UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET SW SUITE 23T85
ATLANTA, GEORGIA 30303-8931

February 26, 2002

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

SUBJECT: MCGUIRE NUCLEAR STATION - NRC INSPECTION REPORT 50-369/01-06, 50-370/01-06

Dear Mr. Barron:

On January 31, 2002, the Nuclear Regulatory Commission (NRC) completed an inspection at your McGuire Nuclear Station. The enclosed report documents the inspection findings which were discussed on January 31, 2002, with you and others of your staff.

The inspection was an examination of activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations, and with the conditions of your operating license. Within these areas, the inspection involved selected examination of procedures and representative records, observations of activities, and interviews with personnel.

No findings of significance were identified during the inspection.

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/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Charles R. Ogle, Chief
Engineering Branch 1
Division of Reactor Safety

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

Enclosure: (See page 2)

Enclosure: Inspection Report 50-369/01-06
and 50-370/01-06 w/Attachment

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U. S. NUCLEAR REGULATORY COMMISSION
REGION II

Docket Nos.:	50-369, 50-370
License Nos.:	NPF-9, NPF-17
Report No.:	50-369/2001-06, 50-370/2001-06
Licensee:	Duke Energy Corporation
Facility:	McGuire Nuclear Station, Units 1 and 2
Location:	12700 Hagers Ferry Road Huntersville, NC 28078
Dates:	January 14-18, 2002, and January 28-31, 2002
Inspectors:	F. Jape, Senior Project Manager, Lead N. Merriweather, Senior Reactor Inspector R. Moore, Reactor Inspector S. Walker, Reactor Inspector M. King, Resident Inspector, V. C. Summer
Approved by:	C. R. Ogle, Chief Engineering Branch 1 Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000369-01-06, IR 05000370-01-06, on 01/14-31/2002, Duke Energy Corporation, McGuire Nuclear Station, Units 1 & 2. Inspection of Safety System Design and Performance Capability - Auxiliary Feedwater System.

This inspection was conducted by a team of regional inspectors and a resident inspector from a different site. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609 “Significance Determination Process” (SDP). Findings for which the SDP does not apply are indicated by “No Color” or by the severity level of the applicable violation. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at http://nrr10.nrc.gov/NRR/OVERSIGHT/index.html.

No findings of significance were identified.

Report Details

1. REACTOR SAFETY
Cornerstones: Initiating Events and Mitigating Systems

1R21 Safety System Design and Performance Capability (71111.21)

.1 System Needs

a. Inspection Scope

Process Medium

The team reviewed the availability, reliability, and adequacy of the preferred and assured water sources for the auxiliary feedwater (CA) system to determine if they would be capable of performing their design functions. This included the licensee's actions to identify and prevent degradation of the assured water source supply piping due to clams, debris, and biofouling and the capacity of the recently installed CA storage tanks. This review included design documentation, drawings, calculations, vendor manuals, test documentation, surveillance and operating procedures, and installed equipment.

Energy Source

The team reviewed the reliability and availability of the steam supply to the turbine driven CA pump (TDCAP). This was done to determine that the design and performance requirements of the air operated valves and steam supply valves were met. This review included design documentation, drawings, calculations, vendor manuals, test documentation, surveillance and operating procedures, and installed equipment.

Electrical Signals

The team reviewed electrical drawings depicting the design of the start and stop controls, permissives, and interlocks, for the turbine driven (TD) and motor driven (MD) CA pumps. The inspectors also reviewed control logic, permissives, and interlocks, associated with selected risk significant CA and service water (RN) motor operated valves, and RN pump motors. The inspectors reviewed CA system interlocks associated with RN pump start on CA pump auto start signals. The inspectors performed the reviews to verify that the motor driven CA pumps start logic was designed to auto start on either a loss of both main feedwater (CF) pumps, low-low level in any steam generator, loss of offsite power, or a safety injection signal. The TD pump start logic was reviewed to verify that the pump would auto start on either a loss of offsite power (blackout) or low-low level in 2 of 4 steam generators. The CA valve control logic design was reviewed to verify that the CA suction valves would open and realign to the assured RN suction source on a low pump suction pressure signal. The inspectors reviews also verified that both motor and turbine driven CA pumps had manual start capability. The inspectors reviewed surveillance test procedures and calibration test

records to verify that the permissives, interlocks, initiation logic, and electrical controls were being adequately tested in accordance with design drawings.

Electrical Power Sources

The team reviewed electrical one-line drawings for the 4160 volt alternating current (VAC) switchgear, 600 VAC load centers and motor control centers (MCCs), 120 VAC vital power, and 125 volt direct current (VDC) to identify and ensure adequate power sources were available for the aforementioned loads. The team reviewed the minimum expected voltage conditions to determine if adequate voltage was available for the loads in accordance with equipment specifications. In addition, the team reviewed fuse and breaker coordination studies for the selected loads to verify adequate protection.

The team evaluated the 125 VDC batteries and battery charger sizing calculation to verify proper loading consideration was given to selected CA and RN system components. The team reviewed periodic testing of onsite AC emergency power supplies to determine if they were capable of providing adequate voltage and current for the CA loads in accordance with design requirements and technical specification.

Instrumentation and Controls

The team reviewed electrical elementary and schematic drawings depicting permissives and interlocks for valves and motor logic to determine if the control logic was consistent with system functional requirements.

The team reviewed process drawings for CA and other interfacing systems to ensure adequate alarms and indications were available to operators for making necessary decisions regarding operation of the system. The team reviewed loop uncertainties of selected CA process instruments (e.g., CA storage tank level and temperature and CA pump suction pressure) to determine if they had been adequately assessed by the licensee in uncertainty calculations. In addition, the team reviewed calibration test records to determine if the instruments were included in a periodic calibration test program.

Operator Actions

The team reviewed the procedural instructions to operators to determine if they were consistent with operator actions required to meet, prevent, and/or mitigate design basis accidents. To do this, the team reviewed abnormal and emergency operating procedures, and requirements and commitments identified in the Updated Final Safety Analysis Report (UFSAR), Technical Specifications, design basis documents, and plant drawings. The team reviewed alarm setpoints and verified that instrumentation and alarms were available to operators for making necessary decisions in coping with postulated accident conditions. In addition, the team reviewed that system alignments were consistent with design and licensing basis assumptions. The review also considered requirements and commitments identified in the UFSAR, Technical Specifications, design basis documents, and plant drawings. The purpose of these reviews was to verify that the auxiliary feedwater and related support system requirements were met.

Heat Removal

The team reviewed availability and reliability of the subsystems required to remove heat from the CA pumps during normal and accident conditions as specified in design basis documents. This review included drawings, vendor manuals, test documentation, surveillance and operating procedures, and installed equipment.

b. Findings

No findings of significance were identified.

.2 System Condition And Capability

a. Inspection Scope

Installed Configuration

The team performed field walkdowns of the CA system to assess material condition, identify degraded conditions, and to verify that the installed configuration was consistent with the design drawings and design inputs to calculations. Additionally the team inspected the flood detection devices to verify the capability to detect internal flooding in the CA pump rooms.

The team performed selective field inspections of the switchgear, auxiliary panels, cable spreading room, main control board sections, auxiliary feedwater pump rooms, and the auxiliary feedwater isolation and turbine steam supply valves. Particular attention was placed on verifying locked valves and components were in their required position. The purpose of these walkdowns was to assess the adequacy of material condition and installation configurations. Particular attention was focused on the installation and configuration of piping, components, and instruments; the placement of protective barriers and systems; the susceptibility to flooding, fire, or other environmental concerns; physical separation; provisions for high energy line break; accessibility for operator action; and the conformance of the installed configurations with the design and licensing bases.

In addition to the above, the team performed visual inspections inside of selected MCC compartments to determine if the type and sizes of installed fuses, overloads, motor starters, and breakers, were consistent with the load lists and cabinet bills of materials. Also, the material condition of the internal electrical wiring was visually inspected for any signs of physical degradation from conditions such as overheating.

Design

Design and test documents were reviewed to determine if the design basis assumptions of system capability were verified. This included net positive suction head (NPSH) for the pumps from the preferred and assured sources. This review included design documentation, drawings, calculations, vendor manuals, test documentation, and surveillance and maintenance procedures.

The limits upon which the degraded voltage dropout setpoints were based were reviewed and evaluated for adequacy to ensure proper equipment protection. An instrument loop inaccuracy calculation for the degraded voltage and undervoltage relays was reviewed and "as-left" and "as-found" values of voltage and time delay setpoints were verified to be consistent with those values delineated in the Technical Specifications and the instrument calibration procedures. The team reviewed the calculation that sized the feeder cables for the CA pump motors to verify that the cables were sized to provide adequate voltage and current to the motors. The team reviewed calculations that determined voltage drop on the 4160 VAC buses when starting a RN or CA pump from the diesel generator. The team reviewed design change packages to assess the impact on the CA system design function.

Testing

The team reviewed the latest calibration records for the degraded and undervoltage relays to verify that relay setpoints (i.e., "as-found" and "as-left") were in accordance with approved plant procedures and Technical Specifications. The team reviewed functional test records for the alternating current (AC) current transducers and metering circuits for 4160 VAC switchgear ETA and ETB on both Units 1 and 2 to determine if they met design performance requirements. The team reviewed calibration test records and functional test procedures to verify that critical CA system level, flow and pressure instrumentation were being monitored and calibrated in accordance with Technical Specifications. The team reviewed functional test procedures to verify that the CA pump start/stop switch, local/remote switch, flow control valve reset, and CA valve position indication were functionally tested.

The team reviewed the program and procedures using Technical Specifications and design basis requirements for inservice testing and inspection of the safety-related valves and pumps in the CA system. These reviews included flow balancing and testing results, pump manufacturer pump curves, and pump and valve inservice test trend records.

On January 16, the team observed actual system testing conducted using Procedure PT/1/A/4252/001A, "1A CA Pump Performance Test," Revision 082.

Operation

The team reviewed periodic testing procedures (listed in the attachment) and results to determine if the design system performance satisfied requirements. The team also reviewed the environmental qualifications of a sample of the CA system components for operation under design environmental conditions and assumed operating parameters (e.g., temperature, radiation, pressure, flowrate, voltage, speed, and power).

The team also reviewed the CA system's operations by conducting system walkdowns, reviews of normal, abnormal, and emergency operating procedures; and review of the UFSAR, Technical Specifications, design calculations, drawings, and procedures. Emphasis was placed on changes to the design bases and normal and emergency operating procedures to ensure system availability, reliability, and functional capability have been maintained.

b. Findings

No findings of significance were identified.

.3 Selected Components

a. Inspection Scope

Operations Training and Simulator Scenarios

The inspectors reviewed OP-MC-CF-CA, "Auxiliary Feedwater System (CA) System Lesson Plan," Revision 30 and operator job performance measures (JPM's) associated with the CA system and the licensed operator requalification (LOR) examination question bank to assess CA system training. The inspectors reviewed CA system related simulator scenarios which the licensee had developed for operator training.

The inspectors observed performance of two additional CA system related simulator scenarios to assess licensed operator performance for controlling and responding to CA system operations and system malfunctions. These scenarios were based on actual industry experiences (low decay heat reactor trips following refueling outages and a mispositioned auxiliary feedwater turbine driven pump discharge valve). The first simulator scenario involved a reactor trip with very low decay heat present which required operator actions to control CA flow to prevent an inadvertent safety injection. The second simulator scenario involved a station blackout situation with a failure of the turbine driven CA pump to provide flow to the steam generators due to a mispositioned discharge isolation valve. This scenario was used to assess emergency operating procedure usage, prioritization of actions, and to determine time lines for diagnosis of the mispositioned valve and implementation of corrective actions.

The inspectors verified that control room instrumentation such as annunciators, switch position indications, flow, and level indicators supported accomplishing required procedural actions. The inspectors reviewed the simulator to determine that it matched the Unit 1 control room configuration. Additionally, the inspectors reviewed the operator aid computer (OAC) data available to support monitoring of CA system performance during normal operational alignment, surveillance testing and emergency operation. The inspection focused on potential common cause problems and potential human errors that could result in a failure or improper operation of the CA system.

Component Inspection

The team reviewed maintenance and testing documentation, performance trending information, and equipment history to assess the licensee's actions to verify and maintain the safety function, reliability, and availability of selected components. Additionally, potential common cause failure mechanisms due to flooding, maintenance, and parts replacement were reviewed. The selected equipment included circuit breakers, pumps, motors, latching relays, and a risk-based selection of critical valves.

Design Changes

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

Operating Experience

The team reviewed the licensee's handling of service bulletins on selected CA auxiliary relays. The review was performed to verify that the issue or issues had been properly assessed for impact on the plant and that, if applicable, appropriate corrective actions had been taken or planned to resolve the items.

b. Findings

No findings of significance were identified.

.4 Identification And Resolution Of Problems

a. Inspection Scope

The team reviewed Problem Investigation Program reports (PIPs), industry operating experience reviews, and corrective actions related to the CA system for the past five years to assess the adequacy of corrective actions.

The team reviewed a sample of CA system (and main steam supply to the CA system turbine driven pumps) problems identified by the licensee in the corrective action program to evaluate the effectiveness of corrective actions related to design issues. The specific corrective action documents that were sampled and reviewed by the team are listed in the attachment to this report. Inspection Procedure 71152, "Identification and Resolution of Problems," was used as guidance to perform this part of the inspection.

The team also reviewed the actions the licensee has taken in response to in-house events (including system operation following reactor trips) as well as industry identified problems with the auxiliary feedwater system and support equipment. This was to verify that applicable insights from operating experience has been applied to the CA system components.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES (OA)

4OA6 Management Meetings

Exit Meeting Summary

On January 31, 2002, the team leader presented the inspection results to Mr. H. B. Barron and other members of licensee management at the conclusion of the onsite inspection. The licensee's management acknowledged the findings presented.

The licensee's representatives were aware that some proprietary information had been reviewed by the team, however, no proprietary information is contained in this report.

PARTIAL LIST OF PERSONS CONTACTED

Licensee
B. Barron, Site Vice President, McGuire Nuclear Station
J. Bryant, Licensing Engineer
B. Dolan, Manager, Safety Assurance
D. Jamil, Station Manager, McGuire Nuclear Station
B. Johansen, System Engineer SSF
S. Kirsey, CA Electrical System Engineer
S. Nader, Severe Accident Analysis Engineer
T. Pedersen, CA Mechanical System Engineer
B. Peele, Manager, Engineering
J. Thomas, Manager, Regulatory Compliance
M. Weimer, Operations Support Engineer

Other licensee employees contacted included engineers, operations personnel, and administrative personnel.

NRC
C. Christensen, Deputy Director, Division of Reactor Safety
E. DiPaolo, Resident Inspector
S. Shaeffer, Senior Resident

ITEMS OPENED, CLOSED, OR DISCUSSED

None

LIST OF DOCUMENTS REVIEWED

Procedures

IP/1/A/3951/001, AC Current Transducer, Rev. 3
IP/1/A/4971/001, Brown Boveri ITE 50 and ITE 51 Relays Test, Rev. 4
IP/1/A/4971/002, Brown Boveri GR-50 Ground Shield Relay, Rev. 1
IP/1/B/3050/036, CA Storage Tank Level Calibration, Rev. 0
IP/0/A/3002/009, Auxiliary Feedwater (CA) Pumps Suction Pressure Switch Calibration, Rev.7
IP/0/A/3190/003A, Cabinet, Terminal Box, and Panelboard Preventive Maintenance, Rev. 3
IP/0/A/4971/007, ITE 27N and Time Delay Relay Calibration, Rev. 11
IP/0/A/4971/010, Brown Boveri ITE 27D Relay Calibration, Rev. 4
PT/1/A/4252/007B, CA System Train 1B Performance Test, Rev. 14
PT//2/A/4252/007A, CA System Train 2A Performance Test, Rev. 11
PT/2/A/4252/007B, CA System Train 2B Performance Test, Rev. 11
PT/1/A/4200/009A, Engineered Safety Features Actuation Periodic Test Train A, Rev. 129
PT/1/A/4252/007, CA System Turbine Driven Train Performance Test, Rev. 59
PT/1/A/4252/007A, CA System Train 1A Performance Test, Rev. 10
PT/1/A/4200/026A, Turbine and MFWPT Trips from SSPS, Rev. 13
PT/0/A/4601/009A, SSPS Train A Periodic Test With NC System Pressure > 1955 PSIG, Rev. 33
PT/0/A/4601/008A, SSPS Train A Periodic Test With NC System Pressure < 1955 PSIG, Rev. 28
PT/2/A/4600/003A, Semi-Daily Surveillance Items, Rev. 68
PT/1/A/4601/001, Protective System Channel I Functional Test, Rev. 66
PT/1/A/4252/002/A, CA Valve Stroke Timing - Quarterly 1A MDCAP Flowpath, Rev. 31
PT/!/A/4252/007, CA System Turbine Driven Train Performance Test, Rev. 59
PT/2/A/4252/001B, 2B CA Pump Performance Test, Rev. 73
PT/1/A/4252/001, TDCAP #1 Performance Test, Rev. 104
PT/2/A4252/001A, 2A CA Pump Performance Test. Rev.64
MP/0/A/7600/89, Atwood and Morrill Parallel Disc Gate Valve Corrective Maintenance, Rev.3
IP/0/A/3219/03, Setting Stem Mounted Limit Switches, Rev. 5
AP/0/A /5500/44, Enclosure 2, Unit 1 CA Pump Room Flooding, Rev. 1
AP/1/A/5500/017, Loss of Control Room, Rev. 15
EP/1/A/5000/E-00, Reactor Trip or Safety Injection, Rev. 16
EP/1/A/5000/E-3, Steam Generator Tube Rupture, Rev. 12
EP/1/A/5000/ECA-0.0, Loss of All AC Power, Rev. 14
EP/1/A/5000/ES-0.1, Reactor Trip Response, Rev. 17
EP/1/A/5000/F-0, Critical Safety Function Status Trees, Rev. 3
EP/1/A/5000/FR-H.1, Response to Loss of Secondary Heat Sink, Rev. 10
IP/0/A3090/010, Sealing Safety-Related Equipment Outside Containment and Doghouses, Rev. 14
OP/1/A/6100/010, F Change Hold Annunciator Response for Panel 1AD-5, Rev. 36
OP/2/A/6250/002, Auxiliary Feedwater System, Rev. 054
OP/1/A/6400/006, Nuclear Service Water System Enclosure 4.5 Shifting Suction from Low Level Intake to SNSWP and Realignment (to ensure T/D CA pump remains operable), Rev 153
PT/1/A/4200/038, Venting of the CA System Suction Piping, Rev. 12

PT/1/A/4250/004, K Test of 1A CF Pump Turbine Mechanical Overspeed Trip, Rev. 3
PT/1/A/4250/004, N#1 CA Pump Turbine Overspeed Trip Setpoint Verification, Rev. 2
PT/1/A/4252/001, #1 TD CA Pump Performance Test, Rev. 104
PT/1/A/4252/001, A 1A CA Pump Performance Test, Rev. 82
PT/1/A/4252/001, B 1B CA Pump Performance Test, Rev. 74
PT/1/A/4252/002, B CA Valve Stroke Timing - Quarterly 1B Motor Driven Pump Flowpath, Rev. 37
PT/1/A/4252/003, A CA Train A Valve Stroke Timing - Quarterly Turbine Driven Pump Flowpath, Rev. 25
PT/1/A/4252/004, S/G Injection Check Valve Verification for #1 TD CA Pump, Rev. 17
PT/1/A/4252/007, CA System Turbine Driven Train Performance Test, Rev. 59
PT/1/A/4252/014, Turbine Driven CA System Flow Balance, Rev. 32
PT/1/A/4252/014, A Motor Driven CA System 1A Flow Balance, Rev. 12
PT/2/A/4252/014 A Motor Driven CA System 2A Flow Balance, Rev. 7
PT/1/A/4252/016, #1 TD CA Pump ARV Bypass and Bleed Valve Leakage Verification, Rev. 13
PT/1/A/4252/028, A Slave Start CA Pump 1A, Rev. 2
PT/1/A/4350/026, C Auxiliary Shutdown Panel Controls Verification for #1 TD CA Pump Controls, Rev. 7
PT/1 and 2/ A/4600/003D, Monthly Surveillance Items (For CA valve checklists), Rev. 53

Drawings

MCRS-0115-01.27 Overcurrent Relay Setting 150/51/1ETA-11 System EPC 4160V, Rev. 2
MCRS-0115-02.27 Overcurrent Relay Setting 150/51/1ETB-11 System EPC 4160V, Rev. 1
MCRS-0215-01.19 Overcurrent Relay Setting 250/51/2ETA-06 System EPC 4160V, Rev. 1
MCRS-0215-02.19 Overcurrent Relay Setting 250/51/2ETB-06 System EPC 4160V, Rev. 0
MCRS-0115-01.26 Overcurrent Relay Setting 150G/1ETA-11 System EPC 4160V, Rev. 1
MCRS-0115-02.26 Overcurrent Relay Setting 150G/1ETB-11 System EPC 4160V, Rev. 2
MCRS-0215-01.18 Overcurrent Relay Setting 250G/1ETB-06 System EPC 4160V, Rev. 0
MCRS-0215-02.18 Overcurrent Relay Setting 250G/2ETB-06 System EPC 4160V, Rev. 0
MC-1717-23.01-02 4160 Switchgear Area Terminal Cabinet #1ATC23, Rev. 0
MCEE-180-03 Unit No.1 Transducer List Electrical Measurements, Rev. 8
MCEE-138-00.45-01 1B Supply to Auxiliary Feedwater Pumps Isolation Valve 1RN162B, Rev.10
MCEE-138-00.45 1B Supply to Auxiliary Feedwater Pumps Isolation Valve 1RN162B, Rev.11
MCEE-146-02.00 Elementary Diagram Feedwater Turbine System Turbine Trip & Reset Controls, Rev. 10
MCEE-146-24.00, Elementary Diagram Feedwater Turbine System Turbine Trip & Reset Controls, Rev. 11
MCEE-0147-01.00, Elementary Diagram Auxiliary Feedwater System AFWP1A Motor Start Circuit (Auto), Rev. 1
MCEE-0147-07.00, Elementary Diagram Auxiliary Feedwater System AFWP 1B Motor Start Circuit (Auto), Rev. 1
MCEE-0147-22.00 Aux. Feedwater System Nuclear Service Water Supply Valve 1CA0018B, Rev. 3
MCEE-0147-21.00 Aux. Feedwater System Nuclear Service Water Supply Valve 1CA0015A, Rev.1

MCEE-0147-28.00 Aux. Feedwater System Nuclear Service Water Supply Valve 1CA0086A, Rev.1
MCEE-0147-29.00 Aux. Feedwater System Nuclear Service Water Supply Valve 1CA00116B, Rev. 3
MCEE-0147-37.00 Aux. Feedwater CST Level Channel 1, Rev. 0
MCEE-0147-38.00 Aux. Feedwater CST Level Channel 2, Rev. 0
MCEE-138 - 00.46 1B Diesel Generator HX Supply Isolation Valve 1RN171B, Rev. 9
MCEE-138 - 00.27 1A Diesel Generator HX Supply Isolation Valve 1RN70A, Rev. 9
MCEE-138 - 00.26-0 1A Supply to Auxiliary Feedwater Isolation Valve 1RN69A, Rev. 9
MCEE-138 - 00.26-01 1A Supply to Auxiliary Feedwater Isolation Valve 1RN69A, Rev. 7
MCEE-238 - 00.26 2B Supply to Auxiliary Feedwater Isolation Valve 1RN162B, Rev. 7
MCFD-1592-01.01 Flow Diagram of Auxiliary Feedwater System (CA), Rev. 11
MCID-1499-CA.17 Instrument Detail Aux. Feedwater Storage Tank Radar Level, Rev. 0
MCM-1314.01-0056.001 Clark CFVR Starter with CPT Wiring Diagram Size 1, Rev. 4
MCCD-1700-00.00 U1 Configuration One Line Diagram, Unit Essential Power System, Rev. 3
MCCD-1702-02.00 One Line Diagram 4160 V Essential Auxiliary Power System, Rev. 0
MCCD-2700-00.00 U2 Configuration One Line Diagram, Unit Essential Power System, Rev. 3
MCEE-0147-00.01 Essential Elementary, Device Index AFWP Turbine System, Rev. 4
MCEE-0147-00.02 Essential Elementary, Device Index AFWP Turbine System, Rev. 3
MCEE-0147-00.03 Essential Elementary, Device Index AFWP Turbine System, Rev. 5
MCEE-0147-00.04 Essential Elementary, Device Index AFWP Turbine System, Rev. 0
MCEE-215-00.05-02 Elementary Diagram 4160V Switchgear #2ETA, Unit #6 AFWP Motor #2A (Part 3), Rev. 7
MCEE-215-00.05-03 Elementary Diagram 4160V Switchgear #2ETA, Unit #6 AFWP Motor #2A (Part 4), Rev. 1
MCEE-215-00.24 Elementary Diagram 4160 V Switchgear 2ETB, Unit 6 Auxiliary Feedwater Pump Motor 2B (Part 1), Rev. 12
MCEE-215-00.24-02 Elementary Diagram 4160 V Switchgear 2ETB, Unit 6 Auxiliary Feedwater Pump Motor 2B (Part 3), Rev. 7
MCEE-215-00.24-03 Elementary Diagram 4160 V Switchgear 2ETB, Unit 6 Auxiliary Feedwater Pump Motor 2B (Part 4), Rev. 1
MCM-1314.01-0056001, Wiring Diagram SZ1 Clark CFVR Starter With CPT 600V Non-Penetration, Essential CKT, Rev. D4
MCEE-115-00.31-01 Elementary Diagram 4160 V Switchgear 1ETB, Unit 11 Auxiliary Feedwater Pump Motor 1B (Part 2), Rev. 11
MCEE-115-00.31 Elementary Diagram 4160 V Switchgear #ETB, Unit 11 Auxiliary Feedwater Pump Motor 1B (Part 1), Rev. 17
MCEE-115-00.12-02 Elementary Diagram 4160 V Switchgear 1ETA, Unit 11 Auxiliary Feedwater Motor 1A (Part 3), Rev. 13
MCEE-115-00.12 Elementary Diagram 4160 V Switchgear 1ETA, Unit 11 Auxiliary Feedwater Motor 1A (Part 1), Rev. 17
MCM 1205.36-00-0025 6-900 Stop/Check Valve w/Limit B30 actuator (1SA-5), Rev. 1
MCM 1205-00-0095 Pressure Seal Non-Return Globe Valve Assembly, (1SA-6) Rev. 1
MCM-1205.01-619 6"-900 Automatic Re-circulation Valve with 3" Bypass, Rev. 1
MCM 1205.37-0001 6" 900# Parallel Disc Gate Valve with Chicago Fluid Power Air Cylinder, Rev. 1

MCFD-1593-01.02 Flow Diagram of Main Steam Supply to Auxiliary Equipment System (SA) Turbine Exhaust System, Rev.3
MCM-1592-01.00 Flow Diagram for Auxiliary Feedwater (CA), Rev. 7
MCM-1592-01.01 Flow Diagram for CA, Rev. 11
MCM-1592-01.02 Flow Diagram for CA, Rev. 7
MCM-1592-02.00 Flow Diagram for CA, Rev. 2
MCM-1574.01.00 Flow Diagram Nuclear Service Water (RN), Rev. 6
MCM-1574.02.00 Flow Diagram RN, Rev. 11
MCM-1574.03.00 Flow Diagram RN, Rev. 14
MCFD-1590-01.00 Flow Diagram condensate (CM) System, Rev. 3
MCFD-1590-01.04 Flow Diagram CM, Rev. 2
MCFD-1590-02.00, Flow Diagram of Condensate Storage System, Rev. 8
MCRSD-CAJ, Auxiliary Building Unit 1, Safety Related Isometric - System CA - Problem CAL(CAJ), Rev. 3
MC-1403-01.41-00 Piping Layout - System CA - Plan at Elevation 716'-0", Aux. Bldg., Rev. 38
MCEE-115-00.12-01 Elementary Diagram 4160 V Switchgear 1ETA, Unit 11 Auxiliary Feedwater Pump Motor 1A (Part 2), Rev. 11
MCEE-115-00.31-02 Elementary Diagram 4160 V Switchgear 1ETB, Unit 11 Auxiliary Feedwater Pump Motor 1B (Part 3), Rev. 13
MCEE-215-00.05 Elementary Diagram 4160 V Switchgear 2ETA, Unit 6 Auxiliary Feedwater Pump Motor 2A (Part 1), Rev. 12

Work Orders

WO 98214983 - PT 2CA0161C Electrical/Mechanical Inspection for Limitorque, dated 7/26/01
WO 98315352 - 2RN-171B Repair Valve Will not Open, dated 9/19/01
WO 98195090 - PM 1EPC RL 1ETA 11, Protective Relaying , dated 3/22/00
WO 98417014 - PM 1EPC RL 1ETB 11, Protective Relaying, dated 12/11/01
WO 98201623 - PM 2EPC RL 2ETA 06, Protective Relaying, dated 12/19/01
WO 98187514 - PM 2EPC RL 2ETB 06, Protective Relaying, dated 3/1/00
WO 98144405 - PM 1EPC RL 1ETA 03, Protective Relaying, dated 3/21/01
WO 98144407 - PM 1EPC RL 1ETB 03, Protective Relaying, dated 9/29/99
WO 98020660 - PM 1EPC BK 1ETA 03, Replace w/Refurbish Breaker, dated 6/17/98
WO 98144401 - PM 1EPC RL 1ETB 03, Replace w/Refurbish Breaker, dated 9/30/99
WO 97109539 - PM 1EP EBK ELXA 5D, Refurbish Breaker, dated 6/17/98
WO 97109547 - PM 1EP EBK ELXA 4B, Refurbish Breaker, dated 6/17/98
WO 98144276 - PM 1ELXB 4B, Replace w/Refurbish Breaker, dated 9/29/99
WO 98144271 - PM 1ELXB 5C, Replace w/Refurbish Breaker, dated 9/29/99
WO 97057140 - PM 1EMXA 600 V Breaker, dated 6/16/98
WO 98203595 - PM 1EMXB 600 V Breaker, dated 6/29/99
WO 98143797 - PM 1EMXB2 600 V Breaker, dated 9/29/99
WO 98143608 - PM 1EMXE 600 V Breaker, dated 3/19/01
WO 97048649 - PM 1EMXF 600 V Breaker, dated 9/29/99
WO 98043617 - PM 2EMXA 600 V Breaker, dated 3/24/99
WO 98043618 - PM 2EMXB 600 V Breaker, dated 9/14/00
WO 98043875 - PM 2EMXB2 600 V Breaker, dated 9/14/00
WO 98043619 - PM 2EMXE 600 V Breaker, dated 3/26/99

WO 98043620 - PM 2EMXF 600 V Breaker, dated 9/14/00
WO 98382208 - OETM PN SDSP, Power Panel Inspection, dated 5/30/01
WO 98459730 - 01 PM 1EQBLP 27A and 27DA Perform Operational Test, dated 1/23/02
WO 98459730 - 02 PM 1EQBLP 27A and 27DA Perform Operational Test, dated 1/23/02
WO 98294988 - 01 PT 1EQBLP 27DA,1ETA Degraded Voltage Relaying Trn A, dated 3/16/01
WO 98458687 - 01 PT 1EQBLP 27B and 27DB Perform Operational Test, dated 1/9/02
WO 98458687 - 02 PT 1EQBLP 27B and 27DB Perform Operational Test, dated 1/9/02
WO 98294987 - 01 PT 1EQBLP 27DB,1ETB Degraded Voltage Relaying Trn B, dated 3/24/01
WO 98458684 - 01 PT 2EQBLP 27A and 27DA Perform Operational Test, dated 1/16/02
WO 98458684 - 02 PT 2EQBLP 27A and 27DA Perform Operational Test, dated 1/16/02
WO 98244189 - 01 PT 2EQBLP 27DA,2ETA Degraded Voltage Relaying Trn A, dated 9/20/00
WO 98456722 - 01 PT 2EQBLP 27B and 27DB Perform Operational Test, dated ½/02
WO 98456722 - 02 PT 2EQBLP 27B and 27DB Perform Operational Test, dated ½/02
WO 98244190 - 01 PT 2EQBLP 27DB,2ETB Degraded Voltage Relaying Trn B, dated 9/12/00
WO 98320881 - MGMM 11728 / EQDBADG / Replace Batteries, dated 1/3/01
WO 98219355 - MCC 1EMXB; NRC Visual Inspection of Fuses, dated 1/29/02
WO 98219356 - MCC 1EMXB2; NRC Visual Inspection of Fuses, dated 1/29/02
WO 98219357 - MCC 2EMXB; NRC Visual Inspection of Fuses, dated 1/29/02
WO 98219358 - MCC 2EMXB2; NRC Visual Inspection of Fuses, dated 1/29/02
WO 9804633206 - PM 1ETA 12, Refurbish Spare Breaker, dated 10/30/01
WO 9402935612 - PM 1ETA 11, Breaker in 4.16 KV Switchgear, dated 9/18/97
WO 9808509901 - PM 1ETB 11, Replace Breaker, dated 5/22/01
WO 9813819801 - PM 1ETB 12, Replace Breaker, dated 8/25/99
WO 9404916705 - PM 4.16 KV Breaker 2ETA6, dated 11/27/95
WO 9404916804 - PM 4.16 KV Breaker 2ETB5, dated 9/17/96
WO 96064804-01 - 1EPCLPXXX1 PM 1ETA Metering Instruments, dated 3/25/97
WO 96064804-02 - 1EPCLPXXX1 PM 1ETB Metering Instruments, dated 3/5/97
WO 9804398901 - PM EPC A Train Metering Instruments, 2ETA, dated 3/16/99
WO 98043989 - PM EPC B Train Metering Instruments, 2ETB, dated 3/31/99
WO 9830563411 - NSM-12518/P1 Perform CA Tank Electrical, dated 3/23/01
WO 9830563412 - NSM-12518/P1 Perform CA Tank Electrical, dated 3/23/01
WO 9833420701 - PT 1CAPS5042, (Train A) TDAFWP Suction Pressure, dated 7/10/01
WO 9834275301 - PT 1CAPS5002, Calibrate Instruments, dated 5/14/01
WO 9835560401 - PT 1CAPS5012, Calibrate Instruments, dated 6/27/01
WO 9833420801 - PT 1CAPS5044, Calibrate Instruments, dated 7/12/01
WO 9834269801 - PT 1CAPS5350, Calibrate Instruments, dated 5/14/01
WO 9835556701 - PT 1CAPS5360, Calibrate Instruments, dated 6/28/01
WO 9833415101 - PT 1CAPS5370, Calibrate Instruments, dated 7/10/01
WO 9833420901 - PT 1CAPS5380, Calibrate Instruments, dated 7/12/01
WO 9833421001 - PT 1CAPS5381, (Train B) TDAFWP Suction Pressure, dated 7/10/01
WO 9833415001 - PT 1CAPS5390, Calibrate Instruments, dated 7/10/01
WO 9832377301 - PT 2CAPS5002, Calibrate Instruments, dated 6/7/01
WO 9833600501 - PT 2CAPS5012, Calibrate Instruments, dated 4/27/01
WO 9832792001 - PT 2CAPS5042, Calibrate Instruments, dated 6/20/01
WO 9832792101 - PT 2CAPS5044, Calibrate Instruments, dated 6/20/01
WO 9832371301 - PT 2CAPS5350, Calibrate Instruments, dated 6/7/01
WO 9833598501 - PT 2CAPS5360, Calibrate Instruments, dated 4/25/01

WO 9832784201 - PT 2CAPS5370, Calibrate Instruments, dated 3/27/01
WO 9832792201 - PT 2CAPS5380, Calibrate Instruments, dated 6/20/01
WO 9832792301 - PT 2CAPS5381, Calibrate Instruments, dated 6/20/01
WO 9832784101 - PT 2CAPS5390, Calibrate Instruments, dated 6/20/01
WO 9814379301 - PM EPC System Metering Instruments, dated 3/1/99
WO 9814379302 - PM EPC System Metering Instruments, dated 3/1/99
WO 9841015801 - PM EPC System Metering Instruments, dated 6/12/01
WO 9841015802 - PM EPC System Metering Instruments, dated 6/12/01
WO 9813416901 - 1CAPNAFPB CA Time Delay Relay Test, dated10/6/99
WO 9837726001 - 1CAPS5044, Test Time Delay Relay, dated 4/9/01
WO 9837744201 - Test/Adjust Time Delay Relay, dated 4/9/01
WO 9834739901 - # 2 TDCAP Speed Indication, dated 1/24/01
WO 93041166 - CA control panel seal barrier inspections (Unit 1)
WO 93041167 - CA control panel seal barrier inspections (Unit 2)
WO 98458667 - 1CA Pump 0002 / replace oil slinger rings
WO 98370599 - Vent Air Port on CA Pump Turbine Governors- Unit 1

Calculations

MCC-1503.13-00-0291, Evaluation of NSMs MG-12266/00 and MG-22266/00, Change Load Center and MCC Breakers on 4kV Power System, dated1/24/91, Rev. 13
MCC-1381.05-00-0094, Protective Relay Setting Calculation for Essential Switchgear, Rev. 15
MCC-1381.05-00-0200, 125 VDC Vital Instrumentation and Control Power System Battery and Battery Charger Sizing Calculation, Rev. 14
MCC-1210.04-00-0043, Instrument Loop Uncertainty for CA-RN Swapover Suction Pressure Switch Loops CAPS 5002, 5012, 5042, 5044, 5350, 5360, 5370, 5380, 5381, 5390, Rev. 13
MCC-1210.04-00-0073, McGuire Nuclear Station Unit 1 &2 Auxiliary Feedwater Storage Tank (CAST) Temperature Loops CA5640/5650/5660, Rev. 0
MCC-1381-05-00-0008, Design Calculations for Cable Sizing for the McGuire Auxiliary Feedwater Pump Motor, Rev. 0
MCC-1381.05-00-0240, Analysis of Diesel Generator System Under Dynamic Loading Conditions Using the CYME Program, Rev. 1
MCC-1381.05-00-0010, Voltage Drop Upon Starting the 4000V Nuclear Service Water Pump (NSWP) or Auxiliary Feed Water Pump (AFWP) Motor from the Diesel Generator, Rev. 1

MISCELLANEOUS DOCUMENTS

PNL-7784 Auxiliary Feedwater System:Risk-Based Inspection Guide for the McGuire Nuclear Power Plant, May 1994 NUREG/CR-5500,
JPM-CF-CA:18, Reset the TD CA Pump Stop Valve
JPM-CF-CA:31, Control CA Flow from the Auxiliary Shutdown Panel
JPM-CP-ASP:32, Transfer Control to the Auxiliary Shutdown Panel
JPM-CF-CF:36, Establish Feedwater Flow to S/G's following a Reactor Trip
JPM-CF-CA:49, Align the Turbine Driven CA Pump for Standby Readiness
JPM-CF-CA:59, Operate the Turbine Driven CA Pump from the Control Room
JPM-CF-CA:152, Reset the Unit 2 Turbine Driven CA Pump Stop Valve

JPM-STM-SG:173T, Locally Isolate #1 TDCA Pump Steam Supply From Ruptured S/G
1CJPM-CF-CA:176T Locally Isolate Unit 1 UST Supply to CA System
JPM-CF-IFE:191-IA Respond to a Loss of S/G Feedwater
MAL-CA003A,B, Selected steam isolation valve fails closed due to mechanical problem.
MAL-CA004A,B, Failure of pumps to start due to broken wires in the control circuit.
MAL-CA005, Control system failure causes electrical or mechanical overspeed trip of auxiliary feedwater pump. Rev 0
MAL-CA006, A,B,C,D,E,F,G,H Aux feedpump discharge control valve fails to selected value due to mechanical problem, Rev. 0
MAL-CA008, A thru H Aux Feed Check Valve fails to selected position, Rev. 0
MAL-CA009A,B, CA Pump Trips due to overcurrent, Rev. 0
MAL-CA010, 1CS-18 fails to selected position due to mechanical fault, Rev 0
MAL-CA011A,B,C, Aux feed pump automatic recirc valve fails to selected value due to mechanical problem, Rev. 0
McGuire PRA Results, Mitigating Operator actions: Activate the SSF, Rev. 2
OP-MC-CF-CA, Auxiliary Feedwater System (CA) Lesson Plan, Rev 30
Test Data Trends, Oil and Vibration Analysis Data for all six CA pumps for the past year
CA System Data
WCAP-9751, “Reliability Analysis of the Auxiliary Feedwater System for the McGuire Nuclear Station, July 1980
CA System Unavailability Scheduling Document, System Unavailability Support for MSE - used to minimize CA system unavailability
Exam Bank Questions, LOR Exam Bank Questions for the CA System
McGuire Nuclear Station, Unit ½ Design Criteria, Operability Requirements and Compensatory Measures, Testing and Acceptance Criteria - Safety Related Automatic Swapover Pressure Switches CAPS 5002, 5012, 5042, 5044, 5350, 5360, 5370, 5380, 5381, 5390 , Rev. 2
MCLL-1703-04.09, 1EMXB2 Electrical Load List, Rev. 12
MCLL-1703-04.07, 1EMXB Electrical Load List, Rev. 16
MCLL-2703-04.09, 2EMXB2 Electrical Load List, Rev. 18
MCLL-2703-04.07, 2EMXB Electrical Load List, Rev. 14
OP-MC-CF-CA, Auxiliary Feedwater (CA) Lesson Plan, Rev. 30
McGuire Nuclear Station Probabilistic Risk Assessment Auxiliary Feedwater System (CA), Rev. 3
MCM 1318.16-3, Sheet 1, Motor Application Sheet for Squirrel Cage Induction Motors Rated 100 HP and Above, approved 1/7/75
MCM 1318.16-4, Motor Percent Power Factor Curve No. 558988, approved 1/3/73
MCM 1318.16-5, Motor Efficiency Curve No. 558986, approved 12/14/72
MCM 1318.16-6, Motor Current vs Time Curve No. 55895, approved 1/13/73
MCM 1318.16-7, Motor Speed - Torque Curve No. 55897, approved 1/13/73
MCS-1592.CA-00-0001, Design Basis Specification for the CA System, Rev. 14
Acceptable Substitute Item Evaluation, SID-2009.03-00-0006, Terry Turbine Gland Case Assembly, dated 12/14/00
SID-2009.03-00-0005, Replacement Parts for Auxiliary Feedwater Pump Turbine, dated 1/22/01
SID-2009.03-00-0007, TDCAP Replacement Parts, dated 2/1/01
MCM-1211.00-1013, Division A Switchgear Room Air handling Units, Installation, and Operating Maintenance Manual, dated 4/24/00

MCM-2201.05-0038/01, Motor Driven Auxiliary Feedwater Pumps - Bingham, Rev. D09
MCM-1201.05-0248, Motor Driven Aux. Feedwater Pump - Unit1, Rev. D13
MCM-05.0258/01, Auxiliary Feedwater Pump turbine Instruction Manual, Rev. D24
MCC-1206.47-69-0001, Auxiliary Building Flooding Analysis, Section 9.2.1, Auxiliary Feedwater Pump Compartments, Rev. 6
MCC-1223.42-00-0030, Documentation of the Adequacy of the Assured Suction Sources to the CA Pumps, Rev.7
MCC-1503.13-00-0740, USQ Evaluation of NSM MG-12518/P1, CA Storage Addition Mechanical and Electrical Tie-ins, Rev. 0
MCC-1223.42-00-0030, Documentation of the Adequacy of the Assured Suction Sources to the CA Pumps, Rev. 7
MCC-1223.42-00-0037, Evaluation of Use of Non-Safety Water Sources for the CA System, Rev.0
MCC-1223.42-00-0035, Documentation of the Computer Model Inputs for the Unit 1 CA System (Post Steam Generator Replacement), Rev. 7
MCC-1223.42-00-0036, CA System Functional Design Requirements Verification & Test Acceptance Criteria, Rev.7
MCC-1223.42-00-0003, Determine Water Available for Secondary Side Makeup During a Security Event, Rev. 3
MCC-1552.08-00-0107, Decay Heat and Its Uncertainty Calculation for Mark-BW and OFA Fuel Types, Rev. 0

Design Basis Documents

MCS -1592. CA-00-0001, Auxiliary Feedwater System, Rev. 3

UFSAR

Section 10.4 Auxiliary Feedwater System (CA)

Technical Specifications (TS)

TS Section 3.3.1, Reactor Trip System (RTS) Instrumentation
TS Section 3.3.2, Engineered Safety Features Actuation System Instrumentation
TS Section 3.7.5, Auxiliary Feedwater (AFW)

Design Changes

NSM MG-12518/P1, CA Storage Addition Mechanical and Electrical Tie-ins, Rev. 0
NSM-MG-12515/00, Addition of CA Pump Auto Recirculation Control Valves, Rev. 0
MGMM-3723, Replace Existing Valve, 1CA-214, with New Borg Warner 3/4" item 6J-024, dated 3/2/95
MGMM-8112, Manufacturers Outline Drawing and Data Sheet for Orifice Do Not Agree on Bore Size, dated 7/3/96
MGMM-10872, Reposition Relief Valves 2CA-167, 2CA-168 from Horizontal to Vertical Position, dated 12/17/99

PIPs Reviewed

M-99–1343, Unit 1 CA Pump Room flooding from RN Drains
M-01-04665, Terry Turbine Part 21 Notice, Incorrect Material for the Throttle valve Screw Spindle
M-92-00406, Effects of a seismic event on air in CA suction pipe
M-92-00453, Possible air pockets in CA suction
M-93-00038, Potential single failure may keep CA from meeting design basis
M-99-02048,Turbine Driven CA Pump #2 is on increased test frequency due to high vibrations.
M-99-05081, Unit 1 T/D CA pump was left in local control following pump run per TT/1A/9100/115 ARV Mod Functional (1EC13LL)
M-00-00135, McGuire should evaluate AP/1/A/5500/06 and determine if the procedure guidance which allows operation above 5% power on auxiliary feedwater is appropriate.
M-00-00631, Evaluate practice of opening the TDCA pump room doors during pump operation.
M-00-00678, Concern with elevated temperatures in the turbine driven auxiliary feedwater pump room during pump operation.
M-00-01632, No pre plan or model for the Unit 2 Turbine Driven CA Pump
M-00-01864, The CA turbine governor, manual, speed control knob must be cycled when securing the pump to preclude an overspeed trip concern.
M-00-01900, Unit 1 CA pumps normal suction sources were inadvertently isolated following a reactor trip and automatically aligned to RN.
M-00-01943, Discrepancy between TAC Manual and Tech Specs
M-00-02266, MNT Tech tripped CAPT#2 stop valve 2SA3 closed while painting in room.
M-00-03228, 2B CA pump ran for approximately 3 hours following a power supply swap on 2EKVD before being discovered and secured.
M-00-03488, While filling the new Unit 1 CA water tower, a noise could be heard coming from inside the 24" suction pipe.
M-00-04132, #2 TD CA Pump was started inadvertently while performing PT/2/A/4252/007 (Section 12.7). Pump injected water to all 4 S/G‘s (ESF actuation). 2EC13LL
M-00-04486, Section 10.4.10 of UFSAR contains conflicting information regarding MDCA and TDCA pumps.
M-00-04531, During the performance of PT/2/A/4200/043B RN to CA system assured makeup we observed the UST rise unexpectedly at a high rate.
M-00-04700, During the performance of ES-0.1 Reactor Trip Response Step 9.b of the procedure asks if total feed flow to the S/Gs is greater than 450 GPM. The crew misinterpreted that step, they used FWP suction flow rate.
M-00-04734, Several enhancements and editorial corrections were identified during the reactor trip review.
M-00-04735, The TDCAP and the SSF are unavailable during the performance of the ASP controls verification points
M-01-00047, Drain header line clogged (CA system)
M-01-00233, SSF Risk Minimization Assessment Study Results
M-00-04811, The Unit 2 CA OAC graphic is incorrect.
M-01-00548, Readiness Review Team observations for new CAST
M-01-01122, Foreign material found in piping system.
M-01-01181, Turbine speed may decrease when the TDCAP pump is operating.
M-01-01471, Travel Stop setting discrepancy on 1CA52 and 1CA-56

M-01-01702, Operations needs to review and evaluate NLO system piping venting practices.
M-01-02011, Information in EBD is inaccurate and incomplete for CA motors, both U1 and U2.
M-01-02217, Evaluate CA recirc line insulation and heat tracing to ensure operability of CA is not challenged during cold weather.
M-01-02278, CA motors are difficult to access or remove due to hangers, supports, etc.
M-01-02611, This PIP documents the details and corrective actions of Self-Assessment OPS-SA01-06 Operations Venting Practices
M-01-02893, Control Board not updated per CA storage tank modification
M-01-03148, 2SA49 Main Steam to TD CA pump did not open in acceptable timeframe
M-01-03389, As-found testing on 1SA-48ABC revealed insufficient actuator capability to open valve against design basis D/P conditions
M-01-04108, Unplanned Tech Spec entry for Unit 2 TD CAP
M-01-04774, AOV Progam Assessment
M-01-05027, Higher than normal particulate count was discovered in the oil sample of the 1CAPU0002.

Vendor Manuals

MCM-1201.05-0258-01, Terry Steam Turbine
MCM1201.05-0248, Unit 1 MD CA Pump
MCM-1201.05-0249, Unit 1 and 2 TD CA Pump
MCM-2201.05-0038, Unit 2 MD CA Pump
1B-18.2.7-1, ITE Circuit Shield, Drawout Semi Flesh Mounted Single Phase and 3-Phase Relays Vendor Instruction Manual
MCM 1312.02-0028001, 4160 V Switchgear Instruction Book, Rev. D17
Cutler-Hammer Industrial Control Catalog 1986-1987
1B-18.1.7-2, ITE Ground Shield, Ground Fault Protective System Vendor Manual
1B-7.2-1.7-1, ASEA Brown Boveri Catalog Series 223/423- Drawout Semi Flesh Mounted Single Phase, 2-Phase, and 3-Phase Relays Vendor Manual

PIPs Issued as a Result of this Inspection

M-02-00190, Alarm response on OAC for 1.47 Bypass Panel for CA pumps bypassed are incorrect. Displayed response does not indicate use of CA Storage Tank. Actual indication is correct.
M-02-00207, Calculation MCC-1210.04-00-0043 includes incorrect reference.
M-02-00220, Incorrect plant paging system referenced in AP/2/A/5500/015.
M-02-00233, Some incorrect information is in the CA DBD, MCS-1592.CA-00-0001.
M-02-00234, OEDB documentation of screening/evaluation results not detailed enough.
M-02-00236, During the PT for the 1A CA pump run, the data recorded in Enclosure 13.3 of PT/1/A/4252/001A was not filled out one row at a time.
M-02-00241, Any oil pump that is powered by an external AC source should have the oil temperatures monitored in the event of a loss of power.
M-02-00315, The amount of water needed for short term use is calculated in CA DBD section 31.1.1.3.1. However, it was noted that the hours used in the calculation should be changed from 5 to 7 hrs.

M-02-00328, Back panel was found unlocked while on walkdown during CA SSDI inspection.
M-02-00419, Verification of the mini flow acceptance criteria on the ARVs.
M-02-00420, MCC-1223.42-00.0003, references 3.8% fuel enrichment for the heat load assumptions.
M-02-00425, PIP M-99-00281 and Editorial Minor Mod MGMM-11610 in CA#1 of the '99 PIP states "the current method of filtration is perferable and acceptable, with the exception that is does not agree with as-built documentation."
M-02-00437, Engineering and Work Control deferred EPC System PM work order from 1EOC13 to 1EOC15 unnecessarily.
M-02-00438, Discrepancy in electrical elementary device index drawing was identified.