



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION II
SAM NUNN ATLANTA FEDERAL CENTER
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ATLANTA, GEORGIA 30303-8931

January 26, 2006

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
05000369/2005005 AND 05000370/2005005

Dear Mr. Peterson:

On December 31, 2005, the US Nuclear Regulatory Commission (NRC) completed an inspection at your McGuire Nuclear Station Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed on January 5, 2006, with you and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. 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 this report. The NRC is treating this violation as a non-cited violation (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy because of the very low safety significance of the violation and because it is entered into your corrective action program. If you contest this non-cited violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the McGuire Nuclear Station.

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

DEC

2

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 Ernstes, Chief,
Reactor Projects Branch 1
Division of Reactor Projects

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

Enclosure: Inspection Report 05000369/2005005 and 05000370/2005005
w/Attachment - Supplemental Information

cc w/encl: (See page 3)

DEC

3

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4

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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: 05000369/2005005 and 05000370/2005005

Licensee: Duke Energy Corporation

Facility: McGuire Nuclear Station, Units 1 and 2

Location: 12700 Hagers Ferry Road
Huntersville, NC 28078

Dates: **October 1, 2005 through December 31, 2005**

Inspectors: J. Brady, Senior Resident Inspector
S. Walker, Resident Inspector
H. Gepford, Health Physicist (Section 40A5.2)

Approved by: Michael Ernstes
Reactor Projects Branch 1
Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR05000369/2005-005, IR05000370/2005-005; 10/1/2005 - 12/31/2005; McGuire Nuclear Station, Units 1 and 2; routine integrated report.

The report covered a three month period of inspection by resident inspectors and an in-house review by a regional health physics inspector. 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. NRC-Identified and Self-Revealing Findings

None.

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 corrective action is listed in Section 4OA7 of this report.

Enclosure

REPORT DETAILS

Summary of Plant Status:

Unit 1 (U1) began the inspection period in a refueling outage shutdown. U1 was taken critical on October 17, went on-line October 18, and reached 100% rated thermal power (RTP) on October 19. U1 initiated a power reduction to 20% RTP on November 24, to add oil to the 1A reactor coolant pump and repair a leaking oil system relief valve. The unit returned to 100% RTP on November 26. U1 tripped on December 17 at 3:11 a.m. from 100% RTP due to a feed-flow signal that failed low and caused a high level in the 1A steam generator. Repairs were made to the feedwater control system and the unit restarted on December 18 and reached 100% RTP on December 19. U1 remained at 100% RTP for the remainder of the period.

Unit 2 (U2) began the inspection period at approximately 100 percent RTP. U2 initiated a power reduction on October 8 to approximately 88% RTP in compliance with Technical Specifications (TS) Limiting Conditions for Operation (LCO) 3.0.3 for two trains of inoperable control room chillers and returned to 100% RTP on October 8. U2 experienced a load rejection to approximately 56% power on November 2 due to loss of all cooling groups for the 2B Main Transformer. Repairs were made and U2 returned to 100% RTP on November 4. The unit remained at 100% RTP for the remainder of the period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

a. Inspection Scope

When freezing temperatures were predicted for the site on December 15, the inspectors reviewed actions taken by the licensee in accordance with procedure PT/0/B/4700/070, On Demand Freeze Protection Verification Checklist, 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.

After the licensee completed preparations for seasonal low temperature, the inspectors walked down the Main Steam Doghouses (Doghouse) and the Refueling Water Storage Tank (FWST). 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, observed plant conditions, and evaluated those conditions using criteria documented in procedures PT/0/B/4700/038, Verification of Freeze Protection Equipment and Systems, and 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:

Enclosure

- M-03-5700, Determine if standby shutdown facility (SSF) Duct Heaters need Freeze Protection preventative maintenance (PM)
- M-04-4930, No fire detection in Doghouses (reviewed related to corrective actions that affected the use of installed area heaters)
- M-04-5487, Freeze Protection for Circulating Cooling Water (RC) Strainer Building may be inadequate

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

.1 Partial System Walkdowns

a. Inspection Scope

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

- U1 train B Nuclear Service Water with train A out of service on October 25
- U1 train B Residual Heat Removal with train A out of service on October 25
- U2 train B Nuclear Service Water with train A out of service on October 25
- U1 train B Emergency Diesel Generator with train A out of service on December 20

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 used the operator aid computer to determine whether system parameters were as expected for the system and plant conditions, and whether equipment status shown for inaccessible equipment supported operability of the system.

b. Findings

No findings of significance were identified.

.2 Complete System Walkdown

a. Inspection Scope

The inspectors conducted a detailed review of the alignment and condition of the 4.16KV Essential Auxiliary Power (EPC) system; excluding the emergency diesel generators. 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 SSC. The inspectors walked down the system, to verify that the existing alignment of the system was consistent with the correct alignment. Items reviewed during the walkdown included the following:

- Electrical power is available as required and correctly aligned.
- Major system components are correctly labeled, cooled, ventilated, etc.
- Essential support systems are operational.
- Ancillary equipment or debris does not interfere with system performance.
- Tagging clearances are appropriate.

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.

- M-03-4003, 1TC4 feeder to SATA tripped open immediately upon energization
- M-04-2989, Trend developing with 4kV overcurrent relays

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

For the six 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 protection 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, as well as reviewed results from related surveillance tests, and 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:

- U1 Lower Containment Pipe Chase (Fire Area RB2)
- U1 Lower Containment Inside Crane Wall (Fire Area RB3)
- U1 Interior Doghouse (Fire Area 28)
- U1 Exterior Doghouse (Fire Area 30)
- U2 Interior Doghouse (Fire Area 29)
- U2 Exterior Doghouse (Fire Area 31)

The inspectors reviewed PIP M-05-1669, Preliminary notification of test results involving Hemyc fire wrap indicate it may not be adequate as a 1-hour fire barrier, to verify that the licensee identified and was implementing appropriate corrective actions.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

Internal Flooding

a. Inspection Scope

The UFSAR sections and the design basis documents listed in the attachment indicate that the following areas are susceptible to flooding that contain safety-related equipment:

- Auxiliary building U1 and U2 auxiliary feedwater pump rooms (712 foot elevation)
- Auxiliary building residual heat removal and containment spray pump area (695 foot elevation)
- Diesel generator rooms
- Internal and external Doghouses

The inspectors walked down the auxiliary building residual heat removal and containment spray pump area (695 foot elevation) containing risk-significant equipment which are below flood levels or otherwise susceptible to flooding from postulated pipe breaks, to verify that the area configuration, features, and equipment functions were consistent with the descriptions and assumptions used in UFSAR sections and in the supporting basis documents listed in the Attachment to this report. The inspectors also did a general walk-through of the auxiliary building to verify the licensee's determination that pipe breaks in the auxiliary building would drain to the auxiliary building areas identified above. The inspectors reviewed preventative maintenance documentation for the sump pumps and level transmitters in the 695 elevation area to determine whether the system equipment was being adequately maintained to perform its design function of mitigating flooding. The level transmitters provide the initial notification to the control room for entry into the flooding procedure. The inspectors reviewed the operator actions credited in the flooding analysis, contained in procedure AP/0/A/5500/44, Plant Flooding, to verify that the desired results could be achieved.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalificationa. Inspection Scope

On October 27, the inspectors observed licensed-operator performance during requalification simulator training for shift C, to verify that operator performance was consistent with expected operator performance, as described in Exercise Guides SRT-41 and SRT-53. This training tested the operators' ability to perform abnormal and emergency procedures dealing with post-LOCA recirculation, instrument failures and loss of the electrical grid. 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 evaluators identified deficiencies that occurred during the simulator training.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectivenessa. Inspection Scope

The inspectors reviewed the two degraded SSC/function performance problems or conditions listed below, to verify the licensee's appropriate handling of these performance problems or condition in accordance with 10CFR50, Appendix B, Criterion XVI, Corrective Action, and 10CFR50.65, Maintenance Rule.

- Struthers-Dunn Relays
- Tin Whiskers on circuit boards

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 (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)

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

- M-05-4469, Tin Whiskers found on Rod Control cards. Ref Tech Bulletin TB-05-04, "Potential Tin Whiskers on Printed Circuit Boards"
- M-05-3574, Manufacturing defect with Struthers-Dunn relay stock

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

The inspectors reviewed the licensee's risk assessments and the risk management actions used to manage risk for the plant configurations associated with the five activities listed below. The inspectors assessed whether the licensee performed adequate risk assessments, and implemented appropriate risk management actions when required by 10CFR50.65(a)(4). For emergent work, the inspectors also verified that any increase in risk was promptly assessed, and that appropriate risk management actions were promptly implemented. The inspectors also reviewed associated PIPs to verify that the licensee identified and implemented appropriate corrective actions.

- Week of October 2, 2005, including failure of a U2 (U2) PCS Cabinet power supply which placed the unit in a yellow Outage Risk Assessment Management (ORAM) condition; Failure of "A" Control Room Area Ventilation / Chilled Water (VC/YC) chiller with "B" train inoperable placing U2 in a LCO 3.0.3 and causing the licensee to request a Notice of Enforcement Discretion (NOED) and subsequent reduction in power for U2.
- Week of October 9, 2005, including failure of 2NI-144B during valve stroke timing test which placed U2 in a 72 hour shutdown TS. During repairs for 2NI-144B, the MCC EMXB-1 was opened and a screw was discovered near the busline. The MCC was de-energized for removal and placed the unit in a red ORAM condition due to de-energizing 2NI-100B, Common Suction for Safety Injection from Refueling Water Storage Tank (FWST).
- Week of October 30, 2005, including loss of both cooling groups to the 2B Main Generator breaker causing a zone lockout and loss of the 2B busline. The risk profile was reassessed due to SSF and Turbine Driven Auxiliary Feedwater Pump (TDCAP) maintenance.
- Week of November 20, 2005, including downpower to 20% RTP for 1A Reactor Coolant Pump (NCP) Motor Oil addition on-line, implementation of a temp mod to accomplish this, and make minor repair to oil leak; during downpower, drain 1A Feedwater Pump Turbine (FWPT) condenser to inspect blockage and correct high condenser backpressure.
- Week of December 10, 2005, including discovery of gas in the U1 Emergency Core

Cooling System (ECCS) system during monthly surveillance, failure of the run/shutdown cylinder on the Unit 2B diesel generator that caused an unplanned yellow risk, delayed planned train swap, and delayed some work on December 12.

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.

- On October 8, 2005, U2 entered TS LCO 3.0.3 for two trains of inoperable control room chillers. The operators entered AP-04, Rapid Downpower and decreased to 88% RTP before receiving a NOED extension.
- On October 17, 2005, U1 startup following refueling outage 1EOC17.
- On November 2, 2005, U2 entered TS 3.8.1 Action Statement 1 for loss of 2B offsite circuit. The unit lost the 2B main transformer which caused a turbine runback to 50%. The operators entered AP-04, Rapid Downpower, and subsequently, AP-03, Load Rejection following the runback.
- On November 24, 2005, U1 decreased to 20% RTP to make repairs to the 1A NCP and 1A FWPT.
- On December 18, 2005, U1 startup was performed following a reactor trip.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

For the five operability evaluations described in the PIPs listed below, the inspectors evaluated the technical adequacy of the evaluations to ensure that TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors reviewed the UFSAR to ensure that the system or component remained available to perform its intended function. In addition, the inspectors reviewed compensatory measures implemented to verify that the compensatory measures worked as stated and the measures were adequately controlled. The inspectors also reviewed a sampling of PIPs to verify that the licensee was identifying and correcting deficiencies associated with operability evaluations. Documents reviewed are listed in the attachment.

- M-05-4919, ECCS Sump Level Instrument Tape (debris) for U1 and 2
- M-05-4871, Cold Leg Accumulator (CLA) Relief Valves 1NI-74,52,63, and 86 failed their IST set pressure tests in 1EOC17
- M-05-4658, During 1B Diesel Generator control circuit test an overspeed logic diode overheated
- M-05-5115, Seal leak off (packing leak) identified on 1ND1B during Mode 3 Full Temperature/Pressure (FTP) walkdown
- M-05-4906, A train VC/YC did not start during swap

b. Findings

No findings of significance were identified.

1R16 Operator Work-Arounds

a. Inspection Scope

The inspectors reviewed the operator work-arounds listed below that warranted selection on the basis of risk insights, to verify that these work-arounds 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 selected samples are listed below.

- 05-05 Hourly Fire watch in Auxiliary Feedwater (CA) pump room due to Hemyc wrap not meeting 1 hour fire resistance criteria
- 05-06 Burnt out lights in the "Reset" for Main Steam (SM), SM Power Operated Relief Valve (PORV) and Feedwater Isolation could result in taking incorrect path during Abnormal Procedure/Emergency Procedure (AP/EP)
- 05-07 The reliability of the reach rod operated Chemical and Volume Control (NV) demineralizer isolation.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications

a. Inspection Scope

The inspectors reviewed the modifications described below, to verify that: these modifications did not degrade the design bases, licensing bases, and performance capabilities of risk significant SSCs; implementing these modifications did not place the plant in an unsafe condition; and, the design, implementation, and testing of these modifications satisfied the requirements of 10CFR50, Appendix B:

- New Reactor Core arrangement for U1, Cycle 18
- MD100523, Remove NV piping for better seal water leakage draining

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

- M-05-5352, EDM-601 Working Groups needs to evaluate use of Non-Fieldwork Mod
- M-05-4310, 1A NV pump water noticed coming from pump seal area

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/4204/002B, Residual Heat Removal (ND) Train B Valve Stroke Timing - Quarterly (replacement of 1ND-14 valve and actuator)
- PT/1/A/4208/006, Leak Test for 1NS-161 and 1NS-163 (maintenance on leaking check valve 1NS-163)
- PT/1/A/4350/002A, Diesel Generator 1A Operability Test (scheduled outage maintenance of 1A Emergency Diesel Generator (EDG))
- PT/1/A/4200/017A, NV To Cold Legs Flow Balance (replacement of 1A NV pump seal, various maintenance on A,B pumps)
- PT/1/A/4403/001A, 1A Nuclear Service Water (RN) Pump Performance Test (retest of the 1A RN Pump Discharge Check Valve)

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

- M-05-4737, Containment Spray (NS) Valve 1NS-163 valve manufacturer error caused disc to stick in slight open position
- M-05-4763, 1NS-163 failed leak test
- M-05-4731, 1ND-14 failed valve stroke time test

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities

a. Inspection Scope

The inspectors evaluated licensee outage activities 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 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
- Spent Fuel Pool Cooling
- 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. The inspectors also observed fuel handling operations (removal, sipping, and insertion) and other ongoing activities including control rod latching, to verify that those operations and activities were being performed in accordance with technical specifications and procedure PT/0/A/4150/037, Total Core Unloading. Additionally, the inspectors observed refueling activities to verify that the locations of the fuel assemblies were tracked, including new fuel, from core offload through core reload.

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

Enclosure

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 reactor physics testing results to verify that core operating limit parameters were consistent with the design.

Periodically, the inspectors reviewed the items that had been entered into the licensee's corrective action program, to verify that the licensee had identified problems related to outage activities at an appropriate threshold and had entered them into the corrective action program.

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 SSCs involved in these tests satisfied the requirements described in the TSs, 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/4206/015B, 1B Safety Injection Pump Head Curve Performance Test
- *• PT/1/A/4206/015A, 1A Safety Injection Pump Head Curve Performance Test
- PT/1/A/4200/009B, Engineered Safety Features Actuation Periodic Test Train B
- PT/1/A/4200/009A, Engineered Safety Features Actuation Periodic Test Train A
- PT/0/A/4600/105, Rod Cluster Control Assembly (RCCA) Drop Timing Using Digital Rod Position Indication (DRPI) System
- PT/1/A/4252/007, CA System Turbine Driven Train Performance Test
- **• PT/1/A/4255/003 A,B, SM Train A(B) Valve Stroke Timing- Shutdown
- PT/1/A/4250/004C, Turbine Overspeed Protection Circuit (OPC) and Mechanical Overspeed Trip Test

*This procedure included inservice testing requirements.

**This procedure included testing of a large containment isolation valve.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed the temporary modifications listed below, to verify that the modifications did not affect the safety functions of important safety systems, and to verify that the modifications satisfied the requirements of 10CFR50, Appendix B, Criterion III, Design Control.

- MD500544, Jumper out oil pressure switch for "A" YC chiller
- MD200588, Unplug low oil flow switch for circuit 9 on Main Start Up (MSU) Transformer 2B due to oil leak

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems

.1 Review of Items Entered into the Corrective Action Program:

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 all 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.

.2 Annual Sample Review

a. Inspection Scope

The inspectors selected PIP M-04-05115, Diversion of Inventory to the Incore Instrument Room from a Smart SBLOCA (Small Break Loss of Coolant Accident), for detailed review. This PIP was associated with the discovery that a reactor coolant system break/leak location inside the shield wall area could divert all or a portion of the water to the Incore Instrument Room, instead of the leaking coolant going to the containment sump for recirculation. The inspectors reviewed this report to verify that the licensee identified the full extent of the issue, performed an appropriate evaluation, 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. Not all corrective actions were complete.

Enclosure

b. Observations and Findings

No findings of significance were identified

.3 Semi-Annual Review to Identify trends

a. Inspection Scope

As required by Inspection Procedure 71152, Identification and Resolution of Problems, the inspectors performed a review of the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The 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 inspector's review nominally considered the six month period of June 2005 through December 2005, although some examples expanded beyond those dates when the scope of the trend warranted. The review included the following areas/documents:

- PIP and department trend reports for 2nd and 3rd quarter 2005
- 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. Assessment and Observations

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

Update of previously identified trends:

A licensee-identified trend on nuclear service water fouling has been discussed in the previous two six month trends. The licensee's actions to reduce the effect of service water fouling on the U2 Reactor Coolant Pump motors improved pump availability during the 2005 spring refueling outage. During the U1 2005 fall outage, the licensee's actions also improved pump availability. No additional examples were identified.

Additionally, the inspectors reported a continuing trend in the identification of problems in the area of fire protection in the last six month trend review. The licensee initiated PIP M-05-3303, to address an emerging trend for inadequate documentation supporting their licensing conditions associated with Appendix R commitments as a result of the inspectors' efforts. The licensee will monitor this trend to assess the effectiveness of

Enclosure

the corrective actions in place.

A trend resulting from degraded performance of main steam isolation valves (MSIVs) was identified in the last 6 month report. The licensee has since implemented modifications on U1 MSIVs to increase closing margin to improve reliability. Modifications included, but were not limited to: addition of a safety related air-assist feature, and new packing material and configuration. These modifications will be implemented on U2 during the next scheduled refueling outage.

There were no additional examples identified during this review for two other trends described in the previous six month trend report regarding 1) Corrective Action Program not being used in real time, and 2) Operator knowledge deficiency/ Lack of Understanding of TS.

New Trends:

The inspectors identified a trend associated with numerous violations for failing to update the FSAR in accordance with regulations outlined in 10 CFR 50.71(e). These non-cited violations included NCV 05000369,370/2004003-02, examples 1 and 2 (regarding the SSF/Safe Shutdown and Feedwater Isolation Valve stroke times respectively); NCV 05000369,370/2005004-01 (associated with a commitment for CAPRM); and NCV 05000369,370/2005004-02 (regarding the SSF). The licensee has initiated PIP M-06-080 to address this trend.

4OA3 Event Follow-up

.1 Reactor Trip

a. Inspection Scope

The inspectors reviewed the licensee's actions associated with the reactor trip that occurred on December 17, 2005, at 3:11 a.m. from 100% power due to a feed-flow signal that failed low and caused a high level in the 1A steam generator. The inspectors observed plant parameters for mitigating systems and fission product barriers, evaluated performance of systems and operators, and confirmed proper classification and reporting of the event.

b. Findings

No findings of significance were identified.

.2 (Open) LER 05000370/2005-007, Power Reduction Due to Entry into LCO 3.0.3 Caused by Inoperable Control Room Area Cooling Water System

On October 8, 2005, the licensee identified U2 as being in a condition prohibited by TS due to both trains of the Control Room Area Cooling Water System (CRACWS) being declared inoperable. At the time, U1 was in Mode 6 for refueling outage and U2 was in

Enclosure

Mode 1 at 100 percent power. At 3:20 a.m., train "A" of the CRACWS, which was electrically aligned to U2, tripped during a start attempt due to a defective oil pressure switch. Having previously been electrically aligned to U1 for "B" train engineered safety features testing, train "B" of the CRACWS was technically inoperable, albeit available and functional, due to its reliance on an inoperable emergency power supply. Specifically, shared portions of this system must be operable for each unit in a mode of applicability; therefore, with U2 in Mode 1, train "B" of the CRACWS must have an emergency power supply. The inoperability of the emergency power supply stemmed from its support system (i.e., nuclear service water) being considered inoperable. Consequently, both trains of the U2 CRACWS were declared inoperable, and in accordance with TS LCO 3.7.10, Required Action E.1, TS LCO 3.0.3 was immediately entered. The licensee requested a NOED, based on it taking approximately three hours to align the "B" train of control room ventilation back to U2 and not wanting to have the control room without ventilation for that amount of time due to overheating concerns. There was not sufficient time to execute repairs, as compliance with TS LCO 3.0.3 required U2 to be in Mode 3 by 10:20 a.m., on October 8, 2005. A power reduction was initiated in accordance with TS LCO 3.0.3 and U2 was reduced to approximately 88 percent power prior to receiving verbal enforcement discretion. The load reduction was subsequently terminated at 8:09 a.m., on October 8, 2005.

The inspectors followed up on the licensee's subsequent corrective actions to determine adequacy and to verify proper implementation, including: reviewing the licensee's NOED request submittal dated October 12, 2005 to verify the accuracy of what was previously verbally communicated to the NRC; evaluating a temporary modification to bypass the failed oil switch, and field observation to verify an individual was stationed to monitor local indications; and verifying permanent repairs were made to replace the defective oil pressure switch. The Licensee Event Report (LER) was reviewed by the inspectors and no findings of significance were identified. The licensee has committed to submitting a license amendment request (LAR) to address operability requirements for shared and unit designated equipment in respective modes of applicability. Pending future submission of the LAR, this item will remain open.

40A5 Other Activities

.1 Initial Cask Loading and Storage Observation

a. Inspection Scope

The inspectors reviewed the U2 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.

- NAC-UMS TSC-MNZ-006 (Document Control NO MCEI 0400-156),
- NAC-UMS TSC-MNZ-007 (Document Control NO MCEI 0400-160),

- NAC-UMS TSC-MNZ-008 (Document Control NO MCEI 0400-161),
- NAC-UMS TSC-MNZ-009 (Document Control NO MCEI 0400-162)

The inspectors reviewed the cask loading verification video tapes 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 October 24, 2005, November 7, 2005, November 28, 2005 and December 12, 2005, respectively. The inspectors reviewed selected licensee activities as 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.

The inspectors reviewed PIP M-05-05888 which the licensee wrote to document an incorrect fuel assembly being moved into the MNZ-009 TSC during cask loading. The licensee recognized that the assembly did not have the correct serial number prior to unlatching, and moved the assembly back to the previous spent fuel pool storage location. The licensee verbally reported this activity to the NRC on December 13 at 6:06 p.m., pursuant to the cask Certificate of Compliance, TS Section B2.1, which requires a 24 hour notification to the NRC Operations Center; followed by a special report within 30 days that describes the cause, actions to be taken to restore or demonstrate compliance and prevent recurrence. The inspectors reviewed the 24 hour report (NRC event notification number 42203) to determine whether the information in the notification was consistent with the PIP and whether the notification met the requirements of the Technical Specifications.

b. Observations and Findings

The inspectors noted that for NAC Cask MNZ-009, the licensee's fuel specifications per the Certificate of Compliance were exceeded when an incorrect fuel assembly was moved during cask loading. This finding is considered more than minor because lifting the incorrect fuel assembly could be considered a precursor for a more significant event. There are fuel assemblies in the spent fuel pool that are susceptible to top nozzle degradation. Lifting one of the fuel assemblies with a fragile top nozzle could result in a fuel handling accident. However, in this specific case, because the cask was open to the spent fuel pool, which was borated to approximately 2773 ppm, and the assembly was not unlatched in the cask, this is considered to be of very low safety significance. The enforcement aspects of this violation are addressed in Section 4OA7. Additionally, the licensee's 24 hour notification to the NRC for the event, which happened at 1:10 p.m. on December 12 (per PIP M-05-05888), was made at 6:06 p.m. on December 13, in excess of the 24 hours required by TS B2.1. This finding constitutes a violation of minor significance that is not subject to enforcement action in accordance with Section IV of the NRC's Enforcement Policy. The licensee documented the problem in corrective action 11 for PIP M-05-05888, which stated the late report will be addressed in the 30 day report to the NRC.

Overall, the licensee established and maintained adequate oversight for the dry cask

Enclosure

storage evolution. With the one exception, the Technical Specifications requirements and acceptance criteria as outlined in the FSAR for the NAC-UMS casks and the procedures were followed appropriately.

.2 Temporary Instruction (TI) 2515/161, Transportation of Control Rod Drives (CRDs) in Type A Packages

a. Inspection Scope

The inspectors reviewed shipping logs and discussed shipment of CRDs in Type A packages with shipping staff. The inspectors reviewed shipments made since January 1, 2002, and noted that no shipments of CRDs in Type A packages were made during this time period.

b. Findings

No findings of significance were identified.

40A6 Meetings, Including Exit

On January 5, 2006, the resident inspectors presented the inspection results to Mr. G. Peterson and other members of his staff. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

40A7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as a NCV.

- Certificate of Compliance 1015 Appendix B, section 2.1 requires each fuel assembly loaded in the NAC-UMS cask to have a decay heat # .958 kW. Contrary to this, during spent fuel cask loading on December 12, 2005, it was discovered that a fuel assembly, with a decay heat calculated to be approximately 1.437 kW, was inadvertently retrieved from the wrong location and inserted into the cask. This was identified in the licensee's corrective action program as PIP M-05-05888. This finding is of very low safety significance because the cask was open to the spent fuel pool, which was borated to approximately 2773 ppm, and the assembly was not unlatched in the cask. Additionally, the licensee has an evaluation demonstrating that the cask could be loaded with 24 unburned, fresh fuel assemblies with an initial enrichment of 5 wt % U-235 and still meet criticality control specifications. The fuel assembly in question had a total enrichment of 3.636 weight % U-235.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

Black, D., Security Manager
Bradshaw, S., Superintendent, Plant Operations
Bramblett J., Outage Manager
Brown, S., Manager, Engineering
Crane, K., Licensing 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
Mooneyhan, S., 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. Stang, Project Manager, NRR

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Closed

2515/161	TI	Transportation of Control Rod Drives in Type A Packages (Section 40A5.2)
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Discussed

05000370/2005-007	LER	Power Reduction Due to Entry into LCO 3.0.3 Caused by Inoperable Control Room Area Cooling Water System (Section 40A3)
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LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures:

IP/0/B/3250/059, Preventive Maintenance and Operational Check of Freeze Protection, Rev. 22
IP/1,2/B/3250/059b, Monthly Check of Freeze Protection
PT/0/B/4700/070, On Demand Freeze Protection Verification Checklist, Rev. 17

Work Orders:

98718300-01,02,03 - Inspect Heat Trace / Freeze Protection Instrumentation, complete 8/17/05

Section 1R04: Equipment Alignment

Partial System Walkdown

RN system:

OP/1/A/6400/006, "Nuclear Service Water System," Revision 167
OP/2/A/6400/006A, "Nuclear Service Water System Valve Checklists," Revision 22
MCFD-1574-01.00, "Flow Diagram Nuclear Service Water System", Revision 6
MCFD-1574-01.01, "Flow Diagram Nuclear Service Water System", Revision 10

ND system:

OP/2/A/6200/004, Residual Heat Removal System, Rev. 74

1B EDG

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

Complete System Walkdown

EPC system:

IP/0/A/2001/007, Bus Inspection and Maintenance
MCCD-1702-02.00, "One Line Diagram 4160 Essential Auxiliary Power System, Rev. 2
Corrective action documents (PIPs) :
Vendor Manuals (VMs), Operating Experience (OE) reports, Significant Operating Experience Reports (SOERs), Significant Event Notices (SENs), Information Notices (INs), system health reports:

<u>Reference #</u>	<u>Title/Description</u>
UFSAR,	Chapter 8, Electrical Power
MCS-0115.00-EPC-0001	DBD 4.16 kV Essential Auxiliary Power, Rev. 9

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

Calculation: MCC-1435.03-00-0014, Hemyc Fire Wrap

Section 1R06: Flood Protection Measures

Internal Flooding

UFSAR Sections

9.5.8, Ground Water Drainage System

9.2.2, Nuclear Service Water System and Ultimate Heat Sink

9.3.3, Equipment and Floor Drainage System

18.2.9, Flood Barriers

Design Basis Documents

MCS-1154.00-00-004, Design Basis Specification for the Auxiliary Building Structures, section 30.2.1.3.4.1, Internal Flooding

Calculations:

MCC-1206.47-69-1001, Auxiliary Building Flooding Analysis, Sec.9.2-9.2.1, Rev. 15

Procedures:

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

IP/0/A/3215/004, Magnetrol Liquid Level Control Switch Calibration, Rev. 15

Work Orders

98656939, 98656940

Other Documents:

Selected Licensee Commitment 16.9.8 Ground Water Level Monitoring System

IN 2003-08, Potential Flooding through unsealed concrete floor cracks

IN 83-44, Potential damage to redundant safety equipment as a result of backflow through the equipment and floor drain system

IN 94-27, Facility Operating Concerns Resulting From Local Area Flooding

IN 92-69, Water leakage from yard area through conduits into buildings

IN-87-49, Deficiencies in Outside Containment Flooding Protection

Section1R12: Maintenance Effectiveness

M-04-1550, Recurring human error with Struther Dunn relays
M-97-1735, Operating Experience item at Hope Creek station involving Struthers Dunn 219 NE series relays
M-96-1567, Struther Dunn relays in 2ATC24 showing excessive wear due to heat
M-05-2991, Tech Bulletin 05-04, Potential Tin Whiskers on Printed Circuit Boards

Section1R15: Operability Evaluations

GL 2004-02 and licensee response dated 9/1/2005
BL 2003-01 and licensee response dated 9/14/2005

Section1R16: Operator Work-Arounds

PIP M-05-1669, Preliminary notification of test results involving Hemyc fire wrap indicate it may not be adequate as a 1 hour fire barrier.
RIS 2005-07, Compensatory measures to satisfy the fire protection program requirements.
SLC 16.9.5, Fire Rated Assemblies
PIP M-05-2682, Reset lights are burnt out for an extended period of time.
WR 98359767, SM PORV Reset Train B
WR 98359770, SM PORV Reset Train A
PIP M-05-3384, Reliability of reach-rod operated NV demineralizer isolation valves.

Section1R17: Permanent Plant Modifications

W.O. 98750334, Seal Housing Leakoff Drain NV pump
EDM 601, Engineering Change

Section1R20: Refueling and Outage Activities

MCEI-0400-36, "McGuire 1 Cycle 18 Final Core Map", Rev. 16
PT/0/A/4150/003C, "Core Verification", Rev. 15
PT/0/A/4150/033, "Total Core Reloading", Rev. 48
OP/1/A/6100/003, Controlling Procedure For Unit Operation
OP/1/A/6300/001, Turbine Generator Startup/Shutdown
PT/0/A/4150/028, Initial Criticality and Zero Power Physics Testing
MCEI-0400-46, U1 Cycle 18 Core Operating Limits Report
M-05-5089, NRC identified items during Mode 4 walkdown

Section 1R23: Temporary Plant Modifications

M-05-5407, Unit 2 performed rapid downpower to 50% due to loss of cooling group to 2B transformer
M-05-4906, A train VC/YC did not start during swap

Section 40A5: Other Activities

Radioactive shipment logs, 01/01/02 - 10/15/05