



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

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

January 29, 2007

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 TRIENNIAL FIRE PROTECTION  
INSPECTION REPORT 05000369/2006008 AND 05000370/2006008 AND  
EXERCISE OF ENFORCEMENT DISCRETION

Dear Mr. Peterson:

On December 14, 2006, the U.S. Nuclear Regulatory Commission (NRC) completed a triennial fire protection inspection at your McGuire Nuclear Station, Units 1 and 2. The enclosed report documents the inspection findings which were discussed at an exit meeting on that date, with you and members of your staff.

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

The enclosed report documents six noncompliances that were identified during the inspection for which the NRC is exercising enforcement discretion. The NRC is not taking any enforcement action for these noncompliances because they meet the criteria of the NRC Enforcement Policy, "Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues (10 CFR 50.48)."

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).

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(the Public Electronic Reading Room).

Sincerely,

**/RA/**

D. Charles Payne, Chief,  
Engineering Branch 2  
Division of Reactor Safety

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

Enclosure: Inspection Report 05000369/2006008 and 05000370/2006008  
w/Attachment; Supplemental Information

cc w/encl: (See page 3)

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Sincerely,

**/RA/**

D. Charles Payne, Chief,  
Engineering Branch 2  
Division of Reactor Safety

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

Enclosure: Inspection Report 05000369/2006008 and 05000370/2006008  
w/Attachment; Supplemental Information

cc w/encl: (See page 3)

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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: 05000369/2006008, 05000370/2006008

Licensee: Duke Energy Corporation

Facility: McGuire Nuclear Station, Units 1 and 2

Location: Huntersville, NC 28078

Dates: November 27 - December 1, 2006 (Week 1)  
December 11- 14, 2006 (Week 2)

Inspectors: N. Merriweather, Senior Reactor Inspector (Lead Inspector)  
R. Fanner, Reactor Inspector  
G. MacDonald, Senior Reactor Analyst  
R. Rodriguez, Reactor Inspector  
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Approved by: D. Charles Payne  
Engineering Branch 2  
Division of Reactor Safety

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**SUMMARY OF FINDINGS**

IR 05000369/2006-008, 05000370/2006-008; 11/27-12/1/2006 and 12/11-14/2006; McGuire Nuclear Station, Units 1 and 2; Fire Protection.

This report covers an announced two-week triennial fire protection inspection by five specialist inspectors from the U. S. Nuclear Regulatory Commission's (NRC's) Region II office located in Atlanta, Georgia. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

No findings of significance were identified.

B. Licensee-Identified Violations

None.

## REPORT DETAILS

**1. REACTOR SAFETY**

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

**1R05 Fire Protection**

This report presents the results of a triennial fire protection inspection for a plant in transition to National Fire Protection Association (NFPA) Standard 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants, 2001 Edition." This inspection was conducted in accordance with NRC Inspection Procedure (IP) 71111.05TTP, "Fire Protection-NFPA 805 Transition Period (Triennial)." The objective of the inspection was to review the McGuire Nuclear Station (McGuire) fire protection program (FPP) for selected risk-significant fire areas. The team selected three fire areas for detailed review to examine the licensee's implementation of the FPP. The team also reviewed issues associated with six other fire areas that are discussed in this report. The original three fire areas chosen for review were selected based on risk insights from the licensee's Individual Plant Examination for External Events (IPEEE), information contained in FPP documents, results of prior NRC triennial fire protection inspections, and in-plant tours by the inspectors. Section 71111.05-05 of the IP specifies a minimum sample size of three fire areas. Detailed inspection of these three fire areas fulfills the procedure completion criteria. The three areas chosen were:

- Fire Area (FA) 2 - Unit 1 Motor Driven Auxiliary Feedwater (MDAFW) Pump Room, Auxiliary Building (AB), Elevation 716 foot (ft.)
- FA 5 - Unit 1 Train "A" Diesel Generator Room, AB, Elevation 736 ft.
- FA 19 - Unit 1 Cable Spreading Room, AB, Elevation 750 ft.

Other fire areas examined for specific issues were:

- FA 3 - Unit 2 MDAFW Pump Room, AB, Elevation 716 ft.
- FA 4 - AB Common, Elevation 716 ft.
- FA 28 - Unit 1 Interior Doghouse, Elevation 750 ft.
- FA 29 - Unit 2 Interior Doghouse, Elevation 750 ft.
- FA 30 - Unit 1 Exterior Doghouse, Elevation 750 ft.
- FA 31 - Unit 2 Exterior Doghouse, Elevation 750 ft.

Enclosure



For each of the selected fire areas, the inspection team evaluated the licensee's FPP against the applicable NRC requirements. The specific documents reviewed by the team are listed in the attachment.

.01 Post-Fire Safe Shutdown From Main Control Room (Normal Shutdown)

a. Inspection Scope

Methodology

The team reviewed the Design Basis Specification for the Appendix R Safe Shutdown Analysis (SSA) MCS-1465.00-00-0022, revision 6, abnormal operating procedures (APs), piping and instrumentation drawings (P&IDs), electrical drawings, the Updated Final Safety Analysis Report (UFSAR), and other supporting documents for postulated fires in FA 5. The review was performed to verify that hot and cold shutdown could be achieved and maintained from the main control room (MCR) for postulated fires in FA 5. This review also included verification that shutdown from the MCR could be performed both with and without the availability of offsite power. Plant walkdowns were also performed to verify that the plant configuration was consistent with that described in the fire hazards analysis (FHA) and SSA. These inspection activities focused on ensuring the adequacy of systems selected for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring instrumentation and support systems functions. The team reviewed the systems and components credited for use during this shutdown method to verify that they would remain free from fire damage.

Operational Implementation

The team reviewed the adequacy of procedures utilized for post-fire safe shutdown (SSD) and performed a walk through of procedure steps to ensure the implementation and human factors adequacy of the procedures. The team also reviewed selected operator actions to verify that the operators could reasonably be expected to perform the specific actions within the time required to maintain plant parameters within specified limits.

The team reviewed time critical actions including those for selected components to prevent fire-induced spurious operation for decay heat removal required components. The team reviewed and walked down applicable sections of fire response procedure AP/0/A/5500/45, "Plant Fire," for FA 5.

The team reviewed local operator manual actions to ensure that the actions could be implemented in accordance with plant procedures in the times necessary to support the SSD method for the applicable FA and to verify that those actions met the criteria in Enclosure 2 of NRC IP 71111.05TTP. The team reviewed Problem Investigation Process (PIP) corrective action document 05-04859, Appendix R Manual Actions, to verify that the licensee had identified operator manual actions for post-fire SSD in III.G.2 areas and had plans in place to keep PIP 05-04859 open to assess and track resolution of the manual action issue as part of the plant-wide risk evaluation for transition to NFPA 805.

b. Findings1) Failure to Protect Cables Associated With Motor Operated Valve 1CA-42B in FA 5

Introduction: A noncompliance with McGuire Unit 1 Operating License Condition 2.C.4 was identified for the licensee's failure to protect or separate cabling associated with the "B" train of MDAFW routed through the Unit 1 "A" diesel generator room (FA 5). The "B" train of MDAFW was required to remain operational to achieve and maintain safe shutdown for a postulated fire in FA 5.

Description: During review of procedure AP/0/A/5500/45, "Plant Fire," Enclosure 11, the team identified that the licensee utilized a local operator manual action (OMA) to de-energize motor operated valve (MOV) 1CA-42B to prevent spurious closure of the MOV due to potential fire damage during a postulated fire in FA 5. MOV 1CA-42B, the 1B MDAFW pump discharge valve to the 1D steam generator (S/G), is normally open and is required to remain open to establish the auxiliary feedwater (AFW) flowpath to the 1D S/G from the 1B MDAFW pump. The McGuire SSA requires the B train of AFW for SSD for a fire in FA 5. The 1D S/G is one of two S/Gs which receive AFW flow from the 1B MDAFW pump. Two S/Gs are required by the SSA for successful SSD. Cables for MOV 1CA-42B were located in FA 5 while the MOV itself was located in the Unit 1 exterior doghouse FA 30. The licensee failed to protect cable 1\*CA548 from potential fire damage in FA 5. In lieu of protecting required cables from fire damage which could cause the MOV to spuriously close and defeat the SSD strategy, the licensee instead de-energized the valve using a local OMA. The local OMA was to de-energize MOV 1CA-42B, after verifying correct open position, by locally opening breaker 3E at motor control center (MCC) 1EMXB in FA 14. The team performed a walk through of this local OMA and determined the action to be feasible and reliable per the criteria in Enclosure 2 to NRC Inspection Procedure (IP) 71111.05TTP, Fire Protection - NFPA 805 Transition Period (Triennial). The cables and the local OMA to prevent spurious operation were described in the licensee's SSA.

Analysis: Failure to protect required SSD equipment from potential fire damage is a performance deficiency and is more than minor because it is associated with the reactor safety Mitigating Systems cornerstone attribute of protection against external events, i.e. fire, and it affects the objective of ensuring the reliability and capability of systems that respond to initiating events. The finding was determined to be of very low safety significance (Green) using the significance determination process (SDP) in NRC Inspection Manual Chapter (IMC) 0609 Appendix F. The local OMA was determined to be feasible and reliable because it met the criteria of IP 71111.05TTP Enclosure 2. As such, the local OMA was determined to be a compensatory measure for the lack of cable protection for required SSD component 1CA-42B. PIP 05-04859 tracked the resolution of III.G.2 OMAs.

Enforcement: McGuire Unit 1 License Condition 2.C.4 states that the licensee shall implement and maintain in effect all provisions of the approved FPP as described in the UFSAR for the facility and as approved in the Safety Evaluation Report (SER) dated March 1978 and Supplements 2, 5 and 6 dated March 1979, April 1981, February 1983, respectively, and the safety evaluation (SE) dated May 1989. McGuire UFSAR Section

9.5.1 states in part, that the McGuire FPP is contained in design basis document MCS-1465.00-00-0008, "Plant Design Basis Specification for Fire Protection." This document states in Appendix C, Section C3, "Appendix R," that the McGuire FPP is required to comply with Title 10 of the Code of Federal Regulations (CFR) Part 50 (hereafter referred to as 10 CFR 50), Appendix R, Sections III.G, J, L and O. It also states that procedure AP/0/A/5500/045 is derived from the Fire Area Failure Analysis and Compliance Strategy in the Appendix R design basis document, MCS-1465.00-00-0022.

The McGuire FPP, which includes the SSA (MCS-1465.00-00-0022) identifies FA 5 as a 10 CFR 50, Appendix R, Section III.G.2 area and further indicates that McGuire is committed to 10 CFR 50, Appendix R, Section III.G. Section III.G.1 of 10 CFR 50 Appendix R requires that cables for equipment relied upon to achieve and maintain SSD be free of fire damage. Section III.G.2 of Appendix R lists three options for satisfying the requirements for separation and protection of equipment needed to ensure safe shutdown remains free of fire damage. The requirements of this section do not allow using manual actions in lieu of protection and separation. Contrary to the above, on December 14, 2006, the licensee utilized a non-approved local OMA as a compensatory measure in lieu of protecting cable 1\*CA548 in FA 5 as required by 10 CFR 50, Appendix R, Section III.G.2. This issue has existed for many years.

Pursuant to the Commission's Enforcement Policy and NRC Manual Chapter 0305, under certain conditions fire protection findings at nuclear power plants that transition their licensing bases to 10 CFR 50.48(c) are eligible for enforcement and Reactor Oversight Program (ROP) discretion. The Enforcement Policy and ROP also state that the finding must not be evaluated as Red. On February 28, 2005, the licensee submitted a letter to the NRC stating its intent to transition to 10 CFR 50.48(c). In a subsequent letter to the NRC dated April 18, 2006, the licensee provided the NRC with the planned schedule for the McGuire Station to transition to NFPA 805. In a followup letter from the NRC to the licensee dated September 26, 2006, the NRC acknowledged that a three year period of discretion will begin on April 18, 2006, and that the period of discretion will continue beyond the three year expiration date of April 18, 2009, while NRC staff is reviewing the license amendment request.

Because the licensee committed, prior to December 31, 2005, to adopt NFPA 805 and change their fire protection licensing bases to comply with 10 CFR 50.48(c), the NRC is exercising enforcement discretion for this issue in accordance with the NRC Enforcement Policy, "Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues (10 CFR 50.48)." Specifically, this issue would have been expected to be identified and addressed during the licensee's transition to NFPA 805, was entered into the licensee's corrective action program and will be corrected, was not likely to have been previously identified by routine licensee efforts, was not willful, and was not associated with a finding of high safety significance.

The licensee entered this issue in their corrective action program under PIP 05-4859.

## 2) Failure to Protect 1SV1AB Cabling in FA 5

Introduction: A noncompliance with McGuire Unit 1 Operating License Condition 2.C.4 was identified for the licensee's failure to protect "D" Steam Generator (S/G) pilot operated relief valve (PORV) cabling located in the Unit 1 Train "A" emergency diesel generator room (FA 5). Cables for the "D" S/G PORV, 1SV1AB, were required to achieve and maintain safe shutdown for a postulated fire in FA 5 but were not protected from fire damage in FA 5. The SSD strategy required that S/G PORV 1SV1AB remain closed and not spuriously operate for a fire in FA 5.

Description: During review of the McGuire SSA and procedure AP/0/A/5500/045, Enclosure 11, the team determined that the licensee did not identify cables 1\*SV588 and 1\*SV591 for the "D" S/G PORV (1SV1AB) as passing through FA 5. The McGuire SSA did not list 1SV1AB cables as being in FA 5 and the cables were not protected from postulated fire damage in FA 5 even though they were associated with equipment required for achieving and maintaining SSD for postulated fires in FA 5. Procedure AP/0/A/5500/045 did not have an action to prevent spurious actuation of 1SV1AB. Opening of 1SV1AB due to potential fire damage to cables 1\*SV588 and 1\*SV591 located in FA 5 could affect the "D" S/G which was one of two S/Gs which receive AFW flow from the "B" MDAFW train. Two S/Gs are required by the SSA for successful SSD. The SSD strategy required that 1SV1AB remain closed and not spuriously operate. Procedure AP/0/A/5500/045, Enclosure 11, contained an action to fail 1SV19AB to the closed position but did not address 1SV1AB. The team reviewed procedure AP/1/A/5500/01, "Steam Leak," revision 15, and determined that the procedure contained guidance for the operators to recognize a spuriously opened S/G PORV and actions to close the valve. The guidance in AP/1/A/5500/01 was similar to the guidance in AP/0/A/5500/045 Enclosure 11 and directed the closure of the S/G PORVs by failing the air to the pneumatic controls. Additionally, further guidance in AP/1/A/5500/01 directed operator action to close the S/G PORV block valve and to close the S/G PORV locally manually, if necessary. The team concluded that while the SSA analysis failed to include fire affected cables to 1SV1AB located in FA 5, the existing procedural guidance would enable the operators to deal with the potential fire-induced spurious valve opening.

Analysis: Failure to protect required SSD equipment from potential fire damage is a performance deficiency and is more than minor because it is associated with the reactor safety Mitigating Systems cornerstone attribute of protection against external events, i.e. fire, and it affects the objective of ensuring the reliability and capability of systems that respond to initiating events. The failure to protect cables for S/G PORV 1SV1AB from potential fire damage in FA 5 could allow spurious opening of the valve, but this condition could easily be recognized and the valve could be closed from the MCR using existing procedures. The performance deficiency was judged to represent a SSD finding of low degradation because the noncompliance would not disable the SSD strategy. The noncompliance was therefore determined to be of very low safety significance (Green) using IMC 0609 Appendix F.

The finding was judged to represent a low degradation to SSD because the OMA was feasible and would not disable the SSD strategy. PIP M-06-05803 was initiated to address corrective actions to procedure AP/0/A/5500/045.

Enforcement: McGuire Unit 1 License Condition 2.C.4 states that the licensee shall implement and maintain in effect all provisions of the approved FPP as described in the UFSAR for the facility and as approved in the SER dated March 1978 and Supplements 2, 5 and 6 dated March 1979, April 1981, February 1983, respectively, and the SE dated May 1989. McGuire UFSAR Section 9.5.1 states in part, that the McGuire FPP is contained in design basis document MCS-1465.00-00-0008, "Plant Design Basis Specification for Fire Protection." This document states in Appendix C, Section C3, "Appendix R," that the McGuire FPP is required to comply with Sections III.G, J, L and O of 10 CFR 50, Appendix R.

The McGuire FPP, which includes the SSA (MCS-1465.00-00-0022), identifies FA 5 as a 10 CFR 50, Appendix R, Section III.G.2 fire area and indicates that McGuire is required to comply with 10 CFR 50, Appendix R, Section III.G. Section III.G.1 of 10 CFR 50 Appendix R requires that cables for equipment relied upon to achieve and maintain SSD be free of fire damage. Section III.G.2 of Appendix R lists three options for satisfying the requirements for separation and protection of equipment needed to ensure safe shutdown remains free of fire damage. Contrary to the above, on December 14, 2006, the licensee had failed to ensure that cables 1\*SV588 and 1\*SV591 associated with S/G PORV 1SV1AB were adequately separated or protected from potential fire damage in FA 5 in accordance with the requirements of 10 CFR 50, Appendix R, Section III.G.2. This issue has existed for several years.

Pursuant to the Commission's Enforcement Policy and NRC Manual Chapter 0305, under certain conditions fire protection findings at nuclear power plants that transition their licensing bases to 10 CFR 50.48(c) are eligible for enforcement and ROP discretion. The Enforcement Policy and ROP also state that the finding must not be evaluated as Red.

Because the licensee committed, prior to December 31, 2005, to adopt NFPA 805 and change their fire protection licensing bases to comply with 10 CFR 50.48(c), the NRC is exercising enforcement discretion for this issue in accordance with the NRC Enforcement Policy, "Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues (10 CFR 50.48)." Specifically, this issue would have been expected to be identified and addressed during the licensee's transition to NFPA 805, was entered into the licensee's corrective action program and will be corrected, was not likely to have been previously identified by routine licensee efforts, was not willful, and was not associated with a finding of high safety significance.

The licensee entered this issue in their corrective action program under PIP M-06-05803.

.02 Protection of Safe Shutdown Capabilities

a. Inspection Scope

For the selected fire areas, the team evaluated the potential for fires, the combustible fire load characteristics, and the potential exposure fire severity. The team reviewed selected licensee maintenance procedures, plant smoking policy, and programs for the control of ignition sources and transient combustibles. These reviews were conducted to assess their effectiveness in preventing fires and in controlling combustible loading within limits established in the Fire Protection Program (FPP).

The team performed plant walkdowns to verify (1) the material condition of fire protection systems and equipment, (2) the storage of permanent and transient combustible materials, (3) the administrative controls for limiting fire hazards, and (4) combustible waste collection, housekeeping practices, and cleanliness conditions were being implemented consistent with the UFSAR, administrative procedures, and other FPP procedures. The specific documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

.03 Passive Fire Protection

a. Inspection Scope

The team inspected the material condition of accessible passive fire barriers surrounding and within fire areas 2, 5, and 19. Barriers in use included walls, ceilings, floors, structural steel fireproofing, mechanical and electrical penetration seals, fire doors, and fire dampers. Construction details and fire endurance test data which established the ratings of fire barriers were reviewed by the team.

Engineering evaluations and relevant exemptions described in NRC SERs related to fire barriers were reviewed. Where applicable, the team examined installed barriers to compare the configuration of the barrier to the rated configuration to verify that the as-built configurations met design requirements, license commitments, standard industry practices and were either properly evaluated or qualified by appropriate fire endurance tests. In addition, a sample of completed surveillance and maintenance procedures for selected fire doors, fire dampers, and penetration seals in the selected fire areas were reviewed to ensure that these passive fire barrier features were properly inspected and maintained. The fire protection features included in the review are listed in the Attachment.

b. Findings

No findings of significance were identified.

.04 Active Fire Protection

a. Inspection Scope

The team reviewed flow diagrams, cable routing information, system operating instructions, operational valve lineup procedures, and vendor documentation associated with the fire pumps and auxiliary building fire protection isolation deluge valves. Using operating and valve alignment procedures, team members toured selected fire pumps and portions of the fire main piping system to evaluate material condition, consistency of as-built configurations with engineering drawings, and to verify correct system valve lineups. The common fire protection water delivery and supply components were reviewed to assess if they could be damaged or inhibited by fire-induced failures of electrical power supplies or control circuits. In addition, the team reviewed periodic surveillance and operability flow test data for the electric fire pumps, fire main loop and auxiliary building fire protection isolation deluge valves to assess whether the test program was sufficient to validate proper operation of the fire protection water supply system in accordance with its design requirements.

The team reviewed the fire detection system protecting the fire areas selected for review to assess the adequacy of the design and installation. This was accomplished by reviewing design drawings, ceiling beam location drawings, and code of record (COR) for detector location requirements (i.e., NFPA 72E, 1974 Edition). The team reviewed the McGuire Fire Protection Code Deviation Calculation to determine if there were any outstanding code detector deviations for the selected areas. The team walked down the fire detection and alarm systems in Fire Areas 2, 5, and 19 to evaluate the appropriateness of detection methods for the category of fire hazards in the selected fire areas. The team also evaluated the installed detector locations relative to the NFPA 72E COR location requirements. Additionally, the team reviewed the surveillance test procedures and alarm annunciator response procedures for the detection and alarm systems to determine compliance with UFSAR Section 16.9.

Through in-plant observation of systems, design document review and reference to the applicable NFPA codes and standards, the team evaluated the material condition and operational lineup of fire suppression systems protecting the selected fire areas. The Halon 1301 suppression system in the train A diesel generator room (FA 5) was also reviewed. Fire hose and standpipe systems were evaluated from source to discharge device including hydraulic calculations performed by the licensee to demonstrate adequate flow, pressure and water distribution. During plant tours, the team observed placement of the fire hoses and extinguishers to verify they were not blocked and were consistent with the pre-fire plans and FPP documents.

The team reviewed the fire brigade staging and dress-out areas to assess the operational readiness of fire fighting and smoke control equipment. The fire brigade personal protective equipment, self-contained breathing apparatuses (SCBAs) and SCBA cylinder refill capability were reviewed for adequacy and functionality.

The team also reviewed operator and fire brigade staffing, fire brigade response reports, offsite fire department communications and staging procedures, fire fighting pre-plan strategies, fire brigade qualification training, and the fire brigade drill program procedures. Five fire brigade response-to-drill scenarios and associated brigade drill evaluations/critiques that transpired over the last 12 months were reviewed. The team reviewed the fire pre-plan strategies for fire areas 2, 5, and 19, as well as the fire response procedures to verify that pertinent information was provided to fire brigade members to identify potential effects to plant safety and personnel safety and to facilitate suppression of an exposure fire that could impact SSD capability.

The team walked down the selected fire areas to compare the associated fire pre-plan strategy drawings with as-built plant conditions and fire response procedures. This was done to verify that fire fighting pre-plan strategies and drawings were consistent with the fire protection features and potential fire conditions described in the FHA. The team also evaluated whether the fire response procedures and fire pre-plan strategies for the selected fire areas could be implemented as intended. Additionally, the team assessed the adequacy of the off-site fire fighting assistance including entry into the plant area, communications, emergency dosimetry, and fire equipment usage. The documents included in the review are listed in the Attachment.

b. Findings

1) Pertinent Fire Brigade Information and Guidance to Facilitate Suppression of a Fire Not Identified in Fire Fighting Strategies

Introduction: A noncompliance with McGuire Unit 1 Operating License Condition 2.C.4 was identified for the licensee's failure to include pertinent fire brigade information and guidance in fire fighting pre-plan strategies for postulated fires in fire areas 2, 5, and 19 as required by the licensing basis.

Description: The team identified on November 28, 2006, that the McGuire fire pre-plan strategies for fire areas 2, 5, and 19 did not provide pertinent information and guidance on plant areas to assist the fire brigade to be better prepared for fire fighting within those areas. The fire strategies were judged to be deficient because they did not identify the most favorable direction from which to fight a fire in the area, as well as providing appropriate information and guidance for accessing the nearest safe location of fire extinguishants best suited for controlling a fire. Information on the most favorable direction from which to fight a fire and on accessing fire fighting equipment are subjects required to be covered 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. These licensing basis' requirements are not currently being met by the licensee.

Analysis: The fire fighting strategy plans are the fire brigade equivalent of abnormal/emergency procedures used by licensed operators, and similarly the strategy actions taken based on these strategy plans are time sensitive. The pre-fire strategies identify to the fire brigade the most favorable direction from which to fight a fire in the area and information on safely accessing fire fighting equipment so that the brigade leader can plan (in a timely manner) a strategy for how to approach and extinguish a fire.

Enclosure



Incomplete fire fighting strategies could increase the time response of the brigade in putting out the fire, resulting in an increase in fire damage. Consequently, the lack of pertinent information covered in the pre-fire strategy plans was considered a degradation for manual fire fighting effectiveness. This performance deficiency affects the Mitigating Systems cornerstone objectives of protection from external factors including fire and procedure quality. Consequently, the finding is greater than minor. Under the SDP analysis the performance deficiency was determined to be of very low safety significance. This was because the performance deficiency only minimally diminished manual suppression effectiveness without affecting the fire ignition frequency within the areas or the previously established safe shutdown strategy for a fully developed active fire within the applicable areas. The licensee initiated PIP M-06-05645 to address this issue. Also, the licensee provided a copy of PIP M-06-0576, in which they had documented other deficiencies in the pre-fire plan layout drawings and strategies discovered following corrective actions to address several examples of NRC identified fire strategy problems documented in NRC inspection reports (IRs) 2004-03, -04, and -05. The team noted that the licensee was currently implementing an ongoing Fire Strategy Revision, Fire Protection Program Design Basis Specification, Appendix B.5 Section Review, project to revise their pre-fire plan strategies by March 2007 to cover these subjects.

Enforcement: McGuire Unit 1 License Condition 2.C.4 states that the licensee shall implement and maintain in effect all provisions of the approved FPP as described in the UFSAR for the facility and as approved in the SER dated March 1978 and Supplements 2, 5 and 6 dated March 1979, April 1981, February 1983, respectively, and the SE dated May 1989. McGuire UFSAR Section 9.5.1 states in part, that the McGuire FPP is contained in design basis document MCS-1465.00-00-0008, "Plant Design Basis Specification for Fire Protection." The FPP states, in Appendix B.5, "Fire Fighting Procedures," that fire fighting procedures would identify the strategies established for fighting fires in all safety-related areas and areas presenting a hazard to safety-related equipment. The strategies should cover specific subjects including the most favorable direction from which to fight a fire in the area, as well as the location of the nearest safe location of fire extinguishants best suited for controlling a fire.

Contrary to the above, prior to November 28, 2006, fire fighting pre-plan strategy numbers 2, 5, and 19 neither identified the most favorable direction from which to fight a fire in the area nor provided appropriate information and guidance for accessing the nearest safe location of fire extinguishants best suited for controlling a fire.

Pursuant to the Commission's Enforcement Policy and NRC Manual Chapter 0305, under certain conditions fire protection findings at nuclear power plants that transition their licensing bases to 10 CFR 50.48(c) are eligible for enforcement and ROP discretion. The Enforcement Policy and ROP also state that the finding must not be evaluated as Red.

Because the licensee committed, prior to December 31, 2005, to adopt NFPA 805 and change their fire protection licensing bases to comply with 10 CFR 50.48(c), the NRC is exercising enforcement discretion for this issue in accordance with the NRC Enforcement Policy, "Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire

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Protection Issues (10 CFR 50.48).” Specifically, this issue would have been expected to be identified and addressed during the licensee’s transition to NFPA 805, was entered into the licensee’s corrective action program and will be corrected, was not likely to have been previously identified by routine licensee efforts, was not willful, and was not associated with a finding of high safety significance.

2) Failure to have Fire Detectors and Automatic Suppression Systems Installed in Fire Areas 28, 29, 30 and 31

Introduction: A noncompliance with McGuire Operating License Condition 2.C.4, for Units 1 and 2, was identified for the licensee’s failure to have fire detectors and an automatic suppression system installed in fire areas 28 through 31 (Units 1 and 2 interior and exterior main steam dog houses). The violation meets the criteria of NRC Enforcement Policy, “Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues (10 CFR 50.48)” for enforcement discretion.

Description: On October 8, 2004, the licensee identified during an internal fire protection audit that fire detection devices and fire suppression are not installed in any of the interior or exterior main steam dog houses. A fire in these areas may not directly be detected and smoke from the areas may not be easily seen. Additionally, the lack of detection may increase the notification and response of the fire brigade in putting out the fire, resulting in an increase in fire damage. Consequently, the lack of fire detection devices and fire suppression was considered a degradation of fire fighting effectiveness. The licensee issued PIP M-04-04930 to track the resolution of this 10 CFR 50, Appendix R, III.G.2 noncompliance and 1-hour roving compensatory fire watch patrols had been initiated for the plant areas.

Analysis: The failure to install detection and suppression in an Appendix R, III.G.2 fire area is a performance deficiency and is more than minor because it is associated with the reactor safety Mitigating Systems cornerstone attribute of protection against external events, i.e. fire, and it affects the objective of ensuring the reliability and capability of systems that respond to initiating events. The inspectors determined the finding was of very low safety significance (Green) because the issue screened out in phase 2 of the IMC 0609, Appendix F, SDP evaluation due to low ignition frequency in the areas and minimal impact to SSD mitigation equipment. Also, the absence of detection and suppression in the affected areas would not result in a control room evacuation and thus would not require the use of the more difficult alternative procedure for shutdown from outside the control room. The principal fire ignition sources in these areas were space heaters. The space heaters were de-energized and placed under administrative control. The licensee indicated that the space heaters would be re-energized only if the doghouse temperature was less than 50° F. Also plant modification, MD200834, had been issued to add detection in the areas.

Enforcement: McGuire License Condition 2.C.4, for Units 1 and 2, respectively, states that the licensee shall implement and maintain in effect all provisions of the approved FPP as described in the UFSAR for the facility and as approved in the SER dated March 1978 and Supplements 2, 5 and 6 dated March 1979, April 1981, February 1983,

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respectively, and the SE dated May 1989. McGuire UFSAR Section 9.5.1 states in part, that the McGuire FPP is contained in design basis document MCS-1465.00-00-0008, "Plant Design Basis Specification for Fire Protection." This document states in Appendix C, Section C3, "Appendix R," that the McGuire FPP is required to comply with Sections III.G, J, L and O of 10 CFR 50, Appendix R. Section III.G.2 of Appendix R lists three options for satisfying the requirements for separation and protection of redundant trains within the same FA to ensure that one of the redundant trains remains free of fire damage. Two of the options require that fire detectors and an automatic fire suppression system be installed in the area. The third option requires that a 3-hour rated fire barrier be utilized to protect one safe shutdown train from fire damage. Contrary to the above, on December 14, 2006, fire areas 28 thru 31 (Units 1 and 2 interior and exterior main steam dog houses), did not have fire detection and automatic fire suppression or a 3-hour rated fire barrier installed for these areas containing redundant trains of systems.

No enforcement action is required for the above noncompliance because pursuant to the Commission's Enforcement Policy and NRC Manual Chapter 0305, under certain conditions fire protection findings at nuclear power plants that transition their licensing bases to 10 CFR 50.48(c) are eligible for enforcement and ROP discretion. The Enforcement Policy and ROP also state that the finding must not be evaluated as Red.

Because the licensee committed, prior to December 31, 2005, to adopt NFPA 805 and change their fire protection licensing bases to comply with 10 CFR 50.48(c), the NRC is exercising enforcement discretion for this issue in accordance with the NRC Enforcement Policy, "Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues (10 CFR 50.48)." Specifically, this issue would have been expected to be identified and addressed during the licensee's transition to NFPA 805, was entered into the licensee's corrective action program and will be corrected, was not likely to have been previously identified by routine licensee efforts, was not willful, and was not associated with a finding of high safety significance.

.05 Protection From Damage From Fire Suppression Activities

a. Inspection Scope

The team performed document reviews and in-plant walkdowns to verify that redundant trains of systems required for hot shutdown were not subject to damage from fire suppression activities or from the rupture or inadvertent operation of fire suppression systems. Specifically, the team:

- Reviewed fire damper location and vendor detail drawings, and heating, ventilation, and air conditioning (HVAC) system drawings to verify that a fire in one of the selected fire areas would not directly, through production of smoke, heat or hot gases, inhibit access to alternate shutdown equipment or performance of alternate safe shutdown operator actions by smoke migration through duct work from the area of a fire to adjacent plant areas.

- Reviewed the physical configuration of electrical raceways and safe shutdown components in the selected fire areas to verify water from a pipe rupture, actuation of the automatic suppression system, or manual fire suppression activities would not directly cause damage to all redundant trains within the FA or an adjacent plant area that could inhibit SSD (e.g., fire suppression caused flooding of other than the locally affected train).
- Reviewed floor drain locations and building drain system drawings to verify that adequate drainage is provided in areas protected by water suppression systems.

The documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

.06 Post-Fire Safe Shutdown From Outside the Main Control Room (Alternative Shutdown)

a. Inspection Scope

Methodology

The team reviewed the licensee's FPP described in UFSAR Section 9.5.1, the SSA, APs, P&IDs, electrical drawings, and other supporting documents for postulated fires in fire areas 2 and 19. The reviews focused on ensuring that the required functions for post-fire SSD and the corresponding equipment necessary to perform those functions were included in the procedures. The review included assessing whether hot and cold shutdown from outside the MCR could be implemented, and that transfer of control from the MCR to the standby shutdown facility (SSF) could be accomplished. This review also included verification that shutdown from outside the MCR could be performed both with and without the availability of offsite power.

Plant walkdowns were performed to verify that the plant configuration was consistent with that described in the SSA. These inspection activities focused on ensuring the adequacy of systems selected for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring instrumentation and support systems functions. The team reviewed the systems and components credited for use during this shutdown method to verify that they would remain free from fire damage.

The team also reviewed a Unit 2 concern involving the licensee's fire response procedures for postulated fires in FA 3 where valves associated with the assured suction source to the turbine driven auxiliary feedwater (TDAFW) pump could spurious operate or be damaged by a fire in the area.

### Operational Implementation

The team reviewed the training lesson plans for licensed and non-licensed operators to verify that the training reinforced the shutdown methodology in the SSA and APs for the selected FAs. The team also reviewed shift turnover logs and shift manning to verify that personnel required for SSD using the alternative shutdown systems and procedures were available onsite, exclusive of those assigned as fire brigade members.

The team reviewed the adequacy of procedures utilized for post-fire SSD and performed a walk through of procedure steps to ensure the implementation and human factors adequacy of the procedures. The team also reviewed selected operator actions to verify that the operators could reasonably be expected to perform the specific actions within the time required to maintain plant parameters within specified limits.

Time critical actions reviewed included electrical power distribution alignment, establishing control at the SSF, establishing reactor coolant makeup, and establishing decay heat removal. The team reviewed and walked down applicable sections of the following fire response abnormal operating procedures:

- AP/0/A/5500/45, Plant Fire, Rev.5
- AP/1/A/5500/24, Loss of Plant Control Due to Fire or Sabotage, Rev.24
- OP/0/A/6100/21, Shutdown Outside the Control Room Following a Fire, Rev. 18

The team also reviewed the periodic test procedures and test records of the alternative shutdown transfer capability and instrumentation and control functions to ensure the tests were adequate to verify the functionality of the alternative shutdown capability. Electrical schematics were reviewed to verify that circuits for SSD equipment, which could be damaged due to fire, were isolated by disconnect switches and by swapping power supplies for selected MCC. In addition, the team reviewed wiring diagrams for instrumentation located on the SSF to verify that necessary process monitoring was available as required by 10 CFR 50, Appendix R, Section III.L.

### b. Findings

#### Potential for Loss of the TDAFW Pump Assured Suction Supply Flow Path (FA3)

Introduction: A noncompliance with McGuire Unit 2 Operating License Condition 2.C.4 was identified for the licensee's failure to ensure that the cables and equipment needed for the alternative and dedicated standby shutdown system (SSS) were independent of cables in FA 3. Specifically, the assured suction supply for the Unit 2 TDAFW pump could be lost as a result of fire damage in FA 3 because it was not independent of cables, systems, and components in FA 3.

Description: The MDAFW pump room (FA 3) is an alternative shutdown area utilizing the SSS with secondary heat removal via the TDAFW pump. The normal suction flow path for the turbine driven auxiliary feedwater pump is from the 300,000 gallon AFW system condensate storage tank through MOV 2CA0007A.

The valve is open during normal plant operation. However, this valve is subject to spurious operation from potential fire damage to the control cables in certain fire areas, including FA 3. Spurious closure of this valve from fire damage could cause damage to the pump if automatic transfer to the alternate suction sources does not initiate within sufficient time. The team noted that the SSA does not take credit for operation of the automatic transfer function to the standby assured suction source on low pump suction pressure due to the fact that the circuits associated with the pressure switches and valves 2CA161C and 2CA162C have not been analyzed for fire damage.

Instead, the licensee has implemented compensatory OMAs in fire response procedure AP/0/A/5500/45 to verify or open valve 2CA0007A and trip open the power supply breaker within the first 10 minutes of a fire. This action is necessary to assure that the normal water supply will remain available for the TDAFW pump. This water source could supply the TDAFW pump and maintain hot standby conditions for several hours. However, the licensee's shutdown strategy requires them to make repairs prior to taking the plant to cold shutdown, so the long term assured source must be available.

The TDAFW pump long term assured suction source is from the service water system through a flowpath that includes valves 2CA161C, 2CA162C, and 0RN4AC which are physically located in FA 3. Their associated cables are unprotected from potential fire damage in the area. The inspectors determined that the licensee would not transfer to the SSS until fire damage had occurred, and they have lost control and indication of vital plant equipment from the MCR. Thus multiple failures would have had to occur prior to transferring to the SSS. The procedure for transferring to the SSS (AP/2/A/5500/24) specifies an operator manual action to open normally closed valves, 2CA161C and 2CA162C, from the SSF control panel. In addition, upon transfer to the SSS, service water valve 0RN4AC will get an automatic signal to go open. If any of the valves (i.e., 2CA161C, 2CA162C, or 0RN4AC) fail to open due to fire damage, an operator would be required to enter the fire affected area to manually open the valves locally.

The two auxiliary feedwater valves (2CA161C and 2CA162C) are normally closed valves that must be opened to support hot shutdown functions. Failure of either of these valves to open would result in a loss of the assured suction source. The other suction valve (0RN4AC) is normally open and must remain open to support hot shutdown. By design this valve goes closed upon a safety injection signal or loss of offsite power. If fire damage to the control circuit occurred prior to a loss of offsite power, the torque switch could possibly be bypassed and the valve could be mechanically damaged, preventing it from being manually reopened.

Based on the above, the team concluded that MOVs 2CA161C, 2CA162C, and 0RN4AC could be subject to failure or spurious operation due to postulated fire damage to their power and control cables in FA 3. The team noted that fire response procedure AP/0/A/5500/45 did not include steps to protect against mal-operation or failure of these valves prior to transferring operation to the SSS. Thus, the assured suction supply to the TDAFW pump may be made unavailable due to fire damage. The SSA only addressed spurious closure of the normal suction supply through auxiliary feedwater valve 2CA0007A.

Therefore, AP/0/A/5500/45 did not have actions to prevent loss of the assured suction flow path due to failure of valves 2CA161C, 2CA162C, and 0RN4AC. This issue was entered into the corrective action program as PIP M-06-5656 and a 1-hour roving fire watch was established in fire areas 3 (Unit 2) and 4 (Unit 1). FA 4 is a common fire area where the equivalent Unit 1 valves 1CA161C and 1CA162C are located.

The inspectors identified that the licensee missed a prior opportunity to correct this problem in 1994 as part of their review for GL 92-08, "Thermo-Lag 330-1 Fire Barriers." In a 1994 letter to the NRC, the licensee committed to open and de-energize valves CA161C and CA162C within the first 10 minutes of a fire in FA 3 as part of the corrective actions to alleviate the reliance on Thermo-lag. However, the licensee failed to implement this commitment in Procedure AP/0/A/5500/45. The failure to implement this NRC commitment has been entered into the licensee's corrective action program as PIP M-06-05730.

Pressure switches 1/2CAPS5044 and 1/2CAPS5380 will initiate swapover to the assured suction source on low TDAFW pump suction pressure by automatically opening valves 1/2CA161C and 1/2CA162C. The team had a concern that the control cables associated with these pressure switches 1/2CAPS5044 and 1/2CAPS5380 were not adequately analyzed for potential fire damage in FA 3. The inspectors postulated that a severe fire in FA 3 could cause multiple shorts to ground, result in a loss of control power, and make the valves inoperable from the SSF control panel. This issue was entered into the corrective action program under PIP M-06-5900.

Analysis: The lack of independence of the SSS from cables in FA 3 is a performance deficiency because it is contrary to the requirements of McGuire Unit 2 Operating License Condition 2.C.4. This performance deficiency is more than minor because it is associated with the reactor safety Mitigating Systems cornerstone attribute of protection against external events, i.e. fire, and it affects the objective of ensuring the reliability and capability of systems that respond to initiating events. The team determined that this issue was of very low safety significance (Green) after reviewing the results of the licensee's risk analysis which had assumed no credit for flow through suction valves 2CA161C, 2CA162C and 0RN4AC for a postulated fire in FA 3. The inspectors reviewed the licensee's analysis and found it to be acceptable.

Enforcement: McGuire Unit 2 Operating License Condition 2.C.4 states that the licensee shall implement and maintain in effect all provisions of the approved FPP as described in the UFSAR for the facility and as approved in the SER dated March 1978 and Supplements 2, 5 and 6 dated March 1979, April 1981, February 1983, respectively, and the SE dated May 1989. McGuire UFSAR Section 9.5.1 states in part, that the McGuire FPP is contained in design basis document MCS-1465.00-00-0008, "Plant Design Basis Specification for Fire Protection." This document states in Appendix C, Section C3, "Appendix R," that McGuire Nuclear Station FPP is required to comply with Sections III.G, J, L and O of 10 CFR 50, Appendix R. 10 CFR 50, Appendix R, Sections III.G and III.L require that the alternative or dedicated shutdown capability be independent of cables in the area under consideration. The dedicated shutdown capability that was relied on for large fires in FA 3 was the SSS.

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Contrary to the above requirements, on December 14, 2006, the alternative and dedicated shutdown capability (the SSS) utilized the TDAFW pump for a severe fire in FA 3 and was not independent of cables for valves 2CA161C, 2CA162C, and 0RN4AC which were located in FA 3. This condition has existed for several years. The safety consequence was a reduction in the availability and reliability of the SSS to mitigate a large fire in FA 3. This noncompliance is also applicable to FA 4 where SSS valves 1CA161C and 1CA162C are not independent of cables in FA 4 which is a SSS shutdown area.

Pursuant to the Commission's Enforcement Policy and NRC Manual Chapter 0305, under certain conditions fire protection findings at nuclear power plants that transition their licensing bases to 10 CFR 50.48(c) are eligible for enforcement and ROP discretion. The Enforcement Policy and ROP also state that the finding must not be evaluated as Red.

Because the licensee committed, prior to December 31, 2005, to adopt NFPA 805 and change their fire protection licensing bases to comply with 10 CFR 50.48(c), the NRC is exercising enforcement discretion for this issue in accordance with the NRC Enforcement Policy, "Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues (10 CFR 50.48)." Specifically, this issue would have been expected to be identified and addressed during the licensee's transition to NFPA 805, was entered into the licensee's corrective action program and will be corrected, was not likely to have been previously identified by routine licensee efforts, was not willful, and was not associated with a finding of high safety significance. The licensee entered this issue in their corrective action program under PIP M-06-5656 and implemented 1-hour roving fire watches as compensatory measures in the FA.

.07 Circuit Analyses

a. Inspection Scope

This segment is suspended for plants in transition because a more detail review of cable routing and circuit analysis will be conducted as part of the fire protection program transition to NFPA 805. However, a review of the licensee's preliminary cable routing information was used by the team to assess the adequacy of the licensee's fire response procedures in the selected fire areas. The routing information was based upon a list of safe shutdown components submitted by the inspectors. Results of these reviews are documented in IR05.01 and IR05.06 sections of this report.

b. Findings

No findings of significance were identified.



.08 Communications

a. Inspection Scope

The team reviewed plant communication capabilities to evaluate the availability of the communication systems to support plant personnel in the performance of local operator manual actions to achieve and maintain SSD conditions. During this review, the team considered the effects of ambient noise levels, clarity of reception, and reliability. The team also reviewed the communication systems available at different locations in the plant. Both fixed and portable communication systems were reviewed for the impact of fire damage in the selected fire areas. A review was performed to verify the availability of the portable radios for use during the SSD procedures. In addition, the team reviewed the radio battery usage ratings for the radios stored and maintained on charging stations for operator use while performing the SSD procedure. The team reviewed preventative maintenance and surveillance test records to verify that the communication equipment was being properly maintained. The team also requested that the licensee exercise the primary method of communication credited to perform the various actions identified in the procedure review.

The team reviewed the plant communication systems that would be relied upon to support fire event notification and fire brigade fire fighting activities to verify their availability. The team reviewed selected fire brigade drill evaluation/critique reports to assess proper operation and effectiveness of the fire brigade command post portable radio communications during fire drills and to identify any history of operational or performance problems with radio communications during fire drills. In addition, the team reviewed the radio battery usage ratings for the fire brigade radios stored and maintained on charging stations to verify their availability.

b. Findings

No findings of significance were identified.

.09 Emergency Lighting

a. Inspection Scope

The team observed the placement and coverage area of fixed eight-hour battery pack emergency lights throughout the selected fire areas to evaluate their adequacy for illuminating access and egress pathways and any equipment requiring local operation and/or instrumentation monitoring for post-fire SSD. The team observed whether emergency exit lighting was provided for personnel evacuation pathways to the outside exits as identified in the NFPA 101, "Life Safety Code," and the Occupational Safety and Health Administration Part 1910, "Occupational Safety and Health Standards." This review also included examination of whether backup emergency lighting units (ELUs) were provided for the primary and secondary fire emergency equipment storage locker locations and dress-out areas in support of fire brigade operations should power fail during a fire emergency.

b. FindingsFixed Emergency Lighting Units not Installed to Support Operator Manual Actions

Introduction. A noncompliance with McGuire Unit 1 Operating License Condition 2.C.4 was identified for failure to install fixed emergency lighting in three areas where OMAs are required to support post-fire SSD procedures.

Description: During a walkdown of post-fire safe shutdown procedures, the inspectors identified three areas where fixed emergency lighting had not been installed to support OMAs. The inspectors determined that fixed emergency lighting had not been installed at panel 1EMXB, or along the access route to panel 1EMXB, or on the 733 ft. elevation of the AB near column DD-53 in FA 4, where operators may be required to manually open Unit 1 auxiliary feedwater valves 1CA161C and 1CA162C. The licensee had previously identified all three areas in PIP M-04-4928 and had developed a modification package to install the lights.

Analysis: This issue is a performance deficiency because the licensee had not installed fixed emergency lighting units for the support of OMAs while performing post-fire safe shutdown procedures as required by the FPP. This finding is more than minor because it is associated with the reactor safety Mitigating Systems cornerstone attribute of protection against external factors (i.e., fire) and it affects the objective of ensuring reliability and capability of systems that respond to initiating events. The team determined that this finding was of very low safety significance (Green) because the operators had a high likelihood of completing the task using flashlights.

Enforcement: McGuire Unit 1 Operating License Condition 2.C.4 states that the licensee shall implement and maintain in effect all provisions of the approved FPP as described in the UFSAR for the facility and as approved in the SER dated March 1978 and Supplements 2, 5 and 6 dated March 1979, April 1981, February 1983, respectively, and the SE dated May 1989. McGuire UFSAR Section 9.5.1 states in part, that the McGuire FPP is contained in design basis document MCS-1465.00-00-0008, Plant Design Basis Specification for Fire Protection. This document states in Appendix C, Section C3, "Appendix R," that McGuire FPP is required to comply with Sections III.G, J, L and O of 10 CFR 50, Appendix R. 10 CFR 50, Appendix R, Section III.J, "Emergency Lighting," states in part, that ELUs with at least an 8-hour battery supply shall be provided in all areas needed for operation of safe shutdown equipment and in access and egress routes thereto.

Contrary to the above, on December 14, 2006, during a walkdown of post-fire SSD procedures, the inspectors identified three areas where fixed emergency lighting had not been installed to support OMAs. The licensee had previously identified all 3 areas in PIP M-04-4928 and had developed a modification package to address this issue. This issue has existed for several years.

Pursuant to the Commission's Enforcement Policy and NRC Manual Chapter 0305, under certain conditions fire protection findings at nuclear power plants that transition their licensing bases to 10 CFR 50.48(c) are eligible for enforcement and ROP discretion.

The Enforcement Policy and ROP also state that the finding must not be evaluated as Red. Because the licensee committed, prior to December 31, 2005, to adopt NFPA 805 and change their fire protection licensing bases to comply with 10 CFR 50.48(c), the NRC is exercising enforcement discretion for this issue in accordance with the NRC Enforcement Policy, "Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues (10 CFR 50.48)." Specifically, this issue had previously been identified, entered into the licensee's corrective action program and will be corrected, and was not associated with a finding of high safety significance.

.10 Cold Shutdown Repairs

a. Inspection Scope

The team reviewed the licensee's SSA to determine if any repairs were necessary to achieve cold shutdown. Station procedures IP/0/A/3090/23, and IP/0/A/3004/05 describe methods for repairing equipment, following a fire, needed to bring the units to cold shutdown. The team verified that repair kits necessary to restore valves 1ND1B, 1ND2AC, 1NV457A, and 1NV458B for remote operation as well as bulk cable reels were tagged and stored on-site for the sole purpose of damage control measures.

b. Findings

No findings of significance were identified.

.11 Compensatory Measures

a. Inspection Scope

The team reviewed the administrative controls for out-of-service, degraded, and/or inoperable fire protection features (e.g., detection and suppression systems and equipment, passive fire barriers, or pumps, valves or electrical devices providing SSD functions or capabilities). The team reviewed the fire protection impairment log for fire areas 2, 5, and 19. The compensatory measures that had been established in these areas were compared to those specified for the applicable fire protection feature to verify that the risk associated with removing the fire protection feature from service was properly assessed and adequate compensatory measures were implemented in accordance with the approved FPP.

Additionally, the team reviewed the licensee's short term compensatory measures (compensatory fire watches) to verify that they were adequate to compensate for a degraded function or feature until appropriate corrective action could be taken and that the licensee was effective in returning the equipment to service in a reasonable period of time.

b. Findings

No findings of significance were identified.

#### 4. OTHER ACTIVITIES

##### 4OA2 Identification and Resolution of Problems

###### a. Inspection Scope

Corrective action program (CAP) PIPs related to the McGuire FPP, and the capability to successfully achieve and maintain the plant in a SSD condition following a plant fire, as well as selected fire brigade response, emergency / incidents, and fire safety inspection reports were reviewed. This review was conducted to assess the frequency of fire incidents and effectiveness of the fire prevention program and any maintenance-related or material condition problems related to fire incidents.

The team also reviewed other CAP documents, including completed corrective actions documented in selected PIPs, and operating experience program (OEP) documents to verify that industry-identified fire protection problems potentially or actually affecting McGuire were appropriately entered into, and resolved by, the corrective action program process. Items included in the OEP effectiveness review were NRC Regulatory Issue Summaries, Information Notices, industry or vendor-generated reports of defects and noncompliance under 10 CFR Part 21, and vendor information letters. In addition, the inspectors reviewed a sample of the fire protection program audits and self-assessments which the licensee performed in the previous one-year period to assess the types of findings that were generated and that the findings were appropriately entered into the licensee's CAP. The inspectors evaluated the effectiveness of the corrective actions for a sample of identified issues. The documents reviewed are listed in the Attachment.

###### b. Findings

No findings of significance were identified.

##### 4OA5 Additional Examples of Unresolved Item (URI) 50-369,370/03-07-04

During the 2003 triennial fire protection inspection, URI 50-369,370/03-07-04, "Requirements Relative to the Number of Spurious Operations That Must be Postulated" was opened. The URI was opened pending NRC guidance related to the number of concurrent fire-induced spurious operations associated with a component or set of components that must be postulated during SSD analysis of a fire area. The licensee's SSA included the assumption that only one spurious operation due to fire damage need be postulated .

The team determined two additional components where multiple fire-induced cable short circuits could cause equipment to change position and affect plant SSD. The examples were AFW air-operated control valves 1CA36AB and 1CA64AB. Two simultaneous, proper polarity direct current short circuits could cause either valve to close isolating AFW flow from the TDAFW pump to either the D or A S/G respectively. The valves are normally open, air-operated control valves which fail open on loss of air or power. The valves and their cables were located in FA 2 and no actions existed in the fire response procedure to prevent spurious operation.

The licensee relied on the assumption of only one spurious operation to justify the valves remaining open during postulated fire scenarios in FA 2. Therefore, this represents an additional example of URI 50-369,370/03-07-04. The URI remains open pending NRC resolution of the generic industry issue regarding the licensing basis for concurrent multiple spurious hot shorts.

4OA6 Meetings, Including Exit

On December 14, 2006, the lead inspector presented the inspection results to Mr. G. Peterson and other members of his staff. Proprietary information is not included in this report.

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee personnel

Arlow, T., Operations  
Ashe, K., Licensing Specialist  
Bradshaw, S., Superintendent, Plant Operations  
Brown, S., Manager, Engineering  
Burns, Renard, Safety Assurance  
Crane, K., Licensing Specialist  
Hunt, M., Mechanical and Civil Engineering (MCE)  
Jennings, D., Nuclear Generating Office Nuclear Performance Assessments  
Johansen, B., MCE Balance of Plant  
Kammer, J., Manager, Safety Assurance  
Mebane, D., MCE  
Nolan, J., Manager, MCE  
Oldham, J., Fire Protection Lead Engineer  
Peterson, G., Site Vice President, McGuire Nuclear Station  
Snyder, S., Manager, RES Engineering  
Thomas, J., Manager, Regulatory Compliance

#### NRC personnel

J. Brady, Senior Resident Inspector  
S. Walker, Resident Inspector

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

#### Opened/Closed

None.

#### Discussed

0500369, 370/2003007-04

URI Requirements Relative to the Number of Spurious Operations That Must Be Postulated (Section 40A5)

## LIST OF DOCUMENTS REVIEWED

### **Section 1R05.03.a: List of Fire Barrier Features Inspected in Relation to Safe Shutdown Separation Requirements**

<u>Floors/Walls/Ceilings</u>	<u>Description</u>
Concrete Masonry Block Wall	Fire Area 2 to Fire Area 2A
Gypsum Wallboard Wall	Fire Area 19 to Fire Area 20
<u>Fire Dampers</u>	<u>Description</u>
716-16.1-7	Fire Area 2 to Fire Area 2A
750-29.1-1	Fire Area 19 to Fire Area 20
750-29.1-3	Fire Area 19 to Fire Area 20
<u>Fire Doors</u>	<u>Description</u>
600A	Fire Area 2 to Stairway
600D	Fire Area 2 to Fire Area 2A
703	Fire Area 5 to Fire Area 15
704	Fire Area 5 to Fire Area 6
RA1	Fire Area 5 to Fire Area 6
801J	Fire Area 19 to Fire Area 20
<u>Fire Barrier Penetration Seals</u>	<u>Description</u>
716-14.1-1	Fire Area 2 to Fire Area 2A
716-14.1-13	Fire Area 2 to Fire Area 2A
716-16.1-11	Fire Area 2 to Fire Area 2A
736-5.1-1	Fire Area 5 to Fire Area 15
736-5.1-9	Fire Area 5 to Fire Area 15
736-5.1-15	Fire Area 5 to Fire Area 15
736-6.1-1	Fire Area 5 to Fire Area 6
750-29.2-3	Fire Area 19 to Fire Area 17A
<b><u>Drawings</u></b>	
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MC-1200-06.03, Architectural Steel Studs & Concrete Block Walls, Rev. 31	
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MC-1208-01.03-02, Architectural Special Purpose Door Details, Rev. 11	
MC-1220-13, Auxiliary Building Units 1&2 Floor Drain Layout, Rev 13	
MC-1224-3, Unit 1 Auxiliary Building Concrete and Curbs, Rev 21	
MC-1231-13, Diesel Generator Building Units 1&2 Floor Drain Layout, Rev 2	
MC-1315-01.02-004, Fire, Flood, & HVAC Boundaries AFW Pump Room, Arrangement, Elevation 716.0, Rev 0	
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MC-1315-01.04-100, Fire, Flood, & HVAC Boundaries Arrangement, Elevation 736.0, Rev 7	
MC-1315-01.05-105, Fire, Flood, & HVAC Boundaries Arrangement, Elevation 750.0, Rev 1	
MC-1315-05.01-005, Penetration Seal Fire Stop Design, Rev. 0	
MC-1384-07.13-01, Fire Plan Layout, Elevation 716.0, Rev 9	
MC-1384-07.14-02, Fire Plan Layout, Elevation 733.0 & 736.5, Rev 11	

MC-1384-07.15-01, Fire Plan Layout, Elevation 750.0, Rev 12  
 MC-1577-01, Flow Diagram of Auxiliary Building Ventilation System (VA), Rev 36  
 MC-1578-01.01, Flow Diagram of Control Area Ventilation System (VC), Rev 28  
 MC-1579-01, Flow Diagram of Diesel Generator Building Ventilation System (VD), Rev 15  
 MCEE-216-00.21-01, Elementary Diagram, Main Fire Protection System Pump A, Rev 2  
 MCEE-216-00.47-01, Elementary Diagram, Main Fire Protection System Pump B, Rev 4  
 MCEE-133-00.19-01, Elementary Diagram, Main Fire Protection System Pump C, Rev 3  
 MCFD-1599.0-Series, Flow Diagram of Fire Protection (RF,R,Y) System, Rev. 15  
 MCM-1206.07-0014-001, Flow Control Valve 1RY113 and 1RY114 Schematic Drawing, Rev D2  
 MC-1705-01.01, One Line Diagram 125 VDC /120 VAC Vital Instr and Control PWR SYS,  
 Rev. 29  
 MC-1705-03.01, One and Three Line Diagram 250/125 VDC Auxiliary Power System Standby  
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 MC-1845-13.00, Lighting Hot Standby Emergency Lights Schedule, Rev. 3  
 MC-1857-04.00, Lighting Standby Shutdown Facility Plans and Details, Rev. 12  
 MC-2901-02.01, Computer Cable Routing Auxiliary Building Plan Below Elev. 733' +0", Rev. 37  
 MCCD-1700-00.00, Unit 1 Configuration One Line Diagram Unit Essential Power System,  
 Rev. 4  
 MCCD-1700-00.01, Unit 1 Configuration One Line Diagram Unit Auxiliary Power System,  
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 MCCD-1702-02.00, One Line Diagram 4160 V Essential Auxiliary Power System, Rev. 2  
 MCCD-1703-06.10, One Line Diagram 600 VAC Essential MCC 1EMXH1, Rev. 2  
 MCCD-1703-06.11, One Line Diagram 600 VAC Essential MCC 1EMXA4, Rev. 3  
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MCCEE-0138-00.68, Elementary Diagram Containment Vent. System Supply Isolation Valve 0RN301AC, Rev. 9

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MCCEE-0171-00.05, Elementary Diagram Steam Generator 1A Blowdown Containment Isolation Valve 1BB5A, Rev. 16

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MCEE-0147-02.00, Elementary Diagram AFW System Selector Station Control Circuit, Rev.0

MCEE-0147-02.01, Elementary Diagram AFW System Selector Station Control Circuit, Rev. 1

MCEE-0147-08.00, Elementary Diagram AFW System Selector Station Control Circuit, Rev. 2

MCEE-0147-13.00, Elementary Diagram AFW System Turbine Start Circuit (Auto), Rev. 3

MCEE-0147-17.00, Elementary Diagram AFW System Hotwell Supply Valve 1CA0002, Rev. 2

MCEE-0147-31.00, Elementary Diagram AFW System Solenoid Valve 1SASV0482 & 1SASV0484, Rev. 5

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MCFD-1574-03.00, Flow Diagram of Nuclear Service Water System, Rev. 23

MCFD-1580-01.00, Flow Diagram of S/G Blowdown Recycle System, Rev. 23

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MCFD-1593-01.03, Flow Diagram of MS System MS Atmosphere, Rev. 15

MCFD-1593-01.03, Flow Diagram of MS System MS Vent to Atmosphere, Rev. 15

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 MCSF-1560.SS-01, Summary Flow Diagram SSS, Rev. 2

### **Procedures**

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 OP/0/A/6100/017, Operation of SSF During Significant Sabotage Event That May Cause Plant Flooding, Rev. 29  
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 OP/0/A/6400/002B, Halon Fire Protection System, Rev. 15  
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**Completed Surveillance Test Procedures and Test Records**

IP/0/B/3260/028, SSS Emergency Lighting Battery Discharge Test, Rev. 10  
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 PT/0/A/4200/002, SSF Operability Test, Rev. 35, completed 09/30/06  
 PT/0/A/4200/002, SSF Operability Test, Rev. 35, completed 10/26/06  
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 WO# 98754231, PT/0/A/4400/001A, Fire Protection Annual Valve Test, completed 4/9/2006  
 WO# 1715387-01, PT/0/A/4400/001C, Fire Protection System Monthly Test, completed 11/9/2006  
 WO# 98694072-01, PT/0/A/4400/001T, Fire Protection System AB Flush and Flow Test, completed 8/2/2005  
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**Calculations**

MCS-1465.00-00-0008, Unit 1&2 Fire Area SSD Train Designation, Rev. 7  
 MCS-1465.00-00-0022, Appendix E. Unit 1 & Unit 2 SSD Equipment List, Rev. 6  
 MC-1174.00-2, Specification for McGuire 1-2 Fire-Rated Concrete Masonry Units, Mill Power Supply, dated October 5, 1972  
 MCC-1435.00-00-0006, McGuire Penetration Seals Design, Rev. 2  
 MCC-1435.03-00-0012, McGuire Penetration Seals Database and 86-10 Evaluations, Rev. 0  
 MCC-1435.03-00-0013, McGuire Fire Protection Code Deviations, Rev. 3  
 MCM-1206.07-0029-001, McGuire Units 1&2 Diesel Generator Area Halon Fire Protection System Calculation, Rev. D01

**Design Changes**

Minor Design Change No. MD200834, EC 92169, Install a Fire Detection System for the Unit 2 Interior and Exterior Doghouses, dated 8/7/2006  
 Minor Design Change No. MD100745, Add 8 Hour Emergency Lights

**Fire Strategies**

Strategy Number 2, Aux-U1-AFWP-Room, Elevation 716, Rev. 1  
 Strategy Number 5, Aux-Diesel Generator 1A Room, Elevation 736, Rev. 0  
 Strategy Number 19, Aux-U1-Cable Room, Elevation 750, Rev. 0

**Applicable Codes and Standards**

NFPA 10 - 1978, Standard for Portable Fire Extinguishers  
 NFPA 12A - 1977, Standard on Halon 1301 Fire Extinguishing Systems  
 NFPA 13 - 1978, Standard for the Installation of Sprinkler Systems

NFPA 14 - 1976, Standard for the Installation of Standpipes and Hose Systems  
 NFPA 15 - 1977, Standard for Water Spray Fixed Systems for Fire Protection  
 NFPA 20 - 1978, Standard for the Installation of Centrifugal Fire Pumps  
 NFPA 24 - 1977, Standard for the Installation of Private Service Mains and Their Appurtenances  
 NFPA 27 - 1975, Private Fire Brigades  
 NFPA 30 - 1977, Flammable and Combustible Liquids Code  
 NFPA 72E-1974, Standard on Automatic Fire Detection  
 NFPA 101-1996, Life Safety Code  
 NUREG-1552, Supplement 1, Fire Barrier Penetration Seals in Nuclear Power Plants, dated January 1999

### **Technical Manuals and Vendor Information**

Data Sheet Angus Redskin 500 Fire Hose, dated 2005  
 Data Sheet Akron Turbojet Fire Hose Nozzles, 1715E, 1720E, and 1727, dated 2006  
 Data Sheet ICI Aerospace Electrically Actuated Frangible Link Assembly, Model 630, dated 10/19/1993  
 Data Sheet O-Z/Gedney Fire Seals, CFS Series, dated 3/28/1981  
 Data Sheet Protectoseal In-Line Flame Arrester, Model 4950, dated 1979  
 Data Sheet and Installation Instructions Air Balance Inc., 119A, UL-Classified Static Rated Fire Damper, dated 3/20/1978  
 Data Sheet Ruskin Manufacturing, IBD23, Fire Damper and Leakage 3Hr Rated Interlocking Blade Dampers, dated 1/6/1986  
 Data Sheet P16164 SuperVac Smoke Ventilator  
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 Ventilator Users Guide for SuperVac Smoke Ventilators, dated 8/28/98  
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 The Overly Manufacturing Company, Order C-45485, Fire Rated Metal Doors and Hardware, dated 7/13/2000  
 The Philipp Manufacturing Company, Order 73-5629H12, Fire Rated Hollow Metal Doors and Hardware, dated 5/17/1994

### **Licensing Basis Documents**

UFSAR Chapter 9, Section 9.5.1, Fire Protection System  
 UFSAR Chapter 16, Fire Protection Selected Licensee Commitments  
 Letter from W.O. Parker, Duke Power Co., to H.R. Denton, NRC, McGuire Nuclear Station Fire Protection, dated January 9, 1979  
 McGuire Operating License Conditions 2.C.4, Fire Protection Program, for Units 1 and 2, respectively  
 Title 10 of the Code of Federal Regulations, Part 50 (10 CFR 50), Appendix R, Sections III.G, J, L, and O  
 10 CFR 50.48, Fire Protection  
 Appendix A to Branch Technical Position Auxiliary and Power Conversion Systems Branch 9.5-1, Guideline for Fire Protection for Nuclear Power Plants

**Design Basis Documents**

MCS-1465.00-00-0008, Design Basis Specification for Fire Protection, Rev. 7

MCS-1465.00-00-0022, Design Basis Specification for the Appendix R Safe Shutdown Analysis, Rev. 6

MCS-1579.VD-00-0001, Design Basis Specification for VD System, Rev. 9

MCS-1599.RF.-00-0001, Design Basis Specification for RF/RV System, Rev. 16

**Other Documents**

TT/1/A/9100/08, Halon Discharge Test for Unit 1 Diesel Generator Rooms, dated 5/9/1978  
Report of a Standard ASTM Fire Endurance Test and Fire and Hose Stream Test on a Non-load-Bearing Wall Assembly, for Duke Power Company, Project 6579, dated December 12, 1978

Duke Memorandum to File, Circuit Protection for Fire Pump C Controls, File MC-1435.00, dated 11/9/1984

Fire Emergency Reports, RP/0/A/5700/025 Enclosure 4.3 for Period January 2003 through November 2006

Fire Drill Summary Reports for Fire Brigade Drills Conducted in 2006

NGD-FB-05, Initial Fire Brigade Training, Fire Hose, Nozzles, Appliances, and Streams, Rev. 4  
McGuire Fire Strategy Revision Workflow Process, Fire Protection Program DBD, Appendix B.5  
Section Review, projected due date 3/2007

Information Notice 2005-01: Halon Fire-Extinguishing System Piping Incorrectly Connected, dated 2/4/2005

Duke Letter of Intent to Adopt NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactor Generating Plants, 2001 Edition, dated 2/28/2006

JPM for AP/0/A/5500/45, Plant Fire, Enc. 23, AB 750' Unit 1 Cable Spreading Room Fire Unit 1  
Actions, 07/25/06

JPM for AP/0/A/5500/45, Plant Fire, Enc. 8, AB 716' Unit 2 T/D CA Pump Room Fire Unit 2  
Actions, 07/25/06

JPM-CP-AD-126T, 1ETA Room Actions

JPM-CP-AD-127T, SSF Actions

JPM-CP-AD-129T, Unit 2 SSF Actions

JPM-CP-AD-61T, SSF Actions

JPM-CP-AD-87T, 1ETA Room Actions

Control Room Shift Turnover Records for Day and Night Shifts for the following dates: 12/20/05, 07/03/06, 08/01/06, 08/02/06, 11/24/06, and 11/27/06

Memorandum To Bruce Hamilton, Nov. 3, 1992, AP/24 Loss of Plant Control Due to Fire Time Line for Local Steps.

Duke Letter to NRC, dated 11/18/1983, McGuire Units 1 and 2, Docket Nos. 50-369 and 50-370, Issuance of Amendment No. 31 to Facility Operating License NPF-9 and Amendment No. 12 to Facility Operating License NPF-17 - McGuire Nuclear Station, Units 1 and 2

Background Document for AP/0/A/5500/45

Background Document for AP/1&2/A/5500/24

Work Request No. WR 911971

Federal Register/Vol. 70, No. 10/Friday, January 14, 2005/Notices, Pages 2662 thru 2664, NRC Enforcement Policy; Extension of Enforcement Discretion of Interim Policy

Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues (10 CFR 50.48)

Duke Letter to NRC dated November 28, 1994, Subject: McGuire Nuclear Station, Units 1 and 2  
Docket Nos. 50-369 and 50-370 NRC Generic Letter 92-08, Thermo-Lag 330-1 Fire Barriers

**Problem Investigation Process (PIP) Reports Generated as a Result of This Inspection**

M-06-05645, Evaluate Potential Enhancements Needed to Revise Fire Plan/Strategies in the DG and Cable Spreading Rooms

M-06-05647, Emergency Lighting and Exit Signs to Support Fire Fighting Emergency Operations and Personnel Evacuation

M-06-05656, NRC inspector questioned response of AP-45 Plant Fire Procedure in dealing with CA assured source to the turbine driven auxiliary feedwater pump

M-06-05671, Loss of Power Supply for Fire Suppression Supply Deluge Valves 1RY113 and 1RY114

M-06-05730, As part of responding to PIP M-06-5656, a potential concern has been identified in how committed actions are tracked by McGuire

M-06-05867, Availability of Assured Power Source for Portable Smoke Ejectors During Plant Fires

M-06-05803, Items noted during NRC triennial fire protection inspection

M-06-05900, NRC question raised during triennial inspection on potential for problem with failure of two specific pressure switches

M-06-05901, Potential Spurious Operation of 1CA64AB and 1CA36AB

**Other Corrective Action Documents (PIPs) Reviewed During This Inspection**

00-04491, Evaluate Cabling for NC PORV and Block Valve

02-06055, Designated App R lighted pathway from Control Room to ETA Room can't be used for fire in cable spreading room

M-03-02118, Appendix R logics for auxiliary feedwater do not show valve 2CA0007A

M-03-03827, DC Emergency Lighting and Ctmt Hoist Motor

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.

04-03317, App R SSF SBMUP NC influent for boration

M-04-04928, Fire Audit observation on Appendix R 8-hour Emergency Lighting

M-04-20983, The Unit 2 ELD system requires classification as A(1) status due to exceeding ELD.02 Performance Criteria.

05-04859, Appendix R Manual Action

M-06-00979, 06 CDBI Self Assessment

M-00-04469, Hot shorts on all three control circuits for fire pumps could prevent automatic start on demand

M-04-04930, No Detection System in Any Doghouse

M-04-05510, Documents 2004 Annual Offsite Fire Drill and Training for Volunteer Departments

M-05-00215, Evaluation of Halon Suppression Systems Incorrectly Piped

M-05-05495, Documents 2005 Annual Offsite Fire Drill and Training for Volunteer Departments

M-06-00576, Track Additional Corrective Actions Needed to Revise Fire Plan/Strategies

M-06-04539, PIP initiated to ensure appropriate actions have been taken in order to receive enforcement discretion during the transition to the NFPA Standard 805

**LIST OF ACRONYMS**

AB	Auxiliary Building
AFW	Auxiliary Feedwater
AP	Abnormal Procedure
CAP	Corrective Action Program
CFR	Code of Federal Regulation
COR	Code of Record
ELU	Emergency Lighting Unit
FA	Fire Area
FHA	Fire Hazards Analysis
FPP	Fire Protection Program
ft.	foot
HVAC	Heating, Ventilation, and Air Conditioning
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IPEEE	Individual Plant Examination for External Events
MCC	Motor Control Center
MCE	Mechanical and Civil Engineering
MCR	Main Control Room
MDAFW	Motor Driven Auxiliary Feedwater Pump
MOV	Motor Operated Valve
NFPA	National Fire Protection Association
NRC	U. S. Nuclear Regulatory Commission
OEP	Operating Experience Program
OMA	Operator Manual Action
P&IDs	Piping and Instrumentation Drawings
PIP	Problem Investigation Report
PORV	Pilot Operated Relief Valve
ROP	Reactor Oversight Process
SCBA	Self-Contained Breathing Apparatus
SDP	Significance Determination Process
SE	Safety Evaluation
SER	Safety Evaluation Report
S/G	Steam Generator
SSA	Safe Shutdown Analysis
SSD	Safe Shutdown
SSF	Standby Shutdown Facility
SSS	Standby Shutdown System
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item