated, etc.
- Hangers and supports are correctly installed and functional

- Essential support systems are operational
- Ancillary equipment or debris does not interfere with system performance
- Tagging clearances are appropriate
- Valves are locked as required by the licensee's locked valve program

The inspectors reviewed the documents listed in the Attachment to this report, to verify that the ability of the system to perform its function(s) could not be affected by outstanding design issues, temporary modifications, operator workarounds, adverse conditions, and other system-related issues tracked by the engineering department. In addition, the inspectors also reviewed the PIPs associated with this area to verify that the licensee identified and implemented appropriate corrective actions.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

For the seven areas identified below, the inspectors reviewed the licensee's control of transient combustible material and ignition sources, fire detection and suppression capabilities, fire barriers, and any related compensatory measures, to verify that those items were consistent with UFSAR Section 9.5.1, Fire Protection System, and the fire protections program as described in the Design Basis Specification for Fire Protection, MCS-1465.00-00-0008. The inspectors walked down accessible portions of each area and reviewed results from related surveillance tests, as well as reviewed the associated pre-fire plan strategy, to verify that conditions in these areas were consistent with descriptions of the areas in the Design Basis Specification. Documents reviewed during this inspection are listed in the Attachment to this report.

The inspected Areas included:

- Unit 1 Spent Fuel Storage Room (fire area 26)
- Unit 2 Spent Fuel Storage Room (fire area 27)
- Unit 1 Main Feed Pump Area (fire area MFTB1)
- Unit 1 Turbine Building all levels (fire area TB1)
- Unit 2 Main Feed Pump Area (fire area MFTB2)
- Unit 2 Turbine Building all levels (fire area TB2)
- Auxiliary Building elevation 767 (fire area 25)

During the 2004 assessment period, the inspection samples were completed in accordance with the inspection procedure. Therefore, this constitutes completion of the annual inspection requirements.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

a. Inspection Scope

Internal Flooding

The inspectors walked down the Unit 1 and Unit 2 diesel generator rooms containing risk-significant equipment which are below flood levels or otherwise susceptible to flooding from postulated pipe breaks. During the walkdowns, the inspectors assessed whether the respective area configuration, features, and equipment functions were consistent with the descriptions and assumptions in the UFSAR sections and supporting basis documents listed in the Attachment to this report. The inspectors also did a general walk-through of the turbine building to verify the licensee's determination that pipe breaks in the turbine building would drain to the areas identified above. The inspectors reviewed preventative maintenance documentation for the sump pumps in the diesel generator sump system to determine whether the system equipment was being adequately maintained to perform its design function of mitigating flooding. The inspectors reviewed the operator actions credited in the flooding analysis, which are contained in procedure AP/0/A/5500/44, Plant Flooding, in order to verify that the desired results could be achieved.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

On November 4, 2004, the inspectors observed licensed-operator performance during requalification simulator training for shift "A", to verify that operator performance was consistent with that described in Exercise Guide OP-MC-SRT-45. This training tested the operators' ability to perform abnormal and emergency procedures dealing with loss of normal charging, steam generator tube rupture with MSIV failure, reactor trip, safety injection, and plant cooldown. 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 verify that the licensee identified deficiencies and discrepancies that occurred during the simulator training.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed the two degraded SSC/function performance problems or conditions listed below, to determine if the licensee appropriately handled these in accordance with 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, and 10 CFR 50.65, Maintenance Rule:

- spent fuel cooling system pump failures
- SSF diesel generator issues during operability performance tests

The inspectors focused on the following:

- Appropriate work practices
- Identifying and addressing common cause failures
- Scoping in accordance with 10 CFR 50.65(b)
- Characterizing reliability issues (performance)
- Charging unavailability time (performance)
- Trending key parameters (condition monitoring)
- 10 CFR 50.65(a)(1) or (a)(2) classification and reclassification, and
- Appropriateness of performance criteria for SSCs/functions classified (a)(2) and/or appropriateness and adequacy of goals and corrective actions for SSCs/functions classified (a)(1)

In addition to the documents listed in the Attachment to this report, the inspectors reviewed the following PIPs associated with this area to verify that the licensee identified and implemented appropriate corrective actions:

- M-04-03488, SSF Diesel Generator Tripped on Overspeed Following Abnormal Indication of High Frequency
- M-04-03950, 2A Spent Fuel Cooling (KF) System Pump High Inboard Motor Bearing Temperature

b. Findings

The KF system pump failures are addressed in Problem and Identification Report 05000369,370/2004008 as non-cited violation 05000369,370/2004008-01, Inadequate Corrective Action for Plant Equipment Issues - (second example).

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 10 CFR 50.65(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 inspectors also reviewed associated PIPs to verify that the licensee identified and implemented appropriate corrective actions. Documents reviewed are listed in the Attachment to this report.

- Week of September 19 - including a complex evolution to replace rod control power supply on Unit 2; an increase in dp across the condenser circulating water (RC) traveling screens and backwash system

- Week of October 03 - safety injection (NI) valve 2NI-76 (Unit 2 'C' cold leg accumulator isolation valve) Regulatory Guide 1.97 indication failure, unplanned Technical Specification Action Item Logbook (TSAIL) entry, and 24-hr shutdown limited condition of operation (S/D Limiting Condition for Operation (LCO)); repeated containment entries made to verify position; temporary modification implemented to satisfy Technical Specification (TS) surveillance requirement and exit LCO

- Week of October 10 - Unit 1 containment ventilation drain tank (VUCDT) level steadily increasing - investigation team assembled; containment entry made to verify assumed causes of level increase; leaking instrument line off 1B steam generator (S/G); repair options considered (online or shutdown)

- Week of October 17 - Unit 1 forced outage to repair 1B S/G leaking instrument line, 1SM-1 MSIV failed to stroke closed during Unit down-power, forced outage extended; repair of leaking instrument line completed

- Week of November 08 - during Unit 1 restart MSIV hot stroke test, 1SM-3 pilot poppet fails to fully close; forced outage extended for repairs; repetitive Unit 2 Operator Aid Computer failures; Unit 1 start up commenced.

- Week of December 20 - due to completion delay for 2A residual heat removal (ND) pump maintenance on 12/21, start of 2A safety injection pump testing was delayed to prevent increased risk (PIP M-04-5881); due to delay in completion of turbine driven auxiliary feedwater pump maintenance, surveillance testing of nuclear instrumentation channel N41 was delayed to prevent increased risk (PIP M-04-5889)

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Nonroutine Plant Evolutions

a. Inspection Scope

During the non-routine evolutions identified below, the inspectors observed plant instruments and operator performance to verify that the operators performed in accordance with the associated procedures and training.

- Unit 1 shutdown per OP/1/A/6100/003, Controlling Procedure for Unit Operation, to repair leaking 1B steam generator level tap
- Unit 1 startup per OP/1/A/6100/003, Controlling Procedure for Unit Operation

The inspectors also reviewed Licensee Event Report (LER) 05000369/2004-001 and associated PIP M-04-3659 to determine whether personnel performance contributed to the cause of that event.

The inspectors reviewed the following PIPs associated with this area to verify that the licensee identified and implemented appropriate corrective actions:

- M-04-03659, Reportability conclusion in PIP M-02-2829 may be in error
- M-02-02829, System Engineering and Regulatory Compliance should evaluate procedural differences when aligning A train nuclear service water (RN) to standby nuclear service water pond

b. Findings

A licensee-identified violation was identified, which is addressed in detail in Section 4OA3.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the operability determinations the licensee had generated that warranted selection on the basis of risk insights. The selected samples are addressed in the PIPs listed below. The inspectors assessed the accuracy of the evaluations, the use and control of any necessary compensatory measures, and compliance with the TS. The inspectors verified that the operability determinations were made as specified by Nuclear System Directive (NSD) 203, Operability. The inspectors compared the arguments made in the determination to the requirements from the TS, the UFSAR, and associated design-basis documents, to verify that operability was properly justified and the subject component or system remained available, such that no unrecognized increase in risk occurred. Supporting documents reviewed are listed in the Attachment to this report.

- PIP M-04-4359, 1ND0068A Rotork valve actuator is model NA1 instead of NA2
- PIP M-04-04788, Multiple alarms generated in Control Room from Process Rupture Panel
- PIP M-04-04837, 2NI-76A indicates intermediate...unplanned entry into TS
- PIP M-04-02441, 1SM-1 found scored during engineering walkdown
- PIP M-04-05133, 1SM-1 transportability to Unit 2

b. Findings

Introduction: Unresolved Item (URI) 05000369/2004008-02, Potential for Multiple MSIV Inoperability, was opened to determine whether the failures of MSIVs 1SM-1 and 1SM-3

to fully stroke closed during a valve stroke timing surveillance test were linked to a common performance deficiency; and therefore, should be addressed collectively for safety significance. The failure of MSIV 1SM-1 was addressed in Inspection Report 05000369,370/2004008. The failure of MSIV 1SM-3 was found to have resulted from improper reassembly. This issue remains unresolved pending review of the licensee's completed root cause investigations for each failure and assessment of any common cause implications.

Description: On November 4, 2004, while performing procedure PT/1/A/4225/003, Main Steam (SM) Valve Timing at Full Temperature and Pressure, valve 1SM-3 ("C" loop MSIV) failed to fully stroke its pilot poppet. The main poppet fully closed. The licensee's investigation determined that inadequate reassembly of the valve from an October 2002 disassembly was the primary reason the pilot poppet did not fully stroke. Specifically, the split ring on the stem was not installed correctly, preventing the pilot poppet nut from screwing into the pilot poppet fully and causing mechanical binding of the pilot poppet. At the time of the stroke, no audible indication that the pilot poppet was seating could be heard. The stroke length of the pilot poppet was determined to be 3/8 inch instead of 1 inch. The maintenance procedure for MSIV assembly (MP/0/A/7200/011, Main Steam Isolation Valve and Actuator Corrective Maintenance) did not explicitly state that the pilot poppet should be screwed flush with the pilot poppet nut. Consequently, maintenance personnel did not recognize that the pilot poppet had not been properly reassembled. The quality control inspector verification of reassembly, required by the procedure, did not identify the deficiency either.

Through a historical review, the inspectors found that inadequate stroke length for the valve had been previously identified and documented in the licensee's corrective action program (PIP M-02-5187) during the period when the valve was reassembled in October 2002. After reassembly and prior to unit startup from Unit 1 end-of-cycle 15 refueling outage, valve 1SM-3 was stroked and determined not to have met the 14 inch (nominal average) valve travel acceptance criteria per procedure PT/1/A/4255/003. The operability of the valve with the short stroke length (13-7/8 inch) was evaluated in PIP M-02-5187, and based on diagnostic testing, it was determined that since the main poppet was fully seating (closing), the safety-related closing function was not affected. The opening function was considered to affect unit reliability and therefore was not a concern for operability of the valve. However, in November 2004, the investigation revealed that the 2002 conclusion was inaccurate. Consequently, the licensee issued LER 05000369/2004-02 to address the inoperability of valve 1SM-3 from October 2002 until November 2004.

Analysis: The as-found configuration of the valve precluded the pilot poppet on 1SM-3 from being capable of performing its pressure equalization function. The pilot poppet typically acts as a "check valve" to balance a significant differential pressure present across the main poppet. In this case, however, the pilot poppet would not work, building a significant pressure difference, greater than the springs on the actuator are sized to mitigate, resulting in the main poppet essentially being lifted of the valve seat. This condition becomes significant where considerable downstream steam pressure exists, which would occur if one of the other MSIVs (such as 1SM-1) did not shut.

The failure of valve 1SM-3 is considered a performance deficiency because inadequate maintenance practices and procedures, as well as inadequate and untimely corrective actions by the licensee, resulted in the degraded functioning of a MSIV during a full temperature and pressure valve stroke timing test. The finding is considered greater than minor because it had a direct impact on the MSIV to perform its safety function, which is to close (and remain closed) during a high energy line break or steam generator tube rupture. The finding affects both the Mitigating Systems and Barrier Integrity cornerstones, in that the failure to close impacts the equipment performance (reliability, availability) attribute and containment isolation (minimization of radiological releases) attribute, respectively. However, due to the concurrent failure of MSIV 1SM-1, the significance of this finding must be evaluated per IMC 0609 Appendix A, Section IV: Treatment of Concurrent Multiple Equipment or Functional Degradations, to determine whether the failures were related to a common cause. The significance remains to be determined until the licensee has completed the root cause investigation for both valves and the inspectors have reviewed these investigations.

Enforcement: The licensee reported in LER 05000369/2004002 that valve 1SM-3 was inoperable in excess of the limiting condition for operation time required in Technical Specification 3.7.2. The failure to have an operable 1SM-3 MSIV will be addressed under URI 05000369/2004008-02, Potential for Multiple MSIV Inoperability, and will be assessed for enforcement action after the inspectors have reviewed the licensee's completed cause investigations. The failure of 1SM-3 is in the licensee's corrective action program as PIP M-04-5315.

1R16 Operator Work-Arounds

a. Inspection Scope

The inspectors reviewed operator work-around 03-10, Operators are Required to Locally Verify Auxiliary Building Ventilation (VA) System Operation During Emergency Procedure (EP) Implementation, to verify that this work-around did not affect either the functional capability of the related system in responding to an initiating event, or the operators' ability to implement abnormal or emergency operating procedures.

The inspectors also reviewed the cumulative effects of the selected operator work-arounds listed in the Attachment to this report, to verify that those effects would not increase an initiating event frequency, affect multiple mitigating systems, or affect the ability of operators to respond in a correct and timely manner to plant transients and accidents.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications

a. Inspection Scope

The inspectors reviewed the modification described in McGuire Modification MGM M-13170 Accelerometer Installed on 2A ND Air Handling Unit (AHU), to verify that:

- this modification did not degrade the design bases, licensing bases, and performance capabilities of risk significant SSCs
- implementing this modification did not place the plant in an unsafe condition
- the design, implementation, and testing of this modification satisfied the requirements of 10CFR50, Appendix B

Documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing

a. Inspection Scope

For the post-maintenance tests listed below, the inspectors witnessed the test and/or reviewed the test data, to verify that test results adequately demonstrated restoration of the affected safety function(s) described in the UFSAR and TS. The tests included the following:

- PT/1/A/4209/001 B, 1NV [Chemical Volume Control] Pump Performance Test - replacement of inboard and outboard pump bearings.
- PT/2/A/4206/002 A, NI Train A Valve Stroke Timing- Quarterly - check oil and lube stem on 2NI-118A
- PT/2/A/4350/002A, Diesel Generator 2A Operability Test - adjust link shaft position for 2A diesel generator
- IP/0/A/3219/003, Setting Stem-Mounted Limit Switches (maintenance on MSIVs 1SM-1 and 1SM-7)
- MP/0/A/7200/011, Pneumatic Leak Test (maintenance on MSIVs 1SM-1 and 1SM-7)
- PT/1/A/4600/030, Cycling Time Critical Manually Operated Valves (lubrication of valves 1SM-1 and 1SM-2, steam isolation valves for the turbine-driven auxiliary feedwater pump) The inspectors reviewed PIP M-04-5884 (1SA-1 and 1SA-2 required two operators to manipulate the valves) to determine if immediate corrective actions were adequate to resolve this problem.

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities

a. Inspection Scope

The inspectors evaluated licensee outage activities for the forced outage that began on October 17 to verify that the licensee considered risk in developing outage schedules, adhered to administrative risk reduction methodologies they developed to control plant configuration, adhered to operating license and TS requirements that maintained defense-in-depth, and developed mitigation strategies for losses of the key safety functions identified below:

- Decay heat removal
- Inventory control
- Power availability
- Reactivity control
- Containment

The inspectors observed portions of the cooldown process to verify that TS cooldown restrictions were followed. The inspectors observed the items or activities described below, to verify that the licensee maintained defense-in-depth commensurate with the outage risk control plan for the key safety functions identified above and applicable TS when taking equipment out of service.

- Clearance Activities
- Reactor Coolant System Instrumentation
- Electrical Power
- Decay Heat Removal
- Inventory Control
- Reactivity Control
- Containment Closure

The inspectors reviewed the licensee's responses to emergent work and unexpected conditions, to verify that resulting configuration changes were controlled in accordance with the outage risk control plan. Prior to mode changes and on a sampling basis, the inspectors reviewed system lineups and/or control board indications to verify that TSs, 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 (RCS) boundary leakage data, and observed the setting of containment integrity, to verify that the RCS and containment boundaries were in place and had integrity when necessary. Prior to reactor startup, the inspectors walked down containment to verify that debris has not 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 systems performed as designed. The inspectors reviewed selected corrective action documents (PIPs) listed in the Attachment to this report, which were generated during the outage, to verify that corrective actions identified were adequate.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

For the surveillance tests identified below, the inspectors witnessed testing and/or reviewed the test data, to verify that the systems, structures, and components involved in these tests satisfied the requirements described in the Technical Specifications, the FSAR, and applicable licensee procedures, and that the tests demonstrated that the SSCs were capable of performing their intended safety functions.

- PT/1/A/4600/001, RCCA [rod control cluster assembly] Movement Test
- * PT/1/A/4208/001 A, 1A NS [containment spray] Pump Performance Test
- * PT/1/A/4208/002 A, NS Train A Valve Stroke Timing - Quarterly
- * PT/2/A/4206/001A, 2A NI Pump Performance Test
- * PT/2/A/4206/002A, NI Train A Valve Stroke Timing - Quarterly
- PT/1/A/4350/002A, Diesel Generator 1 A Operability Test (Slow Start)
- PT/2/A/4350/002A, Diesel Generator 2 A Operability Test (Slow Start), including review of PIP M-04-5081, EDG 2A did not reach 4200 kw acceptance criteria during PT/2/A/4350/002A, to verify that the licensee identified and implemented appropriate corrective actions.
- PT/2/A/4600/030, Cycling Time Critical Manually Operated Valves (performed for valves 2SM-1 and 2SM-2 only, turbine-driven auxiliary feedwater pump steam isolation valves)

*(Note: the asterisked procedures included inservice testing requirements.)

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed the temporary modifications described in the McGuire Temporary Modifications (MGTM) listed below, to verify that the modifications did not affect the safety functions of important safety systems, and to verify that the modification satisfied the requirements of 10 CFR 50, Appendix B, Criterion III, Design Control.

- MGTM-0320, Allow the Add On Pak/stem mounted switch associated with 2NI-76A to provide remote position indication to satisfy TS surveillance
- MD2000059, Energize Unit 2 FWST Heat Trace During Controller Repair

The inspectors reviewed clearances open on December 14, 2004, to verify that clearances were not being used to implement temporary modifications. The inspectors also reviewed PIP M-04-3749, which identified that an FWST trench sump pump had been tagged out for an extended period of time (due to parts unavailability) and had resulted in water in the FWST trench. In addition, the inspectors reviewed the corrective actions which included a weekly work control center review of tagouts intended to ensure that delayed or extended work does not result in unsafe conditions.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation

a. Inspection Scope

The inspectors observed an emergency preparedness drill conducted on December 15, 2004, to verify licensee self-assessment of classification, notification, and protective action recommendation development in accordance with 10 CFR 50, Appendix E.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification

a. Inspection Scope

For the performance indicators (PIs) listed below, the inspectors sampled licensee PI data for the period from September 2003 through October 2004. To verify 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, Revision 2.

Mitigating Systems Cornerstone

- Safety System Unavailability, High Pressure Safety Injection (Units 1 and 2)

The inspectors reviewed Licensee Event Reports, records of inoperable equipment, and Maintenance Rule records, to verify that the licensee had adequately accounted for unavailability hours that the subject systems had experienced during the previous four quarters. 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.

Barrier Integrity Cornerstone

- Reactor Coolant System Specific Activity (Units 1 and 2)

The inspectors observed licensee sampling and analysis of reactor coolant system samples, and compared the licensee-reported performance indicator data with records developed by the licensee while analyzing previous samples. The inspectors also reviewed the PIPs associated with this area to verify that the licensee identified and implemented appropriate corrective actions.

b. Findings

No findings of significance were identified.

4OA2 Problem Identification and Resolution

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 a daily screening of items entered into the licensee's corrective action program. This review was accomplished by reviewing hard copies of condition reports, attending daily screening meetings, and accessing the licensee's computerized database. Documents reviewed are listed in the Attachment to this report.

.1 Annual Sample Review

a. Inspection Scope

The inspectors selected PIP M-04-4788 which addressed multiple alarms received in the control room being generated from the Process Control Panel which provides pressurizer level indication in the standby shutdown facility (SSF). The inspectors reviewed this report to verify that the licensee identified the full extent of the issue, performed appropriate evaluations, and specified and prioritized appropriate corrective actions. The inspectors evaluated the report against the requirements of the licensee's corrective action program as delineated in corporate procedure NSD 208, Problem Identification Process, and 10 CFR 50, Appendix B .

b. Findings

No findings of significance were identified.

.2 Semi-Annual Trend Review

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 inspectors' 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 inspectors' review nominally considered the six month period of July through December 2004, although some examples were reviewed beyond those dates when the scope of the trend warranted. The review included the following areas/documents:

- PIP and department trend reports for 2nd trimester 2004
- NRC performance indicators and departmental performance measures
- equipment problem lists
- maintenance rework trending
- departmental problem lists
- system health reports
- quality assurance audit /surveillance reports
- self assessment reports
- maintenance rule program reports including a(1) list
- corrective action backlog lists

b. Findings

In general, the inspectors found that the licensee's trending of issues has been effective in identifying and preventing problems from becoming more significant.

Two trends were identified in the previous 6 month trend review contained in NRC Inspection Report 05000369,370/2004004. Both related to fire protection with the first being associated with a weakness in the identification of problems in the fire protection area and the second was related to emergency lighting system battery failures. NRC Inspection Report 05000369,370/2004008 documented that a licensee fire protection audit conducted in October 2004 found additional examples of fire protection and emergency lighting problems. While these indicate a continuing trend in fire protection problems, it also indicates an improvement in the identification of problems in the fire protection area.

One licensee-identified trend on nuclear service water fouling has the potential to be a more significant safety issue. Nuclear service water is one of the highest safety significant systems in the plant and necessitates continuous performance monitoring to ensure fouling levels do not affect the ability to safely shutdown the reactor and maintain it in a safe shutdown condition. The fouling has affected the component cooling water heat exchangers, control room ventilation heat exchangers, and the reactor coolant pump motor cooler piping and heat exchangers during the fouling season (July through November). The licensee was taking actions to counteract the affect of the fouling by performing high velocity flushes on-line based on heat exchanger and equipment performance monitoring; otherwise train shutdowns would be necessary to remove the fouling. In addition, replacement of the reactor coolant pump motor cooler inlet piping with stainless steel has been underway in recent past outages which will reduce the affect of the fouling on those components. During the last Unit 1 refueling outage, one of the reactor coolant pumps had to be secured during RCS cool down due to high motor stator temperature during a time period that resulted in a less than optimum reactor coolant system cleanup. This was identified as a contributing factor to significantly higher dose levels during the outage. Because operations identified these

flushes as operator work-arounds in the past six months, engineering was planning other improvements to remove the need for high velocity flushes.

In 2004, there has been an emerging trend in MSIV unreliability indicated by 3 of 4 Unit 1 MSIVs failing to close during surveillance testing. Each failure resulted in a loss of safety function; however, the incidents did not occur during a time when the MSIVs were actually needed for accident mitigation. Should the valves be needed to mitigate high energy line breaks or steam generator tube rupture accidents and not function, the consequences would be more significant. The licensee has had past issues involving the MSIVs, including a 1994 notice of violation due to inadequate maintenance and testing, which resulted from an actual loss of safety function when the MSIVs were called upon to close during a loss of off-site power event. Currently, two of the MSIVs are the subject of an unresolved item discussed in Section 1R15. The licensee is actively working to determine the causes and resolve the MSIV unreliability.

4OA3 Event Followup

(Closed) LER 05000369/2004-001: Auxiliary Feedwater System in Prohibited Condition Due to Inadequate Procedure

On July 21, 2004, during quarterly performance indicator review, the licensee identified an instance in 2001 where Unit 1 and Unit 2 were in a condition which rendered the TDCAP for each unit inoperable for a period in excess of the associated TS completion time. The procedure actions directed the operator to close and remove power from the assured water supply valve to the 'A' train of the TDCAP without declaring the pump inoperable. Assuming a single failure of the 'B' EDG, the automatic alignment of the assured water supply valve to the 'B' train TDCAP would be prevented. In October 2001, the licensee was in this configuration for a period for eight days (from October 13 - 21, 2001, for both units), a period longer than the allowable LCO time of 72 hours. The operators did not recognize this condition and therefore, failed to take the appropriate TS actions. Additionally, a reportability review conducted earlier in 2002 under PIP M-02-2829, did not identify this issue. This issue is more than minor because it affects the procedure quality and equipment availability attributes of the mitigating systems cornerstone, in that the procedures allowed the licensee to exceed TS allowable LCO time for auxiliary feedwater inoperability. Moreover, operator training and knowledge failed to recognize this as a condition that required actions per TS 3.7.5. This issue involves an infrequent alignment that is only necessary during a seismic event assuming the loss of the normal, non-seismic, supplies to the auxiliary feedwater (i.e., auxiliary feedwater storage tank (CAST) and Lake Norman). Review of the IMC 0609 SDP Phase I screening criteria indicated that since there was no actual loss of safety function nor did the finding screen as risk significant during external events, the finding was deemed to be of very low safety significance. This licensee-identified finding involved a violation of TS 3.7.5 Auxiliary Feedwater. The enforcement aspects of the violation are discussed in Section 4OA7. This LER is closed.

4OA5 Other Activities

The Inspectors reviewed the Institute of Nuclear Power Operations (INPO) evaluation completed on September 30, 2004. There were no safety-significant issues identified.

4OA6 Meetings, Including Exit

On January 6, 2005, the resident inspectors presented the inspection results to Mr. G. Peterson and other members of his staff, who acknowledged the findings. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

4OA7 Licensee-Identified Violations

The following finding of very low significance was identified by the licensee and is a violation of NRC requirements which met the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600 for being dispositioned as a non-cited violation.

- TS 3.7.5 LCO specifies that a Unit's three auxiliary feedwater trains shall be operable in Mode 1. As per TS 3.7.5 Condition B, if one train is inoperable, Unit operation may continue provided the inoperable train is restored within 72 hours. If the required action is not met, the unit must be in Mode 3 within 6 hours and Mode 4 within 12 hours. Contrary to the above, from October 13 - 21, 2004, the "A" train of auxiliary feedwater for both units was inoperable and the appropriate TS actions were not taken, in that the licensee exceeded the 72 hours by 96 hours and did not change modes. This was identified in the licensee's corrective action program as PIP —04-3659. This finding is of very low safety significance because it did not result in an actual loss of safety function.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

Black, D., Security Manager
Bradshaw, S., Superintendent, Plant Operations
Bramblett J., Chemistry Manager
Brown, S., Manager, Engineering
Crane, K., Technical Specialist
Evans, K., Manager, Mechanical and Civil Engineering (MCE)
Harrall, T., Station Manager, McGuire Nuclear Station
Kammer, J., Manager, Safety Assurance
Loucks L., Radiation Protection Manager
Parker, R., Superintendent, Maintenance
Peterson, G.., Site Vice President, McGuire Nuclear Station
Thomas, J., Manager, Regulatory Compliance
Thomas, K., Manager, RES Engineering
Travis, B., Superintendent, Work Control

NRC personnel

M. Ernstes, Chief, Reactor Projects Branch 1
J. Shea, Project Manager, NRR

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

05000369/2004-001	LER	Auxiliary Feedwater System in Prohibited Condition Due to Inadequate Procedure (Section 4OA3)

Discussed

05000369,370/2004008-01	NCV	Inadequate Corrective Action for Plant Equipment Issues - second example (Section 1R12)
05000369/2004008-02	URI	Potential for Multiple MSIV Inoperability (Section 1R15)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

For cold weather:

Procedures:
IP/0/B/3250/059, Preventive Maintenance and Operational Check of Freeze Protection, Rev. 15
IP/1/B/3050/013C, FWST Area Temperature Loop Calibration, Rev. 4
IP/0/B/3250/059A, Monthly Check of Freeze Protection, Rev. 14,15

Section 1R04: Equipment Alignment

Partial System Walkdown

1A High Head Safety Injection:
Drawing MCFD-1562-01.00, Flow Diagram of Safety Injection System
Drawing MCFD-1554-03.01, Flow Diagram of Chemical and Volume Control System

1A Emergency Diesel Generator:
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

Unit 1 Auxiliary Feedwater:
Drawing MCFD-1592-01.01, Flow Diagram of the Auxiliary Feedwater System

Complete System Walkdown

Drawing MCFD-1562-01.00, Flow Diagram of Safety Injection System
Drawing MCFD-1562-03.00, Flow Diagram of Safety Injection System
Drawing MCFD-1562-03.01, Flow Diagram of Safety Injection System
Corrective action documents (PIPs) :M-02-5124, M-03-4278, M-04-625, M-04-2406, M-04-2943
UFSAR Section 6.3, Emergency Core Cooling System
MCS-1562.NI-00-0001, Design Basis Specification for the NI System
Vendor Manuals (VMs), Operating Experience (OE) reports, Significant Operating Experience Reports (SOERs), Significant Event Notices (SENs), Information Notices (INs), NI system health report 2004T2

Section 1R05: Fire Protection

Procedures:
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, R4, Design Basis Specification for Fire Protection

Section 1R06: Flood Protection Measures

Internal Flooding

UFSAR Sections
10.4.5, Condenser Circulating Water
9.2.2, Nuclear Service Water System and Ultimate Heat Sink

Calculations:
MCC-1223.42-00-0037, Evaluation of the Use of Non-Safety Water Sources for the Auxiliary Feedwater System, Sec. 10.8, Rev. 6
MCC-1206.47-69-1001, Auxiliary Building Flooding Analysis, Sec.9.2-9.2.1, Rev. 11
MCC-1139.01-00-0268, Turbine/Auxiliary Building Design Basis Flooding Analysis

Procedures:
AP/0/A/5500/44, Plant Flooding, Rev. 3

PIPs:
M-04-5350, 2B2 WN Sump Pump failed to meet IWP acceptance criteria
M-03-5916, 2B2 and 2B3 WN pumps experience high discharge pressure during test
M-04-4917, Performing tasks associated with PIP M-04-2981

Section1R12: Maintenance Effectiveness

PIPs:
M-04-04016, Review of 2A KF pump motor failure
M-99-04603, 2A KF pump removed from service due to hi hi motor inboard bearing temperature
M-98-03970, 1A KF pump motor outboard bearing overheating
M-04-00136, 1A KF pump AHU failed DP test
M-02-5261, 1CFLP6100C S/G SSF Level failed high
M-04-02106, 1SACV0048ABC would not open from SSF

Design Basis Documents:
MCS-1570.KF-00-0001, Design Basis Document for KF System

Section1R13: Maintenance Risk Assessments and Emergent Work Evaluation

PIPs:
M-04-04280, Unit 1 VUCDT input increase
M-04-05315, 1SM-3 has different stroke length than other 3 MSIVs
M-04-5043, 1SM-1 fails valve stroke test
M-04-04837, 2NI-76A indicates intermediate. Unplanned entry into Tech Specs

Other Documents:
MC-2785-10.01, Connection Diagram Auxiliary Relay Rack 1, Rev. 7
MC-2734-01.03, Safety Injection System - MOVs, Rev. 11
MC-1765-00.12, Valve Out of Position Typical, Rev. 10
MCEE-251-00.25-01, Safety Injection System (NI), Accumulator 2C Discharge Isolation 2NI76A, Rev. 9
MCEE-251-00.25, Safety Injection System (NI), Accumulator 2C Discharge Isolation 2NI76A, Rev. 7

Section1R15: Operability Evaluations

PIPs:
M-04-5315, 1SM-3 has different stroke length than other 3 MSIVs
M-04-5043, 1SM-1 fails valve stroke test
M-04-5082, Unexpected movement of valve 1SM-1
M-01-1322, 1SM-1 valve stem was scored and removed from the valve (1EOC14)
M-01-4120, MSIV scored stems discovered during 3rd quarter walkdowns on 1,2 SM 3 & 5
M-04-2109, During VST, 1SM007AB (MSIV) would not fully close
M-04-2441, Found stem scored on 1SM1 during engineering walkdown of U1 Exterior Doghouse
M-02-5187, 1SM3 does not meet acceptance criteria of 14 inch valve travel
M-04-5609, MSIV: Independent Review Team Final Report

Section 1R16: Operator Work-Arounds

Work-arounds reviewed for cumulative affect:
03-10, Operators required to locally verify VA system operation
04-03, Low room temperatures in D/G requires operator to locally check battery temp
04-09, Gradual downward trend in RN flow to KD heat exchanger during flow balance

Section 1R17: Permanent Plant Modifications

MGM M-13170 Accelerometer Installed on 2A ND AHU
Design Basis Specification MCS-1561.ND-00-0001, Rev. 8
Updated Final Safety Analysis Report Section 5.5.7, Residual Heat Removal System

Section 1R20: Refueling and Outage Activities

PIPs:
M-04-5048, Assessment of Steam Leak Repair
M-04-5082, Unexpected operation of Valve 1SM-1 with gag installed

Section 1R22: Surveillance Testing

PIP M-04-5079, TS 3.8.1 and bases, Regulatory Guide 1.9

Section 4OA2: Identification and Resolution of Problems

PIPs:
M-04-4788, Multiple alarms generated in Control Room from Process Rupture Panel
M-04-3941, Request engineering to evaluate recurring problem with 1NCLT5151
M-04-4375, No Annunciator Response Procedures for Process Line Rupture Panel
M-04-4374, Pzr level lo leg alarm on process rupture panel caused entry into TS MO-4-2035
M-04-4729, Unplanned entry into TSAIL due to equipment malfunction

Other Documents:
UFSAR Chapter 6.2.4, Containment Isolation Systems, Rev. 10/2003
Safety Guide 11 : Instrument Lines Penetrating Primary Reactor Containment, dated 3/71

LIST OF ACRONYMS

AHU	-	Air Handling Unit
CA	-	Auxiliary Feedwater
CAST	-	Auxiliary Feedwater Storage Tanks
D/G	-	Diesel Generator
EDG	-	Emergency Diesel Generator
EP	-	Emergency Procedure
FWST	-	Fueling Water Storage Tank
INPO	-	Institute of Nuclear Power Operations
KF	-	Spent Fuel Cooling
LER	-	Licensee Event Report
MDCAP	-	Motor-driven Auxiliary Feedwater Pump
LCO	-	Limiting Condition of Operation
MGTM	-	Temporary Modification
MSIV	-	Main Stem Isolation Valve
NCV	-	Non-Cited Violation
ND	-	Residual Heat Removal
NI	-	Safety Injection
NS	-	Containment Spray
NSD	-	Nuclear System Directive
NV	-	Chemical & Volume Control
PI	-	Performance Indicator
PIP	-	Problem Investigation Process report
RC	-	Condenser Circulating Water
RCCA	-	Rod Cluster Control Assembly
RCS	-	Reactor Coolant System
RN	-	Nuclear Service Water
RTP	-	Rated Thermal Power
S/D	-	Shut Down
S/G	-	Steam Generator
SCC	-	Stress Corrosion Cracking

SDP	-	Significance Determination Process
SSC	-	Structures, Systems, Components
SSF	-	Standby Shutdown Facility
TDCAP	-	Turbine Driven Auxiliary Feedwater Pump
TS	-	Technical Specifications
TSAIL	-	Technical Specification Action Item Logbook
VUCDT	-	Containment Ventilation Drain Tank
UFSAR	-	Updated Final Safety Analysis Report
URI	-	Unresolved Item
VA	-	Auxiliary Building Ventilation