UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
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ATLANTA, GEORGIA 30303-8931

July 30, 2004

Duke Energy Corporation
ATTN: Mr. D. M. Jamil
Site Vice President
Catawba Nuclear Station
4800 Concord Road
York, SC 29745

SUBJECT: CATAWBA NUCLEAR STATION -NRC TRIENNIAL FIRE PROTECTION INSPECTION REPORT 05000413/2004007 AND 05000414/2004007

Dear Mr. Jamil:

On June 25, 2004, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Catawba Nuclear Station Units 1 and 2. The enclosed inspection report documents the inspection findings, which were discussed on June 24, 2004, with you and other members of your staff. Following completion of additional review in the Region II office, a final exit was held by telephone with Mr. B. Dolan and other members of your staff on July 30, 2004, to provide an update on changes to the preliminary inspection findings.

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

This report documents one NRC-identified finding concerning unprotected cables for valves which could affect operation of the centrifugal charging pumps and reactor coolant pump seal cooling. This finding has potential safety significance greater than very low significance, however, a safety significance determination has not been completed. This finding did not present an immediate safety concern because the cables for the standby shutdown facility (which is an alternate means for providing reactor coolant pump seal cooling) were not likely to be damaged by the same fire that could damage the cables for the valves associated with the centrifugal charging pumps. However, we understand that you established fire watches on June 23, 2004, as a compensatory measure until the issue is resolved.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Charles Ogle, Chief
Engineering Branch 1
Division of Reactor Safety

Docket Nos.: 50-413, 50-414
License Nos.: NPF-35, NPF-52

Enclosure: NRC Triennial Fire Protection Inspection Report 05000413/2004007 and 05000414/2004007 w/Attachment: Supplemental Information

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos:	50-413, 50-414
License Nos:	NPF-35, NPF-52
Report No:	05000413/2004007, 05000414/2004007
Licensee:	Duke Energy Corporation
Facility:	Catawba Nuclear Station, Units 1 and 2
Location:	4800 Concord Road York, SC 29745
Dates:	June 7 - 11, 2004 (Week 1) June 21 - 25, 2004 (Week 2)
Inspectors:	M. Thomas, Senior Reactor Inspector (Lead Inspector) N. Merriweather, Senior Reactor Inspector R. Schin, Senior Reactor Inspector B. Melly, Fire Protection Engineer (Contractor)
Approved by:	Charles R. Ogle, Chief Engineering Branch 1 Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000413/2004-007, 05000414/2004-007; 06/07-11/2004 and 06/21-25/2004; Catawba Nuclear Station, Units 1 and 2; Triennial Fire Protection.

The report covered an announced two-week period of inspection by three regional inspectors and a contractor. One unresolved item pending a significance determination, and two unresolved items pending additional inspection were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- TBD. A violation of Catawba operating license condition 2.C.5 and the approved fire protection program was identified for failure to protect the control cables of motor operated valves required for post-fire safe shutdown in multiple fire areas. The valves are related to operation of the charging pumps and reactor coolant system inventory control. The finding is applicable to Units 1 and 2. The licensee had not identified these valves in the safe shutdown analysis as being required to assure post-fire safe shutdown for a fire in the fire areas. Upon discovery, the licensee entered this issue into its corrective action program and established fire watches for the 4160 Volt Essential Switchgear Rooms (Unit 1 Fire Areas 8 and 15, Unit 2 Fire Areas 7 and 14) as a compensatory measure until this issue is resolved.

  The finding is greater than minor because it is associated with the protection against external factors attribute, and degraded the reactor safety mitigating systems cornerstone objective. The finding degraded the defense-in-depth for fire protection. This finding has potential safety significance greater than very low significance, however, a safety significance determination has not been completed. The finding is unresolved pending completion of a significance determination. [Section 1R05.01.b(1)]

B. Licensee-Identified Violations

None

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R05 Fire Protection

The purpose of this inspection was to review the Catawba Nuclear Station (CNS) fire protection program (FPP) for selected risk-significant fire areas (FA). Emphasis was placed on verification that the post-fire safe shutdown (SSD) capability [from both the main control room (MCR) and the standby shutdown facility (SSF)] and the fire protection features provided for ensuring that at least one redundant train of SSD systems was maintained free of fire damage. The inspection was performed in accordance with the U.S. Nuclear Regulatory Commission's (NRC) Reactor Oversight Process using a risk-informed approach for selecting the FAs and attributes to be inspected. The inspectors used the licensee's Individual Plant Examination for External Events and in-plant tours to choose three risk-significant FAs for detailed inspection and review. The FAs (zones) chosen for review during this inspection were:

- FA 7, Unit 2 Train B 4160 Volt (V) Essential Switchgear Room, Auxiliary Building Elevation 560. Shutdown strategy for a fire in this area would involve shutdown of Unit 2 from the MCR utilizing Train A equipment.

- FA 16, Unit 2 Cable Spread Room, Auxiliary Building Elevation 574. Shutdown strategy for a fire in this area would involve shutdown of Unit 2 from the SSF utilizing the standby shutdown system (SSS) equipment.

- FA 18, Auxiliary Building General Area and Unit 2 Component Cooling (KC) Pump Room, Auxiliary Building Elevation 577. Shutdown strategy for a fire in this area would involve shutdown of Unit 2 from the SSF utilizing the SSS equipment.

The inspectors evaluated the licensee's FPP against applicable requirements, including Operating License Condition 2.C.5; Title 10 of the Code of Federal Regulations (10 CFR), Part 50.48; commitments to Appendix A of Branch Technical Position (BTP) Auxiliary Systems Branch (ASB) 9.5-1; BTP Chemical Engineering Branch (CMEB) 9.5-1; CNS Updated Final Safety Analysis Report (UFSAR); related NRC safety evaluation report (SER) through Supplement 5; and plant Technical Specifications. The inspectors evaluated all areas of this inspection, as documented below, against these requirements.

The inspection scope was expanded to include additional FAs based on cable routing data for selected components, as discussed in Section 1R05.01.b(1) of this report. The additional FAs reviewed by the inspectors included the following:

FA 5, Unit 2 Train B Electrical Penetration Room
FA 12, Unit 2 Train A Electrical Penetration Room
FA 14, Unit 2 Train A 4160V Essential Switchgear Room 2ETA
FA 31, Unit 2 Train A Auxiliary Shutdown Panel

FA 33, Unit 2 Train B Auxiliary Shutdown Panel
FA 46, Unit 2 Cable Room Corridor

Specific documents reviewed by the inspectors are listed in the attachment to this inspection report (IR).

.01 Systems Required to Achieve and Maintain Post-fire Safe Shutdown

a. Inspection Scope

The inspectors reviewed the licensee's safe shutdown analysis (SSA) as documented in CNS-1435.00-00-0002, Design Basis Specification for Post Fire Safe Shutdown, Rev. 13; system flow drawings; system descriptions; cable routing data sheets; electrical elementary drawings; and related operating procedures to evaluate the licensee's methodology for SSD in the event of a fire in FAs 7, 16, or 18. In addition, the inspectors performed walkdowns of the three FAs chosen for the focus of this inspection. The inspectors also walked down the proceduralized operator actions that could be needed to achieve and maintain hot standby following a fire in any of the three FAs. The objectives of this review were to:

- Verify that the licensee's post-fire safe shutdown methodology had correctly identified the components and systems necessary to achieve and maintain SSD conditions from either the MCR or alternative shutdown locations.

- Confirm the adequacy of the systems selected for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring and support system functions.

- Verify that SSD can be achieved and maintained with or without off-site power unless it can be confirmed that a postulated fire in any of the selected FAs could not cause the loss of off-site power.

- Verify that local manual operator actions are consistent with the plant's fire protection licensing basis.

The inspectors evaluated whether the SSA properly identified and categorized components in terms of safe shutdown function. In addition, instrumentation required for post-fire safe shutdown (e.g., pressurizer level and steam generator level) was checked. The safe shutdown components, which were reviewed for operability during and after a fire in either FA 7, FA 16, or FA 18, are listed in the attachment to this inspection report. Listings of system drawings and operating procedures reviewed are also included in the attachment.

b. Findings

(1) Failure to Protect Cables of Valves Required for Post-Fire Safe Shutdown in Multiple Fire Areas

Volume Control Tank (VCT) Outlet Valves 2NV188A and 2NV189B

Introduction: The inspectors identified a violation of Catawba operating license condition 2.C.5 and the approved FPP for failure to protect the control circuits for VCT outlet motor operated valves (MOVs) in multiple FAs. This finding is applicable to both units and is an unresolved item (URI) pending completion of the significance determination process (SDP).

Description. A finding was identified for failure to protect the control cables of Unit 2 VCT outlet MOVs 2NV188A and 2NV189B, to prevent spurious operation during a fire, as required by BTP CMEB 9.5-1, Item C.5.b.1.a, and the approved FPP for CNS. These normally open valves are in series and both valves are required to remain open during initial hot standby conditions for post-fire SSD from the MCR using Train A or Train B. Fire damage to the cables could cause one of the valves to spuriously close, resulting in the isolation of normal charging pump suction from the VCT during SSD. Isolating the VCT suction to the running charging pump could cause almost immediate damage to the pump. If the running charging pump was the one credited for SSD during the fire, and the fire damaged the other charging pump (or its attendant components), the plant could be left with no operable charging pump with which to shut down. Consequently, the credited post-fire SSD functions of reactor coolant system (RCS) makeup and reactor coolant pump (RCP) seal cooling would be lost.

The cable routing data showed that valve 2NV189B had control cables routed through FA 5, FA 7, and FA 33; while valve 2NV188A had control cables routed through FA 12, FA 14, FA 31, and FA 46. The licensee had not identified these valves in the SSA as being required to assure post-fire SSD for a fire in these Fas.

In addition, cable routing information showed that cables for KC and the SSF standby makeup pump were also routed through FA 14. Both KC and the SSF standby makeup pump are alternate means for providing RCP seal cooling. Consequently, for a severe fire in FA 14, all means for providing RCP seal cooling could potentially be impacted.

Upon discovery, the licensee entered this issue into the corrective action program as Problem Investigation Process (PIP) reports C-04-2621 and C-04-3060 for Unit 2. The licensee notified the NRC on June 23, 2004, of an unanalyzed condition related to Unit 2 fire protection cable separation pursuant to 10 CFR 50.72. The licensee also determined, and notified the NRC on June 24, 2004, pursuant to 10 CFR 50.72, that a similar condition existed on Unit 1 (relative to VCT outlet valves 1NV188A and 1NV189B, KC, and the SSF standby makeup pump). The Unit 1 issue was entered into the corrective action program as PIP C-04-3101. The licensee established fire watches for the 4160V Essential Switchgear Rooms (Unit 2 FAs 7 and 14; Unit 1 FAs 8 and 15) on June 23, 2004, as a compensatory measure until the issue is resolved. Licensee cable routing information for the Unit 1 valves was not available to the inspectors for review during this inspection.

The specific Unit 2 cables of concern were identified as follows:

2NV189B
Cable 2*NV 541 (routed through FAs 5 and 7)
Cable 2*ATC 577 (routed through FA 7)
Cable 2*CA 611 (routed through FAs 5, 7, and 33)
Cable 2*ATC 866 (routed through FAs 5 and 7)
Cable 2*ATC 1141 (routed through FA 7)
Cable 2*ATC 586 (routed through FA 7)
Cable 2*ENC 508 (routed through FA 5)
Cable 2*ATC 766 (routed through FA 5)

2NV188A
Cable 2*NV 515 (routed through FA 46)
Cable 2*NV 630 (routed through FAs 46, 14, and 31)
Cable 2*ENC 507 (routed through FA 12)

BTP CMEB 9.5-1, Item C.5.b.1.a, requires one train of systems to be free of fire damage. The inspectors found that the licensee had not identified MOVs 2NV189B and 2NV188A in the Design Basis Specification as being required to assure SSD for a fire in these areas.

Analysis: The finding adversely impacted the reliability and capability of equipment required to achieve and maintain a safe shutdown condition following a severe fire. The finding is greater than minor because it is associated with the protection against external factors attribute and degraded the reactor safety mitigating systems cornerstone objective. The finding degraded the defense-in-depth for fire protection. This finding has potential safety significance greater than very low significance, however, a significance determination has not been completed. This finding did not present an immediate safety concern because cables for the SSF (which is an alternate means for providing reactor coolant pump seal cooling) were not likely to be damaged by the same fire that could damage the cables for the VCT outlet valves. This finding is applicable to Units 1 and 2 and is unresolved pending completion of a significance determination.

Enforcement: Operating License Condition 2.C.5 requires that the licensee implement and maintain in effect all provisions of the approved FPP, as described in the UFSAR, as amended, for the facility and as approved in the SER through Supplement 5. BTP CMEB 9.5-1, which incorporated the guidance of Appendix A to BTP ASB 9.5-1 and the technical requirements of Appendix R to 10 CFR Part 50, established the regulatory and licensing requirements for the FPP at CNS. The CNS FPP was reviewed against and approved for conformance with BTP CMEB 9.5-1 in the SER through Supplement 5. BTP CMEB 9.5-1, Item C.5.b.1, requires that fire protection features be provided that are capable of limiting fire damage so that one train of systems necessary to achieve and maintain hot standby conditions from either the control room or emergency control station(s) is free from fire damage. BTP CMEB 9.5-1, Item C.5.b.2 requires one redundant train to be protected from fire damage by one of three specified methods.

Contrary to the above, on June 25, 2004, the inspectors identified that the licensee failed to provide fire protection features to protect control circuits and cables for VCT outlet valves 2NV189B or 2NV188A. This condition has existed since original

construction. The finding and related violation are unresolved pending completion of a significance determination. This finding applicable to both units and is identified as the first example of URI 05000413/2004007-01 and 05000414/2004007-01, Failure to Protect Cables of Valves Required for Post-Fire Safe Shutdown in Multiple Fire Areas.

Charging Pump Mini-Flow Valves 2NV202B and 2NV203A

Introduction: A violation of Catawba Unit 2 operating license condition 2.C.5 and the approved FPP was identified for failure to protect the control circuits for charging pump mini-flow valves 2NV202B and 2NV203A, charging pump return flow path to VCT, to prevent spurious operation during a fire. This finding is applicable to FAs 5 and 33 for 2NV202B; and FAs 14, 31, and 46 for 2NV203A. This finding is a URI pending completion of the SDP.

. Description: Spurious closing of 2NV202B or 2NV203A would result in isolation of the 60 gallons per minute (gpm) minimum flow path for the charging pumps. The credited method for RCS makeup and RCP seal cooling, as stated in the SSA, is using the charging pumps for seal injection which adds water to the RCS. The normal charging flowpath and the KC flowpath to the RCP thermal barriers were not analyzed in the SSA to remain open and free of fire damage during SSD from the control room. As a result, isolation of the minimum flow path could reduce the running charging pump flow to about 35 gpm of RCP seal injection, which is less than the 60 gpm that the pump manufacturer specified as being required to ensure that the charging pump does not overheat and become damaged. Given this scenario, if the running charging pump was the one credited for SSD during the fire, and the fire damaged the other charging pump (or its attendant components), the plant could be left with no operable charging pump with which to shut down. Consequently, the credited post-fire SSD functions of RCS makeup and RCP seal cooling would be lost. The minimum flow valves are required to remain open during a post-fire Train A or Train B shutdown from the MCR to provide cooling through the minimum flow path for the operating charging pump. The valves were not identified in the DBD as required components for Train A or Train B shutdown from the MCR. The cable routing data showed that valve 2NV202B had control cables routed through FAs 5 and 33 (Train A credited for SSD); while valve 2NV203A had control cables routed through FAs 14, 31, and 46 (Train B credited for SSD). Fire damage to the control cables in the FAs identified above could cause one of the valves to spuriously close isolating the minimum flow path for both charging pumps. The specific cables of concern are identified as follows:

2NV202B
Cable 2*RN 665 (routed through FAs 5, and 33)

2NV203A
Cable 2*NV 603 (routed through FAs 14, 31, and 46)
Cable 2*ATC 1043 (routed through FAs 14 and 31)

BTP CMEB 9.5-1, Item C.5.b.1.a, requires one train of systems to be free of fire damage. The inspectors found that the licensee had not identified MOVs 2NV202B and 2NV203A in the Design Basis Specification as being required to assure safe shutdown for a fire in these areas. The licensee entered this issue into its corrective action program as PIP C-04-2997.

Analysis: The finding adversely impacted the reliability and capability of equipment required to achieve and maintain a safe shutdown condition following a severe fire. The finding is greater than minor because it is associated with the protection against external factors attribute and degraded the reactor safety mitigating systems cornerstone objective. The finding degraded the defense-in-depth for fire protection. The finding is applicable to FAs 5 and 33 for valve 2NV202B; and FAs 14, 31,and 46 for valve 2NV203A, and is unresolved pending completion of a significance determination.

Enforcement: Operating License Condition 2.C.5 requires that the licensee implement and maintain in effect all provisions of the approved FPP, as described in the UFSAR, as amended, for the facility and as approved in the SER through Supplement 5. BTP CMEB 9.5-1, which incorporated the guidance of Appendix A to BTP ASB 9.5-1 and the technical requirements of Appendix R to 10 CFR Part 50, established the regulatory and licensing requirements for the FPP at CNS. The CNS FPP was reviewed against and approved for conformance with BTP CMEB 9.5-1 in the SER through Supplement 5. BTP CMEB 9.5-1, Item C.5.b.1, requires that fire protection features be provided that are capable of limiting fire damage so that one train of systems necessary to achieve and maintain hot standby conditions from either the control room or emergency control station(s) is free from fire damage. BTP CMEB 9.5-1, Item C.5.b.2 requires one redundant train to be protected from fire damage by one of three specified methods.

Contrary to the above, on June 25, 2004, the inspectors identified that the licensee failed to provide fire protection features to protect control circuits and cables associated with charging pump mini-flow valves 2NV202B and 2NV203A. This condition has existed since original construction. The finding and related violation are unresolved pending completion of a significance determination. This finding is identified as the second example of URI 05000413/2004007-01 and 05000414/2004007-01, Failure to Protect Cables of Valves Required for Post-Fire Safe Shutdown in Multiple Fire Areas.

Letdown Valve 2NV015B

Introduction: A violation of Catawba Unit 2 operating license condition 2.C.5 and the approved FPP was identified for failure to protect the control cables of MOV 2NV015B, normal letdown, to prevent spurious operation during a fire in FAs 5, 7, and 33. This finding is a URI pending completion of the SDP.

Description: Valve number 2NV015B is in the credited post-fire SSD letdown flowpath for removing water from the RCS during SSD from the control room. Spurious valve closure could result in isolation of this letdown flowpath. Since the credited method of RCP seal cooling is by seal injection, which adds water to the RCS, loss of the letdown flowpath would result in an increasing level in the pressurizer. If this normally open valve remains open during post-fire shutdown to maintain normal letdown, this would prevent challenges to the power operated relief valves (PORVs) and safety relief valves due to the pressurizer going water solid. The cable routing data showed that valve 2NV015B had unprotected control cables routed through FAs 5, 7, and 33 (Train A credited for SSD). Fire damage to the cables in these areas could cause the valve to spuriously close resulting in an isolation of the letdown flowpath. The specific cables of concern are identified as follows:

2*ATC 1141 (routed through FA 7)
2*ATC 577 (routed through FA 7)
2*NV 536 (routed through FAs 7, and 5)
2*CA 611 (routed through FAs 7, 5, and 33)
2*ATC 586 (routed through FA 7)

BTP CMEB 9.5-1, Item C.5.b.1.a, requires one train of systems to be free of fire damage. The inspectors found that the licensee had not identified MOV 2NV015B in the Design Basis Specification as being required to assure SSD for a fire in these areas. The licensee entered this issue into its corrective action program as PIP C-04-2997.

Analysis: The finding adversely impacted the reliability and capability of equipment required to achieve and maintain a safe shutdown condition following a severe fire. The finding is greater than minor because it is associated with the protection against external factors attribute and degraded the reactor safety mitigating systems cornerstone objective. This finding degraded the defense-in-depth for fire protection. The finding is applicable to FAs 5, 7, and 33, and is unresolved pending completion of the SDP.

Enforcement: Operating License Condition 2.C.5 requires that the licensee implement and maintain in effect all provisions of the approved FPP, as described in the UFSAR, as amended, for the facility and as approved in the SER through Supplement 5. BTP CMEB 9.5-1, which incorporated the guidance of Appendix A to BTP ASB 9.5-1 and the technical requirements of Appendix R to 10 CFR Part 50, established the regulatory and licensing requirements for the FPP at CNS. The CNS FPP was reviewed against and approved for conformance with BTP CMEB 9.5-1 in the SER through Supplement 5. BTP CMEB 9.5-1, Item C.5.b.1, requires that fire protection features be provided that are capable of limiting fire damage so that one train of systems necessary to achieve and maintain hot standby conditions from either the control room or emergency control station(s) is free from fire damage. BTP CMEB 9.5-1, Item C.5.b.2, requires one redundant train to be protected from fire damage by one of three specified methods.

Contrary to the above, on June 25, 2004, the inspectors identified that the licensee failed to provide fire protection features to protect control circuits and cables associated with letdown valve 2NV015B. This condition has existed since original construction. The finding and related violation are unresolved pending completion of the SDP. This finding is identified as the third example of URI 05000413/2004007-01 and 05000414/2004007-01, Failure to Protect Cables of Valves Required for Post-Fire Safe Shutdown in Multiple Fire Areas.

These three examples of URI 05000413/2004007-01 and 05000414/2004007-01 remain open pending completion of the SDP.

(2) Associated Circuit Issues Identified as a Byproduct of this Inspection

Introduction: A URI was opened for resolution of Unit 2 associated circuit issues identified as a byproduct of this inspection. This URI will remain open pending the end of the NRC inspection moratorium on addressing and analyzing failure modes and probabilities for associated circuits.

Discussion: During the review of systems required to achieve and maintain SSD, the inspectors noted that the licensee's SSA indicated that several Unit 2 associated circuits, which could affect SSD, were not protected from fire damage.

The Unit 2 associated circuits addressed in this URI include three air-operated pressurizer PORVS and the three corresponding isolation MOVs; four steam generator air-operated PORVs and four related isolation MOVs; one RCP #1 seal bypass AOV; and two residual heat removal pump sump suction MOVs, as described below:

- The SSA indicated that control cables for pressurizer PORVs (2NC-032B, 2NC-034A, and 2NC-036B) and block valves (2NC-031B, 2NC-033A, and 2NC-035B) were not protected from fire damage and were routed through FAs involving SSD from the MCR and from the SSF. Additionally, control cables for each set of PORV and block valves were routed together such that both could be affected by the same fire. For SSD from the MCR, the SSA included an operator action to isolate and ground circuits for a PORV if it spuriously operated; however, that operator action was not included in the operating procedures. Operators stated that if a fire caused a pressurizer PORV to fail open, they would attempt to close the block valve. If the block valve was failed open, operators would then follow the existing procedures to remain in the control room and mitigate the failed open PORV by using safety injection. For SSD from the SSF, the SSA stated that the control circuits for the pressurizer PORVs would be manually shorted out to fail the PORV closed when the SSF was activated; however, operating procedures did not activate the SSF in a timely manner during a fire event. Instead, the procedures directed operators to remain in the control room until it became uninhabitable or became incapable of maintaining primary or secondary inventory. Then the procedures directed operators to go to the auxiliary shutdown panel (ASP), in a lower level of the auxiliary building, and remain there until the controls there were determined to be inadequate to maintain safe plant conditions. Only then did operating procedures direct operators to activate the SSF. Operators stated that, if a pressurizer PORV spuriously opened and the block valve was not immediately closed, RCS pressure would decrease rapidly and a safety injection would be automatically activated in about one minute. Operators further stated that, when a safety injection was activated, they would not leave the control room to activate the SSF because the SSF was not designed to handle a safety injection.

  Licensee cable routing information indicated that at least one set of pressurizer PORV and block valve control cables was routed through the following FAs involving SSD from the MCR: FA 7 (Unit 2 Train B 4160V Essential Switchgear Room); FA 5 (Unit 2 Electrical Penetration Room B); FA 33 (Unit 2 Train B ASP Room); FA 14 (Unit 2 Train A 4160V Essential Switchgear Room); FA 12 (Unit 2 Electrical Penetration Room A); and FA 33 (Unit 2 Train A ASP Room). Additionally, at least one set of PORV and block valve control cables was routed through the following FAs involving SSD from the SSF: FA 9 (Unit 2 Battery Room B); FA 11 (Auxiliary Building Common Area & Unit 1 Component Cooling Water Pump Room; FA 2 (Unit 2 Auxiliary Feedwater Pump Room); FA 44 (Unit 2 Emergency Diesel Generator B Sequencer Tunnel); FA 16 (Unit 2 Cable Spread Room); and FA 21 (Units 1 & 2 Control Room).

- The SSA indicated that control cables for the steam generator PORVs (2SV-1, 2SV-7, 2SV-13, and 2SV-19) and block valves (2SV-25B, 2SV-26B, 2SV-28A, and 2SV-27A) were not protected from fire damage and were routed through FAs involving SSD from the MCR and from the SSF. For SSD from the MCR, the SSA stated that spurious opening of a steam generator PORV would involve two hot shorts, which exceeded the design basis fault criteria. However, the inspectors noted that the NRC position was that two hot shorts did not exceed the design basis. The inspectors also noted that the licensee had an abnormal operating procedure for a secondary steam leak that included directions to close the block valve to isolate a failed open steam generator PORV. However, reliance on this operator action instead of physically protecting the cables from fire damage was not consistent with CNS operating license conditions 2.C.5 and was not approved by the NRC. For SSD from the SSF, the SSA stated that the control circuits for the steam generator PORVs would be shorted out to fail the PORVs closed when the SSF was activated; however, as described above, the operating procedures would not perform the SSF activation in a timely manner. The inspectors noted that a failed open steam generator PORV could cause an uncontrolled cooldown of the RCS, a condition that the SSF was not designed to mitigate. Licensee cable routing information for these valves was not available to the inspectors during this inspection.

- The SSA indicated that control cables for the RCP #1 seal bypass valve (2NV101A) were not protected from fire damage and were routed through FAs involving SSD from the control room and from the SSF. For SSD from the MCR, the SSA stated that if the valve should spuriously open then cooling water flow to the seals of all four RCPs would be interrupted and seal damage could result. The SSA further stated that if this were to occur, the resulting RCS leakage would be made up by charging pumps or by safety injection. However, the inspectors noted that damage to multiple RCP seals could result in RCS leakage that could exceed the capacity of the one charging pump that was analyzed to be free of fire damage and available. The inspectors also noted that safety injection pumps were not analyzed to assure they would be free of fire damage. For SSD from the SSF, the SSA stated that the control circuits for 2NV101A would be isolated and shorted out to fail the valve closed when the SSF was activated. However, as described above, the operating procedures would not perform the SSF activation in a timely manner and would not prevent 2NV101A from spuriously failing open. The inspectors noted that if 2NV101A failed open it could result in RCP seal damage and RCS leakage that would exceed the capability of the SSF. Licensee cable routing information for this valve was not available to the inspectors during this inspection.

- The SSA indicated that control cables for the residual heat removal pump sump suction valves (2NI184B and 2NI185A) were not protected from fire damage and were routed through FAs involving SSD from the control room. For SSD from the control room, the SSA stated that if either of these valves spuriously opened, it would result in draining the fueling water storage tank (FWST) to the containment sump. That would effectively result in loss of the FWST, which was the credited suction source for the charging pumps. The SSA stated that if one of these valves spuriously opened, operators were to close a certain FWST outlet valve to isolate the FWST from the containment sump; however, that

operator action was not included in the operating procedures. For SSD from the SSF, spurious opening of these valves was not an issue because the SSF did not rely on the FWST. Licensee cable routing information for these valves was not available to the inspectors during this inspection.

The inspectors noted that the licensee's 2004 Triennial Fire Protection Audit, dated April 5, 2004, had identified some of the issues discussed above. The audit had identified that procedural delays in activating the SSF during a fire event may challenge the ability to establish RCP seal injection flow within 10 minutes following a loss of normal seal cooling or result in an unrecoverable plant condition. The licensee had written PIP C-04-01573 to address that issue. The audit had also identified that manual actions in the post-fire Design Basis Document (SSA) were not clearly translated into operating procedures. PIP C-04-01566 had been written to address that issue.

This issue will be identified as URI 05000413/2004007-02 and 05000414/2004007-02, Associated Circuit Issues from 2004 Triennial Fire Protection Inspection. This issue will be reviewed when the moratorium on associated circuits is lifted.

.02 Fire Protection of Safe Shutdown Capability

a. Inspection Scope

The inspectors reviewed the Catawba fire hazards analysis (FHA) [documented in Part B of CNS-1465.00-00-0006, Design Basis Specification, Plant Fire Protection, Rev. 8]; UFSAR Section 9.5.1, Fire Protection System; Section 9.5.1, Fire Protection Program, of the CNS SER through Supplement 5; and the plant administrative fire prevention and combustible fire hazards control procedures to determine if they satisfied the objectives established by the NRC-approved FPP. The inspectors walked down the selected FAs to observe the licensee's implementation of these programmatic procedures for limiting fire hazards. The inspectors also reviewed the design control procedure to verify that all changes would be adequately reviewed to assess the potential impact on the fire protection program, equipment and procedures.

The inspectors reviewed the fire detector placement for FAs 7, 14, 16, and 18 to assess the adequacy of the design and installation. This was accomplished by reviewing design drawings, ceiling beam location drawings, ceiling beam schedule drawings and National Fire Protection Association (NFPA) 72E (code of record 1974 edition) for detector location requirements. The inspectors walked down the fire detection and alarm systems in FAs 7, 14, and 16 to evaluate the installed detector locations relative to the NFPA 72E location requirements. Additionally, the inspectors reviewed the surveillance test procedures for the detection and alarm systems to determine compliance with UFSAR Sections 9.5.1 and Selected Licensee Commitment (SLC) 16.9, Fire Detection Instrumentation.

The inspectors reviewed the adequacy of the design and installation of the fire suppression system protecting the component cooling pumps in FA 18. This was accomplished by reviewing the engineering design drawings, suppression system hydraulic calculations, and the as-built system configuration for sprinkler system location requirements. The inspectors also reviewed the fire water supply system calculation

which addressed the piping from the fire pumps to the various sprinkler systems and hose stations.

The inspectors reviewed the fire hose station locations in FAs 7, 14, 16, and 18 to assess the adequacy of the design and installation. This was accomplished by reviewing the fire plan drawings, engineering mechanical equipment drawings, pre-fire plans strategies, and NFPA 14 for hose station location requirements and effective reach capability. The inspectors also performed a field walkdown of the selected FAs to ensure that hose stations were not blocked and to compare hose station location drawings with as-built plant locations. The inspectors reviewed fire pre-plans for FAs 7, 16, and 18 to assess the pre-plans for accuracy and consistency with design drawings.

The inspectors also reviewed the licensee's response to NRC Information Notice 89-52, Potential Fire Damper Operational Problems, to assess the adequacy of the actions taken to address the concerns identified in the information notice.

b. Findings

No findings of significance were identified.

.03 Post-fire Safe Shutdown Circuit Analysis

a. Inspection Scope

Using the SSA, the inspectors reviewed how systems would be used to achieve and maintain reactivity control, over-pressure protection, inventory control with high or low pressure injection systems, and residual heat removal during and following a fire in the areas selected for inspection. The inspection specifically focused on the minimum required systems and equipment necessary to achieve and maintain hot standby conditions because damage to these systems could pose a significantly greater risk than damage to systems required to achieve cold shutdown conditions.

The inspectors performed a detailed review of a number of valves, instruments and other equipment relative to a postulated fire in each of the three selected FAs. This review included examination of the licensee's essential equipment list, power supply list, essential cable list with routing information, resolution of potential problem cables, elementary control diagrams and special fire response procedures. The inspectors walked down these FAs to compare the actual plant configuration to the layout indicated on the drawings.

The potential for spurious valve operation or malfunction was considered in the period immediately following a fire and in the period after operator realignment to hot standby mode but before fire extinguishment. In the case of a severe control room fire, alternative safe shutdown capability was considered. The applicable criterion was that a fire would not degrade the ability to safely shut down from the SSF. The components and equipment included in the review are listed in the attachment.

Fuse and breaker coordination of both alternating current (AC) power and direct current (DC) control protective devices was considered in terms of fire-induced short circuits resulting in loss of SSD capability. Specific breakers and circuits reviewed are listed in the attachment to this report.

b. Findings

See Section 1R05.01.b(1) for a discussion of findings.

.04 Alternative Shutdown Capability

a. Inspection Scope

The inspectors reviewed the licensee's SSA and plant configuration to evaluate the adequacy of the licensee's methodology for post-fire SSD from the SSF in the event of a fire in FAs 16 or 18. The objectives of this evaluation were to:

- Verify that the licensee's alternative shutdown methodology had correctly identified the components and systems necessary to achieve and maintain SSD conditions.

- Confirm the adequacy of the systems selected for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring, and support system functions.

- Verify that hot and cold shutdown from outside the MCR can be achieved and maintained with offsite power available or not available.

Additionally, the inspectors reviewed, on a sample basis, the electrical elementary diagrams depicting the control circuits for selected SSS components and cable routing data sheets for the associated cables to confirm that transfer of controls from the MCR to the SSF would not be affected by fire in these areas. The inspectors reviewed the electrical load list for SSS components to verify that they could be powered from both onsite and offsite power sources.

b. Findings

See the URI discussed in Section in 1R05.01.b(2).

.05 Operational Implementation of Alternative Shutdown Capability

a. Inspection Scope

The inspectors reviewed and walked down the operational implementation of post-fire SSD capability in the event of a fire in FA 7, FA 16, or FA 18. This review functioned to determine if: (1) the training program for licensed personnel included MCR and alternative SSD capability; (2) personnel required to achieve and maintain the plant in hot standby, from the MCR or SSF, following a fire could be provided from normal onsite staff, exclusive of the fire brigade; (3) the licensee had incorporated the operability of alternative shutdown transfer and control functions into plant administrative controls; (4)

the licensee periodically performed operability testing of the alternative shutdown instrumentation, transfer, and control functions; and (5) the implementation and human factors aspects of the alternative shutdown procedures were adequate.

The procedure reviews focused on ensuring that all required functions for post-fire safe shutdown, and the corresponding equipment necessary to perform those functions, were included in the procedures for the selected FAs.

b. Findings

See Sections 1R05.01.b(1) and 1R05.01.b(2) of this IR.

.06 Communications

a. Inspection Scope

The inspectors reviewed plant communication capabilities to evaluate the availability of the communication systems to support plant personnel in the performance of SSD local manual operator actions and fire brigade fire fighting duties. The inspectors observed the in-plant storage of portable radios and sound-powered telephone headsets that could be used for communications during fire events. The inspectors also assessed the portable radio repeater system for vulnerability to a fire in the selected FAs.

b. Findings

No findings of significance were identified.

.07 Emergency Lighting

a. Inspection Scope

The inspectors reviewed the design, placement, operation, and periodic testing procedures for DC self-contained battery powered emergency lighting units (ELUs). During in-plant walkdowns of local manual operator actions that could be needed for post-fire SSD, the inspectors observed the placement of installed ELUs and storage of portable battery-powered lights. The inspectors evaluated the capability of the ELUs to support plant personnel in the performance of the actions and for illuminating access and egress routes to the areas where those manual actions would be performed. The inspectors checked that the battery power supplies for the installed ELUs were rated with at least an 8-hour capacity, as required by BTP CMEB 9.5-1. During walk downs of the plant areas where operators performed local manual actions, the inspectors inspected area ELUs for proper operation and checked the aiming of lamp heads to determine if sufficient illumination would be available to adequately illuminate the SSD equipment, the equipment identification tags, and the access and egress routes thereto, so that operators would be able to perform the actions without needing to use flashlights. The inspectors also reviewed completed surveillance and maintenance procedures and test records to ensure that the licensee properly maintained the lighting equipment.

b. Findings

Introduction: The inspectors identified a finding that was not in accordance with operating license condition 2.C.5 for implementation of the approved FPP. Specifically, the licensee made a change to the FPP which de-rated some ELUs from 8-hours to 1.5-hours. The evaluation for this change did not appear to be adequate to ensure that the change would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

Description:

Some of the 8-hour battery powered ELUs credited for SSD manual actions or for access/egress pathways had been de-rated from 8-hours to 1.5 hours by modification CE-70695. This change was not consistent with the licensing basis, which stated that 8-hour battery powered emergency lights would be provided.

The basis for de-rating selected ELUs credited for post-fire SSD was stated in calculation CNC-1435.00-00-0018. The calculation stated that de-rating selected SSD ELUs was acceptable because access, operator activities, and egress could occur well within 30 minutes. The inspectors questioned the basis for this statement, which was not consistent with the abnormal procedure for control room evacuation due to fire. As observed by the inspectors, the abnormal procedures did not activate the SSF within this time frame for all fire events. Instead, the procedures directed operators to remain in the control room until it became uninhabitable or became incapable of maintaining primary or secondary inventory. Then the procedures directed operators to go to the ASP, in a lower level of the auxiliary building, and remain there until the controls there were determined to be inadequate to maintain safe plant conditions. Only then did abnormal procedures direct operators to activate the SSF. This delay in activating the SSF was not addressed in Calculation CNC-1435.00-00-0018. The inspectors questioned whether this change to the FPP also involved a change to operating license condition 2.C.5 which would require NRC approval prior to implementation. The licensee indicated that a 10 CFR 50.59 evaluation and UFSAR revision were associated with this change. The 10 CFR 50.59 and UFSAR change package were not available to the inspectors for review during this inspection. The inspectors identified this issue as URI 05000414/2004007-03, De-rating Selected Emergency Lighting Units Required for Post-Fire Safe Shutdown. This item is unresolved pending the inspectors' review of the licensee's 10 CFR 50.59 evaluation for this change.

.08 Cold Shutdown Repairs

a. Inspection Scope

The licensee's SSA identified that post-fire repairs would be required within 72 hours to achieve a cold shutdown condition for certain FAs. Thus, cold shutdown repair procedures and fire damage repair kits were examined to verify that equipment and materials were available to accomplish repairs within the time restraints specified in the licensing basis. The inspectors walked down the paths and estimated the cable lengths to repair a KC pump motor cable in FA 18 to confirm that adequate cable was available onsite to repair the damaged cold shutdown equipment. The inspectors also inspected

the fire damage kits and inventory records to verify that all repair equipment, components, and tools and materials were available onsite.

b. Findings

No findings of significance were identified.

.09 Fire Barriers and Penetration Seals

a. Inspection Scope

The inspectors reviewed the selected FAs to evaluate the adequacy of the fire resistance of FA barrier enclosure walls, ceilings, floors, fire barrier mechanical and electrical penetration seals, fire doors, and fire dampers. The review was performed to ensure that at least one train of safe shutdown equipment was free of fire damage. This was accomplished by observing the material condition and configuration of the installed fire barrier features, as well as reviewing construction details and supporting fire endurance tests for the installed fire barrier features, to verify that the as-built configurations were qualified by appropriate fire endurance tests. The inspectors also reviewed selected fire seals identified in the plant against supporting fire tests to ensure the installed seals were bounded by tested configurations and that fire barrier installations met licensing basis commitments.

The inspectors reviewed fire barriers shown on the fire plan drawings for the selected FAs. The inspectors reviewed Calculation CNC-1435.00-00-0036, Evaluation of Changes/Deviations to the Fire Protection Program, to verify that the licensee had documented evaluations which supported the removal of selected barriers from the committed fire barrier list.

The inspectors walked down the selected FAs to evaluate the adequacy of the fire resistance of barrier enclosure walls, ceilings, and floors. The inspectors selected several fire barrier features for detailed evaluation and inspection to verify proper installation and qualification. These features included fire barrier penetration fire stop seals, fire doors, fire dampers, and fire barrier partitions. The inspectors also reviewed the mathematical modeling results using the finite-difference technique for obtaining the temperature field of the exposed structural steel pilasters and concrete block fire barrier walls.

The inspectors observed the material condition and configuration of the selected fire barrier features and also reviewed construction details and supporting fire endurance tests for the installed fire barrier features. This review was performed to verify that the observed fire barrier penetration seal configurations conformed with the design drawings and tested configurations. The inspectors also compared the penetration seal ratings with the ratings of the barriers in which they were installed.

The inspectors reviewed licensing documentation, engineering evaluations of GL 86-10 fire barrier features, and NFPA code deviations to verify that the fire barrier installations met design requirements and license commitments. In addition, the inspectors reviewed surveillance and maintenance procedures for selected fire barrier features to verify the fire barriers were being adequately maintained.

b. Findings

No findings of significance were identified.

.10 Fire Protection Systems, Features, and Equipment

a. Inspection Scope

The inspectors reviewed UFSAR Section 9.5.1, the fire protection design basis specification, fire protection code deviations, and administrative procedures used to prevent fires and control combustible hazards and ignition sources. This review was performed to verify that the objectives established by the NRC-approved FPP were satisfied. The inspectors also toured the selected plant FAs to observe the licensee's implementation of these procedures.

The inspectors reviewed the adequacy of the design and installation of the automatic wet pipe sprinkler system protecting the component cooling pumps (2A1, 2A2, 2B1, and 2B2) in FA 18. The inspectors performed a walk down of the system to ensure proper placement and spacing of the sprinkler heads and the extent of the sprinkler head obstructions. The inspectors reviewed the sprinkler system hydraulic calculations to ensure that the system could be supplied sufficient pressure and volume utilizing the two restricting orifices regulating the maximum allowable flow into the auxiliary building.

The inspectors reviewed the adequacy of the design and installation of the automatic detection and alarm system for the selected FAs. This was accomplished by reviewing the ceiling reinforcing plans and beam schedule drawings to determine the location of ceiling bays. After the ceiling bay locations were identified, the inspectors conducted a plant tour to confirm that each bay was protected by a fire detector in accordance with the Code of Record requirements (NFPA 72E, 1974). Plant walkdowns were performed in FAs 7, 14, and 16 to confirm detector locations.

The inspectors reviewed the fire protection code deviations calculation for automatic detection systems relative to the selected FAs to determine if there were any code deviations cited for the FAs. The inspectors reviewed the fire protection pre-plans and fire strategies to ensure that hose locations could sufficiently reach the selected FAs for manual fire fighting efforts. Hose stations in the selected areas were inspected to ensure that hose lengths depicted on the engineering documents were also the hose lengths located in the field. This was done to ensure that manual fire fighting efforts could be accomplished in the selected FAs.

b. Findings

No findings of significance were identified.

.11 Compensatory Measures

a. Inspection Scope

The inspectors reviewed the compensatory measures implemented relative to the VCT outlet valves 2NV188A and 2NV189B. The review was performed to verify that the risk associated with removing post-fire systems or components was properly assessed and adequate compensatory measures were implemented in accordance with the approved fire protection program.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed selected licensee audits, assessments, and PIPs to verify that issues related to fire protection and SSD were appropriately entered into the licensee's corrective action program in accordance with the licensee's quality assurance program and procedural requirements. The inspectors also reviewed the licensee's SLCs and the 2003 fire impairment log. The items were reviewed for classification, prioritization, timeliness of corrective action, and appropriateness of the corrective actions taken or initiated to resolve the items.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

On June 24, 2004, the lead inspector presented the inspection results to Mr. D. Jamil, Site Vice President, and other members of his staff, who acknowledged the findings. Proprietary information is not included in this inspection report. Following completion of additional review in the Region II office, a final exit was held by telephone with Mr. B. Dolan and other members of the licensee's staff on July 30, 2004, to provide an update on changes to the preliminary inspection findings. The licensee acknowledged the findings.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

Y. Anagnostopoulos, Engineering Supervisor, Reactor and Electrical Systems (RES)
D. Brandes, Fire Protection Consultant
T. Daniels, Engineer, Emergency Planning
D. Davies, Fire Protection System Engineer, Mechanical and Civil Engineering (MCE)
R. Dickard, Engineer, RES
B. Dolan, Engineering Manager
R. Glover, Station Manager
D. Goforth, Engineer, MCE
W. Green, Manager, RES
E. Haack, Engineer, MCE
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D. Henneke, Engineer, Probabilistic and Risk Assessment Group, General Office
W. Hogan, Fire Protection Engineer, MCE
D. Jamil, Vice President, Catawba Nuclear Station
L. Keller, Regulatory Compliance Manager
D. McIntosh, Senior Operations Specialist
J. Oldham, Fire Protection Engineer, Nuclear Generation Department, General Office
R. Simril, Engineering Supervisor, MCE
G. Strickland, Regulatory Compliance Specialist
R. Sweigart, Nuclear Safety Assurance Manager
C. Trezise, Maintenance Manager
D. Ward, Engineering Supervisor, MCE

NRC Personnel

E. Guthrie, Senior Resident Inspector,
A. Sabisch, Resident Inspector
C. Ogle, Chief, Engineering Branch 1, Division of Reactor Safety, Region II

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000413, 414/2004007-01	URI	Failure to Protect Cables of Valves Required for Post-Fire Safe Shutdown in Multiple Fire Areas [Section 1R05.01.b(1)]
05000413, 414/2004007-02	URI	Associated Circuit Issues from 2004 Triennial Fire Protection Inspection [Section 1R05.01.b (2)]

05000414/2004007-03	URI	De-rating Selected Emergency Lighting Units Required for Post-Fire Safe Shutdown (Section 1R05.07)

Closed

None

Discussed

None

LIST OF COMPONENTS INSPECTED

Section 1R05.03: Post-Fire Safe Shutdown Circuit Analysis

Component Identification	Description
2NV202B and 2NV203A	Charging pump mini-flow valves
2NV188A and 2NV189B	Volume Control Tank outlet valves
2NV015B	Letdown Outside Containment Isolation valve
2SA005	SG 2C Main Steam to CA Pump Turbine
2SA145	Main Steam to CA Pump Turbine
2CA178	RC to CA Suction Isolation valve
2CA174	RC to CA Suction Isolation valve
2NCLT 5151	Pressurizer level
2CFLT 5612	SG A Wide Range level
2CFLT 5622	SG B Wide Range level
2CFLT 5632	SG C Wide Range level
2CFLT 5642	SG D Wide Range level
2CAPS 5240, 5241, & 5242	Pressure Signal to CA174 and CA175
2CA015A	CA Pump 2A Suction from RN
2PMTR 0438	Standby Makeup Pump
2PMTR 0196	TDCAP Sump Pump
2NI184B	ND Pump 2B Suction from Sump
2CFLT 5500	SG A Narrow Range Level (Channel 3)
2CFLT 5501	SG A Narrow Range Level (Channel 1)
2RN250A	RN Header A to CA Pump Suction Isolation
2PMTR0148	Motor Driven CA Pump 2A
2NC032B	Pressurizer PORV
2NC031B	Block Valve for 2NC032B
2NC034A	Pressurizer PORV
2NC033A	Block Valve for 2NC033A
2NC036B	Pressurizer PORV
2NC035B	Block Valve for 2NC036B

Section 1R05.03 Fuse/Breaker Coordination

125 VDC Distribution 2EDE Breakers F01A, F01G, F01H, F01L, F01J
600V MCC 2EMXA Breaker F05B and MCC 2EMXS Breakers F01A, F01C, F01D
600V Load Center 2ELXC Breaker 5C and MCC 2EMXK F05A, F08B, F11B
600V MCC 2EMXQ F01A, fed from MCC 2EMXC and fed from 600V load center 2ELXA Bkr 5A
600 V MCC 2EMXQ F02B fed from MCC 2EMXC
600 V Load Center 2ELXA Breaker 5B & MCC 1EMXG F06A, F05C
600 V Load Center 2ELXA Breaker 5A & MCC 2EMXC Breakers F04A, F03C, F07C, F06A
125 VDC Vital I&C Power Panel 2EPA Breakers 6, 7 & 10
125 VDC Distribution Center 2CDA Breakers F04A and F01C

LIST OF DOCUMENTS REVIEWED

Procedures

AM/2/A/5100/004, Altering Circuit to Prevent 2NV-10A from Opening, Rev. 002
EM/2/A/5200/010, Venting Air from MSIV (2SM-1, 2SM-3, 2SM-5, 2SM-7) Operators, Rev. 000
AP/2/A/5500/006, Loss of S/G Feedwater, Rev. 026
AP/2/A/5500/008, Malfunction of Reactor Coolant Pump, Rev. 012
AP/2/A/5500/011, Pressurizer Pressure Anomalies, Rev. 014
AP/2/A/5500/012, Loss of Charging or Letdown, Rev. 017
AP/1/A/5500/017, Loss of Control Room, Rev. 045
AP/2/A/5500/021, Loss of Component Cooling, Rev. 025
AP/2/A/5500/028, Secondary Steam Leak, Rev. 002
EP/2/A/5000/E-0, Reactor Trip or Safety Injection, Rev. 023
EP/2/A/5000/ES-0.1, Reactor Trip Response, Rev. 019
EP/2/A/5000/ECA-2.1, Uncontrolled Depressurization of All Steam Generators, Rev. 020
EP/2/A/5000/FR-H.3, Response to Steam Generator High Level, Rev. 006
EP/2/A/5000/FR-H.4, Response to Loss of Normal Steam Release Capabilities, Rev. 007
RP/0/B/5000/029, Fire Brigade Response, Rev. 004
OP/0/B/6100/013, Standby Shutdown Facility Operations, Rev. 047
IP/0/A/3350/009, EFA System Detector Test Procedure for DGP06, Rev. 14
IP/0/A/3350/010, EFA System Detector Test Procedure for DGP07, Rev. 16
IP/0/A/3350/011, EFA System Detector Test Procedure for DGP08, Rev. 15
OP/0/A/6400/002A, Fire Protection System, Rev. 108
PT/0/A/4200/048, Periodic Inspection of Fire Barriers and Related Structures, Rev. 20
PT/0/A/4200/048A, Periodic Inspection of Fire Dampers, Rev. 2
PT/0/A/4400/001A, Exterior Fire Protection Functional Capability Test, Rev. 43
PT/0/A/4400/001C, Fire Suppression System Test, Rev. 82
PT/0/A/4400/001D, Fire Pump Operability Test, Rev. 41
PT/0/A/4400/001E, Fire Hydrant Operability Test, Rev. 26
PT/0/A/4400/001G, Multi-fire Alarm System Test, Rev. 25
PT/0/A/4400/001H, Fire Door Inspections, Rev. 19
PT/0/A/4400/001M, Visual Inspection of Fire Hose Stations and Equipment Houses, Rev. 19
PT/0/A/4400/001S, RY Fire Protection Flow (Underground) Periodic Test, Rev. 42
PT/0/A/4400/001W, SLC Fire Hose Station Flow Test, Rev. 16
PT/0/A/4400/001X, Essential Area Sprinkler Alarm System Test, Rev. 16
PT/0/A/4400/001Z, Non-Essential Area Sprinkler Alarm System Test, Rev. 13
PT/0/A/4400/015, Fire Hose Station Gasket Inspection, Rev. 1
Standard Operating Procedure #1, Fire Brigade - General Response Guide, dated 12/21/99
Standard Operating Procedure #2, Fire Brigade - Staffing Guidelines, dated 12/21/99
Standard Operating Procedure #3, Fire Brigade - Electrical Fires, dated 10/10/01
Standard Operating Procedure #4, Fire Brigade - Brigade Leadership Guide, dated 12/21/99
Standard Operating Procedure #5, Fire Brigade - Restoring Equipment, dated 02/96
Standard Operating Procedure #6, Fire Brigade-Hazardous Material Response, dated 03/03/02

Drawings

CN-2553-1.0, Flow Diagram of Reactor Coolant System (NC), Rev. 22
CN-2553-1.1, Flow Diagram of Reactor Coolant System (NC), Rev. 15
CN-2553-1.2, Flow Diagram of Reactor Coolant System (NC), Rev. 08
CN-2553-1.3, Flow Diagram of Reactor Coolant System (NC), Rev. 13
CN-2553-1.4, Flow Diagram of Reactor Coolant System (NC), Rev. 00
CN-2554-1.0, Flow Diagram of Chemical & Volume Control System (NV), Rev. 17
CN-2554-1.1, Flow Diagram of Chemical & Volume Control System (NV), Rev. 08
CN-2554-1.2, Flow Diagram of Chemical & Volume Control System (NV), Rev. 21
CN-2554-1.3, Flow Diagram of Chemical & Volume Control System (NV), Rev. 12
CN-2554-1.4, Flow Diagram of Chemical & Volume Control System (NV), Rev. 12
CN-2554-1.5, Flow Diagram of Chemical & Volume Control System (NV), Rev. 11
CN-2554-1.6, Flow Diagram of Chemical & Volume Control System (NV), Rev. 13
CN-2554-1.7, Flow Diagram of Chemical & Volume Control System (NV), Rev. 16
CN-2554-1.8, Flow Diagram of Chemical & Volume Control System (NV), Rev. 07
CN-2573-1.0, Flow Diagram of Component Cooling System (KC), Rev. 22
CN-2573-1.1, Flow Diagram of Component Cooling System (KC), Rev. 11
CN-2573-1.2, Flow Diagram of Component Cooling System (KC), Rev. 13
CN-2573-1.3, Flow Diagram of Component Cooling System (KC), Rev. 10
CN-2573-1.4, Flow Diagram of Component Cooling System (KC), Rev. 09
CN-2573-1.5, Flow Diagram of Component Cooling System (KC), Rev. 09
CN-2573-1.7, Flow Diagram of Component Cooling System (KC), Rev. 09
CN-2573-2.0, Flow Diagram of Component Cooling System (KC), Rev. 07
CN-2573-2.1, Flow Diagram of Component Cooling System (KC), Rev. 07
CN-2573-2.2, Flow Diagram of Component Cooling System (KC), Rev. 04
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CN-1599-02.00, Flow Diagram of Interior Fire Protection System (RF), Rev. 26
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CNM-1203.03-0014.001, Main Fire Pump A - Performance Curve, Rev. A, dated 12-03-98
CNM-1203.03-0015.001, Main Fire Pump B - Performance Curve, Rev. A, dated 12-03-98
CNM-1203.03-0016.001, Main Fire Pump C - Performance Curve, Rev. A, dated 12-03-98
CNM-1203.03-65, Jockey Pump Performance Curves, dated June 1, 1959
ERN-CN001MVH - Jockey Pump Performance Curves, Dated July 20, 1964

Design Basis Specifications, Calculations, Analyses, and Evaluations

CNS-1435.00-00-0002, Design Basis Specification for the Post Fire Safe Shutdown, Rev. 13
CNS-1465.00-00-0006, Design Basis Specification for the Plant Fire Protection, Rev. 8
CNS-1560.SS-00-0001, Design Basis Specification for the Standby Shutdown Facility, Rev. 14
CNC-1435.00-00-0009, Fire Endurance Test of Seismic Concrete Block Walls, Revision 0
CN-1109.00, Memo to File - Seismic Concrete Block Walls, Dated 9/21/1978
CNC-1435.00-00-0036, Eval. of Changes/Deviations to the Fire Protection Program, Rev. 1
CNC-1206.09-00-0017, KC Pumps 2A1 & 2A2 Sprinkler System As-Built Hydraulic Calc, Rev. 0
CNC-1206.09-00-0018, KC Pumps 2B1 & 2B2 Sprinkler System As-Built Hydraulic Calc, Rev. 0
CNC-1223.49-02-0032, Aux Bldg. Hose Racks Pressure Loss Calc, Not Issued, Under Review
CNC-1223.49-02-0029, Aux Bldg. Fire Protection System Test Acceptance Criteria, Rev. 0
CNC-1223.49-00-0003, RF/RY Auxiliary Building, Rev. 10
CNC-1435.00-00-0022, Trending of Fire Protection Test Data, Rev. 7
CNC-1435.00-00-0018, Evaluation of Battery Powered Emergency Lights, Rev. 1

Codes and Standards

NFPA 20, 1978 edition, Standard for the Installation of Centrifugal Fire Pumps
NFPA 72E, 1974 edition, Automatic Fire Detectors
NFPA 80, 1983 edition, Fire Doors and Windows

Audits and Self-Assessments

Triennial Fire Protection Audit GO-04-013 (NPA) (TFP) (CNS), dated 4/5/2004

PIPs Reviewed

C-98-2088, Program deviation, without evaluation, from NFPA standards and NSD's
C-01-1688, Found CNIAC20348 out of tolerance
C-01-3509, Valves 1RY25 & 1RY32 cabling routed together subject to a single fire
C-02-6484, Water found inside EFA smoke detector A01 of zone 58 causing fire alarm
C-03-0315, PT/0/A/4400/001S, One point not within acceptance criteria for AB short loop
C-03-0893, Problem with EFA Zone 58
C-03-1162, Door gap clearance criteria cannot be met
C-03-3258, Licensing basis requirement to start SSF in 10 minutes - McGuire inspection issue
C-03-3503, Response to McGuire PIP M-03-2588 regarding App R violation applicability to CNS
C-03-4040, Annual change out of plant fire hose resulted in wrong fire hose being installed
C-03-4080, Inspection of wall loss on 2" RF piping
C-03-4520, Hose station valve 1RF-262 clogged during SLC 3-yr flow test PT/0/A/4400/001W
C-04-1082, CNS Triennial Fire Protection Audit GO-04-013, seal around fire door AX353C
C-04-1404, ANI Inspection Report 1/20-21/04.
C-04-1566, Manual actions in post-fire DBD not clearly translated into post-fire procedures
C-04-1574, Loss of control room procedure directs operators to ASP first during fire scenarios

PIPs Initiated During Inspection

C-04-2551, Shift assignments in site autolog sometimes inconsistent with SLC 16.13-4
C-04-2621, VCT outlet valves 2NV188A and 2NV189B
C-04-2847, Post-fire SSD DBD contains inaccurate reference to manual actions for MSIVs
C-04-2858, Materials in fire damage control kits exceed 3-year shelf life
C-04-2905, Revise calculation CNC-1435.00-00-0009 to confirm exposed steel surface area
C-04-2997, Document and evaluate NRC comments from week-1 of fire protection inspection
C-04-3026, Review cable routing questions from triennial fire protection inspection
C-04-3060, Unit 2 fire scenario for ETA switchgear room that could lead to RCP seal failures
C-04-3063, Rooms in aux building not clearly shown as to which fire area they are included
C-04-3093, Fire dampers may not close under airflow conditions - Information Notice 89-52
C-04-3101, Unit 1 fire scenario for ETB switchgear room that could lead to RCP seal failures

OTHER DOCUMENTS

UFSAR Chapter 7.4, Systems Required for Safe Shutdown, dated 3/27/2003
UFSAR Chapter 9.5.1, Fire Protection, dated 3/27/2003

UFSAR Chapter 18.2.8, Fire Protection Program, dated 3/27/2003
Catawba SER Section 9.5 .1, Fire Protection Program
Catawba SER Supplement 2, Section 9.5.1, Fire Protection Program
Catawba SER Supplement 3, Section 9.5.1, Fire Protection Program
Catawba SER Supplement 4, Section 9.5.1, Fire Protection Program
Catawba SER Supplement 5, Section 9.5.1, Fire Protection Program
Letter W. O. Parker (Duke) to H. R. Denton (NRC), Catawba Fire Protection Review of APCSB (CMEB) 9.5-1, dated 10/3/1981
Letter H. B. Tucker (Duke) to H. R. Denton (NRC), Catawba Fire Protection Review of APCSB (CMEB) 9.5-1, dated 11/4/1983
Information Notice 89-52, Potential Fire Damper Operational Problems
OEP IEN-89-52, Potential Fire Damper Operational Problems, File: GS-832.04
SLC 16.9-1, Fire Suppression Water System, Rev. 1
SLC 16.9-2, Sprinkler Systems, Rev. 2
SLC 16.9-3, CO2 Systems, Rev. 0
SLC 16.9-4, Fire Hose Stations, Rev. 1
SLC 16.9-5, Fire Rated Assemblies, Rev. 2
SLC 16.9-6, Fire Detection Instrumentation, Rev. 0
SLC 16.9-23, Fire Hydrants, Rev. 1
Catawba Cable Installation Data, Cable Number - 1EOA849, RY Fire Pump A, dated 7/22/1980
Catawba Cable Installation Data, Cable Number - 1EPB522, RY Fire Pump A, dated 6/21/1979
Catawba Cable Installation Data, Cable Number - 1EPC557, RY Fire Pump A, dated 6/25/1979
Catawba Cable Installation Data, Cable Number - 1RF559, RY Fire Pump A, dated 6/25/1980
Catawba Cable Installation Data, Cable Number - 1RY505, RY Fire Pump A, dated 1/17/1984
Catawba Cable Installation Data, Cable Number - 1RY513, RY Fire Pump A, dated 3/05/1979
Catawba Cable Installation Data, Cable Number - 1RY514, RY Fire Pump A, dated 3/05/1979
Catawba Cable Installation Data, Cable Number - 1RY515, RY Fire Pump A, dated 7/18/1979
Catawba Cable Installation Data, Cable Number - 1RY520, RY Fire Pump A, dated 7/22/1980
Catawba Cable Installation Data, Cable Number - 1ATC732, RY Fire Pump B, dated 2/26/1979
Catawba Cable Installation Data, Cable Number - 1EOA851, RY Fire Pump B, dated 7/22/1980
Catawba Cable Installation Data, Cable Number- 1EQB546, RY Fire Pump B, dated 12/17/1979
Catawba Cable Installation Data, Cable Number - 1RF560, RY Fire Pump B, dated 6/25/1980
Catawba Cable Installation Data, Cable Number - 1RY503, RY Fire Pump B, dated 1/16/1984
Catawba Cable Installation Data, Cable Number - 1RY504, RY Fire Pump B, dated 9/18/1979
Catawba Cable Installation Data, Cable Number - 1RY519, RY Fire Pump B, dated 7/13/1980
Catawba Cable Installation Data, Cable Number - 1RY509, RY Fire Pump C, dated 1/16/1984
Catawba Cable Installation Data, Cable Number - 1RY518, RY Fire Pump C, dated 7/13/1980
Catawba Cable Installation Data, Cable Number - 1RF5882, RY Fire Pump C, dated 1/08/1982
Catawba Cable Installation Data, Cable Number - 1EOA850, RY Fire Pump C, dated 1/05/1981
Catawba Cable Installation Data, Cable Number - 1ATC693, RY Fire Pump C, dated 3/02/1982
Catawba Cable Installation Data, Cable Number- 1ATC1117, RY Fire Pump C, dated 6/25/1980
Catawba Cable Installation Data, Cable Number - 2RY510, RY Fire Pump C, dated 3/18/1982
Catawba Cable Installation Data, Cable Number - 2EQB545, RY Fire Pump C, dated 7/29/1980
Akron Brass Company, Technical Data, TurboJet Flow & Reach Data, Model 1720, 1-1/2" Hose Nozzle, dated 06-01-98
Catawba NRC Committed Fire Damper List, Excel Spreadsheet, Dated 12-19-2001
NUREG-1805, Volumes 1 & 2, Fire Dynamics Tools (FDT's) Quantitative Fire Hazard Analysis

Methods for the U.S. Nuclear Regulatory Commission Fire Protection Inspection Program Draft Report
Catawba Approved Storage Areas (NSD 313), Excel Spreadsheet, Dated 06-07-2004
DE&S Technical Document 00003-23-0065-F16-006, Duke Power Pen Seal Fire Test Analysis
Omega Point Laboratories 3-Hour Qualification Test - Project 14980-104516, Fire Resistance Evaluation of Seven Different Fire Barrier Penetration Seal Designs," dated May 12, 1999
CNS, Section 1.20, Pre-Fire Plan Area 18, Auxiliary Building 577 Level
CNS, Section 1.24, Pre-Fire Plan Area 22, Auxiliary Building 594 Level
CNS, Section 1.27, Pre-Fire Plan Area 38, Auxiliary Building 631 Level, Room 801.
CNS, Section 2.11, Unit 2 Elect Pen Room, Pre-Fire Plan Area 5, Aux Bldg 560 El, Room 360
CNS, Section 2.12, Unit 2 Ess Swgr, Pre-Fire Plan Area 7, Aux Bldg 560 El, Rooms 362 & 363
CNS, Sect. 2.14, Unit 2 Cable Room, Pre-Fire Plan Area 16, Aux Bldg 574 El, Room 481, 481A
CNS, Section 2.19, Unit 2 SFP Purge Unit, Pre-Fire Plan Area 47, Aux Bldg 636 El, Room 802
Fire Brigade Trng Records, Fire Area 2, Course ID CNFA03, dated 5/31/00
Fire Brigade Trng Records, Fire Area 5, Course ID CNFA03, dated 2/26/97, 1/30/97, 2/13/97
Fire Brigade Trng Records, Fire Area 9, Course ID CNFA03, dated 8/11/01
Fire Brigade Trng Records, Fire Area 14, Course ID CNFA03, dated 4/12/04
Fire Brigade Trng Records, Fire Area 16, Course ID CNFA03, dated 12/14/99
Fire Brigade Trng Records, Fire Area 18, Course ID CNFA03, dated 12/21/02
Fire Brigade Trng Records, Fire Area 21, Course ID CNFA03, dated 2/11/03

LIST OF ACRONYMS USED

AC	Alternating Current
ASB	Auxiliary Systems Branch
ASP	Auxiliary Shutdown Panel
BTP	Branch Technical Position
CFR	Code of Federal Regulations
CMEB	Chemical Engineering Branch
CNS	Catawba Nuclear Station
DBD	Design Basis Document
DC	Direct Current
ELU	Emergency Lighting Unit
FA	Fire Area
FHA	Fire Hazards Analysis
FPP	Fire Protection Program
FWST	Refueling Water Storage Tank
GL	Generic Letter
gpm	Gallons Per Minute
IR	Inspection Report
KC	Component Cooling Water
MCE	Mechanical and Civil Engineering
MCR	Main Control Room
MOV	Motor Operated Valve
NFPA	National Fire Protection Association
NRC	Nuclear Regulatory Commission
NV	Chemical and Volume Control System
PIP	Problem Investigation Process
PORV	Power Operated Relief Valve
PRA	Probabilistic Risk Assessment
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RES	Reactor and Electrical Systems
SDP	Significance Determination Process
SER	Safety Evaluation Report
SLC	Selected Licensee Commitments
SSA	Safe Shutdown Analysis
SSD	Safe Shutdown
SSF	Standby Shutdown Facility
SSS	Standby Shutdown System
TS	Technical Specification
UFSAR	Updated Final Safety Evaluation Report
URI	Unresolved Item
V	Volt
VCT	Volume Control Tank