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

June 9, 2005

Mr. Dale E. Young, Vice President
Crystal River Nuclear Plant (NA1B)
ATTN: Supervisor, Licensing &
Regulatory Programs
15760 West Power Line Street
Crystal River, FL 34428-6708

SUBJECT: CRYSTAL RIVER UNIT 3 - NRC SAFETY SYSTEM DESIGN AND PERFORMANCE CAPABILITY INSPECTION REPORT NO. 05000302/2005006

Dear Mr. Young:

On May 13, 2005, the U.S. Nuclear Regulatory Commission (NRC) completed a safety system design and performance capability team inspection at your Crystal River Unit 3. The enclosed report documents the inspection findings which were discussed on May 12, 2005, with you and other members of your staff.

The inspection examined 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 license. The inspection team reviewed selected procedures and records, observed activities, and interviewed personnel.

Based on the results of the inspection, no findings of significance were identified.

In accordance with 10 CFR 2.390 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 No.: 50-302
License No.: DPR-72

cc w/encl: - (See page 2)

Enclosure: NRC Inspection Report 05000302/2005006
w/Attachment: Supplemental Information

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

REGION II

Docket No.:	50-302
License No.:	DPR-72
Report No.:	05000302/2005006
Licensee:	Progress Energy Florida (Florida Power Corporation)
Facility:	Crystal River Unit 3
Location:	15760 West Power Line Street Crystal River, FL 34428-6708
Dates:	April 25-29, 2005 May 9-13, 2005
Inspectors:	L. Mellen, Senior Reactor Inspector (Lead Inspector) R. Cortés, Reactor Inspector D. Mas-Peñeranda, Reactor Inspector C. Julian, Senior Project Manager (1st week only) C. Smith, Senior Reactor Inspector
Accompanied by:	C. Peabody, Reactor Inspector (Trainee) R. Fanner, Reactor Inspector (Trainee) C. Fong, Reactor Inspector (Trainee)
Approved by:	Charles R. Ogle, Chief Engineering Branch 1 Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000302/2005-006; 04/25-29/2005 and 05/09-13/2005; Crystal River Unit 3; Safety System Design and Performance Capability Inspection.

This inspection was conducted by a team of inspectors from the NRC's Region II office. No findings of significance were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

No findings of significance were identified.

B. Licensee-Identified Violations

None.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events and Mitigating Systems

1R21 Safety System Design and Performance Capability (71111.21)

The team evaluated the capability of installed plant equipment to detect and respond to a loss of coolant accident (LOCA) which includes small break LOCA, inter-system LOCA, and large break LOCA. Procedures which direct the mitigating actions for this event were also evaluated.

A specific list of components and documents reviewed for each section is included in the Attachment to this report.

.1 System Needs

.11 Process Medium

a. Inspection Scope

The team reviewed the availability and reliability of water sources required for response and recovery from small break, large break, and inter-system LOCAs. These water sources included the borated water storage tank (BWST) and the reactor building (RB) recirculation sump. The team reviewed design documentation, drawings, the Updated Final Safety Analysis Report (UFSAR), Technical Specifications (TSs), corrective actions history, volumetric calculations for the BWST, calculations of system capacity, and calculations of net positive suction head (NPSH) available and required for the make-up pumps (MUPs) and decay heat removal (DHR) pumps. Additionally, the team reviewed minimum flow protection for the MUP and the DHR pumps.

The team reviewed system flow rates as well as suction piping configuration drawings to verify that vortexing had been evaluated in the BWST and RB recirculation sump suction configuration for the DHR and MU systems. The team also reviewed the flow passage opening sizes in the most restrictive portions of the make up (MU) and DHR systems to verify that the flow passage opening sizes in the RB sump strainers were sized accordingly.

b. Findings

No findings of significance were identified.

.12 Energy Sources

a. Inspection Scope

The team reviewed design basis documentation (DBDs), drawings and walked down portions of systems used to identify and mitigate small break, large break, and

inter-system LOCAs to verify power would be available. The team reviewed appropriate test and design documents to verify minimum voltage specifications for electrical equipment during and following a LOCA event. This included a review of design thrust values for selected high risk motor-operated valves (MOVs) to verify that the safety functions (open/closed) were adequately tested assuming minimum voltage.

b. Findings

No findings of significance were identified.

.13 Controls

a. Inspection Scope

The team reviewed electrical elementary diagrams depicting the logic for initiation of the high pressure injection (HPI) and DHR functions in addition to the sequencing of engineered safeguard equipment onto the emergency diesel generator (EDG) for mitigating a LOCA. Additionally, the team reviewed a sample of engineered safeguard equipment used to mitigate LOCAs. The team also reviewed surveillance test procedures and logic functional tests results performed in accordance with the requirements of the TSs.

The review was performed in order to verify that the electrical interlocks satisfied the requirements of the licensing and design bases as demonstrated by the logic of the equipment operation. Additionally, review of the surveillance test results was performed to verify that the logic for the equipment operation was being adequately tested and that the equipment operation was consistent with the plant's licensing and design bases requirements.

b. Findings

No findings of significance were identified.

.14 Operator Actions

a. Inspection Scope

The team reviewed plant operating instructions, including emergency operating procedures (EOPs), abnormal operating instructions, alarm response procedures, and operating instructions that would be used in the identification and mitigation of a LOCA. The team focused on installed equipment and operator actions that could be used to mitigate these events. The review was done to verify that the instructions were consistent with the UFSAR description of a LOCA event and with the Babcock & Wilcox Owner's Group emergency procedure guidelines (EPGs), any step deviations were justified and reasonable, and the instructions were written clearly and followed the EOP writer's guide. The team reviewed job performance measures and training lesson plans pertaining to identification and mitigation of LOCAs to confirm that training was consistent with the applicable operating instructions.

In addition, the team reviewed simulation of various LOCA scenarios on the plant simulator and walked down portions of applicable instructions to verify that operator training, instruction guidance, and instrumentation were adequate to identify a LOCA event and implement post-LOCA mitigation strategies. The manual operator action times for performance of LOCA mitigation activities were reviewed to verify consistency with accident analyses, EPGs, and operator training.

b. Findings

No findings of significance were identified.

.15 Heat Removal

a. Inspection Scope

The team reviewed heat load calculations for LOCAs. The team reviewed the vendor manuals, drawings, DBDs, and surveillance test documentation to assess the design and performance of the mitigating systems including the supporting cooling systems for the DHR and the MUPs which include the lubricating oil cooling, pump bearing cooling, and the self-cooling functions of the mechanical seals.

The team reviewed the acceptance criteria basis for minimum service water flow to each decay heat heat exchanger (DHHE). This basis incorporated hydraulically limiting service water system configurations, vendor manual information, and worst-case design basis accident (DBA) containment analysis.

The team reviewed periodic test results to verify that the service water system was capable of supplying the required minimum service water flow rates to each DHHE under limiting configurations. Additionally, the team reviewed evaluations of DHHE heat transfer values to verify consistency with related inputs to the current containment analysis.

b. Findings

No findings of significance were identified.

.2 System Condition and Capability

.21 Installed Configuration

a. Inspection Scope

The team performed field walkdowns of selected portions of systems which identify and mitigate LOCAs to observe the present condition and configuration. The team walked down portions of the building spray (BS) system as well as portions of the BWST suction source to verify that they were aligned so that they would be available for operators to mitigate a DBA. The team compared valve positions with those specified in the system operating procedure line-ups and drawings, and observed the material condition of the plant to verify that it would be adequate to support operator

actions. Equipment examined included accessible portions of the MU, DHR, and BS system valves, piping, and related components. During this walkdown the team compared valve positions with the configurations on the approved drawings and operating procedures. The team reviewed periodic test documentation to verify independent verification was performed and that “spectacle” flanges were removed when returning the BS system to service.

The team also performed a field inspection of the BWST level instruments. Field inspection of the BWST level transmitters was to verify that the instruments were installed in accordance with the instrument installation drawing. Additionally, the team verified that the material condition of the field mounted instruments were acceptable, freeze protection was provided where necessary, and that redundant instrument sensing lines were routed and protected to prevent common cause failure of the instruments.

The team performed field walk downs of portions of the 125 Volt (V) direct current (DC) system to verify that the installed configuration was consistent with design basis information. Also, the team inspected 480V alternating current (AC) Motor Control Centers (MCCs), the 125VDC vital batteries, chargers, inverters, and DC distribution panels. These reviews were performed to evaluate material condition and system installed configuration.

b. Findings

No findings of significance were identified.

.22 Operation

a. Inspection Scope

The team reviewed selected portions of procedures used to mitigate LOCAs to verify the licensee had included appropriate human factors considerations in the instructions and in the plant. This review included verification of labeling, lighting, noise, communications, and accessibility. The team also checked system alignments to verify consistency with design and licensing basis assumptions, and the TSs.

The team reviewed operating instructions for switching various distribution panels in the 250 VDC system between their normal and alternate sources to evaluate whether these switching operations could result in inadvertent undesirable consequences such as plant trips, loss of alternate current (AC) power, or violation of the divisional separation requirements. Selected annunciator response procedures and operator rounds procedures were also reviewed from the viewpoint of whether anticipated problems such as grounds would be quickly identified and corrected.

b. Findings

No findings of significance were identified.

.23 Design

a. Inspection Scope

.1 Mechanical Design Review

The team reviewed design calculations, specifications, and the UFSAR to verify that system and equipment design functions were appropriately evaluated and maintained. Surveillance test procedures and equipment monitoring activities were reviewed to verify the design criteria were appropriately translated into the acceptance criteria on the tests. The team reviewed DBDs, selected piping, selected TSs, Nuclear Condition Reports (NCRs), and corrective maintenance history for systems used to identify and mitigate LOCAs and to assess the implementation and maintenance of the systems design basis.

The team reviewed head curves and calculations that assessed the NPSH available to pumps to verify the capability of the system to meet the minimum specified flow and head requirements during DBA conditions. The review included verifying that adequate NPSH is available at the sump temperature during a LOCA. The team also reviewed heat transfer vendor manual calculations and surveillances to verify DHHE would provide sufficient heat transfer during worst-case DBA conditions. Additionally, the team reviewed drawings and discussed with design engineers the potential for air accumulation between the RB recirculation sumps and the sump isolation valves to verify the system was not adversely affected by air entrainment. In addition, the team reviewed the smallest restrictions and orifice sizing in the DHR and MU systems to verify the proper sizing of the sump strainers.

The level switches setpoint calculations for automatic swapover were also reviewed to verify the vortexing phenomenon was addressed. Design for pump minimum flow and run out protection was reviewed for the MU and DHR pumps to verify the pumps were properly protected under these conditions and not susceptible to common cause failures. The team also reviewed a sample of replacement parts to verify the parts were appropriately evaluated and qualified for use in safety-related applications to ensure the design function of the equipment was maintained. The team also reviewed MOV thrust testing results to verify differential pressure (dP) calculations outputs were correctly used as inputs for the acceptance criterion.

The team reviewed the UFSAR and TSs bases to determine the design basis mission time for the 250 VDC batteries which supply power to DC loads used to identify and mitigate LOCAs. The team reviewed battery sizing calculations and voltage calculations to verify that adequate power supply capacity would be available to meet design basis scenarios. Particular attention was paid to voltage at key MOVs, and it was checked that voltage calculations were coordinated with torque and thrust calculations. In addition, MOV actuator test results were reviewed to check that motor in-rush currents were consistent with those used in the calculations. Selected samples within the calculation for sizing of thermal overloads were reviewed, and the methodology was compared to industry standards. The criterion for sizing thermal overloads was that they shall not inadvertently trip to defeat the design basis function of the MOV.

The team inspected installed equipment and recorded nameplate data and setpoint information for selected devices such as thermal overload heaters and overcurrent protective relays and compared this data to design documents. The team verified that ventilation was provided for the battery rooms to mitigate the effects of battery hydrogen generation.

.2 Instrumentation and Controls Design Review.

The team reviewed instrument uncertainty calculations and drawings depicting the logic for initiation of the HPI and DHR functions in addition to the sequencing of engineered safeguard equipment onto the emergency diesel generator for mitigating LOCAs. The team selected a sample of process instruments that provide input signals to identify and mitigate LOCAs. Among the examples chosen for examination were electronic dP transmitters that provide the low reactor coolant system (RCS) pressure information to the bistables for the HPI function. The team also evaluated the electronic dP transmitters instrument loop that provides low-low RCS pressure information to the bistables for the DHR function. Additionally, the team reviewed and evaluated the pressure switches which monitor high RB pressure to initiate RB isolation and cooling when the RB pressure exceeds the set point. The team reviewed and evaluated completed calibration procedures of the instruments which were performed in accordance with the requirements of TS 3.3.17-1.

The review was performed in order to verify that the process instruments were sufficiently accurate to comply with the allowed values delineated in the TSs. Additionally, the review was to verify that engineered safeguards instrument loop uncertainties delineated in UFSAR Table 7.3 were being met. Additionally, reviews of the completed calibration procedures were performed in order to verify that the plant's instrument calibration procedures had correctly incorporated as-found, as-left, and set point values delineated in the calculations of record.

b. Findings

No findings of significance were identified.

.24 Testing and Inspection

a. Inspection Scope

The team reviewed performance and post-maintenance testing of pumps and valves to verify that the assumptions of the licensing and design bases were being maintained and that performance degradation would be identified. Additionally, the team reviewed service and performance testing and electrical preventive maintenance procedures for the DC batteries. The team also reviewed calibrations for the overcurrent protective relays to support proper operation of the 4160VAC Safety Buses 3A and 3B. The review was performed in order to verify that specified acceptance criteria were met and that the equipment operation was consistent with the plant's licensing and design bases.

The team reviewed selected full flow surveillance test data to ensure that injection flow rates remained within system design calculations. The team reviewed documentation of completed surveillance tests, and pump head curves to verify that equipment performance was appropriately monitored and maintained consistent with the design and licensing bases. Component testing reviewed included DHR and MUPs, selected critical MOVs on the water injection, water swapover from BWST to the recirculating sump valves, vacuum relief check valves, and check valves.

The team reviewed valve operability stroke time testing, thrust testing, dP inputs, and corrective maintenance records for selected risk significant MOVs, including the emergency core cooling system injection valves. This review was conducted to verify the availability of the selected valves, adequacy of surveillance testing acceptance criteria, and monitoring of these valves for degradation. The team reviewed completed surveillance procedures related to system venting for the DHR and MU piping, valve position verification, and BWST level verification to verify that testing was being performed in accordance with applicable TSs requirements. Test records were reviewed to verify that permissives and interlocks not normally tested during pump testing were verified during periodic surveillance testing.

The team also reviewed selected risk-significant check valve periodic tests to verify these valves would function in the appropriate (open/check) positions to support system operation.

The team reviewed calibration records of selected post-accident monitoring instruments that were completed in accordance with the requirements of the TSs. The reviews were performed in order to verify that the instruments were sufficiently accurate to comply with the plant's licensing and design bases requirements under DBA conditions. The team verified that the instrument uncertainty calculations included the effects of environmental induced uncertainties which would exist during post-accident conditions.

b. Findings

No findings of significance were identified.

.3 Selected Components

.31 Component Degradation

a. Inspection Scope

The team reviewed maintenance and testing documentation, modifications, performance trending, and equipment history as identified by work orders, NCRs, and system health reports to assess the licensee's actions to verify and maintain the safety function, reliability and availability of selected components. Equipment reviewed included LOCA mitigating pumps, selected MOVs, check valves, and relief valves. Field walkdowns were performed to assess observable material condition and identify degraded equipment on the equipment selected.

The team also reviewed the potential for common cause failure mechanisms in maintenance. Additionally, the team reviewed in-service trending data for selected components to verify that the components were continuing to perform within the limits specified by the test and design basis documents. In addition, the team reviewed current monitoring of RCS leakage to verify requirements for the program were not being exceeded. The review included verifying valves that do not see DBA pressures are not leaking beyond the licensee specified thresholds during normal operations.

The team reviewed documentation of oil analysis results for the MU and DHR pumps common reservoir (inboard and outboard pump bearings) to verify the analysis results indicate normal, anticipated oil conditions. Additionally, the team reviewed documentation of completed performance as well as the frequency of oil changes for these pumps to verify the results were within the normal acceptance criteria.

b. Findings

No findings of significance were identified.

.32 Equipment/Environmental Qualifications

a. Inspection Scope

The team reviewed qualification test data associated with the environmental testing of the components used to mitigate LOCAs. The test data was reviewed to confirm that the components were qualified for the worst case postulated accident environments where they are installed. The team also reviewed seismic test data on instruments to verify that they would perform satisfactorily during and after a seismic event.

In addition to the above, the team reviewed the environmental classification for several other instruments to determine if the components had been properly evaluated for inclusion in the Environmental Qualification program. The team conducted in-plant walk downs to verify that the observable portions of selected mechanical components were suitable for the environment expected under all conditions, including high energy line breaks (HELBs).

b. Findings

No findings of significance were identified.

.33 Equipment Protection

a. Inspection Scope

The team walked down portions of the systems used to mitigate LOCAs to verify the equipment was adequately protected against external events such as a HELB in the DHP vaults and MUP rooms. During the walkdowns, the team also verified that there was no observable damage to installations designed to protect selected components from potential effects of high winds, flooding, and high or low outdoor temperatures. Additionally, walkdowns were performed in areas containing major equipment in the

250 VDC systems to assess the potential for damage from flood, missiles, and HELBs. The team also verified that cold weather protection provisions around the BWST return lines from the DHR and MU systems and the level transmitters were maintained.

b. Findings

No findings of significance were identified.

.34 Component Inputs/Outputs

c. Inspection Scope

The team reviewed selected MOV operator requirements calculations and evaluated the capability of the MOVs to perform their design function under degraded voltage and dP conditions. The team reviewed the dP calculations for the selected MOVs and verified the completed thrust testing procedures would include the dP inputs as part of their acceptance criteria calculations.

b. Findings

No findings of significance were identified.

.35 Operating Experience

a. Inspection Scope

The team reviewed a sample of extent of condition reviews and corrective actions for industry and station operating experience issues related to equipment problems, use of non-conservative acceptance criteria in safety related pump surveillance tests, and check valve problems to verify that plant specific issues were appropriately identified and addressed. Work orders, procedures, field observations through discussions with engineering and licensing staff were used to verify if operating experience related corrective actions were accomplished.

b. Findings

No findings of significance were identified.

.4 Identification and Resolution of Problems

a. Inspection Scope

The team reviewed selected system health reports, maintenance records, surveillance test records, and NCRs to verify that design and performance problems were identified and entered into the corrective action program. The team assessed the scope of the licensee's extent-of-condition reviews and the adequacy of the corrective actions. The team reviewed calibration test records to verify that "out of tolerance" conditions were properly entered into the corrective action program for evaluation and

disposition. Additionally, the team reviewed a sample of corrective maintenance work orders on the selected pumps and valves

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA6 Meetings, Including Exit

The lead inspector presented the inspection results on May 12, 2005, to Mr. Young and other members of the licensee staff. The licensee acknowledged the findings presented. Proprietary information is not included in this inspection report.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

D. Young, Site Vice-President
G. Englert, Supervisor of Mechanical/Civil Design
R. Tyrie, Superintendent of Shift Operations
J. Franke, Plant General Manager
D. Roderick, Director of Site Operations
R. Warden, Manager of Nuclear Assessment
T. Hobbs, Manager of Nuclear Assessment
M. Annacone, Manager of Engineering
R. Allen, Supervisor of Reactor Systems
S. Powell, Supervisor of Licensing and Regulatory Programs
K. Wilson, Performance Evaluation Section,
D. Herrin, Lead Engineer of Licensing and Regulatory Programs
M. Bishara, Superintendent of Design Engineering
S. Barkofski, Supervisor of Electrical/I&C Engineering

NRC (attended exit meeting)

C. Ogle, Chief, Engineering Branch One, Division of Reactor Safety
T. Morrissey, Resident Inspector

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

None

LIST OF COMPONENTS AND DOCUMENTS REVIEWED

Components:

1R21.11a Process Medium

BWST

Valves:
DHV-58, -73, BWST Outlet Valves
DHV-34, -35, DH Suction from BWST Valves

1R21.12a Energy Sources

Valves:
MUV-24, -25, -26, -27, HPI Control Valves
DHV-5, -6, DHR Containment Isolation Valves
DHV-3, Shutdown Cooling Isolation Valve
DHV-42, -43, Containment Sump Valves
DHV-11, -12, DH Valves for Piggyback Mode to MU Suction
DHV-34, DHV-35, DHV-58, DHV-73

Pumps:
DHP-3A, -3B, Decay Heat Pumps
MUP-3A, -3B, -3C, Make-Up Pumps / High Pressure Injection Pumps

Instrumentation:
Reactor Coolant Electronic Pressure Transmitters: RC3A-PT-3, RC3A-PT-4, and RC3B-PT-3
Low RCS Pressure Bistables: RC-3-BT1, RC-3-BT2 and RC-3-BT3
Low-Low RCS Pressure Bistables: RC-3-BT7, RC-3-BT8 and RC-3-BT9
Reactor Building Pressure Switches: BS-24-PS, BS-25-PS and BS-26-PS, BS-27- PS, BS-28-PS and BS-29- PS
BWST Level Instruments: DH-7-LT and DH-37- LT
Reactor Building Sump Level Instruments: WD-301- LI, and WD-302- LI
Reactor Building Flood Level Instruments: WD-303- LI and WD-304- LI

1R21.13a Instrumentation & Controls

Valves:
MUP-23, HP Injection Control Valve
MUV-58, DHV-5, DHV-11, DHV-43

Pumps: DHP-3A, DHP-3B, MUP-3A, MUP-3B, MUP-3C

1R21.15.a Heat Removal

DHHE-3A, -3B, DH Heat Exchanger

1R21.21a Installed Configuration

BWST

Pumps: DHP-3A, DHP-3B, MUP-3A, MUP-3B, MUP-3C

Valves:
DHV-37, 38, DH Suction Side
DHV-17, 28, DH Discharge Side
MUV-60, -72, Make-up Suction Side
MUV-36, 43, Make-up Discharge Side
DHV-33, 36, DH Suction Side
DHV-58, DHV-73, DHV-5, DHV-6, DHV-3, DHV-34, DHV-35, DHV-42, DHV-43, DHV-11, DHV-12, MUV-24, MUV-25, MUV-26, MUV-27

MCCs: 3B1, 3A1, 3B3, 3A3

Inverters: 3A, 3C

Batteries: DPBA-1D, DPBA-1A

Battery Chargers: DPBC-1A, DPBC-1C, DPBC-1E

DC Distribution Panels: DPDP-5A, DPDP-1A

1R21.23a Design

Pumps: DHP-3A, DHP-3B, MUP-3A, MUP-3B, MUP-3C

Valves: DHV-58, DHV-73, DHV-5, DHV-6, DHV-3, DHV-34, DHV-35, DHV-42, DHV-43, DHV-11, DHV-12, DHV-33, DHV-36, MUV-24, MUV-25, MUV-26, MUV-27, MUV-60, MUV-72, MUV-36, MUV-43

MCCs: 3B1, 3A1, 3B3, 3A3

Inverters: 3A, 3C

Batteries: DPBA-1D, DPBA-1A

Battery Chargers: DPBC-1A, DPBC-1C, DPBC-1E

DC Distribution Panels: DPDP-5A, DPDP-1A

Instrumentation:
Reactor Coolant Electronic Pressure Transmitters: RC3A-PT-3, RC3A-PT-4, and RC3B-PT-3
Low RCS Pressure Bistables: RC-3-BT1, RC-3-BT2 and RC-3-BT3
Low-Low RCS Pressure Bistables: RC-3-BT7, RC-3-BT8 and RC-3-BT9
Reactor Building Pressure Switches: BS-24-PS, BS-25-PS and BS-26-PS, BS-27- PS, BS-28-PS and BS-29- PS
BWST Level Instruments: DH-7-LT and DH-37- LT
Reactor Building Sump Level Instruments: WD-301- LI, and WD-302- LI

Reactor Building Flood Level Instruments: WD-303- LI and WD-304- LI

1R21.24a Testing and Inspection

Pumps: DHP-3A, DHP-3B, MUP-3A, MUP-3B, MUP-3C

Valves: DHV-58, DHV-73, DHV-5, DHV-6, DHV-3, DHV-34, DHV-35, DHV-42, DHV-43, DHV-11, DHV-12, DHV-33, DHV-36, MUV-24, MUV-25, MUV-26, MUV-27, MUV-60, MUV-72, MUV-36, MUV-43

Inverters: 3A, 3C

Batteries: DPBA-1D, DPBA-1A

Battery Chargers: DPBC-1A, DPBC-1C, DPBC-1E

1R21.31a Component Degradation

Pumps: DHP-3A, DHP-3B, MUP-3A, MUP-3B, MUP-3C

Valves: DHV-58, DHV-73, DHV-5, DHV-6, DHV-3, DHV-34, DHV-35, DHV-42, DHV-43, DHV-11, DHV-12, MUV-24, MUV-25, MUV-26, MUV-27

MCCs: 3B1, 3A1, 3B3, 3A3

Inverters: 3A, 3C

Batteries: DPBA-1D, DPBA-1A

Battery Chargers: DPBC-1A, DPBC-1C, DPBC-1E

DC Distribution Panels: DPDP-5A, DPDP-1A

1R21.32a Equipment/Environmental Qualification

Pumps: DHP-3A, DHP-3B, MUP-3A, MUP-3B, MUP-3C

1R21.34a Component Inputs/Outputs

Valves: DHV-58, DHV-73, DHV-5, DHV-6, DHV-3, DHV-34, DHV-35, DHV-42, DHV-43, DHV-11, DHV-12, MUV-24, MUV-25, MUV-26, MUV-27

1R21.4a Identification and Resolution of Problems

Pumps: DHP-3A, DHP-3B, MUP-3A, MUP-3B, MUP-3C

Valves: DHV-58, DHV-73, DHV-5, DHV-6, DHV-3, DHV-34, DHV-35, DHV-42, DHV-43, DHV-11, DHV-12, DHV-33, DHV-36, MUV-24, MUV-25, MUV-26, MUV-27, MUV-60, MUV-72, MUV-36, MUV-43

Batteries: DPBA-1D, DPBA-1A

Battery Chargers: DPBC-1A, DPBC-1C, DPBC-1E

Documents:

Calculations
E-99-0003, MOV Differential Pressure Calculations for DHV-110 and DHV-111, Rev. 0
E-92-0076, MOV Differential Pressure Calculations for MUV-58 and MUV-73, Rev. 0
E-93-0013, MOV Differential Pressure Calculations for DHV-3 and DHV-4, Rev. 1
E-92-0078, MOV Differential Pressure Calculations for DHV-5 and DHV-6, Rev. 1
E-92-0037, MOV Differential Pressure Calculations for DHV-42 and DHV-43, Rev. 2
E-92-0039, MOV Differential Pressure Calculations for MUV-23, 24, 25, and 26, Rev. 2 ICA
E-92-0214, MOV Operability Assessment, Rev. 20
E-92-0160, MOV Differential Pressure Calculations for DHV-11 and DHV-12, Rev. 0
E-92-0073, MOV Differential Pressure Calculations for DHV-34 and DHV-35, Rev. 0
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B-205-021 DH-07, Instrument Loop Diagram Borated Water Storage Tank Level, Revision 4
B-205-060 WD-01, Instrument Loop Diagram Sump Level, Revision 9
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B-208-028 ES-A20, Elementary Diagrams Engineered Safeguard, E. S. Actuation “A” H. P. Injection & Loading Sequence, Channel RC1, Revision 19.
B-208028 ES-A21, Elementary Diagrams Engineered Safeguard, E. S. Actuation “A” H. P. Injection & Loading Sequence, Channel RC2, Revision 19.
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SP-412, ECCS and Containment Spray System Leak Rate Test, Rev. 23
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00095805, OE Review Reveals Possible Calculation Error at CR3, 12/31/04
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00143979, "B" DH Vault Contaminated Due to Vent Valve Seat Leakage, 11/17/04
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00149657, MOV Calculations Self-assessment, 01/31/05
00086366, DPBC-1A Tripped When Door Was Opened During SP-521
00086367, DPBC-1E Voltmeter Reads High
00093455, VBIT-1D Taken Out of Service 3 Hours Prior to Work Start
00083345, WSV-5 Failed to Close Causing Entry Into Its 3.6.3

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00217658, MUV-23 Lubrication, 02/15/02
00366925, MOVATs test on DHV-5, 10/30/97
00221815, MOVATs test on MUV-73, 08/25/04
00358060, MOVATs test on MUV-23, 08/27/99
00367522, MOVATs test on MUV-25, 08/15/01
00355123, MOVATs test on MUV-24, 08/27/99
00221816, MOVATs test on MUV-58, 03/23/04
00294726, MOVATs test on DHV-43, 08/30/04
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00221793, MOVATs test on DHV-11, 03/23/04
00221789, PM-178B 6-year maintenance on DHV-42, 04/24/03
00383385, MOVATs test on DHV-34, 08/27/04
00156663, DHP-1A Boron in pump seal area, 07/31/04
00630257, Quarterly Battery Check A-SI, 12/20/04
00637892, DPBA-1D Checks (Q), 01/25/05
00221970, EGDG-1B, Test Relay and Metering, 9/15/03
00245418, DPBC-A1 Cleaning Cabinets and Calibration & Setpoint Checks, 2/22/05
00221694, PM on MUV-26 Required By NOCS 95222, 2/06/03
00221815, PM on MUV-73, PM-178B Valve Testing, 8/31/04
00221816, PM on MUV-58, PM-178B Valve Testing, 04/01/04
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00224221, PM on DHV-35, PM-178B 6YR. Perform Required Inspection, 07/17/02
00383385, PM on DHV-34, PM-178B Valve Maintenance and Testing, 8/24/04
00294726, PM on DHV-43, PM-178B Test and Inspection,11/09/04
00221793, PM on DHV-11, PM-178B Test and Inspection,09/15/04
00221840, PM on DHV-12, PM-178B Test and Inspection,07/17/02
00536865, PM, MUP-1A, Megger & PI, 11/17/04
00222017, PM, MUP-1A Relaying, 4 Year Calibration, 01/21/03
00222018, PM, MUP-1C Calibrate Relays and Metering, 01/05/04
00537954, PM, MUP-1A, Megger & PI, 11/17/04
00222016, PM, MUP-1B (CUB 3B6) Calibrate MUP-1B Relays IAW PM-102, 04/15/03

00222019, PM, MUP-1B (CUB 3B9) Calibrate MUP-1B Relays IAW QOP-6, 07/09/03
00536866, PM, MUP-1B, Megger & PI, 02/04/05
00240407, Test Relay and Metering BKR-3220,09/29/03
00549377, DPBC-1E Clean, Calibrate and Check Set Points, 02/22/05
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00221966, DHP-1 Calibrate Relays and Metering, 07/21/04
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00501909,VBIT-1A Inverter Maintenance, 08/12/04
00456374, DPBC-1C Station Charger Load Test, 02/22/05
00237025, Station Battery Service Test A Train,09/09/03
0357096, 250/125VDC Main Panel 1A Inspection and Cleaning, 10/23/98
0357219, Required PM Relay Calibration for EGDG-1G,10/26/98
0342332, Required PM Relay Calibration for EGDG-1A, Calibrate Megawatt Transducer in RR3A & Alarm Module, 04/01/97
0356708, Required PM Relay Calibration for EGDG-1A,10/04/98
0360760, Modification of MTMC-3-5A Cubicle, 04/30/99
0366925, Perform a Required Inspection on DHV-5, 08/20/00
0367522, Limitorque Operator Lube Check/Change and Inspection on MUV-25,10/05/00
0355123, Limitorque Operator Lube Check/Change and Inspection on MUV-24, 07/22/98
0358060, Limitorque Operator Lube Check/Change and Inspection on MUV-23,12/02/98
0355803, ENG. Safeguards D.C. Panel 3A,08/26/98
0365752, Replace DHV-3 and Replace Certain EQ Components, 05/08/00
0342644, Relay Setting to E.S. Transformer 3A 4160/480 H.S.,04/10/97
0355627, Clean and Calibrate Relays 0199 Through 0202 per PM-102, 08/18/98
0357238, ES Transformer 3B 4160/480 High Side (MTSW-3G XFMR) Protective Relay Testing, 10/26/98
0364885, Decay Heat Pump 3A Relay Calibration, 01/19/98
0353295, DHP-1B Check Relays and Metering, 04/01/98

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DD-01, CR-3 Deviation Document
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EBD for the Decay Heat Removal System, Rev. 16

EBD for the Emergency Feedwater System, Rev 14
EBD for the Engineered Safeguards Actuation System, Rev. 8
EBD for the Class 1E AC System, Rev. 9
EBD for the Post Monitoring Instrumentation System, Issue Date: 09/5/86
EBD for the Engineered Safeguards Actuation System, Issue date: 7/8/91
EBD for the Make-up and Purification System, Issue date: 1/11/90
EBD for the Decay Heat System, Issue date: 6/8/89
EBD for the Reactor Coolant System, Issue date: 10/1/90
EBD for the Reactor Protection System, Issue date: 10/19/90

Action Requests (ARs) Written Due to This Inspection
AR 157369 Error Found in EOP-08 Flow Diagram
AR 158564 Auxiliary Pressurizer Spray Line Design Temperature
AR 158585 Discrepancy in E92-0214
AR 158650 Historical MUV-24 Failure Was Not Evaluated for MR Impact
AR 158654 Historical MUP-1A Failure to Start Was Not Evaluated for MR
AR 158643 Relay Setting Sheets Missing Decimal Points for Some Values
AR 149657 Added Assignments #28 and #29 Based on Further Review. Wrong Sump Level (Delta P) for Four Valves

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