



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
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FEBRUARY 23, 2001

Duke Energy Corporation
ATTN: Mr. G. R. Peterson
Site Vice President
Catawba Nuclear Station
4800 Concord Road
York, SC 29745

**SUBJECT: CATAWBA NUCLEAR STATION - NRC INSPECTION REPORT
50-413/01-02, 50-414/01-02**

Dear Mr. Peterson:

On January 26, 2001, the NRC completed a safety system design and performance capability inspection at your Catawba Units 1 and 2. In conjunction with this inspection effort, a 10 CFR 50.59 safety evaluation inspection was also conducted. The enclosed report documents the inspection findings which were discussed on January 11 and 26, 2001, with Mr. Pete Herran and other members of your staff.

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

No findings of significance are identified in the enclosed report.

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

Sincerely,

/RAI

Charles R. Ogle, Chief
Engineering Branch
Division of Reactor Safety

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

Enclosure: NRC Inspection Report 50-413,414/01-02
(with Appendix of documents reviewed)

cc w/encl:
Regulatory Compliance Manager

Duke Energy Corporation

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

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

Report Nos: 50-413/01-02, 50-414/01-02

Licensee: Duke Energy Corporation (DEC)

Facility: Catawba Nuclear Station, Units 1 & 2

Location: 4800 Concord Road
York, SC 29745

Dates: January 8 - 26, 2001

Lead Inspector: R. Carroll, Senior Project Engineer

Team: S. Freeman, Resident Inspector
N. Merriweather, Senior Reactor Inspector
R. Moore, Reactor Inspector
M. Scott, Senior Reactor Inspector (Section 1R02)
C. Smith, P.E., Senior Reactor Inspector

Other Personnel: K. Maxey, Reactor Inspector Trainee
S. Walker, Reactor Inspector Trainee

Approved by: C. R. Ogle, Chief, Engineering Branch
Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000413-01-02, 05000414-01-02, on 01/08-26/01, Duke Energy Corporation, Catawba Nuclear Station, Units 1 & 2, safety system design.

This safety system design and performance capability inspection, which included a 10 CFR 50.59 safety evaluation inspection, was conducted by regional inspectors and a resident inspector.

No findings of significance were identified.

Report Details

Inspection Background: This was an inspection of risk significant systems and components that are required to ensure successful mitigation of a loss of offsite power (LOOP) and/or station blackout (SBO). The risk significant systems and components were identified based on LOOP/SBO related core damage frequency contribution from turbine building flood (FTB), tornados (TORN), and LOOP (T3) initiating event sequences. The effort encompassed: essential and SBO alternating current (AC) systems/components; emergency and standby shutdown facility (SSF) diesels; direct current (DC) battery systems; standby makeup pumps (SMP); auxiliary feedwater turbine-driven pumps (CATP); and related supporting systems. As a risk informed inspection, not only were system/component capabilities evaluated, but recovery activities (i.e., emergency and abnormal operating procedures) and effects on related initiating event frequencies were assessed as well.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R02 Evaluations of Changes, Tests, or Experiments

a. Inspection Scope

The inspectors reviewed nine “full safety evaluations” to confirm that the licensee had appropriately reviewed and documented changes in accordance with 10 CFR 50.59 and licensee procedure Nuclear Site Directive (NSD) 209, 10 CFR 50.59 Evaluations, Revision 8. The inspectors also reviewed ten design changes and two procedure changes for which the licensee determined safety evaluations were not required. This was done in order to confirm that the licensee’s conclusions to “screen out” these changes were correct and consistent with 10 CFR 50.59 and NSD 209. Highlighted accordingly as “Full 50.59 Safety Evaluations” or “50.59 Screenings” in the attached Appendix, are the seventeen minor modifications (MM), two nuclear system modifications (NSM), and the two abnormal procedures (AP) that were reviewed to ensure that changes could be made to the facility without obtaining a license amendment. The inspectors also reviewed applicable sections of the Updated Final Analysis Report (UFSAR), site drawings, supporting analyses, calculations, Technical Specifications (TS), and procedures to ensure they were correctly revised.

In addition, the inspectors reviewed nine corrective action program documents (listed in the attached Appendix) to confirm that the licensee was identifying 10 CFR 50.59 related issues, entering issues into the corrective action program, and resolving the concerns. Reviewed were two corporate audits and Problem Investigation Process reports (PIP) associated with six site modification assessments and one modification readiness review.

b. Findings

No findings of significance were identified.

1R21 Safety System Design and Performance Capability

.1 System Needs

a. Inspection Scope

Energy Source

The team performed a design review for probable common cause failure of risk significant equipment to operate due to inadequate equipment utilization voltage. The team reviewed design basis documents, installed equipment, calculations of record, vendor information, and approved design output drawings for Unit1 4160 volt AC (VAC) and 600 VAC power distribution systems. The team evaluated the adequacy of the licensee's analysis of the electrical distribution system and its compliance with the guidance of Branch Technical Position PSB-1, Adequacy of Station Electric Distribution System Voltages. Capability of risk significant motors to perform was evaluated for compliance with vendor recommendations and the requirements of American National Standards Institute (ANSI) C50.41-1982, American National Standard for Polyphase Induction Motors for Power Generating Stations. The capability of risk significant motors and Generic Letter 89-10 motor operated valves to perform was also evaluated against industry standards.

The team reviewed plant modification NSM CN-11339, 125 VDC Vital Instrumentation and Control (I&C) Power (EPL) System Battery Replacement Modification, design basis documents, installed equipment, calculations of record, and industry standards used for sizing the 125 VDC batteries and battery chargers for the vital I&C power system. Calculation CNC-1381.05-00-011, 125 VDC Vital I&C Power System Batteries and Battery Charger Sizing, was reviewed to confirm capability of the lead calcium model NCN-21 batteries to power their loads for two hours upon a loss of coolant accident/LOOP. Additionally, calculation CNC-1381.05-00-0122, Station Blackout Battery Sizing Calculation for the 125 VDC Vital I&C Batteries, was reviewed to confirm capability of the batteries to power their loads for a four-hour coping duration during a SBO without load stripping.

The team reviewed design documentation, drawings, calculations, technical manuals, test documentation, and installed equipment to verify that the sizing of storage tanks and design of the automatic fuel oil transfer valves were adequate to provide the fuel requirements to operate the emergency diesel generators (EDGs) for the period of time assumed in the accident analysis. This included diesel testing to determine the fuel consumption rate and calculations determining the fuel oil volume required for seven days of operation. Additionally, station acceptance criteria for fuel oil quality was reviewed to verify these were consistent with the EDG vendor recommendations and applicable industry standards.

The team reviewed design documentation and equipment specifications to verify that the EDG air start system capability and storage capacity were consistent with design bases assumptions. This included calculations for air receiver sizing and test documentation to verify multiple start capability.

The team reviewed design documentation and sizing calculations to verify that the SSF diesel fuel oil day tank contained enough fuel to start the diesel and support an orderly shutdown if the main fuel oil tank failed. The SSF diesel generator battery sizing calculation was also reviewed to verify that the starting system had the design capacity for 10 starts. In addition, the team reviewed the other SSF diesel support systems (e.g., fuel transfer pump, inlet dampers, room heaters, etc..) to verify they were supplied from sources powered by the SSF diesel.

Controls

The team reviewed elementary wiring diagrams which depicted the permissives and starting circuits for EDGs and EDG load sequencers for degraded and loss of voltage conditions on the essential 4160 VAC safety-related buses. The objective of the review was to verify that risk significant systems and components required to ensure successful mitigation of a LOOP or SBO would be capable of performing their design functions consistent with the licensing and design basis for the plant. The team specifically reviewed the 2-out-of-3 relay logic for the degraded and undervoltage relays. These reviews were performed to verify that upon a LOOP the EDGs and the load sequencer would start and initiate load shedding and sequencing of required blackout loads.

The team reviewed elementary wiring diagrams which depicted the electrical interlocks between 4160 VAC switchgear breakers ETA(B)-2, FTA-1, and GTA-1. This review was performed to verify that the associated EDG could not be inadvertently aligned to the grid through the blackout bus if blackout bus supply breaker GTA-1 was closed or failed to open.

The team reviewed elementary wiring diagrams depicting permissives for starting the CATP on a LOOP. This review was performed to verify that the pump would start and provide feedwater to the steam generators in a LOOP or SBO condition. The team also reviewed the control logic and permissives for automatically opening the CATP suction isolation valves (CA-174 and -175) on low suction pressure. This review was performed to verify that this transfer was operable during a LOOP/SBO. The team also reviewed the level controls for the CATP A sump pump to verify that it would adequately control sump pump water level during a LOOP/SBO event.

Operator Actions

The team reviewed pertinent operating procedures to determine consistency with assumed LOOP/SBO operator recovery actions. Specific actions assessed were: manually load shedding the essential busses; locally starting the EDGs; manually closing the output breaker; starting the SSF diesel generator and SMP from the SSF; transferring the power supply of motor control center (MCC) EMXS from Unit 1 to the SSF; controlling letdown using the reactor head vents from the SSF; manually controlling pressurizer heaters; fully isolating the primary and secondary systems; controlling the CATP from the SSF; and verifying primary side natural circulation. Also reviewed were the qualifications and training records of security personnel designated as qualified to operate the SSF diesel generator.

Heat Removal

The team reviewed calculations and equipment specifications to verify that the internal cooling systems for the engine cooling and lubricating oil were adequate to maintain EDG operation within vendor specifications. This included heat transfer testing data sheets which verified the capacity of the EDG heat exchangers.

The team reviewed the sizing calculation for the SSF intake dampers to verify adequate cooling and combustion air was provided for the SSF diesel generator.

The team reviewed the availability and capacity of auxiliary feedwater (CA) water sources (necessary for primary-to-secondary side heat removal) during a SBO event. These sources included condensate storage tanks, main condensers, and the condenser circulating water (RC) system imbedded piping. The review included calculations which determined the volume of water to remove decay heat during a SBO event, tank and piping drawings, and calculations determining the volume of the available water sources.

b. Issues and Findings

No findings of significance were identified.

.2 System Condition and Capability

a. Inspection Scope

Installed Configuration

The team performed field walkdown inspections of the associated SBO and Unit 1 essential 4160 VAC, 600 VAC, and 120 VDC power systems, including: 4160 VAC degraded and undervoltage relays; transformers SATA, SATB, 1ATC, and 1ATD; EDGs and their support systems (e.g., fuel oil, starting air, batteries, etc.); EDG load sequencer and control panels; and the SSF diesel and its support systems (e.g., fuel oil, starting batteries, etc.). Also field inspected in Unit 1 was the accessible equipment related to the CATP, SMP, and isolated phase bus (IPB) system. The walkdowns were performed to look for degraded or nonconforming conditions and to verify consistency with design documents and drawings.

Design

The team reviewed design bases documents and approved design output drawings of the 4160 VAC essential auxiliary power system in order to verify that the degraded voltage relay set point values of voltage magnitude and time delays were consistent with values incorporated in the TS. The analytical limits upon which the degraded voltage dropout set points were based were also reviewed to ensure that steady state voltage criteria for risk significant equipment were not violated when fed from the preferred power supply during degraded voltage conditions. The loss of voltage relay set point values of voltage magnitude and time delay was also evaluated to demonstrate agreement with values delineated in the TS and to ensure compliance with General Design Criteria 17 for minimizing loss of offsite power to the 4160 VAC essential

auxiliary power system. Instrument loop inaccuracies associated with the degraded voltage relays and the loss of voltage relays were reviewed for agreement with values listed in the instrument calibration procedures.

The team reviewed the as-built sizing data for the CATP pit sump pump motor to verify that the overload heater had been selected consistent with site engineering guidance and vendor recommendations.

The team reviewed the voltage drop and electrical loading calculation for the SSF to verify that required loads were within the continuous rating of the SSF diesel.

Testing

The team reviewed a sample of completed calibration records to verify that instruments were being calibrated in accordance with setpoint documents. The records addressed calibration of the load sequencer timer relays, CATP sump level transmitters, and CATP suction pressure switches. The test methods were also reviewed to verify that all appropriate relay contacts were being verified as operable. The records reflected the most recent calibrations and are described as follows:

- Calibration Data Sheets from IP/1/A/3670/001A for EDG1A Load Sequencer Timers (EQB) (Performed by Work Order No. 98275137-01)
- Calibration Data Sheets from IP/1/A/3181/001 for CATP Sump Pump Level Transmitter Calibration (Performed by Work Order No. 98297423-01)
- Calibration Data Sheets from IP/1/B/3140/005 for Calibration of Auxiliary Feedwater System (CA) Non-Safety Related Instrumentation (Performed by Work Order 98185746-01)
- Calibration Data Sheets from IP/2/B/3140/005 for Calibration of Auxiliary Feedwater System (CA) Non-Safety Related Instrumentation (Performed by Work Order 98292682-01)

The team reviewed the maintenance procedures for 4160 VAC circuit breakers to determine whether breaker operating times were being checked, and whether the allowable operating times specified were adequate to support proper operation of the electrical interlocks between breakers ETA-2, FTA-1, and GTA-1 during blackout loading of the EDG if breaker GTA-1 failed to open.

The team reviewed data from the most recent performance of the monthly SSF diesel generator run and from the functional test performed at SSF installation. In addition, the level in the SSF fuel oil day tank before and after the monthly run was compared to verify operation of the fuel oil transfer pump.

b. Issues and Findings

No findings of significance were identified.

.3 Selected Components

a. Inspection Scope

Component Maintenance

The team reviewed design changes of equipment accomplished through the licensee's design change process, as well as component level design changes accomplished using the licensee's procurement process, to verify that system and equipment function was appropriately evaluated and maintained.

The team reviewed maintenance and testing documentation to assess the licensee's actions to verify and maintain the function, reliability and availability of: 4160 VAC switchgear breakers 1ETA3, 1ETA4, and 1ETA18; EDG related equipment (i.e., the diesels, fuel oil storage tanks, air start system tanks, and critical valves FD-22 and RN-232); SSF power delivery system related equipment (i.e., the diesel, fuel oil day tank, fuel oil transfer pump, and the inlet dampers); the SMP(s) and associated valves NV-865 and NV-872; and the CATP(s), associated suction isolation valves CA174 and CA175, and CATP sump pump(s).

Component Inputs/Outputs

The team reviewed pump performance curves and motor/pump speed torque curves for the nuclear service water pump motors in order to verify that the motors were adequately sized based on mechanical load demand. Additionally, the team reviewed design basis calculations for degraded voltage conditions in order to verify the capability of the 4160 VAC electrical distribution system to support operation of risk significant motors. The team also reviewed diesel generator room supply fan motor performance curves in order to verify that the motors were adequately sized for performing their design function. The capability of the fan motors, as well as risk significant Generic Letter 89-10 motor operated valves, to perform their design function under degraded voltage conditions at 600 VAC Motor Control Centers was inspected by review of calculation CNC-1381.05-00-0070, Auxiliary Power System Voltage Study - Source Voltage, Revision 6.

Operating Experience

The team reviewed the licensee's evaluation of Information Notice (IN) 2000-06, Offsite Power Voltage Inadequacies. The licensee's evaluation of the IN was incorporated in their response to INPO SOER 99-01, Loss of Grid, issued in December 1999. The team reviewed the licensee's response to Recommendation 4 of this SOER in order to verify that grid stability and reliability assumptions are valid to ensure that the switch yard voltage is maintained within the limits necessary for supporting operation of the nuclear units.

The team also reviewed the licensee's evaluation for IN 88-75, Disabling of Diesel Generator Output Circuit Breakers by Anti-Pump Circuitry, and IN 97-21, Availability of Alternate AC Power Source Designed For Station Blackout Event.

b. Issues and Findings

No findings of significance were identified.

.4 Identification and Resolution of Problems

a. Inspection Scope

The team reviewed PIPs and corrective maintenance documentation related to the EDGs and their support systems, the SSF diesel and its support systems, CATP(s), and the SMP(s) for the past three years to assess the adequacy of corrective actions for identified problems.

The team reviewed Licensee Event Report (LER) 50-414/96-001 and associated PIPs C-96-00455, C-96-00273, and C-96-00864 to verify appropriate corrective actions had been implemented for the 1996 LOOP event on Catawba Unit 2. As indicated in Section 1R21.2, a walk-down was performed of the Unit 1 IPB system to verify that those corrective actions implemented to prevent recurrence of moisture accumulation were still in place and operable. The team also reviewed the preventive and corrective maintenance records for the IPB system since 1996 to verify that similar problems have not occurred.

The team reviewed PIPs C-98-01748, C-98-01057, and C-00-02947, which described I&C problems on equipment relied on for a LOOP and/or SBO, in order to verify that appropriate corrective actions were planned or taken to resolve the concerns.

The team reviewed PIP C-00-02488, which addressed the unexpected intermittent reset actuation of the EDG 2A load sequencer due to a failed timer relay. The review focused on the investigation to determine the root cause for the timer failure and the planned corrective actions to prevent recurrence of the problem.

The team reviewed the June 2000 Catawba Nuclear Station Stationary Battery Assessment Report, which documented continuous problems with nickel cadmium batteries used for the 125 VDC EDG auxiliary power. Recommendations for replacing the batteries were delineated in Section 3.4 of the report. The team reviewed MM CNCE-70521, dated October 17, 2000, and Commercial Grade Item Evaluation CGD-3014.06-03-0001, Revision 12, in order to verify compliance with the report recommendations, as well as industry guide and standards for sizing nickel cadmium batteries. The commercial grade dedication package for the replacement batteries was reviewed to ensure that required technical and quality requirements had been incorporated.

The team reviewed PIPs C-96-00241 and C-99-04064, which concerned stress cracking and age-related deterioration of the RC system rubber expansion joints. Since the Catawba Probabilistic Risk Assessment (PRA) recognizes the failure of the RC expansion joints as a turbine building flood LOOP initiator (due to the 6900 VAC:4160 VAC transformers for both units being located in turbine building basement), the review focused on the licensee's replacement plans and interim compensatory actions.

b. Issues and Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA6 Management Meeting

The lead inspector presented the inspection results to Mr. P. Herran, Engineering Manager, and other members of the licensee's staff at an exit meeting on January 25, 2001. The licensee acknowledged the findings presented. Proprietary information is not included in the inspection report.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

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C. Ogle, Chief, Engineering Branch, Division of Reactor Safety, Region II

APPENDIX

LIST OF DOCUMENTS REVIEWED

PIPs Initiated as a Result of this Inspection

PIP C-01-00184, CNC-1381.05-00-0070 References Outdated FSAR Page Number
PIP C-01-00193, Outdated FSAR Table Reference in DBD CNS-115.01-EPC-0001
PIP C-01-00383, FSAR Section 8.2.2.1 is Confusing Concerning Grid Stability and Requires Clarification
PIP C-01-00386, CNC-1381.05-00-0012 Does Not Document Basis for Degraded Voltage Allowable Value in Technical Specifications
PIP C-01-00397, NSM CN-11339 Incorrectly States Design Basis Duty Cycle for Replacement Vital Batteries is One Hour Instead of Two Hours
PIP C-01-00189, CNC-1223.42-00-004 Does Not Model Flow From CAPT to All Four Steam Generators.
PIP C-01-00413, No Pre-Op or Regular Testing to Verify Inability of Breakers FTA(B)-1 and ETA(B)-2 to Close While GTA(B) is Closed
PIP C-01-00179, Incorrect Airflow Input in CNC-1211.00-00-0032 for SSF Diesel Room Dampers
PIP C-01-00182, No PM Performed on Inlet Dampers VK DA 4A & 4B and Heaters VK EH 5 & 6
PIP C-01-00350, No PM for SSF D/G Fuel Oil Day Tank and Transfer Pump
PIP C-01-00350, Vendor Recommended Engine Coolant Flush Not Being Performed
PIP C-01-00437, Use of Flexible Hose versus Metal Tubing on Engine Cooling Water Subsystem
PIP C-01-00440, Conduct Analysis of Grid Faults and Affect on 4160 V Essential Bus Blackout Relays and Degraded Voltage Relays
PIP C-01-00381, Enhancements to EP/1(2)/5000 ECA-0.0, Loss of All AC Power
PIP C-01-00425, Apparent Discrepancy Between Vendor Information and CNS Practice Regarding RC Expansion Joints
PIP C-01-00435, Cracks Were Found on the 1C2 and 2C2 Condenser Inlet Rubber Expansion Joints

Technical Specifications

TS Section 3.3.5, Loss of Power Diesel Generator Start Instrumentation

UFSAR

Section 8.2, Offsite Power System (4/8/00)
Section 8.3, Onsite Power System (4/8/00)
Selected Licensee Commitment 16.7-9, Standby Shutdown System (9/20/99)

Vendor Documents

CGD-3009.03-11-0001, Commercial Grade Dedication Package for Cutler Hammer D87 Timers, Attachment 2
CNM 1301.02-0058 002, Cummings Engine Co. Generator Set Service Manual II

CNM 1301.02-0040 001, 75A SFT Assembly
 CNM 1301.02-0040 002, SSF Diesel Generator Standard Day Tank Parts List
 CNM 1301.02-54, Fuel Oil Day Tank Terminal Strip Box Wiring Detail
 CNM 1301.02-46, Day Tank
 CNM 1211.00-0552.001, VK System Controls
 CNM 1211.00-0735 001, Dampers by Ruskin
 Squirrel Cage Induction Motor Data Sheet for Motors Rated 100 HP and Above; Motor
 Application- Nuclear Service Water Pump Motors
 Induction Motors Starting Characteristics and Time Current and Thermal Limit Curves,
 Figures 33-37
 Joy Manufacturing Company Fan Model 60-26-1170 Diesel Generator System Ventilation Fan
 Performance Curves
 Joy Manufacturing Company Air Fan Test Data for Fan Model No. 60-26-1170,
 Tag Nos. DSF-1A1, 1A2, 1B1, and 1B2

LERs

LER 50-414/96-001, Loss of Offsite Power on Unit 2 due to Electrical Fault Near Unit 2 Main Transformer

INs

IN 00-06, Offsite Power Voltage Inadequacies
 IN 88-75, Disabling of Diesel Generator Output Circuit Breakers by Anti-Pump Circuitry
 IN 97-21, Availability of Alternate AC Power Source Designed for Station Blackout Event

Miscellaneous Documents

Duke Power 10 CFR 50.59 USQ Evaluation , UFSAR Change Summary Form Package No. 00-036, Approved on January 20, 2000.

50.59 Screenings for Selected Modifications and Procedures

MM CE-61654, Rewiring of Damaged Cable (8/31/00)
 MM CE-61390, Speed Indication Addition for Auxiliary Feedwater Pump (8/25/98)
 MM CE-10357, Diesel Control Power Circuit Breaker Replacement (4/28/99)
 MM CE-9523, Replacement of Diesel Generator Speed MOP with DRU (7/20/98)
 MM CE-61640, Rewiring of Devices Affected by Damaged Cable (9/7/00)
 MM CE-61381, Instantaneous Trip Setpoint for Breaker in Remote Starters (DG DC Fuel Oil Pump, 4/22/98)
 MM CE-10518, RN Pump Discharge Valve MOV Motor Replacement (12/20/99)
 MM CE-10275, Condenser High Refrigerant Pressure Switch Replacement (12/20/99)
 MM CE-61301, Blackout Auxiliary Power Supply Feeder Breaker Replacement (7/7/97)
 MM CE- 61505, CN-1702-05.01 Revision (7/8/97)
 AP/1/A/5500/06, Revision 19, Loss of Steam Generator Feedwater
 AP/1/A/5500/07, Revision 32, Loss of Normal Power

Full 50.59 Safety Evaluations for Selected Modifications

MM CE-61291, Auxiliary Feedwater Check Valve Internals Removal (2/18/98)
 MM CE-61396 & 7, Unit 1 and 2 CA-6 Valve Alignment (with Unit 1 CE-61530, Restoration of CA-6 to Operable Status (11/12/98)
 NSM CN-11383, CA Flow Rate reduction Nuclear System Modification (7/9/97)
 MM CE-61625, NV Pump 1-A 3rd Generation Mechanical Seal (9/20/00)
 MM CE-70610, Piping Replacement Between RN Pump Structure and Pit Wall (11/6/00)
 MM CE-10107, Chilled Water Recycle Temperature Switch Jumpered (1/16/99)
 MM CE-61487, Reference Leg Pressure Tap Between Annulus Ventilation and Auxiliary Building Changed (7/6/99)
 NSM CN-21379, Replacement of 6.9 kV Switchgear Tie Breakers with Faster Vacuum Breakers (5/12/98)
 MM CE-10411, Installation of Enclosures Around CS Expansion Joints (5/20/99)

Corrective Action Documents

PIP C-99-01125, Assessment Modification CNCE-7901
 PIP C-00-02058, SRG Assessment Modification CNCE-61395
 PIP C-00-02059, SRG Assessment Modification CNCE-21393
 PIP C-00-02060, SRG Assessment Modification CN-21405
 PIP C-00-02061, SRG Assessment Modification CNCE-61395
 PIP C-00-02516, Readiness Review performed on NSM CN-50477
 PIP C-00-00165, Assessment of 10 CFR 50.59 Screenings and USQ Evaluations
 PIP C-96-01725, RC to CA Manway Vent Valves Not Checked for Proper Operation
 PIP C-00-03194, High Repair Rate for Limit Switch of 1CA-67
 PIP C-93-00183, CAPT #2 Sump Pump 2A Failed to Start in Auto
 PIP C-00-04898, 2A EDG Trip During Operability PT
 PIP C-99-01223, EDG 1B Failed to Start on PT
 PIP C-99-01643, EDG 1B Would Not Start When Taken Out of Maintenance Mode
 PIP C-99-01648, EDG 1B Output Breaker Trip on 50 DGT Relay
 PIP C-99-01755, KD Hx 2B Exceed Trend Data for Number of Tubes Plugged
 PIP C-99-02666, OEDB No. 99-021588 Regarding Cleaning Agent Used On Fuel Oil Tanks
 PIP C-99-03288, EDG 1A Load Swings
 PIP C-96-01561, SSF Diesel Generator Maintenance
 PIP C-96-01627, No Design Basis for SSF 24V Battery
 PIP C-97-03218, No Battery Capacity Test for SSF 24V Batteries
 PIP C-98-02004, Discrepancies in Calculation CNC-1211.00-00-0032
 PIP C-98-02456, Incorrect Sizing Calculation CNC-1211.00-00-0032
 PIP C-98-02461, Discrepancies in Calculation CNC-1211.00-00-0032
 PIP C-98-03155, SSF Instrumentation
 PIP C-01-00179, Incorrect Sizing Calculation CNC-1211.00-00-0032
 PIP C-01-00182, No Preventive Maintenance on SSF Intake Dampers
 PIP C-01-00350, SSF Diesel Generator Fuel Oil Day Tank
 PIP C-01-00381, Changes to Loss of All AC Power EOP
 PIP C-01-00437, Flexible Cooling Hose on SSF Diesel Generator
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WO 98273976-01, PM Potential XFMR In Top Hat 1ETA3 (10/23/00)

WO 98275107-01, PM Breaker 1ETA-3 (10/04/00)

WO 93001900-01, Inspect/Replace Clip/Fastener On Bottom Cubicle 1ETA4 (09/29/93)

WO 93060295-01, Install New Breaker In 1ETA4 09/27/93

WO 94094296-01, 1EPC - PM Potential XFMR In Top Hat 1ETA4 (02/23/95)

WO 97077582-01, Refurbish Breaker 1ETA-4 (02/16/98)

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WO 96094022-01, 2CA175 Perform Comprehensive Limitorque PM (12/17/97)

WO 96014503-01, 2AD - Replace DOI NK1 In 2ELCC0034 (04/11/97)

WO 98213465-01, 2CA174 Perform Comprehensive Limitorque PM (12/07/00)

WO 98306194-01, 2CA174 Perform Limited Limitorque PM (10/05/00)

WO 98262695-01, 2CA174 Inspect/Replace Actuator Setup (05/09/00)

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WO 98094345-01, 2CA174 Inspect/Replace Control From SSF (10/15/99)

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WO 97089194-01, 2CA175 Perform Limited Limitorque PM (11/17/98)

WO 95092314-01, E07492 WU01 - 2CA175 Perform MOV Test (01/30/97)