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

July 12, 2000

Duke Energy Corporation
ATTN: Mr. H. B. Barron
Vice President
McGuire Nuclear Station
12700 Hagers Ferry Road
Huntersville, NC 28078-8985

SUBJECT: MCGUIRE NUCLEAR STATION - NRC INSPECTION REPORT 50-369/00-04 AND 50-370/00-04

Dear Mr. Barron:

On June 17, 2000, the NRC completed an inspection at your McGuire facility. The enclosed report presents the results of this inspection. The results of the inspection were discussed on June 29, 2000, with Mr. Jack Peele and other members of your staff.

The inspection was an examination of 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. Within these areas the inspection consisted of a selective examination of procedures and representative records, observations of activities, and interviews with personnel.
Based on the results of this inspection no findings were identified.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/NRC/ADAMS/index.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Charles R. Ogle, Chief
Reactor Projects Branch 1
Division of Reactor Projects

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

Enclosure: (See page 2)
Enclosure: NRC Inspection Report
w/Attached NRC's Revised Reactor

Oversight Process

cc w/encl:
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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos:	50-369, 50-370
License Nos:	NPF-9, NPF-17
Report No:	50-369/00-04, 50-370/00-04
Licensee:	Duke Energy Corporation
Facility:	McGuire Nuclear Station, Units 1 & 2
Location:	12700 Hagers Ferry Road Huntersville, NC 28078
Dates:	April 2 - June 17, 2000
Inspectors:	S. Shaeffer, Senior Resident Inspector M. Franovich, Resident Inspector D. Jones, Senior Radiation Specialist (Section 2OS1)
Approved by:	C. Ogle, Chief, Projects Branch 1 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

McGuire Nuclear Station, Units 1 and 2
NRC Inspection Report 50-413/00-04, 50-414/00-04

The report covers an 11-week period of resident inspection, as well as an inspection by a regional radiation specialist. The significance of issues is indicated by their color (green, white, yellow, red) and was determined by the Significance Determination Process (Inspection Manual Chapter 0609), as discussed in the attached summary of the NRC's Revised Reactor Oversight Process.

There were no safety significant findings during this inspection.

Report Details

Summary of Plant Status:

Unit 1 operated at or near 100 percent power between April 2 and May 24, 2000. On May 25, Unit 1 automatically tripped on a low-low 1C steam generator water level following a failure of the 1EVIA vital inverter output switch. The unit was restarted on May 27 and attained full power on May 28. The unit operated at 100 percent until June 14 when reactor power was reduced to 65 percent to repair a pilot-valve air leak for the main generator 1B output breaker. The unit was returned to 100 percent on June 15. On June 16, reactor power was reduced to 95 percent to replace a servo-card associated with turbine generator throttle valve number 2. The unit was returned to 100 percent power later that day and operated at that power level through the end of the inspection period.

Unit 2 operated at or near 100 percent for the entire inspection period.

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

1R04 Equipment Alignment

a. Inspection Scope

The inspectors conducted partial walkdowns of :

- 1B emergency diesel generator (EDG) system while the 1A EDG system was out-of-service for cylinder head replacement
- 2B EDG system while the 2A EDG was out-of-service for routine maintenance
- Units 1 and 2 auxiliary feedwater (AFW) system suction sources following system manipulation during a Unit 1 reactor trip event
- Fire protection system following fire pump testing

The inspectors assessed conditions such as equipment alignment (i.e., valve positions and breaker alignment) and system operational readiness (i.e., fuel tank levels, water tank levels, and temperature) that could affect operability of these systems.

b. Issues and Findings

No findings were identified.

1R05 Fire Protection

.1 Fire Drill Observations

a. Inspection Scope

On June 7, 2000, the inspectors monitored an unannounced fire drill. The purpose of the inspection was to monitor the fire brigade's use of protective equipment and fire fighting equipment, to verify that fire fighting pre-plan procedures and appropriate fire fighting techniques were used, and to verify that the directions of the fire brigade leader were thorough, clear, and effective. The inspectors also reviewed drill critiques and evaluations to ensure they were critical and identified appropriate areas for licensee followup.

b. Issues and Findings

No findings were identified.

.2 Fire Protection Walkdowns

a. Inspection Scope

To assess the adequacy of the fire protection program implementation, the inspectors conducted numerous tours of a variety of risk significant areas, including: the EDG rooms; battery rooms; vital instrumentation power equipment rooms; and cable spreading rooms. The inspectors checked for the control of transient combustibles and the condition of the fire detection and fire suppression systems. The inspectors also verified that ventilation in the battery rooms was functional and checked during cell charging operations. The inspectors also reviewed the adequacy of design basis information on hydrogen control in these rooms as addressed in calculation MCC-1211.00-00-0042, Rev. 30, Appendix K, Hydrogen Gas Concentration Evaluation.

b. Issues and Findings

No findings were identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

The inspectors observed testing and training for senior reactor operators, reactor operators, and non-licensed operators for procedural use and adherence. The licensee conducted requalification training on a revised Operations Management Procedure 4-1, Use of Operating and Periodic Test Procedures. Classroom and the training flow-loop simulator sessions were observed to determine if the training addressed previous operator performance deficiencies that were noted in an identified adverse trend in human performance.

b. Issues and Findings

No findings were identified.

1R12 Maintenance Rule Implementation

a. Inspection Scope

For the equipment issues described in the Problem Investigation Process reports (PIPs) listed below, the inspectors reviewed the licensee's implementation of the Maintenance Rule (10 CFR 50.65) with respect to the characterization of failures, the appropriateness of the associated a(1) or a(2) classification, and the appropriateness of either the associated a(2) performance criteria or the associated a(1) goals and corrective actions:

PIP Number	Title/Description.
M99-4521	1A containment spray (NS) pump air handling unit failed differential pressure test
M99-4519	Control room ventilation chiller trip
M00-1250	Rotork actuator motor rotor-to-shaft slip condition for valve 1NS03
M00-1816	Main steam pressure switch 1SMPS5211 diaphragm failure
M00-1340	Instrument loop lambda power supply failures. Repetitive failures for a generic plant component
M99-2905	Inadvertent Unit 2 engineered safeguards feature (ESF) actuation of turbine driven auxiliary feedwater (TDAFW) pump during standby shutdown facility (SSF) maintenance and subsequent reactor coolant system (RCS) positive reactivity addition from RCS cooldown

The inspectors also reviewed licensee corrective actions and root cause analysis under PIP M00-1759 to address an incorrect licensee determination that the TDAFW pump was available during in-service testing. This included a review of the calculated maintenance rule unavailability time for the TDAFW pump to ensure it was not significantly affected and that the additional unavailability time did not exceed the system's unavailability limit.

b. Issues and Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

The inspectors reviewed the licensee's control of plant risk and configuration through the review of selected structures, systems, and components (SSCs), listed below, within the scope of the maintenance rule or which were otherwise risk-significant. Emphasizing potential high risk configurations and high priority work items, the inspectors evaluated, (1) effectiveness of the work prioritization and control; (2) level of maintenance support; (3) assessment of integrated risk of the work backlog; and (4) safety assessments and/or management activities performed when SSCs are taken out of service.

PIP Number	Title/Description
M00-1860	Failure of pressure switch 1SMPS5211 affecting plant run back capability
M00-1368	1A isolated phase bus cooling fan trip
M00-1573	No power available for 1B pressurizer heater
M00-2141	B main fire pump relief valve failure due to corrosion
M00-1900	Vital inverter 1EVIA failed output switch
M00-1688	Inadvertent fire protection actuation in the Unit 1 turbine building

b. Issues and Findings

No findings were identified.

1R14 Personnel Performance During Nonroutine Plant Evolutions

.1 Nonroutine Plant Evolution

a. Inspection Scope

Personnel performance in coping with nonroutine evolutions and/or transients was reviewed concerning the following:

PIP Number	Title/Description
M00-1368	1A isolated phase bus cooling fan trip
M00-1688	Inadvertent fire protection actuation in the Unit 1 turbine building

b. Issues and Findings

No findings were identified.

.2 Unit 1 Reactor Trip and Restart Activities

a. Inspection Scope

Licensee performance was evaluated following a May 25, 2000, failure of vital inverter 1EVIA output switch and subsequent reactor trip. The event response was complicated by operator errors that resulted in isolation of the AFW pumps preferred water sources and subsequent automatic ESF actuation of the service water supply valves. (This was discussed in NRC Special Inspection Report 50-369/00-08.) In addition, inspectors evaluated licensee performance during the subsequent May 27, 2000, restart and power ascension.

The inspectors performed a detailed and independent review of risk significant SSC response to the event by using operator logs, plant computer data, alarm logs and/or strip charts, and operator statements. The inspectors also evaluated the licensee's post trip/readiness review for restart. The inspectors evaluated the proposed corrective actions for an NRC identified deficiency in the licensee's post-trip review, which erroneously indicated that no feedwater isolation occurred. Review of operating experience and the root cause for the switch failure were assessed. Associated problem identification and resolution for operator performance, procedural quality, training, and equipment performance were also evaluated.

b. Issues and Findings

An operator performance finding related to following emergency procedures for maintaining AFW sources was identified and discussed in Special Inspection Report 50-369/00-08. No other findings were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed selected operability evaluations affecting risk significant SSCs listed below, to assess the technical adequacy of the evaluations. Where compensatory measures were involved, the inspectors also determined whether the compensatory measures were in place, would work as intended, and were appropriately controlled.

PIP Number	Title/Description
M00-1376	Supplemental walkdowns and analysis supporting steamline break analysis affects on solid state protection system
M00-1559	Unplanned entry into Technical Specifications (TS) for 1NIP5270 (containment sump level) indicating 1.75 feet
M00-1386	Operability reviews for main steam system valve leakage

M00-1816	Failure of pressure switch 1SMPS5211 affecting plant run back capability
M00-1456	SSF diesel generator breaker operability
M00-1750	Degraded Rotork Actuators (motor rotor-to-shaft slip)

a. Issues and Findings

No findings were identified.

1R16 Operator Workarounds

a. Inspection Scope

The inspectors evaluated the selected risk-significant operator workarounds listed below, for potential affects on the functionality of mitigating systems. The workarounds were reviewed to determine: (1) if the functional capability of the system or human reliability in responding to an initiating event was affected; (2) the effect on the operator's ability to implement abnormal or emergency procedures; and (3) if operator workaround problems were captured in the licensee's corrective action program.

- Operator workaround 96-13 concerning AFW suction source monitoring/ dedicated operator for impact of nonsafety-related AFW sources on safety-related AFW pumps.

- Operator workaround 99-07 concerning grid frequency changes that may cause rated thermal power to exceed 100 percent.

b. Issues and Findings

No findings were identified.

1R17 Permanent Plant Modifications

a. Inspection Scope

The inspectors reviewed the following modifications to: (1) verify that the design bases, licensing bases, and performance capability of risk significant SSCs have not been degraded through the modifications; and (2) verify that the modifications performed during risk-significant configurations did not place the plant in an unsafe condition.

Modification Number	Title/Description
MM11046	Cooling supply to 6900 volt switchgear rooms

MM11717	Primary- to-secondary leakage operator aid computer monitor - (This modification provides an audible alarm for increase S/G tube leakage)

b. Issues and Findings

No findings were identified.

1R19 Post-Maintenance Testing (PMT)

a. Inspection Scope

The inspectors reviewed PMT procedures for the equipment below to ensure the equipment was returned to service satisfactorily. The inspectors evaluated the PMT to ensure it properly addressed the work performed.

- 1A EDG system following significant cylinder head replacement activities
- 2A EDG system following routine maintenance
- 1EVIA A.C. output switch replacement
- 2A reactor vessel level indication system deviation concern (PIP M00-1574)
- Troubleshooting of battery switch breaker 2A for EVDD (PIP M00-1659)
- 2B residual heat removal pump lower bearing oil low (PIP M00-1912)

b. Issues and Findings

No findings were identified.

1R22 Surveillance Testing

.1 Routine Surveillance Testing

a. Inspection Scope

The inspectors witnessed surveillance tests and/or reviewed test data of the selected risk-significant SSCs listed below, to assess, as appropriate, whether the SSCs met TS requirements, Updated Final Safety Analysis Report (UFSAR), and licensee procedure requirements. The inspectors also determined if the testing effectively demonstrated that the SSCs were operationally ready and capable of performing their intended safety functions.

- PT/2/A/4350/002A, EDG 2A Operability Test
- PT/2/A/4252/001, Unit 2 AFW Pump Operability Test
- WO 98227169, Battery EVCA Service Discharge Test
- WO 98217093, Fire Pump Surveillance Testing
- 1IPECA9010, Test on Solid Stat Protection System Train A
- WO 98251578, Unit 2 A Train Hydrogen Distributed Ignition System

b. Issues and Findings

No findings were identified.

.2 Inservice Surveillance Testing

a. Inspection Scope

The inspectors also evaluated inservice testing of the Unit 2 turbine driven AFW pump and associated system valves to determine the effectiveness of the licensee's American Society of Mechanical Engineers (ASME) Section XI testing program. The inspectors evaluated compliance with ASME code requirements, reviewed test methods, acceptance criteria, test instrument range/accuracy, and compliance with TS action statements/reporting requirements. The inspectors also verified that corrective actions were taken as applicable.

b. Issues and Findings

No findings were identified.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed the following temporary modifications to determine whether system operability and availability were affected, that configuration control was maintained, and that post-installation testing was performed:

Modification Number	Title/Description
MGTM-0142	Control of valves for chemical cleaning of the main generator stator cooling system

b. Issues and Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation

a. Inspection Scope

On June 7, 2000, the inspectors observed an emergency drill from the control room simulator (CRO). The emergency drill involved activation of the technical support center and emergency operations facility. Operator performance, emergency and abnormal procedure use and adherence, event classifications, drill objectives, post-drill critique, and problem identification and resolution were evaluated. The purpose of the inspection

was to also verify that the licensee conducted an effective emergency drill that demonstrated staff and operator proficiency in responding to an event, as well as identified areas for enhancements.

b. Issues and Findings

No findings were identified.

2. RADIATION SAFETY
Cornerstone: Occupational Radiation Safety

2OS1 Access Control to Radiological Significant Areas

a. Inspection Scope

The inspectors reviewed the procedurally established access controls for high radiation areas (HRAs), extra high radiation areas (EHRAs), and very high radiation areas (VHRAs). Incorporation of those controls into selected radiation work permits (RWPs) typically used for work in those areas was also reviewed. Adherence to RWP specified access controls by radiation workers and radiation protection technicians working at two HRA job sites was observed by the inspectors. The entrances to 14 ERHAs were evaluated for proper locking and posting for the radiological conditions present and the inspector performed independent verification of the dose rates which were recorded on postings at the entrances to three HRAs. The effectiveness of problem identification and resolution for selected access control related issues identified by the licensee during 1999 and 2000 (year to date) was evaluated by the inspectors.

b. Issue and Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Quarterly Performance Indicator Verification

a. Inspection Scope

The inspectors verified the following three Reactor Safety Performance Indicators (PIs) for accuracy. To verify the PI data, the inspectors reviewed monthly operating reports, licensee event reports, control room logs, PIP historical records, and Technical Specification Action Item List entries.

Cornerstone	PI
Initiating Events	Unplanned Scram Rate
Initiating Events	Unplanned Power Changes Per 7,000 Critical Hours

b. Issues and Findings

No findings were identified.

4OA3 Event Followup

a. Inspection Scope

On May 25, 2000, the inspectors responded to a Unit 1 reactor trip. Unit 1 automatically tripped on a low-low 1C steam generator level following the 1EVIA Vital Inverter output switch failure. The inspectors observed operator performance in the control room and verified that timely NRC notifications were made. The inspectors also independently reviewed plant parameters, status of mitigating systems, and condition of fission product barriers. The licensee's preliminary post-trip recovery activities and the failed switch were also observed. The inspectors reported risk factors surrounding the event to the Region II senior reactor analyst for determination of the event's conditional core damage probability.

b. Issues and Findings

Based on preliminary risk assessment and in accordance with Management Directive 8.3, "NRC Incident Investigation Procedures," a special inspection was initiated on May 30, 2000, to gather additional facts and to determine the risk significance of the event findings using the Significance Determination Process. Observations and findings regarding the event followup are discussed in Special Inspection Report 50-369/00-08.

No additional findings were identified.

4OA5 Meetings

The inspectors presented the inspection results to Mr. Jack Peele, Engineering Manager, as well as other members of licensee management and staff, at the conclusion of the inspection on June 29, 2000. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

Barron, B., Vice President, McGuire Nuclear Station
Bradshaw, S., Superintendent, Plant Operations
Byrum, W., Manager, Radiation Protection
Cash, M., Manager, Regulatory Compliance
Dolan, B., Manager, Safety Assurance
Evans W., Security Manager
Geer, T., Manager, Civil/Electrical/Nuclear Systems Engineering
Jamil, D., Station Manager, McGuire Nuclear Station
Patrick, M., Superintendent, Maintenance
Peele, J., Manager, Engineering
Loucks, L., Chemistry Manager
Thomas, K., Superintendent, Work Control
Travis, B., Manager, Mechanical Systems Engineering

NRC

R. Bernhard, Region II Senior Reactor Analyst
W. Rogers, Region II Senior Reactor Analyst

ITEMS OPENED, CLOSED, AND DISCUSSED

None.

LIST OF ACRONYMS USED

AFW	-	Auxiliary Feedwater
ASME	-	American Society of Mechanical Engineering
CA	-	Auxiliary Feedwater
CRO	-	Control Room Simulator
EDG	-	Emergency Diesel Generator
ESF	-	Engineered Safeguards Feature
HRA	-	High Radiation Area
MOV	-	Motor-Operated Valve
NS	-	Containment Spray
PI	-	Performance Indicator
PIP	-	Problem Investigation Process
PMT	-	Post-Maintenance Testing
RCS	-	Reactor Coolant System
RWP	-	Radiation Work Permit
RCS	-	Reactor Coolant System
SSC	-	Selected Structures, Systems, and Components
TDAFW	-	Turbine Driven Auxiliary Feedwater
TS	-	Technical Specifications
UFSAR	-	Updated Final Safety Analysis Report
VHRA	-	Very High Radiation Area

NRC's REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) recently revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting and assessing safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

Reactor Safety	Radiation Safety	Safeguards
● Initiating Events	● Occupational	● Physical Protection
● Mitigating Systems	● Public	
● Barrier Integrity		
● Emergency Preparedness		

To monitor these seven cornerstones of safety, the NRC uses two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent very low safety significance. WHITE findings indicate issues that are of low to moderate safety significance. YELLOW findings are issues that are of substantial safety significance. RED findings represent issues that are of high safety significance with a significant reduction in safety margin.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing varying levels of performance and incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections. WHITE corresponds to performance that may result in increased NRC oversight. YELLOW represents performance that minimally reduces safety margin and requires even more NRC oversight. And RED indicates performance that represents a significant reduction in safety margin but still provides adequate protection to public health and safety.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner which regulatory actions should be taken based on a licensee's performance. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings. As a licensee's safety performance degrades, the NRC will take more and

increasingly significant action, which can include shutting down a plant, as described in the Action Matrix.

More information can be found at: http://www.nrc.gov/NRR/OVERSIGHT/index.html.

Attachment