UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
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ATLANTA, GEORGIA 30303-8931

July 9, 2004

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 05000369/2004004 AND 05000370/2004004

Dear Mr. Peterson:

On June 12, 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 June 17, 2004, with Mr. T. Harrall, Station Manager, and other members of your staff.

The inspection examined activities conducted under your licenses as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your licenses. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents six findings of very low safety significance (Green). Five of the findings were determined to be violations of NRC requirements. However, because of the very low safety significance of the violations and because they were entered into your Corrective Action Program, the NRC is treating these findings as non-cited violations (NCV) consistent with Section VI.A of the NRC Enforcement Policy. Additionally, 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 these non-cited violations, 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/

Robert C. Haag, 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 05000369/2004004 and 05000370/2004004
w/Attachment - Supplemental Information

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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:	05000369/2004004, 05000370/2004004
Licensee:	Duke Energy Corporation
Facility:	McGuire Nuclear Station, Units 1 and 2
Location:	12700 Hagers Ferry Road Huntersville, NC 28078
Dates:	March 14, 2004 - June 12, 2004
Inspectors:	J. Brady, Senior Resident Inspector S. Walker, Resident Inspector R. Baldwin, Senior Operations Engineer (Sec. 1R11.2) L. Mellen, Senior Operations Engineer (Sec. 1R11.2 and 1EP4) M. Bates, Operations Engineer (Sec. 1R11.2) G. Kuzo, Senior Health Physicist (Sec. 2OS1, 2PS2, 4OA1.2 and 4OA7) A. Nielsen, Health Physicist (Sec. 2OS2 and 4OA5.1) S. Vias, Senior Reactor Inspector (Sec. 1R08) J. Fuller, Reactor Inspector (Sec. 1R08) P. Fillion, Reactor Inspector (Sec. 4OA5.3)
Approved by:	Robert C. Haag Reactor Projects Branch 1 Division of Reactor Projects

Enclosure

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SUMMARY OF FINDINGS

IR05000369/2004004, IR05000370/2004004; 3/14/2004 - 6/12/2004; McGuire Nuclear Station, Units 1 and 2; Fire Protection, Maintenance Effectiveness, Surveillance Testing, Access Control to Radiologically Significant Areas, and ALARA Planning and Controls

The report covered a three month period of inspection by resident inspectors and announced inspections by three regional operations engineers, two health physicists, and two reactor inspectors. Six Green findings which include five non-cited violations (NCV) were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609, "Significance Determination Process (SDP)." Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. Inspector-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems, Barrier Integrity

- Green. The inspectors identified a non-cited violation (NCV) of the operating license condition for fire protection for failing to update fire strategy plans when a modification removed numerous fire extinguishers from plant fire areas that contain safety-related equipment. The non-updated fire strategy plans could decrease the effectiveness of the fire brigade.

  This finding is greater than minor because it is associated with fire protection equipment availability and degraded the ability to meet the manual suppression Mitigating Systems Cornerstone objective. The finding is of very low safety significance because the areas where the inspectors found extinguishers missing did not have both trains of safe shutdown and the standby shutdown system in the same fire area while utilizing 20 foot separation between trains, hence, the significance of the fire brigade's decreased effectiveness was reduced. (Section 1R05)

- Green. The inspectors identified a non-cited violation of 10 CFR 50.65 (maintenance rule) for failing to demonstrate that the performance of the emergency lighting battery system was being effectively controlled after it exceeded its Maintenance Rule a(2) performance. The licensee had not established goals nor monitored the performance of the batteries per 10 CFR 50.65a(1).

  The finding is more than minor because of the affected reliability objective of the Equipment Performance attribute under the Mitigating Systems Cornerstone. Portions of the emergency lighting were not available to perform their intended function of supporting operator actions to mitigate the consequences of fires upon loss of all other lighting. The finding is of very low safety significance because there is no design deficiency, the finding does not represent an actual loss of a safety function, nor does this involve a risk significant system for mitigating fire, flood, seismic, or severe weather events, in accordance with MC 0609, Safety Determination Process, Phase 1 worksheet. (Section 1R12)

- Green. A non-cited violation of 10 CFR 50 Appendix B, Criterion XVI, Corrective Action was identified for failure to take adequate corrective action to resolve a deviation from the as-designed configuration for the B train containment spray suction isolation valve actuator (1NS-1B). The deviation prevented the B train common emergency core cooling system containment sump isolation valve (1NI-184B) for the residual heat removal and containment spray systems from opening when manually actuated from the valve's main control board switch.

  The self-revealing finding was greater than minor because it affected the availability and reliability of the emergency core cooling system recirculation function for the Mitigating System Cornerstone and the containment spray system for the Barrier Integrity Cornerstone. The finding is of very low safety significance because of the short time interval during which both the automatic function and manual backup function were unavailable, and the availability of a redundant train during this short time interval. (Section 1R22)

- Green. The inspectors identified two examples of a non-cited violation of 10 CFR 50, Appendix B, Criterion XI, Test Control for failure to perform adequate surveillance testing on the Ice Condenser lower inlet doors under suitable conditions.

  The first example involved the failure to control the environmental conditions in the containment during the testing of the lower inlet doors which resulted in obtaining inaccurate data.

  This finding is more than minor because the failure to establish suitable environmental conditions to obtain accurate door torque data impacts the ability to verify that the lower inlet doors will open at the appropriate limits. Consequently, the mitigating function of the ice condenser to maintain containment integrity in the Barrier Integrity Cornerstone was affected. The finding is considered of very low safety significance because when the plant returned to cold shutdown (one week later) and the licensee conducted a retest under the appropriate accident configuration, all values were found to be within acceptable limits. (Section 1R22)

  The second example involved the inappropriate performance of preventative maintenance immediately prior to the lower inlet doors surveillance test which resulted in unacceptable preconditioning.

  This finding is more than minor because performing preventative maintenance immediately prior to the surveillance test has the potential to mask the as-found condition of the lower inlet doors and results in the inability to verify operability. Consequently, the equipment operability and function objectives of the Barrier Integrity Cornerstone were affected. The finding is of very low safety significance due to the licensee performing an as-found visual inspection of the lower inlet doors at initial cold shutdown and having not found any degraded conditions that would affect lower inlet door operability. (Section 1R22)

Cornerstone: Occupational Radiation Safety

- Green. An NRC identified example and a self-revealing example of a non-cited violation (NCV) of Technical Specification (TS) 5.4.1(a) were identified for failure to follow approved radiation protection guidance for Unit 1 (U1) steam generator (S/G) maintenance activities.

  NRC identified example: The licensee failed to properly configure ventilation equipment and conduct required radiological analyses for initial airborne particulate samples collected. Failure to properly establish the ventilation system equipment contributed to the uncontrolled dispersion of airborne particulate radiological material within the U1 reactor building.

  Self-revealing example: The failure to monitor for alpha emitting radionuclides in particulate air samples prevented timely and thorough evaluation of potential radiological hazards for occupational workers.

  These examples are more than minor because they adversely affect the plant equipment and the program and process attributes of the Occupational Radiation Safety cornerstone. The failure to properly establish the ventilation equipment resulted in unnecessary radionuclide intakes by workers and the failure to conduct particulate air sample alpha analyses impacted the thorough and timely evaluation of potential airborne radiological hazards. The examples were determined to be of low safety significance because subsequent analyses did not identify any significant alpha emitter hazards, workers were monitored for exposures from external radiation fields and from internally deposited radionuclides as appropriate, and no individuals exceeded either internal or external exposure limits. (Section 2OS1)

- Green. The inspectors identified a finding for inadequate implementation of proposed contamination control initiatives for Unit 1 End-of-Cycle 16 refueling outage eddy current test (ECT) activities. The primary control initiative which involved scrubber brushes used to clean particulates from ECT drive and communication cables during their withdrawal from S/G tubes were improperly sized and thus ineffective in minimizing the transfer of radioactive particulate contamination from the S/Gs onto the work platforms. Further, backup contamination control equipment and felt pads were not available until the end of the subject task. The inadequate implementation of the proposed controls resulted in extensive contamination on the S/G platforms resulting in increased general area dose rates.

  This finding is greater than minor because it adversely affects the source term control attribute of the Occupational Radiation Safety Cornerstone and resulted in the unexpected increase in general area S/G platform dose rates and increased worker exposure. This finding is of very low safety significance because the licensee's three year rolling average collective dose per unit was less than 135 person rem, and all individual worker exposures were closely monitored by the licensee and were within regulatory limits. (Section 2OS2)

B. Licensee-Identified Violations

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

- 10 CFR 20.1501(a)(1) requires surveys be made to comply with the regulations in 10 CFR Part 20. Contrary to the above, on August 4, 2003, transport package confirmation dose rate surveys identified a maximum contact dose rate of approximately 2000 millirem per hour (mrem/hr) for a bag of hot particle trash which was significantly above the original October 2, 2002, radiation surveys of the material which documented a maximum contact dose rates of approximately 150 mrem/hr. The inadequate dose rate surveys resulted in the improper interim storage of waste and if shipped, would have resulted in the waste processor exceeding guidelines for receipt of radioactive waste. This event is documented in the licensee's Corrective Action Program (CAP) as PIP number M-03-03355. This item is of very low safety significance since the inaccurate survey results did not compromise other high radiation controls and did not result in any significant unintended exposures to personnel.

REPORT DETAILS

Summary of Plant Status:

Unit 1 began the inspection period shutdown in refueling outage 16. The unit returned to service on April 12 and reached 100 percent power on April 14, 2004.

Unit 2 began the inspection period at approximately 100 percent power and remained at 100 percent for the entire period except for May 1, when power was reduced to approximately 85 percent for three hours to perform turbine valve testing.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R04 Equipment Alignment

a. Inspection Scope

Partial System Walkdowns

During this inspection period, the inspectors performed the following five partial system walkdowns while the indicated systems/equipment were out of service for maintenance and testing:

- Unit 1 train A spent fuel cooling with train B out of service for maintenance on the 1ETB electrical safety bus on March 17. All fuel assemblies from the reactor were in the spent fuel pool.
- Unit 2 train B residual heat removal system with train A out of service for maintenance on April 6.
- Train B shared Unit 1 and 2 control room ventilation system with train A out of service for maintenance on May 10 and 11.
- Unit 1 train B emergency diesel generator with train A out of service for maintenance on May 11.
- Unit 2 train B emergency diesel generator with train A out of service for maintenance on June 1.

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.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

For the eight 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 MCS-1465.00-00-0008, Design Basis Specification for Fire Protection. 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:

- Fire Area 9, Unit 1 "B" Electrical Penetration Room
- Fire Area 10, Unit 2 "B" Electrical Penetration Room
- Fire Area 11, Unit 1 1ETB Switchgear Room
- Fire Area 12, Unit 2 2ETB Switchgear Room
- Fire Area 17, Unit 1 1ETA Switchgear Room
- Fire Area 19, Unit 1 Cable Spreading Room
- Fire Area 20, Unit 2 Cable Spreading Room
- Fire Area 13, Unit 1 and 2 Vital Batteries, Chargers, and Instrument Busses

The inspectors observed a Fire Brigade Drill on June 9, 2004 to evaluate the readiness of the licensee's personnel to fight fires, including the following aspects:

- Protective clothing/turnout gear was properly donned.
- Self-contained breather apparatus (SCBA) equipment was properly worn and used.
- Fire hose lines were capable of reaching all necessary fire hazard locations.
- The fire area of concern was entered in a controlled manner.
- Sufficient fire fighting equipment was brought to the scene by the fire brigade to properly perform their firefighting duties.
- The fire brigade leader's fire fighting directions were thorough, clear, and effective.
- Radio communications with the plant operators and between fire brigade members were efficient and effective.
- Effective smoke removal operations were simulated.
- The fire fighting pre-plan strategies were utilized.
- The licensee pre-planned drill scenario was followed, and that the drill objectives acceptance criteria were met.

b. Findings

Introduction: A Green non-cited violation (NCV) was identified for failing to update fire strategy plans when a modification removed numerous fire extinguishers from plant fire areas that contained safety-related equipment. The non-updated fire strategy plans could decrease the effectiveness of the fire brigade.

Description: The inspectors found on February 15, April 23, and April 29, that fire extinguishers identified in pre-fire strategy plans for the standby shutdown facility, Unit 2 electrical penetration room on elevation 733, and 1ETA switchgear room respectively, were not in the identified locations. The licensee's investigation revealed that a modification (MGMM 8227) had been performed in 1996-1997 time frame to reduce the number of fire extinguishers and the ones the inspectors identified, along with a number of others, were removed. However, no changes were made to the pre-fire strategy plans. Fire extinguisher locations are required to be in the pre-fire strategy plans as described in the licensee's fire protection program (MCS-1465.00-0008, Design Basis Specification for Fire Protection), Appendix B, Section 5.d.2.

Analysis: The pre-fire strategy plans identify to the fire brigade where fire fighting equipment is located so that the brigade leader can plan a strategy for how to approach and extinguish a fire. The failure to have comprehensive pre-fire (strategy) plans is addressed in Inspection Manual Chapter (MC) 0609 Appendix F, Attachment 2, as a moderate impact (degradation) for manual fire fighting effectiveness of the defense-in-depth feature to rapidly detect and suppress those fires that do occur. The impact is on the manual suppression fire fighting portion of the feature as shown in Appendix F, Figure 4-1. This performance deficiency affects the Mitigating Systems Cornerstone objective of protection from external factors including fire. Consequently, the issue is greater than minor. Because the areas where the inspectors found extinguishers missing did not have both trains of safe shutdown and the standby shutdown system in the same fire area while utilizing 20 foot separation between trains (MC 0609 Appendix F, Protection Scheme 3), the significance of the fire brigade response timeliness was reduced. Consequently, the issue screened out as very low safety significance (Green).

Enforcement: McGuire operating license condition 2.C.4, for Unit 1 and 2, states that the licensee shall maintain in effect and fully implement all provisions of the approved fire protection program as described in the Final Safety Analysis Report, as updated, for the facility and as approved in the NRC Staff's McGuire Safety Evaluation Report (NUREG-0422) and its supplements. McGuire UFSAR Section 9.5.1 states that the fire protection program is contained in document MCS-1465.00-0008, Design Basis Specification for Fire Protection. The Fire Protection Program states, in Appendix B, Section 5, Fire Fighting Procedures, that the fire fighting procedures should identify the strategies established for fighting fires in all safety-related areas and areas presenting a hazard to safety-related equipment; and that the strategies should cover the nearest location of extinguishant. Appendix B, Section 6, Quality Assurance , provides the design control and procedure control quality assurance criteria. Contrary to the above, prior to February 15, 2004, the licensee had not adequately implemented design control and procedure control measures in that modification MGMM 8227 was implemented to remove fire extinguishers from the plant, and fire strategy plans that showed the extinguisher locations were not updated. The failure to have updated fire strategy plans when a modification removed numerous fire extinguishers listed on the plans, as required by the fire protection program, is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy and is identified as NCV 05000369,370/2004004-01: Failure to update fire strategy plans when a modification removed numerous extinguishers. This issue is in the licensee's Corrective Action Program as PIPs M-04-762, M-04-1114, M-04-2466, and M-04-2477.

1R06 Flood Protection Measures

a. Inspection Scope

External Flooding

The inspectors walked down the outside portions of the plant in the vicinity of the auxiliary building which are susceptible to flooding from external sources, to verify that the area configuration, features, and equipment functions were consistent with the descriptions and assumptions used in UFSAR Section 2.4.10, Flood Protection Requirements, and in the supporting basis documents listed in the Attachment to this report.

In addition, the inspectors reviewed preventative maintenance for manholes that contain cables important to safety and were subject to flooding, to verify that cables and associated support equipment described in UFSAR Sections 2.4.10, Flooding Protection Requirements were not damaged by submergence and would perform their intended function.

The inspectors discussed the susceptibility to flooding with various system engineers to verify that systems that were not listed in the UFSAR or design basis documents were not susceptible.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance

a. Inspection Scope

Annual Inspection

The inspectors reviewed the inspection results and digital pictures of the 1A diesel generator cooling water and 1B component cooling water heat exchangers, to verify that inspection results were appropriately categorized against the pre-established acceptance criteria described in procedures MP/0/A/7650/101, Diesel Generator Cooling Water (KD) HX [heat exchanger] Corrective Maintenance and MP/0/A/7700/013, Component Cooling Water (KC) HX Corrective Maintenance, respectively. The inspectors also verified that the frequency of inspections were sufficient to detect degradation prior to loss of heat removal capability below design basis values. The inspectors reviewed the pictures to determine the number of tubes plugged and then verified that number would not adversely affect heat exchanger performance.

The inspectors reviewed PIP M-03-02356, Evaluate Catawba PIP C-02-5052 for applicability to McGuire regarding KC HX fouling, to verify that the licensee identified and implemented appropriate corrective actions.

b. Findings

No finding of significance were identified.

1R08 Inservice Inspection (ISI)

a. Inspection Scope

The inspectors observed inspection activities and reviewed the documentation and selected supporting records for ISI work activities conducted during McGuire Unit 1 refueling outage 1EOC-16. This was the last outage of the 1st period of the 3rd ISI interval. McGuire Unit 1 has a risk-informed ISI inspection program. The inspection activities, documentation, and supporting records were reviewed for compliance to the Technical Specifications (TS); the ASME Boiler and Pressure Vessel Code, Section XI, 1995 Edition, with the 1996 addenda; and other appropriate industry and NRC guidance and standards. Documents reviewed during this inspection are listed in the Attachment to this report.

The inspectors reviewed the following nondestructive examinations (NDE):

- Ultrasonic Test: (UT): Weld No: SA1FW3-2, Pipe to Pipe
- Ultrasonic Test: Weld No: SA1FW3-3, Pipe to Pipe
- Ultrasonic Test: Weld No: 1-ELDHX-HD-FL6
- Liquid Penetrant Test (PT): Weld No: 1MCA-ND-H16, welded attachment

The inspectors also inspected the following NDE by record and film review:

- Radiographic Test (RT): Weld No: SA1FW3-2, Pipe to Pipe
- Radiographic Test: Weld No: SA1FW3-3, Pipe to Pipe
- Magnetic Particle Test (MT): Weld No: SA1FW3-2, Pipe to Pipe
- Magnetic Particle Test: Weld No: SA1FW3-3, Pipe to Pipe

Qualification and certification records for NDE procedures, examiners, and equipment and consumables (i.e., UT oscilloscopes, transducers, calibration blocks, couplant, PT cleaner, penetrant and developer) for the inspected ISI examinations were reviewed.

During review of the above NDE examinations, the inspectors verified that indications and defects were dispositioned in accordance with the ASME Code. The following indications and defects were reviewed:

- Weld No: SA1FW3-2; 60-deg shear exam - 100% DAC RI, Geometric reflector due to root configuration. Supplemental scan with 70° shear and WSY 70 to confirm geometric condition.
- Weld No: SA1FW3-3; 60-deg shear exam - 100% DAC RI, Geometric reflector due to root configuration. Supplemental scan with 70° shear and WSY 70 to confirm geometric condition.

The inspectors reviewed the following recorded indications since the beginning of 1EOC-15 outage to ensure that they were dispositioned in accordance with ASME Code

requirements. The following data sets were all resolved as root geometry or counterbore indications:

- UT - Weld No. 1NCIF-3-2, elbow to safe end
- UT - Weld No. 1NCIF-3-3, safe end to elbow
- UT - Weld No. 1SGA-W65

The inspectors reviewed Maintenance Work Order (MWO) 98316681-10 for the installation of new vent valve, 1NV1057. The new valve installation was done per MGMM-11624, Addition of six new 1" vent connections on Unit 1 ECCS systems [refueling water(1), chemical and volume control(2), and residual heat removal(3)]. The inspectors reviewed the weld process sheets and Preservice Examination (PSI) inspection documentation (system pressure test, PT, and VT-2) for this new weld on ASME Class 2 pressure boundary piping. This new weld was done to ASME Section III, Subsection NC. The PSI was done per Code Case N-416-1.

The inspectors also reviewed MG-12556/00, Modification for SA Valve 1SA0048 (ASME Class 2). The inspectors reviewed PSI for two new full penetration butt welds: Weld No: SA1FW3-2 and Weld No: SA1FW3-3, UT, MT, and RT per ASME Section III.

The inspectors selected the following work packages from the licensee's listing of ASME Section XI code repairs and replacements since the last refueling outage:

- WO 98225738-09: 1NC-2 Pressurizer Safety Valve Seat Leak. Relief valve, Crosby N56925-00-0009 was replaced with Crosby N56925-00-0002. This valve was replaced due to seat leakage, and the licensee determined that no failure had occurred.
- WO 98294172-06: PM 1NC-3, Remove, Test, and Replace Pressurizer Safety Relief Valve. Relief valve, Crosby N56925-00-0008 was replaced with Crosby N56925-00-0009. This valve was replaced with a direct replacement and the licensee reported that no pressure boundary degradation occurred.

The inspectors observed and reviewed the following SG eddy current testing (ECT) examination activities: (1) bobbin data acquisition for a sample of SG tubes in all four SGs; and (2) licensee SG inspection requirements relative to in-situ pressure test criteria, ECT scope and expansion criteria, plugging limits and repair criteria, appropriateness of ECT equipment for expected types of degradation, and corrective action for loose parts.

The only mechanism of tube degradation that has been identified in the McGuire Unit 1 steam generators is wear at the secondary side u-bend fan bar and lattice grid tube supports. The inspectors reviewed samples of ECT data for tubes with wear indications and their disposition and corrective action. During the visual examination of the secondary side, the licensee found loose parts at various locations (small wire filaments). The inspectors discussed with the licensee their evaluation and proposed corrective actions.

In addition to the ISI review, a sample of ISI issues in the licensee's Corrective Action Program were reviewed for adequacy:

- PIP M-04-01342, Recordable indication found during Liquid Penetrant exam on Excess Let-Down Heat Exchanger support. Corrective Action: Indications were documented as pre-existing fabrication welding flaws, and will be repaired. The ISI sample was expanded per ASME Section XI. The support weld flaw is not associated with the heat exchanger pressure boundary.

- PIP M-03-06088, Failure to perform PT exam on NPS 1" and smaller ASME Class B socket welds. Corrective Action: All welds were examined and found to be acceptable.

- PIP G-01-00168, UT examination coverage for two piping welds (1NCIF-3-2 and 1NCIF-3-3) were improperly conducted. These two welds were reexamined during the EOC-15 outage, and found to be acceptable.

On March 11, 2004, the licensee observed two boron deposits on the Unit 2 NS line (Containment Spray System) in the Annulus. This was documented in PIPs M-04-01262, M-04-1294, and M-04-01299. The licensee performed the system functionality and operability and had Structural Integrity Associates perform a structural integrity calculation (MNS-02Q-301) to determine the allowable flow size and leakage. The licensee established compensatory measures and submitted a relief request of ASME Section XI code for having a through wall leak on Class 2 piping on April 2.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

.1 Quarterly Inspection

a. Inspection Scope

On April 22, 2004, the inspectors observed licensed-operator performance during requalification simulator training for shift “D” group 3, to verify that operator performance was consistent with expected operator performance, as described in Exercise Guide OP-MC-SRT-32. This training tested the operator’ s ability to perform abnormal and emergency procedures dealing with secondary side transients, load increases, non-isolable primary leakage, large break loss-of-coolant accident, and safety injection malfunctions. The inspectors focused on clarity and formality of communication, as well as 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.

.2 Biennial Inspection

a. Inspection Scope

The inspectors reviewed the facility operating history and associated documents in preparation for this inspection. During the week of May 24, 2004, the inspectors reviewed documentation, interviewed licensee personnel, and observed the administration of simulator operating tests and simulator Job Performance Measures (JPMs) associated with the licensee's operator requalification program. Each of the activities performed by the inspectors was done to assess the effectiveness of the licensee in implementing requalification requirements identified in 10 CFR 55, "Operators' Licenses." The evaluations were also performed to determine if the licensee effectively implemented operator requalification guidelines established in NUREG-1021, "Operator Licensing Examination Standards for Power Reactors." The inspectors also reviewed and evaluated the licensee's simulation facility for adequacy for use in operator licensing examinations. The inspectors observed three operator crews during the performance of the operating tests. Documentation reviewed included written examinations, JPMs, simulator scenarios, licensee procedures, on-shift records, licensed operator qualification records, watchstanding records, simulator discrepancy report records and performance test records. Licensee documents reviewed during the inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed the two degraded system/function performance problems or conditions listed below to verify the licensee's appropriate handling of these performance problems or conditions in accordance with 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, and 10 CFR 50.65, Maintenance Rule. The inspector reviewed historical data (i.e., work orders, PIPs) and conducted subsequent interviews with engineering personnel. Documents reviewed are listed in the Attachment to this report.

- Diesel Generator Room temperature below Selected Licensee Commitment (SLC) Manual temperature requirements
- Emergency Lighting DC system (ELD)

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-04-0074, 1B D/G room temperature fell below the minimum SLC temperature of 55F.
- M-02-01434, The ELD Emergency Lighting system performance during quarterly testing is poor.

b. Findings

Introduction: A Green non-cited violation of the maintenance rule was identified for the licensee's failure to effectively demonstrate the performance and condition of the emergency lighting battery system. As a result, the licensee had not established goals nor monitored the performance of the batteries per 10 CFR 50.65a(1).

Description: The inspectors discovered on June 2, 2004, that in February 2001, the emergency lighting system (ELD) exceeded its Maintenance Rule a(2) performance criteria and the licensee was neither monitoring under a(1) nor had they performed an evaluation to demonstrate that monitoring under a(1) was not required.

The ELD system is within the scope of the Maintenance Rule because it is required by operations personnel to perform emergency procedure operator actions to mitigate accidents upon loss of all other lighting. The licensee's Maintenance Rule criteria for the 8-hour emergency lights specifies to maintain less than a 20% failure rate of the batteries during an annual performance test. In excess of a 20% failure rate results in a Maintenance Preventable Functional Failure (MPFF); one or more MPFFs exceeds the system performance criteria. A review of the Unit 2 data indicated on February 14, 2001, the licensee had a failure rate of 34%, exceeding the set performance criteria. For additional information on the historical trend of the ELD system's performance, see Section 4OA2.3 of this report. The licensee acknowledged the ELD system was not being properly monitored per the Maintenance Rule, thus this failure remained unrecognized. Furthermore, a Maintenance Rule self-assessment conducted in December of 2003 focusing on the adequacy of availability and reliability determinations for several systems, including the ELD system, discovered that issues existed with the ELD Maintenance Rule performance criteria and that a significant number of batteries and bulbs had failed. However, these identifications did not translate into prompt and adequate corrective actions to discover the a(1) status, resulting in a missed opportunity for the licensee.

Analysis: The inspectors determined that the licensee's failure to demonstrate that the performance or condition of the 8-hr emergency lighting batteries for Unit 2 were capable of performing their intended function, was more than minor because of the affected reliability objective of the Equipment Performance attribute under the Mitigating

Systems Cornerstone. After assessing the finding in accordance with MC 0609, Safety Determination Process, Phase 1 worksheet, the inspectors concluded the finding to be of very low safety significance because there was no design deficiency, the finding did not represent an actual loss of a safety function, nor did this issue involve a risk significant system for mitigating fire, flood, seismic, or severe weather events.

Enforcement: 10 CFR 50.65, Maintenance Rule, paragraph (a)(1) states, in part, that the performance or condition of systems shall be monitored against established goals, to provide reasonable assurance that the systems are capable of performing their intended functions. Paragraph (a)(2) of 10 CFR 50.65 requires, in part, that monitoring as specified in paragraph (a)(1) is not required where it has been demonstrated that the performance or condition of a system is being effectively controlled through the performance of appropriate preventive maintenance such that the system remains capable of performing its intended function. Contrary to the above, from February 14, 2001 to June 2, 2004, the licensee had failed to monitor the emergency lighting 8-hr battery system under a(1) or demonstrate that the emergency lighting 8-hr battery system should not be monitored under a(1) as specified by a(2) in that, the number of emergency light battery failures had exceeded the system functional failure criteria and the number of functional failures had exceeded the performance monitoring criteria. The licensee was neither monitoring under a(1) nor had they performed an evaluation to demonstrate that monitoring under a(1) was not required. The failure to monitor the ELD system under a(1), is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy and is identified as NCV 05000370/04-04-02: Failure to Monitor the Emergency Lighting System under 10 CFR 50.65a(1). This issue is in the licensee's Corrective Action Program as PIPs M-04-2837, M-04-2981, and M-04-2983.

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 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 PIP M-04–2126, Steam Generator PORV 2SV-19 leaking to atmosphere, to verify that the licensee identified and implemented appropriate corrective actions.

- Unit 1 emergent need for additional reactor coolant system mid-loop on March 24 to remove B steam generator hot leg nozzle dam prior to reactor vessel head installation. The need resulted from delays in steam generator eddy current testing.

- Unit 1 reactor coolant system mid-loop on March 28 to remove steam generator nozzle dams.

- Unit 1 emergent condition on March 29 due to problems with 1B diesel generator output breaker and configurations necessary to adequately perform a post maintenance test.

- Unit 1 emergent work on March 30 on the diesel generator starting air system for operability of 1B DG to continue "A" ESF testing. To correct the problem, a starting air pressure switch was jumpered out due to a ground fault on the circuit.

- Week of April 4 emergent work on Unit 1 1SM-7AB, Main Steam Isolation Valve after performing valve stroke timing; valve would not stroke completely. Initiated cooldown to Mode 5 for repair.

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Nonroutine Plant Evolutions

a. Inspection Scope

During the three 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. Documents reviewed are listed in the Attachment to this report.

- Unit 1 startup from 1EOC16 refueling outage including dilution to critical and zero power physics testing per procedure PT/0/A/4150/028, Initial Criticality and Zero Power Physics Testing.

- Unit 2 quarterly main turbine valve movement test per procedure PT/2/A/4250/004 A, Turbine Valve Movement Test.

- Loss of F instrument air compressor and use of procedure AP/1/A/5500/022, Loss of VI ([instrument air)

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed five 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.

- M-04-1262, Unit 2 Containment Spray pipe leak in the annulus on Trains A and B
- M-04-2409, Unit 1 and 2 shared control room ventilation chiller (VC/YC) refrigerant leak
- M-04-1235, Unit 1 C cold leg accumulator isolation valve leaks slightly
- M-04-1116, Unit 2 Turbine-driven auxiliary feedwater pump steam supply valve closing operability question related to nitrogen accumulator relief valve location
- M-04-439, Unit 2 service water valve RN-279B, cooling water return isolation from auxiliary building ventilation, Rotork actuator add-on-pack not annealed

b. Findings

No findings of significance were identified.

1R16 Operator Work-Arounds

a. Inspection Scope

The inspectors reviewed operator work-around 03-09 U1 CR, 1NV-6 letdown relief valve leaks when temperature changes occur over short periods of time, which required operators to increase letdown as charging is increased. The inspection was conducted to verify that those effects which could 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 were correctly identified and adequately resolved prior to clearing the work-around.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing

a. Inspection Scope

For the seven 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 associated maintenance activity is identified in parenthesis. The tests included the following:

- PT/1/A/4350/002A, Diesel Generator 1A Operability Test (outage preventative maintenance)
- PT/1/A/4350/019B, 1B D/G Governor and Voltage Regulator Benchmark Comparison Test (voltage regulator replacement)
- IP/0/A/3090/002, Enclosure 11.4, Additional Sheet For Troubleshooting Or

Corrective Action Plan; OP/1/A/6350/002, Diesel Generator; and PT/1/B/4200/009B, Engineered Safety Features Actuation Periodic Test Train B (unexpected trip of 1B diesel generator output breaker)
- IP/0/A/3250/016D, D/G Woodward Controls Alignment Following Replacement (governor replacement on 1B D/G)
- PT/1/A/4204/002B, ND Train B Valve Stroke Timing - Quarterly (failure of valve 1ND-14 during B ESF testing)
- PT/1/A/4252/001C, #1 TD CA pump Performance Test Opening 1SA-49 (failure of valve 1SA-48 to stroke from the SSF)
- PT/1/A/4255/003C, SM Valve Timing Test at Full Temperature and Pressure (failure of A steam generator MSIV to fully stroke)

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, and adhered to operating license and TS requirements that maintained defense-in-depth and developed mitigation strategies for losses of the following key safety functions:

- Decay heat removal (DHR)
- Inventory control
- Power availability
- Reactivity control
- Containment

On April 5, following the failure of the “A” steam generator main steam isolation valve to completely stroke, the inspectors observed portions of the cooldown process from mode 3 to mode 5 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
- 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 location of the fuel assemblies was tracked, including new fuel, from core offload through core reload.

The inspectors reviewed the licensee's preparations for reactor coolant system mid-loop to verify that the commitments made in response to Generic Letter 88-17, Loss of Decay Heat Removal, were still in place. In particular, that training was conducted prior to drain-down and that the controls and administrative procedures were implemented during mid-loop conditions to ensure that risk was minimized. The inspectors accomplished these reviews for the mid-loop operations that occurred on March 24 and 28. The inspectors verified that control room distractions were limited during mid-loop conditions to ensure that operator focus was on the higher risk mid-loop conditions.

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 had 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. Following unit startup, the inspectors observed incore instrumentation calibration and axial flux limit determination.

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. For the significant problems documented in the Corrective Action Program and listed in the Attachment to this report, the inspectors reviewed the results of the licensee's investigations to verify that the licensee had determined the root cause and implemented appropriate corrective actions as required by 10 CFR 50, Appendix B, Criterion XVI, Corrective Action.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

For the nine 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 commitments, and that the tests demonstrated that the SSCs were capable of performing their intended safety functions.

- PT/1/A/4250/004N, #1 CA Pump Turbine Overspeed Trip Setpoint Verification
- PT/0/A/4200/032, Periodic Inspection of Ice Condenser Lower Inlet Doors
- PT/1/B/4200/009B, Engineered Safety Features Actuation Periodic Test Train B
- PT/1/B/4200/009A, Engineered Safety Features Actuation Periodic Test Train A
- ** PT/1/A/4200/1H, Equipment Hatch Leak Rate Test
- ** PT/1/A/4200/1N, VP Valve Leak Rate Test
- * PT/1/A/4252/007, CA System Turbine Driven Train Performance Test
- PT/1/A/4250/004C, Turbine OPC and Mechanical Overspeed Trip Test
- PT/1/A/4250/004I, Pre-Startup Turbine Testing

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

The inspectors reviewed PIP M-04-N664, Failure of Valve INI-184B, B containment sump isolation valve to determine the root cause and significance of the issue.

b. Findings

.1 Failure to Adequately Correct Configuration Discrepancies for ECCS Sump Valve

Introduction: A Green non-cited violation (NCV) of 10 CFR 50 Appendix B, Criterion XVI, Corrective Action, was identified for failure to take adequate corrective action to resolve a deviation from the as-designed configuration for the B train containment spray suction isolation valve actuator (1NS-1B). The deviation prevented the train B common emergency core cooling system containment sump isolation valve (1NI-184B) to the residual heat removal and containment spray systems from opening when actuated from the valve's main control board switch.

Description: On March 20, 2004, a self-revealing finding was identified when Unit 1 valve 1NI-184B, the "B" train Containment Sump Isolation valve on the common suction header to both the residual heat removal and containment spray systems, failed to stroke from the main control board during a valve stroke timing test. During troubleshooting activities, it was discovered that an interlock on the valve actuator add-on-pak (AOP) for containment spray suction isolation valve 1NS-1B was not actuated to provide a permissive signal for valve 1NI-184B to open. The licensee's investigation identified, through review of work orders, that during a valve actuator change out for valve 1NS-1B in 1993, the AOP for the valve actuator was initially installed. During that installation, the wiring configuration for AOP switch 1AS2 on 1NS-1B, which provides the permissive signal to 1NI-184B, was changed from that specified in the drawing. The

wiring change apparently compensated for a cam that was not in the appropriate position to actuate the normally open 1AS2 contact. Collectively, these two conditions allowed for normal functioning of the valve from the main control board switch. Neither a corrective action document nor a drawing change to document the new configuration in the design documents were initiated.

On January 7, 2003, maintenance was performed on 1NS-1B, per Work Order 98550460, to anneal the AOP cams. While performing this work, the technicians noticed the as-found condition did not agree with the drawings. According to documentation in the work order, the technicians rolled the Add-On-Pak cam 180 degrees to agree with the as-designed wiring configuration drawing for contact 1AS2, unaware that the installed wiring configuration had been changed in 1993. This action disabled the manual operation of valve 1NI-184B from the main control room. Neither the as-found deviation nor the as-left configuration were documented in the licensee's Corrective Action Program for investigation nor were design document changes initiated. Also, a functional test was not performed to confirm that the change had not affected the function of the valve.

Analysis: The failure of the common containment sump isolation valve (1NI-184B) for the residual heat removal and containment spray system to manually stroke from the main control board switch is significant if the automatic suction switch-over function from the refueling water storage tank to the containment sump does not work. In that case, the emergency procedures require the operators to manually perform the switch-over using the main control board switches. While performing an evaluation of this finding, it was recognized that on January 23, 2003, a freeze event had occurred rendering the Unit 1 automatic function of swapping over from the refueling water storage tank to the containment sump inoperable for several hours (LER 369/03-01) during the same time that the manual switch-over deficiency existed. Consequently, the finding was greater than minor because the availability and reliability of the recirculation function for the Mitigating System Cornerstone emergency core cooling system and the Barrier Integrity Cornerstone containment spray system was affected. A Phase 3 analysis, which was performed by the regional Senior Reactor Analyst for the January 23, 2003 freeze event, assumed a loss of both the refueling water storage tank level instrumentation and manual operation of 1NI-184B. The Phase 3 analysis bounded the conditions discussed in this finding. Thus, due to the short time interval for the loss of the automatic function concurrent with the loss of the manual control board function, and availability of a redundant train, the finding was determined to be of very low safety significance.

Enforcement: 10 CFR 50 Appendix B, Criterion XVI states, in part, that measures be established to assure that conditions adverse to quality are promptly identified and corrected. Further, in the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition. Contrary to the above, the licensee failed to take adequate corrective actions to resolve a deviation between design drawings and actual field configuration in that the field configuration affecting the safety function for 1NI-184B was changed twice without correcting the design drawings between 1993 and March 2004. Changes were documented only in Work Orders and not in the licensee's Corrective Action Program. Since this violation is of very low safety significance, and has been entered into the Corrective Action Program as PIP M-04-01664, this failure to

adequately resolve these deviations is being treated as an NCV in accordance with Section VI.A.1 of the NRC Enforcement Policy: NCV 05000369/2004004-03, Failure to Adequately Correct Configuration Discrepancies for ECCS Sump Valve.

.2 Failure to Establish Adequate Test Conditions During Surveillance Testing of Ice Condenser Lower Inlet Doors

Example1: Failure to control lower containment environmental conditions

Introduction: A Green non-cited violation was identified by the NRC inspectors for performing a surveillance test on the ice condenser lower inlet doors in uncontrolled environmental conditions resulting in obtaining inaccurate data.

Description: On March 22, 2004, during performance of surveillance procedure PT/0/A/4200/032, Periodic Inspection of Ice Condenser Lower Inlet Doors, the inspectors observed the torque pull test which implements, in part, TS Surveillance Requirement 3.6.13.5 to ensure the inlet doors have not become stuck in the closed position. Midway through the performance of the pull test on the 24 door pairs, the inspector noticed significant increases in recorded torque values. The pull torque on the door pairs had increased from such values as 3.5 - 5 pounds to values recorded at 11 - 14 pounds. The inspector questioned what these increases were attributed to (i.e., friction, door springs). The licensee's investigation determined that the changes in the pull test data were due to changes in containment environment resulting from the air locks cycling, the missile barriers being replaced, and variations in the containment ventilation system. During the accident conditions when the lower inlet doors are needed, all air locks are closed and all missile shields that separate upper and lower containment are in place. The inspector reviewed the procedure and noticed there were no guidelines specifying under what environmental conditions the test should be performed, other than during unit shutdown. The inspector discussed the concern with the licensee to ascertain whether the data being obtained was accurate given the test was not performed under suitable, controlled conditions. The licensee did not have an evaluation demonstrating that uncontrolled environmental conditions (i.e., equipment hatch open, air locks cycling, missile shield replacement, containment purge on/off) under which the test was conducted, were bounded or commensurate with those of which the doors would be needed to perform their safety function.

Analysis: The ice condenser lower inlet doors are the immediate set of doors to open when pressure in lower containment increases due to a loss of coolant accident or steam line break. Air and steam is then directed through the ice baskets to the intermediate and top deck doors. The failure to establish suitable environmental conditions to obtain accurate door torque data is considered more than minor because the function of the ice condenser to maintain containment integrity is adversely affected if the lower inlet doors do not open at the appropriate limits. In addition, these inaccurate values are unreliable in trending for maintenance rule, causal analyses, and operability evaluations. The finding is considered of very low safety significance because albeit the door torque values did significantly increase, the licensee conducted a retest under the appropriate accident configuration after returning to cold shutdown (approximately 5 days later) and all values were found to be within acceptable limits.

Enforcement: 10 CFR 50 Appendix B, Criterion XI, Test Control, states, in part, that tests shall be established to assure structures, systems, and components will perform satisfactorily in accordance with written procedures, and that the test is performed under suitable environmental conditions. TS Surveillance Requirement 3.6.13.5 requires that the Ice Condenser lower inlet doors opening pull force be verified within limits. Contrary to the above, prior to March 22, 2004, the licensee failed to establish an adequate procedure for testing of the lower inlet doors in that the procedure did not include provisions to assure the test is performed under suitable environmental conditions. The failure to control the test environment as required by 10 CFR 50 Appendix B, Criterion XI, is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy and is identified as Example 1 of NCV 05000369/04-04-04: Failure to establish adequate test conditions during surveillance testing of Ice Condenser lower inlet doors - 2 Examples. This issue is in the licensee's Corrective Action Program as PIP M-04-02131.

Example 2: Preconditioning of Lower Inlet Doors Prior To Surveillance Testing

Introduction: A Green non-cited violation was identified for performing preventative maintenance prior to the Lower Inlet Ice Condenser doors surveillance test which resulted in unacceptable preconditioning.

Description: On March 22, 2004, the inspectors observed implementation of procedure PT/0/A/4200/032, Periodic Inspection of Ice Condenser Lower Inlet Doors (LID), which, in part, measures initial opening torque forces for the doors per the Technical Specifications. In Step 12.2 of the procedure, it instructs personnel to perform LID preventative maintenance by removing any ice, frost, or debris from around, between, above, or below the doors that may have resulted from previous outage maintenance activities. In addition, it instructs to clean the door seals with Isopropyl alcohol and lubricate the hinges with Neolube. During the test, the inspectors questioned whether cleaning the door seals and lubrication of the door hinges constituted preconditioning as described in NRC Inspection Manual, Part 9900,Technical Guidance on Maintenance - Preconditioning of Structures, Systems, and Components before Determining Operability. The technical guidance states that, "except where there is a need to protect personnel or prevent equipment damage, preventative maintenance should not be performed before TS surveillance testing." Cleaning the lower inlet door seals and lubricating the hinges, performed as preventative maintenance immediately prior to the TS surveillance test, represents unacceptable preconditioning because performing these maintenance steps is not necessary to prevent door damage due to testing.

Analysis: The ice condenser lower inlet doors are the immediate set of doors to open when pressure in lower containment increases due to a Loss of Coolant Accident or steam line break. Air and steam is then directed through the ice baskets to the intermediate and top deck doors. Performing maintenance prior to the surveillance test has the potential to mask the as-found condition of the lower inlet doors and result in the inability to verify operability of the doors as required by TS Surveillance Requirement 3.6.13.5. This, in turn, affects the equipment operability and function objectives of the Barrier Integrity Cornerstone, thus this finding is greater than minor. The finding was determined to be of very low safety significance because the licensee performed an

as-found visual inspection of the lower inlet doors at initial cold shutdown and had not found any degraded conditions that would affect lower inlet door operability.

Enforcement: 10 CFR Part 50, Appendix B, Criterion XI, Test Control, states, in part, that tests shall be established to assure structures, systems, and components will perform satisfactorily in accordance with written procedures which incorporate the requirements and acceptance limits contained in design documents. In addition, the test is to be performed under suitable environmental conditions. Contrary to the above, the licensees' preventative maintenance activities on the lower inlet doors, prior to performing the Tech Specification surveillance requirement represented a failure to test under suitable conditions, in that, cleaning the door seals and lubricating the hinges changed the conditions under which the equipment will be required to perform its intended function. The failure to adequately test the lower inlet doors under suitable conditions as required by 10 CFR 50 Appendix B, Criterion XI is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy and is identified as Example 2 of NCV 05000369/04-04-04: Failure to establish adequate test conditions during surveillance testing of Ice Condenser lower inlet doors - 2 Examples. This issue is in the licensee's Corrective Action Program as PIP M-04-02788.

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 modifications satisfied the requirements of 10 CFR 50, Appendix B, Criterion III, Design Control.

- MGTM-0316, Gag 2B diesel generator room fire damper closed until actuator can be repaired
- MGTM-0302, Leak repair valve 2NI-465, drain valve off of safety injection line to reactor coolant loop 2

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP4 Emergency Action Level and Emergency Plan Changes

a. Inspection Scope

The inspectors reviewed the changes made to 04-01 of the Radiological Emergency Response Plan (RERP), dated March 1, 2004, against the requirements of 10 CFR 50.54(q) to determine whether any of the changes decreased the effectiveness of the RERP.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation

a. Inspection Scope

The inspectors observed an emergency preparedness drill conducted on April 28 to verify licensee self-assessment of classification, notification, and protective action recommendation development in accordance with 10 CFR 50, Appendix E. The drill involved a loss of coolant accident.

The inspectors also observed an emergency preparedness drill conducted on May 13 to verify licensee self-assessment of classification, notification, and protective action recommendation development in accordance with 10 CFR 50, Appendix E. The drill involved a fire in the 1A diesel generator voltage regulator, a failure of the control rods to trip, and a loss of coolant accident.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstones: Occupational Radiation Safety and Public Radiation Safety

2OS1 Access Control To Radiologically Significant Areas

a. Inspection Scope

Access Controls During the weeks of March 8, 2004, and March 22, 2004, licensee activities for controlling and monitoring worker access to radiologically significant areas and tasks associated with the Unit 1, End-of-Cycle16 Refueling Outage (1EOC16) were evaluated. The inspectors evaluated changes to and adequacy of procedural guidance, directly observed implementation of established administrative and physical radiological controls, appraised radiation worker and technician knowledge of and proficiency in implementing radiation protection activities, and assessed radiation worker (radworker) exposures to radiation and radioactive material.

The inspectors directly observed controls established for workers and Health Physics Technician (HPT) staff in airborne radioactivity area, radiation area, high radiation area (HRA), extra-high radiation area (EHRA), and very high radiation area (VHRA) locations. Controls and their implementation for EHRA keys and for storage of irradiated material within the spent fuel pools were reviewed and discussed in detail. Evaluated 1 EOC16 tasks included under reactor vessel inspection, reactor head removal and flood-up, valve maintenance, fuel movement, steam generator (S/G) maintenance, cavity decontamination, and spent filter and radioactive waste (radwaste) handling and storage. The inspectors attended pre-job briefings, and reviewed radiation work permit

(RWP) details to assess communication of radiological control requirements to workers. Occupational worker's adherence to selected RWPs and HPT proficiency in providing job coverage were evaluated through direct observations and interviews with licensee staff. Electronic dosimeter (ED) alarm set points and worker stay times were evaluated against area radiation survey results with a focus on S/G maintenance activities and tasks in areas where dose rates could change significantly as a result of plant shutdown and refueling operations. Worker exposure as measured by ED and by licensee evaluations of skin doses resulting from discrete radioactive particle or dispersed skin contamination events during current 1EOC16 activities were reviewed and assessed independently. For HRA tasks involving significant dose gradients, e.g., under-vessel inspection and S/G maintenance, the inspectors evaluated the use and placement of dosimetry to monitor worker exposure. In addition, radiological controls and resultant personnel exposure data for fuel rod straightening activities conducted in January 13 - 17, 2004, were reviewed and discussed in detail with cognizant licensee representatives.

Postings for access to radiologically controlled areas (RCAs) and physical controls for the Unit 1 (U1) reactor building (RB) and for U1 and Unit 2 (U2) auxiliary building (AB) locations designated as EHRAs and VHRAs were evaluated during facility tours. The inspectors independently measured radiation dose rates or directly observed conduct of licensee radiation surveys and results for U1 reactor building pressurizer relief tank equipment and in-core sump access area, U2 AB radioactive waste storage areas and demineralizer sluice line. Results were compared to current licensee surveys and assessed against established postings and radiation controls.

Licensee controls for airborne radioactivity areas with the potential for individual worker internal exposures of greater than 30 millirem (mrem) Committed Effective Dose Equivalent (CEDE) were evaluated. For selected RWPs identifying potential airborne areas associated with refueling activities, e.g., cavity flood-up following reactor head lift and S/G maintenance, the inspectors evaluated the implementation and effectiveness of administrative and physical controls including air sampling, barrier integrity, engineering controls, and postings. Licensee identification and assessment of potential radionuclide intakes by workers between January 1, 2003, through March 23, 2004, were reviewed and evaluated.

Radiation protection activities were evaluated against Updated Final Safety Analysis Report (UFSAR), Technical Specifications (TS), and 10 Code of Federal Regulations (CFR) Parts 19 and 20 requirements. Specific assessment criteria included UFSAR Section 11, Radioactive Waste Management, and Section 12, Radiation Protection; 10 CFR 19.12; 10 CFR 20, Subpart B, Subpart C, Subpart F, Subpart G, Subpart H, and Subpart J; TS Sections 5.4.1, Procedures, and 5.7, HRA Controls; and approved procedures. Radiological controls for fuel rod degassing and straightening activities were evaluated against details specified in Amendment No. 198 to Facility Operating License Nuclear Production Facility (NPF)-17 for the McGuire Nuclear Station (MNS) U2 dated August 4, 2003. Detailed procedural guidance and records review for this inspection area are listed in the Attachment to this report.

Problem Identification and Resolution Licensee CAP documents associated with access control to radiologically significant areas were reviewed and assessed. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with Nuclear System Directive (NSD) 208, Problem Investigation Process, Revision 12. Licensee Problem Investigation Process (PIP) documents associated with access controls, personnel monitoring instrumentation, and personnel contamination events were reviewed. Licensee PIP documents reviewed and evaluated in detail during inspection of this program area are identified in the Attachment to this report .

b. Findings

Introduction: Two examples of a Green non-cited violation of TS 5.4.1(a) were identified for failure to properly implement approved procedures for radiological controls.

Description:

- Example 1 During review of radiation controls and their effectiveness for 1EOC16 activities, the inspectors noted that on March 16, 2004, approximately six individuals became contaminated as result of improper configuration and installation of ventilation exhausting from the primary side of the U1 'A' and 'D' S/Gs. Specifically, high-efficiency particulate airborne (HEPA) prefilters initially were not installed in the ventilation equipment (COPUS fan unit) as specified to prevent transfer of contamination from the S/G bowls nor was the hose manifold properly connected to the lower containment charcoal auxiliary ventilation units in lower containment. This improper ventilation configuration/installation resulted in significant contamination being dispersed within lower containment and subsequent unintended personnel contaminations and intakes.

- Example 2 The inspectors noted that for air samples collected during the initial S/G maintenance activities, the licensee failed to conduct alpha analysis of particulate air samples as specified in the ALARA pre-planning work sheets. Review of followup surveys and analyses determined the presence of alpha emitting radionuclides to be negligible. Licensee followup of personnel contamination event (PCE) data for the affected individuals indicated that all external and internal doses resulting from the unintended exposures to the contaminated materials were significantly below regulatory limits.

Analysis: The inspectors determined that each of these examples was greater than minor in that the failure to follow radiation protection procedural requirements resulted in the uncontrolled dispersal and subsequent unexpected external and internal worker exposures from radioactive particulates materials in lower containment. Further, the failure to have initial air samples analyzed for alpha emitting radionuclides negatively impacted the licensee's ability conduct a timely and thorough evaluation of radiological hazards associated with the personnel exposures. These examples were associated with the equipment and the program and process attributes of the Occupational Radiation Safety Cornerstone and affected the cornerstone objective to protect occupational workers from exposure to radiation. The finding was evaluated using the Occupational Radiation Safety Significance Determination Process (SDP). Each

example was determined to be of very low safety significance because all individuals were monitored for exposures from external contamination, followup evaluations for potential alpha emitting radionuclides indicated negligible contributions to worker dose, and none of the affected individuals exceeded either internal or external exposure limits.

Enforcement: TS Section 5.4.1(a) requires procedures, including those for personnel radiation protection, to be prepared consistent with the requirements of Regulatory Guide 1.33, Rev. 2, Appendix A, February 1978. Contrary to the above, on March 16, 2004, the licensee failed to follow the Duke Power Company System ALARA Manual, Rev. 14, which requires implementation of ALARA work plan documents and pre-job briefing details. Specifically, the licensee failed to establish proper ventilation system equipment configuration and failed to monitor for alpha emitting radionuclides associated with 1EOC16 S/G maintenance activities. Because the failure to follow the approved procedures is of very low safety significance and has been entered into the Corrective Action Program as PIP document numbers M-04-01500 and M-04-01746, this violation is being treated as an non-cited violation, consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 05000369/2004004-05, Failure to establish proper engineering and monitoring controls during 1EOC16 S/G maintenance activities.

2OS2 ALARA Planning and Controls

a. Inspection Scope

As Low As Reasonably Achievable (ALARA) During the weeks of March 8, 2004, and March 22, 2004, the inspectors reviewed ALARA program guidance and its implementation for ongoing 1EOC16 job tasks. The inspectors evaluated the accuracy of ALARA work planning and dose budgeting, observed implementation of ALARA initiatives and radiation controls for selected jobs in-progress, assessed the effectiveness of source-term reduction efforts, and reviewed historical dose information.

Projected dose expenditure estimates detailed in ALARA planning documents were compared to actual dose expenditures and noted differences were discussed with cognizant ALARA staff. Changes to dose budgets relative to changes in job scope were also discussed. The inspectors attended pre-job briefings and evaluated the communication of ALARA goals, RWP requirements, and industry lessons-learned to job crew personnel. The inspectors also reviewed ALARA procedural guidance and the minutes from a 2004 ALARA committee meeting.

The implementation and effectiveness of ALARA planning and program initiatives during work in progress was evaluated. The inspectors made direct field or closed-circuit-video observations of work activities involving reactor head lift and flood-up, S/G maintenance and eddy current test (ECT) activities, valve maintenance, and shielding operations. For the selected tasks, the inspectors evaluated radworker and HPT job performance, extent of management oversight, individual and collective dose expenditure versus percentage of job completion, surveys of the work areas, appropriateness of RWP requirements, and adequacy of implemented engineering controls. The inspectors

interviewed radworkers and job sponsors regarding understanding of dose reduction initiatives and their current and expected final accumulated occupational doses at completion of the job tasks.

Implementation and effectiveness of selected program initiatives with respect to source-term reduction were evaluated. Shutdown chemistry program actions and cleanup initiatives, and their effect on U1 RB and AB area dose rates, were compared to previous refueling outage trending data. The effectiveness of selected shielding packages installed for the current outage was assessed through reviews of survey records and comparison to expected planning data. Cobalt reduction initiatives for U1 valve maintenance and replacement activities were reviewed and discussed.

The plant collective exposure history for calendar years (CY) 2000 through CY 2002, based on the data reported to the NRC pursuant to 10 CFR 20.2206 (c), was reviewed and discussed with licensee staff, as were established goals for reducing collective exposure. Dose rate trending data for selected in-plant monitoring points were reviewed and compared to previous years. The inspectors reviewed procedural guidance for and examined dose records of three declared pregnant workers to evaluate current gestation dose.

ALARA program activities and their implementation were reviewed against 10 CFR Part 20, and approved licensee procedures. In addition, licensee performance was evaluated against Regulatory Guide (RG) 8.8, Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Stations will be As Low As Reasonably Achievable; RG 8.10, Operating Philosophy for Maintaining Occupational Radiation Exposures As Low As is Reasonably Achievable; and RG 8.13, Instruction Concerning Prenatal Radiation Exposure. Procedures and records reviewed within this inspection area are listed in the Attachment to this report.

Problem Identification and Resolution. Licensee CAP documents associated with ALARA activities were reviewed and assessed. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with NSD 208, Problem Investigation Process, Rev. 12. The inspectors also discussed post-job reviews with licensee supervisors and evaluated whether issues were appropriately entered in the CAP. Specific self-assessments and PIP documents reviewed in detail for this inspection area are identified in the Attachment to this report.

b. Findings

Introduction: The NRC identified a Green self-revealing finding (FIN) for the failure to use and to implement adequate engineering controls to effectively manage the radioactive contamination source term during 1EOC16 S/G ECT activities

Description: As part of the planned preventative maintenance work for the 1EOC16 refueling outage, the licensee performed full or partial ECT on each of the four S/Gs. This work involved inserting ECT probes into individual S/G tubes to check for tube cracking or degradation. During previous outages, the licensee noted that as the probe drive and data communication cables were withdrawn from the S/G tubes, the contaminated equipment transferred significant quantities of radioactive material from

the S/G tubing onto the platform work areas. To control and mitigate this transfer of contamination from the S/Gs during 1EOC16, the licensee implemented an ALARA initiative, with modifications, which had been successfully used during previous outages. Specifically, a stationary ring of brushes enclosing and contacting the probe cables was installed directly beneath the S/G tube sheets to remove (scrub) contamination by friction from the equipment prior to it being withdrawn from the S/G bowls. The current modification included an enclosure around the brushes to further contain and control the contamination. In addition, the licensee plans identified the use of felt pad scrubbers as a backup to the brushes for contamination controls if the brushes proved to be ineffective.

During the initial days of 1EOC16 ECT activities which began March 16, 2004, an unexpected amount of radioactive contamination, consisting of powdery activated cobalt radionuclides, was discovered on the 'A' and 'D' S/G work platforms and ECT equipment. This contamination raised general area dose rates to levels approximately 10 times higher than expected. The licensee's initial evaluation determined that as configured, the inside diameter of the brush ring was too large to adequately scrub the equipment cables as they were withdrawn from the tubes. Replacement brushes were requested from the vendor, but upon their receipt, licensee representatives determined that the inside dimensions of the replacement brush rings were highly variable and did not provide effective contamination control. Further, the inspectors noted that the backup scrubber equipment was not available at the beginning of the ECT activities and did not arrive onsite until a few days prior to the end of the task evolution on March 28, 2004. Installation of the backup equipment at that time was deemed inappropriate from a dose savings perspective. Licensee representatives initiated additional contingency plans including installation of an another scrubber on the probe cable outside the S/G bowls, but in front of the pinch wheels, to reduce ECT equipment contamination. This contingency action was minimally effective because the newly installed scrubber brushes did not make sufficient contact with the contaminated cables to prevent excessive contamination of the equipment.

For completion of the task on March 28, 2004, the licensee reported a final dose expenditure of 48.808 person-rem relative to the 8.73 person-rem originally budgeted. The inspectors noted that the task's dose expenditure goals were re-estimated on March 19, 2004, and again on March 23, 2004, with the work continuing even though inadequate contamination control equipment was still in use and backup equipment was not available until the end of the task. Further, the inspectors noted that although the dose expenditure had exceeded the original budgeted amount early in the task, no MNS ALARA Committee review and proposed actions regarding source term control and contamination controls were documented during the extensive ECT activities.

Analysis: The inspectors determined that this finding is a performance deficiency because licensees are expected to have programs to ensure proper operation of contamination control equipment prior to use and to have backup equipment on site and ready for use as specified in their ALARA planning documents. The finding was more than minor because it affected the Occupational Radiation Safety Cornerstone objective attribute of having adequate equipment for source term control. The subject engineering controls, if properly designed and/or implemented, would have further reduced the excessive particulate contamination transferred onto the S/G platforms and

contributed to mitigating the unplanned cumulative dose received by workers conducting/supporting ECT activities. The identified issue was assessed using the Occupational Radiation Safety SDP, and based on the licensee's three-year average collective dose of less than 135 person-rem per unit, the finding was determined to be of very low safety significance (Green). The inspectors noted that other licensee-initiated dose minimization activities were implemented effectively including use of state-of-the-art bubble suits, frequent cleaning of contaminated equipment, and use of teledosimetry and remote HP coverage. In addition, individual worker doses were being reviewed and administrative dose extensions were issued in accordance with established procedures.

Enforcement: The inspectors determined that no violation of TS or 10 CFR Part 20 requirements occurred because the initial contamination controls were implemented resulting in some limited reduction in S/G platform contamination, criteria have not been established for the effectiveness of the control initiatives, and individual worker doses were tracked and monitored appropriately. This finding has been entered into the licensee's Corrective Action Program under PIP number M-04-01629. The finding is identified as FIN 50-369/2004004-06: Failure to implement/use adequate engineering controls to effectively manage the radioactive contamination source term during 1EOC16 S/G ECT activities.

2PS2 Radioactive Material Processing and Transportation

a. Inspection Scope

Waste Processing and Characterization The inspectors reviewed and discussed the currently installed radioactive waste (radwaste) processing system as described in the UFSAR Section 11. In addition, stored and disposed radwaste types and quantities as documented in Effluent Release Reports for CYs 2002 and 2003 were discussed with responsible licensee representatives.

During the week of March 22, 2004, the operability and configuration of selected liquid and solid radioactive radwaste processing systems and equipment were evaluated. Inspection activities included document review, interviews with plant personnel, and direct inspection of processing equipment and piping. The inspectors directly observed equipment material condition and configuration for liquid and solid radwaste processing systems. The radwaste processing equipment was inspected for general condition and licensee staff were interviewed regarding equipment function and operability. The licensee's policy regarding abandoned radwaste equipment was reviewed and discussed with cognizant licensee representatives. Chemistry staff were interviewed to assess knowledge of radwaste system processing operations. Procedural guidance involving transfer of resin and filling of waste packages was reviewed for consistency with the licensee's Process Control Program (PCP) and UFSAR details.

Licensee radionuclide characterizations of each major waste stream were evaluated. For dry active waste (DAW), primary resin, secondary resin, and filters, the inspectors evaluated PCP and licensee procedural guidance against 10 CFR 61.55 and the Branch Technical Position (BTP) on Radioactive Waste Classification details. Part 61 data and scaling factors were reviewed and discussed with licensee representatives for radwaste

processed or transferred to licensed burial facilities for the January 1, 2003, through March 23, 2004 period. The licensee's analyses and current scaling factors for quantifying hard-to-detect nuclides were assessed. The inspectors discussed potential for changes in plant operating conditions and reviewed selected DAW waste stream radionuclide data to determine if known plant changes were assessed and radionuclide composition remained consistent for the period reviewed.

Transportation The inspectors evaluated the licensee's activities related to transportation of radioactive material. The evaluation included review of shipping records and procedures, assessment of worker training and proficiency, and direct observation of shipping activities.

The inspectors assessed shipping-related procedures for compliance to applicable regulatory requirements. Selected shipping records were reviewed for completeness and accuracy, and for consistency with licensee procedures. Training records for individuals qualified to ship radioactive material were checked for completeness. In addition, training curricula provided to these workers were assessed. On March 24, 2004, the inspectors observed the loading, bracing, and placarding; and independently reviewed radiation and contamination survey results applicable to transport of surface-contaminated equipment. The inspectors directly observed radiation surveys of the boxes and the transport vehicle being prepared for shipment. Responsible staff were interviewed to assess their knowledge of package radiation and contamination controls and applicable limits.

Transportation program guidance and implementation were reviewed against regulations detailed in 10 CFR 71, and 49 CFR 170-189 and applicable licensee procedures listed in the Appendix to this report. In addition, training activities were assessed against 49 CFR 172 Subpart H, and the guidance documented in NRC Bulletin 79-19.

Problem Identification and Resolution Licensee CAP documents associated with radwaste processing and transportation activities were reviewed and assessed. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with NSD - 208, Problem Investigation Process, Rev. 12. Specific assessments and PIP documents reviewed in detail for this inspection area are identified in the Attachment to this report.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification

a. Inspection Scope

.1 Reactor Safety

For the reactor safety performance indicators (PIs) listed below, the inspectors sampled licensee PI data for the period from April 2003 through March 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 - Auxiliary Feedwater System (Units 1 and 2)
- Safety System Unavailability - Emergency AC Power (Units 1 and 2)

To verify the PI data, the inspectors conducted interviews with the system engineers, reviewed control room logs, system engineering databases, TS Action Item Log entries, and maintenance rule data for the aforementioned time frame. The inspectors also reviewed the licensee's corrective action system to assess the licensee's ability to identify and correct problems.

Barrier Integrity Cornerstone

- Reactor Coolant System Leak Rate Performance Indicator (Units 1 and 2)

The inspectors reviewed surveillance performance results for RCS identified leakage contained in the licensee's operator logs (Technical Specification Surveillance Requirement 3.4.13.1) and compared the highest value for each month to the value reported by the licensee.

.2 Radiation Safety

Occupational Radiation Safety (OS) Cornerstone

The inspectors reviewed Occupational Radiation Safety PI data collected from January 1, 2003, through December 31, 2003, for the Occupational Radiation Safety Cornerstone. For the reviewed period, the inspectors assessed CAP records to determine whether HRA, VHRA, or unplanned exposures, resulting in TS or 10 CFR 20 non-conformances, had occurred during the review period. In addition, the inspectors reviewed selected personnel contamination event data, internal dose assessments, and Unusual Dosimetry Occurrence (UDO) records documented from January 1, 2003, through March 23, 2004. Reviewed documents relative to this PI are listed in the Attachment to this report.

Public Radiation Safety (PS) Cornerstone

The inspectors reviewed the RETS/ODCM Radiological Effluent Release Occurrences PI results for the Public Radiation Safety Cornerstone from January 1, 2003, through December 31, 2003. For the review period, the inspectors reviewed data reported to the NRC, procedural guidance for reporting PI information, and PIP reports documented in Section 4OA1 of the Attachment to this report. In addition, the inspectors reviewed out-of-service effluent monitor logs, compensatory sampling records, and selected effluent release permits.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems

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.

.1 Annual Sample Review

a. Inspection Scope

The inspectors selected for detailed review PIP M-03-05559, associated with over pressurization of the control room ventilation chiller condenser that caused a divider plate leak. The over pressurization occurred during performance of a nuclear service water super flush to reduce the effects of fouling. 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.

b. Observations and Findings

No findings of significance were identified.

.2 Cross-References to PI&R Findings

Two issues associated with problem identification and resolution were identified in this report. The first was associated with fire protection in section 1R05 and is the sixth example of a weakness in identification of problems in the fire protection area as described in Inspection Report 05000369/370/2004003. The second issue involves emergency lighting battery test failures as identified in section 1R12. Problems with the emergency lighting battery system maintenance rule performance monitoring criteria

was identified in PIP M-03-6181 in a fall 2003 maintenance rule assessment. Corrective actions had not yet been implemented because the significance of the issue was not recognized.

.3 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 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 January 2004 through June 2004, 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 4th quarter 2003 and 1st quarter 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. Observations and 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 by the inspectors during the six month period. The first trend involved the identification of fire protection problems (five examples were previously documented in Inspection Report 05000369/370/2004003 and a sixth example is documented in section 1R05 of this report.) These six examples of NRC identified problems constitute a trend in the identification of problems in the fire protection area that has existed for an extended period of time despite the licensee's performance of self-assessments and audits of fire protection.

The second example involved a trend of emergency lighting system 8-hour battery failures discussed in section 1R12 of this report. The trend on battery failures was 34% in 2001, 13.5% in 2003, and 18.4% in 2004. The emergency lighting supports the operation of the standby shutdown system during a fire event. The trend of battery failures was not being adequately evaluated under maintenance rule or the corrective action program to ensure that operator actions would not be impacted. Although the aforementioned maintenance rule issue is associated with the emergency lighting system exceeding the performance criteria (20%), the functional failure criteria did not

appear to be related to the safety function provided (emergency lighting for operator actions during a fire). Consequently, the failure rate appeared to be more significant in relation to the safety function than how the maintenance rule data characterized it, i.e. one functional failure verses the number of operator actions that might not be able to be performed because of failed batteries. The licensee opened PIPs for these two trends (M-04-1140 and M-04-2837). The emergency lighting trend is also related to fire protection.

4OA5 Other Activities

.1 Independent Spent Fuel Storage Installation (ISFSI) Radiological Controls

a. Inspection Scope

The inspectors conducted independent gamma and neutron surveys of the ISFSI facility and compared the results to previous quarterly surveys. The inspectors also observed and evaluated implementation of radiological controls and discussed the controls with HPT and HP supervisory staff. Protocols for transporting loaded casks to the ISFSI facility were discussed and evaluated.

Radiological control activities for ISFSI areas were evaluated against 10 CFR Part 20, 10 CFR Part 72, and applicable licensee procedures. Documents reviewed are listed in the Attachment to this report .

b. Findings

No findings of significance were identified.

.2 (Closed) TI 2515/153, Reactor Containment Sump Blockage (NRC Bulletin 2003-01)

a. Inspection Scope

The inspectors observed activities associated with the inspection of the Unit 1 and Unit 2 containment sumps in response to NRC Bulletin 2003-01. The guidelines for the inspection are provided in NRC temporary instruction (TI) procedure 2515/153, “Reactor Containment Sump Blockage (NRC Bulletin 2003-01).” The inspectors reviewed the licensee’s responses to the bulletin, dated August 7, 2003, and May 27, 2004. Because McGuire was an Option 2 plant, the inspectors verified that the interim compensatory measures were completed by the committed dates or were in the corrective action program with due dates commensurate with the licensee’s bulletin response.

The inspection included a review of foreign material exclusion (FME) control procedures for containment, assessment of previous containment closeout inspections performed in response to NEI 02-01, “Condition Assessment Guidelines: Debris Sources Inside PWR Containments,” and resident inspector conducted walk-downs of upper and lower containment. Discussions were also held with contractor representatives and other licensee personnel. The inspectors also performed a visual inspection of the exterior of the emergency sump and containment to verify the licensee had identified and evaluated any potential debris that could degrade the function of the sump. The

activities and documents listed below were examined to verify licensee compliance with regulatory requirements and gather information to help the NRC staff identify possible further regulatory positions and generic communications.

Specifically, the inspectors reviewed:

- PT/1&2/A/4600/003/F, Containment Cleanliness and ECCS Operability Inspection
- NSD 104 Material Condition/Housekeeping, Cleanliness/Foreign Material
- Results of Unit 1 containment cleanliness and ECCS operability inspection
- Results of Unit 2 containment cleanliness and ECCS operability inspection (IR 05000369,370/2003005)

b. Findings

TI 2515/153 Reporting Requirements:

For Units that entered refueling outages (RFOs) after August 31, 2002, and subsequently returned to power:

1.1 Was a containment walkdown to quantify potential debris sources conducted by the licensee during the RFO?

During the Unit 1 RFO Cycle 15 (October 2002) and Unit 2 RFO Cycle 15 (September 2003), walkdowns were conducted by the licensee prior to heating up to Mode 4 to identify, document, and evaluate any debris found in upper and lower containment which could adversely affect the function of the ECCS containment sump. Per NEI 02-01, "Condition Assessment Guidelines: Debris Sources Inside PWR Containments," a spreadsheet outlining FME and insulation volume found in containment was made. The data described how much insulation was available for each system and its location in containment. In addition, a coatings inspection is performed every outage. The inspection results from the previous RFO 14 for both units was used to assess the coatings for the NEI inspection. The assessment included a review of the design basis for the sump, historical debris sources, high energy break locations and other design basis transients, and transport calculations. The inspectors independently walked down containment, after QC acceptance, prior to Unit startup for each unit per Inspection Procedure 71111-20, including the guidance from this Temporary Instruction.

1.2 Did the walkdowns conducted check for gaps in the sump's screened flowpath and for major obstructions in containment upstream of the sumps?

The emergency core cooling system engineer conducted inspections of the sump (PIP M-04-1385 for Unit 1) and focused on the ability of the sump to perform its intended function, i.e. the condition of the screens and the screen supports (including gaps), the condition of the sump structure including piping, and whether any significant amounts of boron were in the sump. Since McGuire is an ice condenser containment with the sump outside the polar crane wall, the containment cleanliness walkdowns verified that the many holes in the crane

wall, designed to allow flow from lower containment in the reactor coolant system loop area to the sump, were free from loose debris. The inspectors verified that these walkdowns were effective by independently walking down the containment per Inspection Procedure 71111-20. The inspectors also reviewed digital pictures from the licensee's inspections of both unit's sumps. The pictures documented both the as-found and as-left condition from inside and outside the sumps.

1.3 Are any advanced preparations being made at the present time to expedite the performance of sump-related modifications, in case it is found to be necessary after performing sump evaluation?

The licensee performed inspections during the Unit 1 refueling outage 16 to assess space available in the event that containment sump area increase is warranted.

.3 (Closed) URI 05000369, 370/2003007-06: Methods of Reactor Coolant System Pressure Control During SSF Operation

One of the concerns of this unresolved item was to determine if the pressurizer heater capacity powered from the standby shutdown facility (SSF) was adequate to compensate for pressurizer heat losses in a post-fire shutdown condition. To resolve this question, calculations were made by the inspectors of the pressurizer heat losses and compared to the available heater capacity. The calculation applied a factor to account for realistic heat leakage paths. (One reference used in determining this factor was a 1982 report by the Electric Power Research Institute (NP-2694)). The calculation indicated, that assuming as-designed pressurizer insulation performance, that the 70 kW heater capacity powered from the SSF would offset pressurizer heat losses, thus allowing pressure and level to be maintained in the normal post-trip band. The inspectors reviewed copies of functional test data sheets representing objective evidence that the 70 kW heater capacity was fully operational. No documentation was reviewed by the inspectors which indicated a degradation in pressurizer insulation performance.

Another issue identified in the URI related to the concept of using the "water-solid pressurizer" method to shutdown the plant from the SSF as an alternative to controlling pressurizer level and pressure in the normal manner (i.e., maintaining a steam bubble in the pressurizer). This concern stemmed from the fact that the operating procedure for the SSF provided guidance on this method of shutdown. The inspectors reviewed the shutdown procedure, AP/1/A/5500/024, "Loss of Plant Control Due to Fire or Sabotage," and found that the procedure was adequate and did not routinely establish a "water-solid pressurizer ." The conclusion of the inspector was that the procedure guidance was for beyond-the-design basis situations and as such did not represent a violation of any requirements. This unresolved item is closed.

4OA6 Meetings, Including Exit

.1 Quarterly Exit Meeting

On June 17, 2004, 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.

.2 Annual Assessment Meeting Summary

On April 15, 2004, the NRC's Chief of Reactor Projects Branch 1 and McGuire Senior Resident Inspector met with Duke Energy to discuss the NRC's Reactor Oversight Process and the McGuire Nuclear Station annual assessment of safety performance for the period of January 1, 2003 - December 31, 2003. The major topics addressed were the NRC's assessment program and the results of the McGuire assessment. Attendees included McGuire site management and members of site staff. No members of the public or local news media attended.

This meeting was open to the public. The presentation material used for the discussion is available from the NRC's document system (ADAMS) as accession number ML041890600. ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

4OA7 Licensee-Identified Violations

The following violation of very low safety significance (green) was identified by the licensee and is a violation of NRC requirements which met the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for disposition as an non-cited violation.

10 CFR 20.1501(a)(1) requires surveys be made to comply with the regulations in 10 CFR Part 20. Contrary to the above, on August 4, 2003, transport package confirmation dose rate surveys identified a maximum contact dose rate of approximately 2000 millirem per hour (mrem/hr) for a bag of hot particle trash which was significantly above the original October 2, 2002 radiation surveys of the material which documented a maximum contact dose rates of approximately 150 mrem/hr. The inadequate dose rate surveys resulted in the improper interim storage of waste and, if shipped, would have resulted in the waste processor exceeding guidelines for receipt of radioactive waste. This event is documented in the licensee's CAP as PIP number M-03-03355. This item is of very low safety significance since the inaccurate survey results did not compromise other high radiation controls, and did not result in any significant unintended exposures to personnel.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

Black, D., Security Manager
Boyle, J., Training Manager
Bradshaw, S., Superintendent, Plant Operations
Bramblett, J., Chemistry Manager
Brown, S., Manager, Engineering
Bryant, J., Regulatory Compliance Engineer
Crane, K., Technical Specialist
Brenton, D., Shift Operations Manager
Evans, K., Manager, Mechanical and Civil Engineering (MCE)
Harrall, T., Station Manager, McGuire Nuclear Station
Helms, S., Supervisor of Operations Training
Johansen, R., Mechanical System Engineer
Kammer, J., Manager, Safety Assurance
Loucks, L., Radiation Protection Manager
Murray, K., Site Emergency Prepardness Manager
Orton, A., Manager of Operations Training
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

R. Haag, Chief, Reactor Projects Branch 1
J. Shea, Project Manager, NRR
R. Martin, Project Manager, NRR

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000369,370/2004004-01	NCV	Failure to update fire strategy plans when a modification removed numerous extinguishers. (Section 1R05)
05000370/2004004-02	NCV	Failure to Monitor the Emergency Lighting System under 10 CFR 50.65a(1). (Section 1R12)
05000369/2004004-03	NCV	Failure to Adequately Correct Configuration Discrepancies for ECCS Sump Valve. (Section 1R22)
05000369/2004004-04	NCV	Failure to establish adequate test conditions during

		surveillance testing of Ice Condenser lower inlet doors, 2 Examples. (Section 1R22)
05000369/2004004-05	NCV	Failure to establish proper engineering and monitoring controls during 1EOC16 S/G maintenance activities. (Section 2OS1)
05000369/2004004-06	FIN	Failure to implement/use adequate engineering controls to effectively manage the radioactive contamination source term during 1EOC16 steam generator eddy-current testing activities. (Section 2OS2)

Closed

TI 2515/153		Reactor Containment Sump Blockage (NRC Bulletin 2003-01). (Section 4OA5.2)
05000369, 370/2003007-06	URI	Methods of Reactor Coolant System Pressure Control During SSF Operation. (Section 4OA5.3)

LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

Partial System Walkdown

Spent Fuel Pool Cooling	Drawing: MCFD 1570-01.01
Residual Heat Removal	Diagram: MCFD-2561-01.00
Control Room Ventilation	Drawings MCS-1578-1.0 and MCS-1578-2 DBD: MCS-1578.VC-00-0001
Emergency Diesel Generator	Drawings: MCFD-1609.01.00, MCFD-1609.02.01, MCFD-1609.03.01

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

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

UFSAR Sections
2.4.10, Flooding Protection Requirements
3.4, Water Level (Flood) Design

Design Basis Documents
MCS-1465.00-00-0012, Design Basis Specification for Flooding From External Sources, Rev 1

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

Other Documents:
PM Work Order 98615023, inspect WY sump pumps

Section1R07: Heat Sink Performance

Procedures:
MP/0/A/7700A013, Component Cooling System Heat Exchanger Corrective Maintenance, Rev. 7: performed 3/17/04 for 1B KC HX
OP/1/A/6400/006, Enclosure 4.9, KC Heat Exchanger Flush and Realignment: performed 11/1/03 for 1B KC HX high velocity flush; 11/2/03 for 1B KC HX super flush

Calculations:
MCC-123.24-00-0072, RN/KD Heat Exchanger Tube Plugging Analysis
MCC-123.24-00-0075, RN/KC Heat Exchanger Tube Plugging Analysis

PIPs:
M-03-02356, Evaluate Catawba PIP C-02-5052 for applicability regarding rapid fouling of KC heat exchangers resulting in emergent work

Other documents:
Digital pictures of 1A KD heat exchanger inlet and outlet end and associated piping taken during 1EOC16
Digital pictures of 1B KC heat exchanger inlet and outlet end and associated piping taken during 1EOC16
Duke Power Generic Letter 89-13 response dated 9/30/1996
UFSAR section 9.2.2, Nuclear Service Water System and Ultimate Heat Sink
Framatome ANP- BOP Eddy Current Team: Preliminary Eddy Current Inspection Report dated 3/22/04

Section 1R08: Inservice Inspection (ISI)

NDE-10, General Radiography Procedure, Rev. 22
NDE-25, Magnetic Particle Examination, Rev. 21
NDE-35, Liquid Penetrant Examination, Rev. 19
NDE-330, Evaluation Program Manual, Rev. 1
NDE-600, UT Examination of Similar Metal Welds in Ferritic or Austenitic Piping, Rev. 15
NDE-640, Ultrasonic Examination Using Longitudinal Wave and Shear Wave, Straight Beam Techniques, Rev. 21
CFR-80, Steam Generator Tube Integrity Assessment, McG U-1, Calc: MCC-1201.37-00-0074, 10/10/01
Eddy Current Acquisition Guidelines for Duke Power Company's CFR80 Steam Generators, Rev. 10

Eddy Current Analysis Guidelines for Duke Power Company's CFR80 Steam Generators, Rev. 5
SGMEP-105, CFR-80 Specific Assessment of Potential Degradation Mechanisms, Rev. 5
NSD-104, Material Condition/Housekeeping, Cleanliness/Foreign Material Exclusion and Seismic Concerns, Rev. 22

Section1R11.2: Licensed Operator Requalification

OP-MC-ASE-04, RCS Leak with a failure of Containment Spray.
OP-MC-ASE-12, Main Steam Line Break with a failure of an MSIV from closing.
OP-MC-ASE-17, Large LOCA with AUTO SI failure.
OP-MC-ASE-31, Large Steam Break on the "D S/G with a failure of one MSIV to close.
OP-MC-ASE-34, LOCA due to Ejected Rod.
OP-MC-ASE-45, LOCA outside of containment.
OP-MC-JPM-PS-NV:123A, Establish Charging Flow.
OP-MC-JPM-CA-SA: 217, Manually Fail Open 2SA-48ABC and 2SA-49AB.
OP-MC-JPM-CP-AD:129T, Transfer Control of Unit 2 to SSF-SSF Building Actions.
OP-MC-JPM-SS-VI:091, Start "E" Instrument Air Compressor.
OP-MC-JPM-SS-VI:162, Perform an Emergency Manual Start of "G" VI Compressor.
OP-MC-JPM-CNT-VX:178, Start the 1 "A" Hydrogen Analyzer.
OP-MC-JPM-GEN-IPB:190T, Restart a Unit 2 IPB Fan following a "2A" Fan Busline Lockout (86A)
OP-MC-CNT-VP, Containment Purge System (VP) Lesson Plan, Revision 15
OMP 2-2, Conduct of Operations
OMP 4-3, Use of Abnormal and Emergency Procedures.
Work Request OAC-0136, dated August 8, 2000
Work Request OAC-0198, dated December 8, 2003
SDR 20000151, Actual Loss of 1 EKVA at McGuire, dated May 29, 2000
SDR 20040027, Video Repeat Problem, dated April 4, 2004
MTP 2701.0, Simulator Configuration Management and Operating Limits, Revision 3
Simulator/MNS1 Differences
MTP 2201.0, Management Oversite of Training Programs
MTP 4116.1, Licensed Requalification Program
MTP 5405.0, Operations Examination Development, Validation, and Security
PIP, Conflict Between MSN EP Guidance and NEI Performance Indicator Guidance, 5/27/2004
LOR 3-04 D, Licensed Requal Annual Written Exam, Shift D
LOR 3-04 C, Licensed Requal Annual Written Exam, Shift C
SPT/A/T/11, Simulator Periodic Transient Test Transient 11, Reactor Trip, Revision 6 06/04-25-00/TST/A0
SPT/A/T/11, Simulator Periodic Transient Test Transient 11, Reactor Trip, Revision 7 07/04-03-03/TST/A0
D.2, Real Time Periodic Certification Test
NSD 509, Site Standards in Support of Operational Focus
NSD 512, Maintenance of RO/SRO NRC Licenses
PIP # M-03-01991, Operation Managements audit of 2002/2003 Licensed Operator Reactivation paperwork.

PIP # M-03-03681, Document results of the 2003 Licensed Operator Requalification Exam.
PIP # M-04-2669, Findings of 2004 MNS Operations Licensed Reactivation Audit.
PIP # M-04-02844, Clarification of issues related to power change reactivity manipulations used in license applications in accordance with 10 CFR 55.31.
PIP # M-04-02917, Findings concerning an invalid Critical Task (CT) identified following the evaluation of an operating crew during annual LOR examinations.

Section1R12: Maintenance Effectiveness

Maintenance Rule: SSC Summary Sheets
M-00-02502, Various high temperature alarms were received during 2 B D/G Operability test
M-00-05047, D/G room temperatures drop during complex plan activities
M-04-00293, 1 A D/G room temperature fell below SLC temperature of 55 deg F
M-04-00825, 1 A D/G room temperature fell below SLC temperature of 55 deg F
M-02-06029, While performing Emergency Lighting Annual Test, multiple lights were burned out with no replacement lights available
M-04-06181, Maintenance Rule Program Group Assessment
W.O. 98521715, PT 2ELDLPXXX1, Test Emergency Lighting Unit 2, 12/16/02
W.O. 98142932, PT 1ELDLPXXX1, Test Emergency Lighting Unit 1, 10/27/99
W.O. 98384233, PT 1ELDLPXXX1, Test Emergency Lighting Unit 1, 9/24/01
W.O. 98488545, PT 1ELDLPXXX1, Test Emergency Lighting Unit 1, 8/30/02
W.O. 98370310, PT 2ELDLPXXX1, Test Emergency Lighting Unit 2, 02/12/01
IP/0/B/3260/028, SSS Emergency Lighting Battery Discharge Test, Rev. 05

PIPs Generated For This Inspection
M-04-02837, Engineering review of ELD system Maintenance Rule functions
M-04-02981, The ELD system has not been adequately monitored per 10 CFR 50.65, the Maintenance Rule
M-04-02983, The Unit 2 ELD system requires classification as a(1) status due to exceeding the ELD.02 performance criteria

Section1R13: Maintenance Risk Assessments and Emergent Work Evaluation

PIPs Generated For This Inspection
M-04–2126, Steam Generator PORV 2SV-19 leaking to atmosphere.

Section1R14: Personnel Performance During Nonroutine Plant Evolutions

MCEI-0400-46, McGuire 1 Cycle 17 Core Operating Limits Report , Rev. 27

Section1R20: Refueling and Outage Activities

MCEI-0400-41, “McGuire 1 Cycle 17 Final Core Map,” Rev. 11
PT/0/A/4150/033, “Core Verification,” Rev. 15
PT/0/A/4150/033, “Total Core Reloading,” Rev. 43

MP/2/A/7150/073, “Rod Cluster Control Assembly Heavy Drive Rod Unlatching and Latching,” Rev. 14
OP/1/A/6100/003, Controlling Procedure For Unit Operation, Rev. 116
OP/1/A/6100/001, Controlling Procedure For Unit Startup, Rev. 178
OP/1/A/6100/SO-3, Draining the Refueling Cavity, Rev. 21
PT/0/A/4150/028, Initial Criticality and Zero Power Physics Testing, Rev. 46
PT/0/A/4150/009, NCS Dilution with Shutdown Banks Inserted, Rev. 12
PT/0/A/4600/002G, Incore and Nuclear Instrumentation System Recalibration, Rev. 37
MCEI-0400-46, Unit 1 Cycle 17 Core Operating Limits Report, Rev. 27
PT/1/A/4200/006B, Boron Injection Valve Lineup Verification
NSD 403, Shutdown Risk Management (Modes 4,5,6 and No Mode per 10 CFR 50.65(a)(4)
1EC16-Risk Management Plan (RMP)-02
1EC16-Risk Management Plan (RMP)-04
OP/1/A/6100/SU-1, Mode 6 and Core Alterations Checklist
OP/1/A/6100/SU-3, Mode 5 Checklist
OP/1/A/6100/SU-6, Venting the NC System

PIPs reviewed identification and resolution of problems:
M-04-1802, Significant Schedule Change and PORC for 2 mid-loop orange periods during 1EOC16 outage

PIPs generated for this inspection:
M-04-1786, Mid-loop time longer than needed due to lack of coordination on drain down and maintenance ready to remove nozzle dam.
M-04-1808, Evaluate response to GL 88-17 item #1 on OE training on Diablo Canyon event
M-04-2073, Several items identified in containment by NRC walkdown
M-04-2131, NRC resident & MNT observed changes in data during Ice Condenser LID surveillance test
M-04-2159, Paint chips found on top of A-D S/G domes under grating

Section 1R22: Surveillance Testing

MP/0/A/7150/169, Ice Condenser Walk-down and Inspection, Rev. 001
MP/0/A/7150/006, Ice Condenser Lower Inlet Doors Inspection and Testing, Rev. 19 (CNS)
M-02-03314, Engineering Review and OE from the Ice Condenser Working Group meeting on 7/2/02
M-02-03634, Operating Experience discussed at the Ice Condenser Utility Group Meeting at DC Cook
C-02-03527, Need to review procedure MP/0/A/7150/006, Ice Condenser LID Testing and Corrective Maintenance, to determine if procedure incorporates adequate threshold for PIP initiation
NRC Information Notice 97-16, Preconditioning of Plant SSC Before ASME Code Inservice Testing or TS Surveillance Testing
Technical Guidance Part 9900, Maintenance-Preconditioning of SSC Before Determining Operability, 9/28/98

PIPs generated for this inspection:
M-04-2131, NRC resident & MNT observed changes in data during Ice Condenser LID surveillance test
M-04-02788, The NRC residents are questioning if maintenance activities that are performed on the lower inlet doors of the ice condenser are preconditioning activities, and if so, are they acceptable

Section 1EP4: Emergency Action Level and Emergency Plan Changes

McGuire Nuclear Site Emergency Plan, Revision 04-01
EPIP Index, R44SR/0/B/2000/003, Activation of the Emergency Operations Facility, R12
SR/0/B/2000/004, Notification to States and Counties from the Emergency Operations Facility, R07
RP/0/A/5700/000,Classification of Emergency, R10
RP/0/A/5700/001, Notification of Unusual Event, R20
RP/0/A/5700/002, Alert, R20
RP/0/A/5700/003, Site Area Emergency, R20
RP/0/A/5700/004, General Emergency R20
RP/0/A/5700/012,Activation of the Technical Support Center (TSC), R24
RP/0/A/5700/018, Notifications to the State and Counties from the TSC, R13
RP/0/B/5700/029, Notifications to Offsite Agencies From The Control Room, R1

Section 2OS1: Access Controls to Radiologically Significant Areas (71121.01)

Procedures, Manuals, and Guidance Documents

Health Physics (HP) Procedure HP/1/B/1006/009, Controls for Reactor Building Entry Under Power, Revision (Rev.) 3
HP/1/B/1006/012, Controls for Radiological Status and Areas of Radiological Significance, Rev. 13
HP/0/A/3007/009 B, Movable Incore Detector Thimble Retraction and Insertion, Rev. 27,
RPMP 7-5, Radiation Protection Risk Assessment Process, Rev. 004
Shared Health Physics (SH) Procedure SH/0/B/2001/002, Investigation of Unusual Dosimetry Occurrence or Possible Over Exposure, Rev. 3
Radiation Work Permit (RWP) 1242, Unit 1 (U1) Reactor Building (RB): Under Vessel Inspection for Boron Degradation in Incore Sump Room (Inspection Only), Rev. 0
RWP 1243, U1 RB: Insulation Remove/Replace for Boron Degradation Inspection in the Incore Sump Room, Rev. 0
RWP 1244, U1 RB: Scaffold Installation/Replacement for Boron Degradation Inspection in the Incore Sump Room, Rev. 0
RWP 1701, U1 RB; Steam Generator (S/G) Primary Manway Removal/Replacement & Diaphragm Replacement on ‘A’ S/G, Rev. 1
RWP 1705, U1 RB; S/G Diaphragm Removal on ‘A’ S/G, Rev. 9
RWP 1709, U1 RB; S/G Eddy Current Test (ECT) in ‘A’ S/G Platform Work, Rev. 9

RWP 1725, U1 RB; Reactor Head Detension, Remove/Replace, & Tension Reactor Head Studs, Rev. 10
RWP 2234, Unit 2 (U2) Auxiliary Building (AB): All Work Associated With (AWAW) Spent Fuel Rod Degassing/Straightening, Rev. 0
Amendment 198 to Facility Operating License NPF-17 for the McGuire Nuclear Station (MNS) Unit 2, and Safety Evaluation Related to Amendment No. 198 to Facility Operating License NPF-17, Duke Energy Corporation, MNS U2, Docket 50-370, Issued August 4, 2003

Licensee Records and Data

Maximum Individual Dose Per Department (Work Group) CY 2003
Maximum Individual Dose (Electronic Dosimeter Data) for January 1, 2004, through March 23, 2004
Personnel Contamination Event Records: CY 2003 and January 1, 2004
Worker Dose Card History Report Data for RWP Nos. 1700, and 1709 - 1713, For Radiologically Controlled Area Entries Made Between 03/01 - 23/04.
Personnel Contamination Summary Personnel Contamination Event (PCE) Nos. 03-022, completed 09/13/03; 03-023,completed 9/13/03; 03-026 completed 09/15/03; 03-054 completed 9/23/03; and 03-066, completed 11/6/03
Survey Data Sheet, Unit 1 (U1) 733 foot Elevation (‘ Elev) Room 731, VCT Hallway, 3/13/04
Survey Data Sheet, U1 Incore Room, 3/06/04
Air Sample Results for Incore Room Initial Decontamination, Insulation Removal, and Inspection Activities between 3/06/04 through 03/06/04
Air Sample Results for U2 SPF Spent Fuel Rod Degassing/ Straightening Activities between 1/14/04 through 01/15/04

Corrective Action Program (CAP) Documents

McGuire Problem Investigation Process (PIP) Document Number (M-) 03-03917, Radiation Protection (RP) Evaluate Use of ST2 as an Additional Barrier to Incore Detector Movement (1EOC16 and 2EOC15), 09/04/2003
M-03-04220, Higher Than Expected Dose Rates Observed at the Extra High Radiation Area (EHRA) Boundary Established for Fuel Movement, 09/12/03
M-03-02867, RP Shift Person Failed to Wear Self-Reading Dosimetry Within the Radiolocially Controlled Area (RCA), 06/30/03

Section 2OS2: As Low As Reasonably Achievable

Procedures, Manuals, and Guidance Documents

Duke Power Company System ALARA Manual, Rev. 14
Maintenance Directive 3.11, Cobalt Control Procedure for Valves and Valve Related Maintenance, Rev. 1
SCM-9, Optimized CRUDBurst Program, Rev. 4
MCM 5.3, Unit Shutdown in Primary Chemistry, Rev. 25
SH/0/B/2002/003, Declared Pregnant Worker, Rev. 1

OP/1/A/6100/SO-2, Filling the Refueling Cavity, Rev. 17
Nuclear System Directive 208, Problem Investigation Process, Rev. 12

Licensee Records

ALARA Planning Worksheet, 1EOC16 CV Team Work on 1NV-124, 3/4/04
ALARA Planning Worksheet, 1EOC16 CV Team Work on 1NC-27 & 1NC-29, 3/4/04
ALARA Planning Worksheet, 1EOC16 S/G Eddy Current Testing, 3/7/04
1EOC16 S/G Eddy Current Testing Re-Estimation, 3/23/04
ALARA Planning Worksheet, 1EOC16 Rx Bldg: Install/Remove Temporary Shielding, 2/26/04
ALARA Planning Worksheet, 1EOC16 Rx Head Removal & Replacement, 2/24/04
Steam Generator ALARA Plan, 1EOC16 McGuire Nuclear Station, 1/19/04
1EOC16 Cavity Decon Plan, Rev. 0
Lesson Plan RP-MC-RFT-260, Mururoa Delta Suit, Rev. 0
ALARA Committee Meeting Minutes From 2/11/04
U1 'D' S/G Channel Head Survey, 3/15/04
U1 'A' S/G Channel Head Survey, 3/15/04
1NV-459 Post-Shielding Survey, 3/7/04
U1 Lower Containment Initial Entry Survey, 3/6/04
U1 PRT Post-Shielding Survey, 3/9/04
'D' S/G Platform Airborne Survey, 3/17/04
'A', 'C', and 'D' S/G Platforms Eddy Current Contamination Survey, 3/24/04
U1 Upper Containment Airborne Survey - Head Movement, 3/10/04
RWP 1728, Rx Head Lift, Rev. 2
RWP 1247, 1NV-459 Valve Work, Rev. 0
RWP 1709, U1 Rx Bldg S/G's: ECT in 'A' S/G Platform Work, Rev. 12
RWP 1712, U1 Rx Bldg S/G's: ECT in 'D' S/G Platform Work, Rev. 5
Temporary Shielding Request 108, Pressurizer Relief Tank Shield Wall
1EOC16 CRUDburst - Reactor Coolant System CRUDburst Cleanup Curve, March 2004
1EOC16 CRUDburst - U1 ND Pump Rooms, Dose Rate vs. Time After Shutdown, March 2004
PCE Nos. 04-64, 04-85, 04-63, 04-60, 04-59, 04-58, 04-62
Minor Modification No. MGMM14091(valve replacement), 7/15/03
Minor Modification No. MGMM14166 (valve replacement), 9/7/03
U1 E.733' Mechanical Penetration Room Dose Rate Trends, 3/23/02 - 3/7/04

Corrective Action Program Documents

PIP M-04-01500, Improper S/G Ventilation Setup Resulted in 6 PCEs, 3/17/04
PIP M-03-05886, 2EOC15 ALARA Assessment of Valve Work, 12/09/03
PIP M-02-01671, Stellite Reduction Program May Not be Aggressive in Some Areas, 3/25/02
PIP M-04-01629, S/G Primary Side Maintenance Creates Significant Radiation Exposure Challenges, 3/21/04
PIP M-03-04784, Activate Corrosion Products Create Significant Dose and Contamination Problems During 2EOC15, 9/29/03
PIP No. 04-01197, Increased Dose in Lower Containment Due to Leak-by Through 1NI-76A And 1NI81, 3/10/04

Assessment No. GO-03-002(NPA)(RP)(ALL), Radiation Protection Functional Area Evaluation, 2/17/03 - 2/27/03

Section 2PS2 Radioactive Material Processing and Transportation

Procedures, Manuals, and Guidance Documents

Duke Power Company, Nuclear Generating Department, McGuire Nuclear Station, 10 CFR Waste Classification and Waste Implementation Program, 2/25/04
Duke Energy, Radioactive Waste Process Control Program, Rev. 14, 11/20/03
Appendix B, MNS Process Control Program, Rev. 16, 3/26/03
Appendix D, Approved Suppliers of PCP Services, Rev. 1, 3/23/04
Appendix G, Waste Processor Checklist, 12/18/02
Appendix H, Licensee Initiated Changes, Rev. 1, & Rev. 2,
MNS, 10 CFR 61 Manual, Rev. 7, 2/25/04
HP/0/B/1004/026, Waste Handling and Segregation, Rev. 5
HP/0/B/1006/011, Procedure for Changing, Logging, Segregating and Storing Radioactive Filters, Rev. 8
HP/0/B/1009/025, Offsite Radiological Transportation Incident, Rev. 4
Radiation Work Permit (RWP) 5024, Unit 1 & 2 Auxiliary Building Removal and Replacement of Radioactive Filters/Strainers (Including Vacuum HEPAs), Rev. 3

Licensee Records

Annual Radioactive Effluent Release Report, Attachment 2, Solid Waste Disposal Report for Calendar Year (CY) 2002, submitted 4/10/2003
Annual Radioactive Effluent Release Report , Attachment 2, Solid Waste Disposal Report for CY 2001, submitted 4/27/2002,
Procedure Process Record, HP/0/B/1006/011, for Floor Drain Tank Filters 'A' and 'B' completed 3/10/04
McGuire Nuclear Station (MNS) Survey Data Sheets for Floor Drain Tank 'A' and 'B' Activities including Auxiliary Building 760 foot Elevation (' Elev.) Filter Bunker Room 818, conducted 3/10/04 and Filter and Transfer Cart Equipment located in the AB 760 ' Elev, 03/10/04
Memorandum To File, McGuire Nuclear Site, Use of Current 10 CFR 61 Scaling Factors for DAW, 06/13/02
Radioactive Shipment Record (RSR) No. 03-01, Radioactive Material, Surface Contaminated Object, 7, Un 2913, dated 1/7/03
RSR no. 03-04, Radioactive Material, Low Specific Activity (LSA) n.o.s., 7, UN 2912, Fissle Excepted RQ-Radionuclides , Dry Active Waste (DAW) and De-watered Mechanical Filters, 2/21/03
RSR no. 03-16, Radioactive Material, LSA, n.o.s., 7, UN 2912, DAW, LSA II, 08/12/03
RSR no. 04-05, Radioactive Material, Surface Contaminated Object, 7, UN2913, 03/24/04

Corrective Action Program Documents

General Office (GO) Assessment Number GO-03-63 (NPA)(Contam Waste (All), Long Term Storage and Disposal of Contaminated Waste Assessment, conducted at MNS 9/22-25/03

PIP M-04-0988, Incorrect Inventory Noted for 60 Gallon High Integrity Container (MNS Container Number 98-8) Recently Shipped for Processing, 03/02/04

PIP M-04-00246, Waste Processor Canceled Receipt of Scheduled Spent Filter Shipment, 01/16/04
PIP M-03-05129, Corrective Actions for Contaminated Waste Assessment, 10/16/2003
PIP M-03-02657, Americium-241 Source Returned to Manufacturer, Not Accounted For On Shipment Manifest, 06/12/03
PIP M-03-01194, Error Situation Likely Exists Due to User Configured Material Type in the RAMSHP Module of RADMAN Computer Program, 03/13/2003
PIP M-03-01076, Type A Container Obtained from Vendor Received With Degraded Gasket Seal and Is Not Acceptable for Transport of Radioactive Material, 03/06/03
PIP M-03-00956, Documentation of Radiation Protection Group Assessment RP-SA02-18, Radiation Protection Support Functions Unit 1 End of Cycle15 Lessons Learned, 10/24/02 through 10/29/02.

4OA1 Performance Indicator Verification

Cumulative Dose Commitment Data Sheet, 12/01/03 through January 1, 2004.
Weekly Out of Service Log of Effluent Monitoring Equipment, January 1, 2003 through December 31, 2003.
Miscellaneous Sampling and Activity Record Logs for the U1 Plant Vent, March 21 -23, 2003
Miscellaneous Sampling and Activity Record Logs for the U2 Plant Vent, March 14 -24, 2003
Procedure Process Record PT/0/B/4600/025, Cumulative Offsite Dose from Liquid and Gaseous Effluents for December 2003, 02/28/04
PIP M-04-01055, Failure to Reset Unit 1 EMF 14 Trip Setpoints Following System Work on February 17, 2004, 03/04/04
PIP M-03-05019, Incorrect Tritium Protocol Used for October Unit 1 VQ Sample, 10/09/2003
PIP M-03-01531, Unplanned Gaseous Release Through Unit 1 Vent on 11/21/02 Not Evaluated for PORC Review Per SLC 16.13.3 Requirements, 04/02/2003
PIP M-03-02828, Low Levels of Tritium Identified in the Weekly Chemistry Sample of the WZ Sump C, 06/25/03
PIP M-04-02803, Unavailability for calibration of 2CAPS 5360 and 5012 had not been counted in NRC April 2004 PI data
PIP M-03-05419, A Work Order resulted in extended inoperability time for 2B Diesel Generator

Section 4OA5.1: Other Activities

RPMP 7-8, Maintaining Radiation Control Zones (RCZs) Associated with Independent Spent Fuel Storage Installation (ISFSI), Rev. 001
Quarterly Routine ISFSI Surveys, 1st Quarter 2003 - 1st Quarter 2004
PIP 01-02252, Loaded Cask Alarmed S/G Radiation Monitor in Route to the ISFSI, 5/3/01
PIP M-03-2662, NRC Commitments of NRC Bulletin 2003-01
PIP M-04-1385, As-found condition of Unit 1 ECCS Sumps for 1EOC16
PIP M-03-00473, Documented results of NEI Sump Debris Inspection for 1EOC15
PT/2/A/4600/003 F, Containment Cleanliness and ECCS Operability Inspection
Training Records for licensed operators and Emergency Coordinators.

Work Order 98592120, Access unit 2 ECCS Sump & Inspect Sump and Piping
Licensee responses to NRC Bulletin 2003-01 dated August 7, 2003 and May 27, 2004

PIP M-04-02983, Unit 2 ELD system requires classification as “A(1)” status due to exceeding performance criteria

Section 4OA5.3: Other Activities

Procedures

AP/2/A/5500/024, Loss of Plant Control Due to Fire or Sabotage, Rev.20

Specifications

DPS 1206.13-00-0001, Heat Insulation for Reactor Building Piping and Equipment, Rev. 1

Calculations

MCC-1223.03-00-0048, Determination of Pressurizer Heater Capacity Powered from the SSF Diesel, Rev. 0
OSC-3144, Pressurizer Heater Losses [Oconee plant], Rev. 2

Miscellaneous

Letter from Westinghouse Electric Corporation to Duke Power Company, on the subject of Estimated NSSS Heat Losses Inside Containment, dated November 5, 1976

Report NP-2694, by Electric Power Research Institute, titled Control of Containment Air Temperature: An Industry Survey and Insulation Test, pages 3-1 through 3-9, dated October 1982

Work Order 98607974-01, to perform Periodic Test PT-1/A/4150/017A, Pressurizer Heater Capacity Measurement, on 9/18/03 Unit 1

Work Order 98613869-01, to perform Periodic Test PT-2/A/4150/017A, Pressurizer Heater Capacity Measurement, on 10/24/03 Unit 2

LIST OF ACRONYMS

1EOC16	Unit 1, End-Of-Cycle 16 Refueling Outage
AB	auxiliary building
ALARA	As Low As Reasonably Achievable
AOP	Add-On Pack
ASME	American Society of Mechanical Engineers
BTP	Branch Technical Position
CA	Auxiliary Feedwater
CAP	Corrective Action Program
CEDE	Committed Effective Dose Equivalent
CFR	Code of Federal Regulations
CY	calendar year
DAW	dry active waste
ECCS	Emergency Core Cooling System
ECT	Eddy Current Test
ED	electronic dosimeter
EHRA	extra high radiation area
ELD	emergency lighting system
EOC	End-Of-Cycle
ESF	Engineered Safeguards Feature
FIN	Self-Revealing Finding
FME	Foreign Material Exclusion
HEPA	High Efficiency Particulate Air
HPT	Health Physics Technician
HRA	high radiation area
HX	Heat Exchange
ICM	Interim Compensatory Measures
ISFSI	Independent Spent Fuel Storage Installation
ISI	In Service Inspection
KC	Component Cooling Water
KD	Diesel Generator Water Cooler
LER	Licensee Event Report
LID	Lower Inlet Doors
MGTM	McGuire Temporary Modifications
MNS	McGuire Nuclear Station
MWO	Maintenance Work Order
mrem/hr	millirem per hour
NCV	non-cited violation
ND	Residual Heat Removal
NDE	Non-Destructive Examination
NEI	Nuclear Energy Institute
NI	Safety Injection
NIST	National Institute of Standards and Technology
no.	number
NOED	Notice of Enforcement Discretion
NOUE	Notice of Unusual Event

NPF	Nuclear Production Facility
NS	Containment Spray
NSD	Nuclear System Directive
NV	Chemical and Volume Control
OA	Other Activities
OS	Occupational Radiation Safety
ODCM	Offsite Dose Calculation Manual
PAR	Protective Action Recommendation
PCE	personnel contamination event
PCP	Process Control Program
PI	Performance Indicator
PIP	Problem Investigation Process
PMT	Post-Maintenance Testing
PS	Public Saftey
PT	Liquid Penetrant
PWR	Pressurized Water Reactor
PWSCC	Primary Water Stress Corrosion Cracking
QC	Quality Control
radwaste	radioactive waste
radworker	radiation worker
RB	reactor building
RCA	radiologically controlled area
RCCA	Rod Cluster Control Assembly
RCS	Reactor Coolant System
RCZ	radiation control zone
RFO	Refueling Outages
RERP	Radiological Emergency Response Plan
RETS	Radiological Effluent Technical Specification
Rev.	revision
RF	Fire System
RG	Regulatory Guide
RN	Nuclear Service Water
RTP	Rated Thermal Power
RWP	Radiation Work Permit
SCV	Steel Containment Vessel
SDP	Significance Determination Process
SFP	Spent Fuel Pool
S/G	Steam Generator
SSC	Structures, Systems, Components
SSF	Standby Shutdown Facility
TI	Temporary Instruction
TS	Technical Specifications
U1	Unit 1
U2	Unit 2
UFSAR	Updated Final Safety Analysis Report
UDO	Unusual Dosimetry Occurrence
URI	Unresolved Item

UT	Ultrasonic Testing
VCC	Vertical Concrete Cask
VCT	Volume Control Tank
VHRA	Very High Radiation Area
WA	Work Around
WO	Work Order
YC	Ventilation Chiller