



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

June 10, 2003

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 NUCLEAR PLANT - NRC INSPECTION REPORT NO.  
50-302/2003-02

Dear Mr. Young:

On May 22, 2003, the Nuclear Regulatory Commission (NRC) completed a safety system design and performance capability inspection at your Crystal River facility. The enclosed report documents the inspection findings which were discussed on May 22, 2003, with you and other members of your staff.

This 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 this 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 No.: 50-302  
License No.: DPR-72

Enclosure: (See page 2)

Enclosure: NRC Inspection Report No. 50-302/03-02  
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.: 50-302/03-02

Licensee: Florida Power Corporation

Facility: Crystal River Unit 3

Location: 15760 West Power Line Street  
Crystal River, FL 34428-6708

Dates: May 5-9, 2003  
May 19-22, 2003

Inspectors: J. Moorman, Senior Reactor Inspector (Lead Inspector)  
F. Jape, Senior Project Manager  
N. Merriweather, Senior Reactor Inspector  
R. Schin, Senior Reactor Inspector  
M. Giles, Resident Inspector, Catawba Nuclear Station  
R. Cortés, Reactor Inspector

Accompanied by: C. Casto, Director, Division of Reactor Safety  
D. Mas-Peñeranda, Inspector Trainee  
N. Giglio, Summer Student

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

Enclosure

## SUMMARY OF FINDINGS

IR 05000302/2003-02; Florida Power Corporation; on 5/5-9/03 and 5/19-23/03;  
Crystal River Unit 3; safety system design and performance capability inspection.

This inspection was conducted by a team of regional and resident inspectors. 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.

## REPORT DETAILS

### 1. REACTOR SAFETY

#### Cornerstones: Initiating Events and Mitigating Systems

##### 1R21 Safety System Design and Performance Capability (71111.21)

This team inspection reviewed selected components and operator actions that would be used to prevent or mitigate the consequences of a steam generator tube rupture (SGTR) event. Components in the main steam (MS), emergency feedwater (EFW), steam generator (SG) blowdown, make-up (MU), reactor coolant (RCS), and radiation monitoring systems were included. This inspection also covered supporting equipment, equipment which provides power to these components, and the associated instrumentation and controls. The SGTR event is a risk-significant event as determined by the licensee's probabilistic risk assessment.

##### .1 System Needs

##### .11 Process Medium

##### a. Inspection Scope

The team reviewed selected emergency core cooling systems (ECCS) and EFW net positive suction head and water source calculations, licensing and design basis information, drawings, vendor manuals, operating/lineup procedures, and surveillance procedures. The team also walked down the systems in the plant. The reviews and walkdowns were conducted to verify that system design, Improved Technical Specifications (ITS), and Updated Final Safety Analysis Report (UFSAR) assumptions were consistent with the actual capability of systems and equipment required to mitigate a SGTR event. This review included the borated water storage tank (BWST) and its refill capability, the emergency feedwater tank, alternate EFW supplies, and min-flow flowpaths for EFW and ECCS pumps. The review also included the ability of the main steam atmospheric dump valves (ADV) and turbine bypass valves (TBVs) to support RCS cooldown, and the ability of the high pressure injection (HPI) pumps and pressurizer power operated relief valve (PORV) and safety valves to provide feed and bleed cooling of the RCS.

The team reviewed the level instrumentation of the condensate storage tank, emergency feed water tank, and borated water storage tank to verify that they were designed, constructed and operated in accordance with design and licensing basis documents. The team performed walk down inspections of the instrument installations to verify that 1) instrument tubing and sensors were located, scaled and calibrated in accordance with loop uncertainty documents, 2) redundant instruments and tubing were adequately spaced and protected, 3) heat tracing was installed where required, and 4) redundant channels were powered by redundant power sources. The team also reviewed appropriate design basis documents, ITS sections, UFSAR sections, system flow diagrams, instrument uncertainty calculations, calibration and surveillance test procedures, and calibration test records to verify that the instruments had the proper

range and accuracy needed to perform their safety function. The applicable reference documents reviewed are listed in the Attachment.

The team reviewed maintenance and calibration records for the condenser vacuum exhaust radiation monitor (RM-A12) to verify that surveillance and annunciator response procedures were adequate for monitoring steam generator tube rupture leakage. The maintenance history of the radiation monitor was reviewed to determine the current performance capability of the radiation detection equipment. The team reviewed the setpoints for the radiation monitor alarms to verify that they were established in accordance with setpoint guideline procedures.

b. Findings

No findings of significance were identified.

.12 Energy Sources

a. Inspection Scope

The team reviewed valve lineup procedures and walked down the energy sources of selected mechanical components needed during a SGTR to verify that selected portions of the system alignments were consistent with the design basis assumptions, performance requirements, and system operating procedures. Among the lineups reviewed were the steam supply to the turbine driven EFW pump (EFP-2), the fuel oil and starting air for the diesel driven EFW pump (EFP-3) and the backup air bottle for the ADVs to verify that the lineups were consistent with the system design. The team also reviewed calculations for the amount of backup air required for the ADVs and the accessibility of the backup air bottles during a SGTR event.

The team reviewed voltage drop calculations for a sample of safety-related loads such as motors, valve operators, inverters, and radiation monitors to verify that adequate voltage would be available at the end device during worst case minimum grid operating voltage conditions. The team also reviewed calibration procedures and calibration data records of the motor feeder breakers and protective relays to verify that they were correctly established in accordance with setpoint calculations. The setpoint calculations were reviewed to verify that they had correctly considered such things as motor starting times during reduced voltage conditions in developing the overcurrent setpoints. The team also reviewed surveillance records on breaker alignment checks and bus voltage readings to verify that these checks were being performed in accordance with the requirements specified in the ITS. The specific components reviewed are listed below:

- AFW Pump Motor (FWP-7)
- DC Pump Motors (DCP-1A, 1B)
- EFW Pump Motor (EFP-1)
- Make-up Pump Motors (1A, 1B, 1C)
- SW Pump Motors (SWP-1A, 1B)
- Make-up Valves (MUV-23,24,25,26,58,73)
- AFW Control Valves (FWV-216, 217)

- EFW Valves (EFW- 11, 14, 32, 33, 55, 56, 57, 58)
- Radiation Monitor (RM-A12, RM-G25, 26,27, 28 -RI)
- Pressurizer PORV (RCV-10)
- Main Steam Valves (MSV-25,26)
- Vital Inverters (VBIT-1A, 1B, 1C, 1D, 1E)

b. Findings

No findings of significance were identified.

.13 Instrumentation and Controls

a. Inspection Scope

The team reviewed surveillance and calibration records of the instrument loops listed below to verify that the instruments and associated loop components were being properly calibrated and tested in accordance with calibration procedures and the ITS. The calibration records were also reviewed to verify that instrument “out of tolerance” conditions were properly evaluated by the licensee for impact on system performance and, if applicable, entered into the corrective action program.

- SG High Range Level (SP-17-LT thru 24-LT)
- SG Low Range Level (SP-25-LT thru 32-LT)
- OTSG Steam Presssure (MS-106-PT thru 113-PT)
- Narrow Range RCS Pressure (RC-3A-PT1, PT2; RC-3B-PT1, PT2)
- Wide Range RCS Pressure (RC-3A-PT3, PT4; RC-3B-PT3)
- Low Range RCS Pressure (RC-147-PT, RC-148-PT)
- Hot Leg RCS Temperature (RC-4A-TE2, TE3; RC-4B-TE2, TE3)
- Pressurizer Level (RC-1-LT1, LT3)
- Make-up Tank Level (MUT-14-LT1, LT2)

The team reviewed electrical control schematics of the EFW flow control system, SG PORVs, EFW motor driven and steam driven pumps, and pressurizer PORV to verify that the control systems were in accordance with their design bases and would be functional and provide desired control during accident/event conditions.

b. Findings

No findings of significance were identified.

.14 Operator Actions

a. Inspection Scope

The team reviewed procedures, including Emergency Operating Procedures (EOPs), Abnormal Procedures (APs), and Operating Procedures (OPs), that would be used in the identification and mitigation of a SGTR event. This procedure review was done to verify that the procedures were consistent with the UFSAR description of a SGTR event



and with the owner's group guidelines, any step deviations were justified and reasonable, and the procedures were written clearly and unambiguously. The team conducted discussions with licensed operators and reviewed job performance measures and training matrixes pertaining to SGTR events to ensure that the training was consistent with the procedures. In addition, the team observed two simulator scenarios of a SGTR event to verify that procedural guidance was adequate to identify a SGTR event, and implement post-event mitigation strategies.

b. Findings

No findings of significance were identified.

.15 Heat Removal

a. Inspection Scope

The team reviewed design calculations, drawings, surveillance and test procedures, and operating data for selected equipment to assess the reliability and availability of cooling for equipment required to mitigate a SGTR event. The team also walked down the equipment to verify that operating conditions were consistent with design assumptions. The equipment reviewed included equipment used to cool the HPI and EFW pumps; the EFP-3 diesel/pump room ventilation fans; and the EFP-3 diesel/pump battery ventilation fan.

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 mechanical components in the HPI, decay heat (DH), EFW, main feedwater (FW), condensate (CD), and main steam (MS) systems. One purpose of the walkdowns was to assess general material condition and identify degraded conditions of components that could be used to mitigate a SGTR event. Additionally, the team assessed the potential impact of external events on SGTR mitigation equipment; including flooding, high energy line breaks, and hurricanes or tornados. The team also inspected selected controls and indicators for these systems for appropriate human factors such as labeling, arrangement, and visibility.

The team performed field walkdowns of the motors, valves, and instruments identified in the Attachment, to verify that:

- the configuration of each component in its system was consistent with the corresponding piping and instrument diagram;

- equipment and instrumentation elevations will support the design function;
- sloping of piping and instrument tubing appeared adequate;
- required equipment protection barriers (such as walls) and systems (such as freeze protection) were in place and intact;
- adequate physical separation and/or electrical isolation had been provided;
- oil levels were obvious in motors;
- no signs of oil leaking or draining from motor operated valves; and
- electrical conduits, fittings, and boxes were in good physical condition.

b. Findings

No findings of significance were identified.

.22 Operation

a. Inspection Scope

The team reviewed system operating/lineup procedures and system drawings and walked down selected portions of the HPI, DH, EFW, FW, CD, and MS systems to verify that system alignments were consistent with design and licensing basis assumptions.

The team performed walkdowns of selected tasks to verify that human factors in the procedures and in the plant (e.g. clarity, lighting, noise, accessibility, labeling) were appropriate to support effective use of the procedures. Specifically, the team reviewed procedures used to align a ruptured once-through steam generator (OTSG) to the hotwell, and the makeup to the BWST from the spent fuel pool.

In addition, the team reviewed the operator workaround program to ensure that degraded equipment conditions, that could adversely impact control room operators during a SGTR event, were properly identified and prioritized. The team also reviewed the licensee's adverse weather program to assess the protection against adverse weather for significant structures, systems and components used in the mitigation of a SGTR event.

b. Findings

No findings of significance were identified

.23 Design

a. Inspection Scope

The team reviewed records of completed design changes, corrective maintenance, and preventive maintenance; and walked down selected components of the HPI, DH, RCS, EFW, FW, CD, and MS systems to verify that these activities were maintaining the assumptions of the licensing and design bases. During these reviews, the team focused on potential common mode failure vulnerabilities that could be introduced by design or maintenance activities.

The team reviewed instrument loop uncertainty calculations for the following monitoring instruments to verify that plant instrument calibration procedures had accurately incorporated set point values delineated in the calculations.

- Condensate Storage Tank Level (CD-67-LT)
- Emergency Feedwater Tank Level (EF-98-LT, EF-99-LT)
- BWST Level (DH-7-LT, DH-37-LT)

b. Findings

No findings of significance were identified.

.24 Testing and Inspection

a. Inspection Scope

The team reviewed records of completed surveillance tests, performance tests, inspections, and predictive maintenance; and walked down selected components of the HPI, DH, RCS, EFW, FW, CD, and MS systems to verify that the tests and inspections were appropriately verifying that the assumptions of the licensing and design bases were being maintained. This review included testing of pump discharge pressures and flowrates, valve stroke times, motor operated valve (MOV) torque and limit switch settings, and check valve operation; inspection of MOV operator components and grease; and analysis of pump bearing oil and vibration.

The team reviewed the surveillance testing and test records for the 125/250 VDC station batteries to verify that the battery capacity was adequate to supply and maintain in operable status, the required emergency loads for the design basis duty cycle.

b. Findings

No findings of significance were identified.

.3 Selected Components

.31 Component Degradation

a. Inspection Scope

The team reviewed system health reports, corrective maintenance records, action requests, and performance trending of selected mechanical components in the HPI, DH, RCS, EFW, FW, CD, and MS systems to verify that components that could be relied upon to mitigate a SGTR event were not degrading to unacceptable performance levels. The selected components reviewed included:

- HPI pumps
- EFW pumps
- HPI MOVs (MUV-23 to 27, 18, & 596)

- HPI check valves (MUV-1, 7, 11, 36, 37, 42, 43, & 160 to 164)
- DH MOVs (DHV-3, 4, & 41)
- Pressurizer PORV (RCV-10) and PORV block valve (RCV-11)
- MS ADVs (MSV-25 & 26)
- MS TBVs (MSV-9, 10, 11, 14)
- Main steam isolation valves (MSIVs) (MSV-411 to 414)
- Main feed isolation valves (MFIVs) (FWV-29 to 33, 36, 14, 15, 28)
- Main steam safety valves (MSSVs) (MSV-33 to 48)
- EFW tank (EFT-2) vacuum breakers and relief valves.

The team reviewed the 5-year maintenance history for the electrical components listed below to determine their current performance capability to mitigate a SGTR event.

- EFW Pump Motor (FWP-7)
- DC Pump Motors (DCP-1A, 1B)
- EFW Pump Motor (EFP-1)
- Make-up Pump Motors (1A, 1B, 1C)
- SW Pump Motors (SWP-1A, 1B)
- Make-up Valves (MUV-23,24,25,26,58,73)
- EFW Control Valves (FWV-216, 217)
- EFW Valves (EFW- 11, 14, 32, 33, 55, 56, 57, 58)
- Radiation Monitors (RM-A12, RM-G25, 26,27, 28 -RI)
- Pressurizer PORV (RCV-10)
- Main Steam Valves (MSV-25,26)
- Vital Inverters (VBIT-1A, 1B, 1C, 1D, 1E)

Specifically the team reviewed:

- each component's maintenance history by reviewing selected corrective-maintenance and preventive-maintenance work order summaries and trends of component performance data, to verify that unexpected degradation had not been found, and that performance problems had not reappeared; and
- each component's preventive-maintenance schedule, to verify that the schedule was based either on vendor recommendations or appropriate industry experience.

b. Findings

No findings of significance were identified.

.32 Equipment/Environmental Qualification

a. Inspection Scope

The team conducted in-plant walkdowns to verify that the observable portion of selected mechanical components and electrical connections to those components were suitable for the environment expected under all conditions, including high energy line breaks.

b. Findings

No findings of significance were identified.

.33 Equipment Protection

a. Inspection Scope

The team conducted in-plant walkdowns to verify 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.

b. Findings

No findings of significance were identified.

.34 Operating Experience

a. Inspection Scope

The team reviewed the licensee's dispositions of operating experience reports applicable to the SGTR event to verify that applicable insights from those reports had been applied to the appropriate components. The specific operating experience reports reviewed are listed in the Action Request section of the Attachment to this report.

b. Findings

No findings of significance were identified.

.35 Once-Through Steam Generator Inservice Inspection

a. Inspection Scope

The team performed a limited-scope review of the inservice inspection program for the OTSGs to verify that OTSG tubes were inspected and to determine if there were obvious omissions or inaccuracies in the data for the OTSG tube inspections.

b. Findings

No findings of significance were identified.

.36 Foreign Material Exclusion Control Program

a. Inspection Scope

The team reviewed the procedural guidelines for cleanliness requirements during maintenance with systems open to verify that controls existed to prevent the introduction of foreign material. These guidelines included a method for controlling and accounting

for material, tools and parts. The team reviewed a portion of the accountability control log used during refueling outage in October 2001 to verify that records were kept as required.

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, calibration test records, precursor cards, and action requests to verify that design problems were identified and entered into the corrective action program. Examples of issues reviewed included instrument out of tolerance conditions, copper contamination of station batteries, and battery charger tripping problems. The team reviewed selected SGTR mitigation equipment problems identified in the licensee's corrective action program to assess the adequacy of the corrective actions to prevent recurrence and the scope of broadness reviews to other plant equipment. In addition, the team reviewed work orders on risk significant equipment to evaluate failure trends. The team also reviewed the licensee's performance in the identification of procedural deficiencies.

b. Findings

No findings of significance were identified.

**4. Other Activities**

40A6 Meetings, Including Exit

The lead inspector presented the inspection results to Mr. D. Young, and other members of the licensee staff, at an exit meeting on May 22, 2003. The licensee acknowledged the findings presented. Proprietary information is not included in this inspection report.

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

#### Licensee

M. Bishara, Superintendent of Technical Services  
M. Donovan, Supervisor, Reactor Systems  
R. Fuller, Superintendent of Plant Operations Assessment  
D. Herrin, Lead Engineer, Licensing and Regulatory Programs  
D. Porter, Superintendent of Operations Support  
J. Terry, Manager of Engineering  
E. Welch, Supervisor, Mechanical Maintenance  
D. Young, Site Vice President, Crystal River

#### NRC (attended exit meeting)

C. Casto, Director, Division of Reactor Safety, NRC Region II  
R. Reyes, Resident Inspector  
S. Stewart, Senior Resident Inspector

### LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

None.

### LIST OF DOCUMENTS REVIEWED

#### Procedures

AI-1001, Internal Cleanliness of Fluid Systems and Associated Components, Rev. 3  
AI-400F, New Procedures And Procedure Change Processes For EOPs, APs, And Supporting Documents  
AI-513, Seasonal Weather Preparations  
AP-510, Rapid Power Reduction  
CAP-NGGC-0201, Self-Assessment Report, Assessment Number 80432  
CAP-NGGC-0202, Operating Experience Program, Rev. 4.  
CH-266, Primary-to-Secondary Leak Rate, Rev. 14  
CH-602, Reactor Coolant Letdown Sampling, Rev. 6  
CHA-266, Leak Rate, Primary-to-Secondary, Operating Guidelines, Rev. 11  
CP-152, Primary To Secondary Leakage Operating Guideline  
EM-225, Duties Of The Technical Support Center Accident Assessment Team  
EOP-2, Vital System Status Verification  
EOP-6, Steam Generator Tube Rupture  
EOP-14, Emergency Operating Procedure Enclosures  
- Enclosure 12 OTSG TRACC Isolation  
- Enclosure 6 OTSG Blowdown Lineup

Foreign Material Exclusion Control Program, Rev. 10  
 Framatome Technical Document Number 74-1152414-08, Volumes 1, 2, & 3  
 MP-109, RCSG Relief Valve Maintenance, Rev. 28  
 MP-111, Valve Packing, Rev. 29  
 MP-113, Main Steam Isolation Maintenance, Rev. 16  
 MP-113, Main Steam Isolation Maintenance, Rev. 19  
 MP-120, Maintenance of Pressure Seal Gate, Globe and Check Valves, Rev. 24  
 MP-122, Disassembly and reassembly of flanged connections, Rev. 24  
 MP-122, Disassembly and reassembly of flanged connections, Rev. 29  
 MP-155, Electromatic Relief Valve (RCV-10) and Block Valve (RCV-11) Removal and Installation, Rev. 19  
 MP-305, Maintenance of Fisher Type EP Valves with Belleville Springs (MSV-25 and MSV-26), Rev. 4  
 MP-402C, Maintenance of "Limitorque" Valve Actuators Type SMB-0 Thru SMB-4, SMB-4T, SMB-5, SB-0 Thru 4, and HBC Units, Rev. 19  
 MP-402E, Motor Operated Valve Test, Setup and Diagnosis Using MOV Test Equipment, Rev.19  
 MP-420, Maintenance of Asco Solenoid - Operated Valves, Rev.1  
 MP-420, Maintenance of Asco Solenoid - Operated Valves, Rev. 3  
 NEI 97-06, Steam Generator Guidelines, Rev. 1  
 OP-402, Makeup and Purification system, Rev. 122  
 OP-403B, Chemical Addition - Boric Acid System  
 OP-404, Decay Heat Removal System, Rev. 133  
 OP-406, Spent Fuel Cooling System  
 OP-450, Emergency Feedwater System, Rev. 39  
 PM-102E, Functional Testing 4160 Volt Unit Aux. Bus 3B, Rev. 3  
 PM-130A, Vital Bus Static Inverters and Static Switches, Rev. 15  
 PM-102B, Functional Testing Crystal River #3 Generator, Step-up Transformer and Unit Auxiliary Transformer Protective Relay Circuitry, Rev. 2  
 PM-130C, Vital Bus Static Inverter VBIT-1E, Rev. 2  
 PM-102D, Functional Testing 4160 Volt Unit Aux. Bus 3A, Rev. 2  
 PM-107, 480V Breakers, Rev. 30  
 PM-102A, Functional Checking Miscellaneous Protective Relay Circuits, Rev. 3  
 PM-101, 4.16 kV and 6.9 kV Switchgear, Rev. 32  
 PM-102C, Functional Testing Startup Transformer and 230 kV Plant line 4 Protection Relay Circuitry, Rev. 4  
 PM-102, Calibration of Protective Electrical Relays, Rev. 24  
 PM-178A, Preventive Maintenance of Limitorque Actuators 2-year Inspection, Rev. 5  
 PM-178B, Preventive Maintenance of Limitorque Actuators 6-year Inspection, Rev. 6  
 PM-180A, Check Valve Predictive/Preventive Maintenance Program Non-Intrusive Examination Techniques, Rev. 4  
 PM-180A, Check Valve Predictive/Preventive Maintenance Program Non-Intrusive Examination Techniques, Rev. 4  
 PT-320, ADV/TBV Response Time Test, Rev. 5  
 SP-255, Main Steam Isolation Valves Fail-Safe Testing, Rev.1  
 SP-305, OTSG Inservice Inspection and Tube Repair, Operations, Rev. 24



SP-306, Weekly Surveillance Log  
 SP-340B; DHP-1A, BSP-1A and Valve Surveillance; Rev. 47  
 SP-340C; MUP-1A, MUP-1B and Valve Surveillance; Rev. 30  
 SP-340E; DHP-1B, BSP-1B and Valve Surveillance, Rev. 31  
 SP-340F, MUP-1C and Valve Surveillance, Rev. 30  
 SP-347, ECCS and Boration Flowpaths, Rev. 57  
 SP-349A, EFP-1 and Valve Surveillance System, Rev. 39  
 SP-435, Valve Testing During Cold Shutdown, Rev.55  
 SP-602, ASME Section XI Relief Valve Testing, Rev. 29  
 SP-602, ASME Section XI Relief Valve Testing, Rev. 24  
 SP-630, MUP/HPI Check Valves Full Flow Test, Rev. 15  
 SP-650, ASME Code Safety Valve Test, Rev. 30  
 SP-650, ASME Code Safety Valve Test, Rev. 28  
 SP-929, HPI Check Valves Closure Test, Rev. 3

### Drawings

B-205-032, Instrument Loop Diagram, Feedwater, Rev. 2  
 B-205-039, Instrument Loop Diagram, OTSG B Atmospheric Pump MSV-25 & MSV-26, Rev. 4  
 B-208-032, Auxiliary Feed Pump FWP-7, FWV-216 & FWV 217, Rev. 3  
 B-208-049, Waste Gas Tank Radiation Monitoring Interlocks, Rev. 5  
 B-208-008, Sheet AS-01, TD EF Pump Inlet Isolation Valve ASV-5, Rev. 33  
 B-208-026, Sheet EF-15, EFIC Matrix "A" Control And EFW Actuation "A", Rev. 13  
 B-208-026, Sheet EF-31A, Diesel Driven Pump EFP-3 Engine Control Schematic, Rev. 1  
 B-208-026, Sheet EF-31B, Diesel Driven Pump EFP-3 Engine Control Schematic, Rev. 1  
 B-208-026, Sheet EF-31D, Diesel Driven Pump EFP-3 Engine Control Schematic, Rev. 1  
 B-208-026, Sheet EF-16, EFIC Matrix "B" Control And EFW Actuation "B", Rev. 4  
 B-208-039, Sheet MS-10, MS Supply Isolation To EFP-2 Turbine Drive MSV-55, Rev. 24  
 B-208-039, Sheet MS-09, MS Supply Isolation To EFP-2 Turbine Drive MSV-56, Rev. 23  
 E-999279, Radiation Monitoring System, Rev. 3  
 E-999279, Radiation Monitoring System, Rev. 3  
 EC-206-051, Electrical-One Line Diagram 250/125V DC System Sheet 2, Rev. 6  
 EC-206-054, Electrical-One Line Diagram Motor Control Center, ES 3A1-Aux Bldg. 95'-0"  
 MTMC 3 Sheet 1, Rev. 57  
 EC-206-078, Electrical-One Line Diagram 4160 Switchgear Reactor Auxiliary Bus 3, Rev. 6  
 EC-206-014, Electrical-One Line Diagram Generation & Relaying 4160V Bus, Rev. 10  
 EC-206-024, Electrical-One Line Diagram 4160 Switchgear Engineered Safeguards Bus 3A,  
 Rev. 20  
 EC-206-051, Electrical-One Line Diagram 250/125V DC System Sheet 1, Rev. 16  
 EC-206-015, Electrical-One Line Diagram Generation & Relaying 4160V Engineering  
 Safeguard Bus, Rev. 15  
 EC-206-025, Electrical-One Line Diagram 4160 Switchgear Engineered Safeguards Bus 3B,  
 Rev. 19  
 EC-206-074, Electrical-One Line Diagram Motor Control Center, ES 3A3 Aux Bldg. 119'-0"  
 MTMC 21 Sheet 1, Rev. 25

EC-206-075, Electrical-One Line Diagram Motor Control Center, ES 3B3 Aux Bldg. 95'-0"  
 MTMC 22, Rev. 32  
 EC-206-076, Elementary Diagram-One Line 480V EFW Tank enclosure MCC 3B( MTMR-23 ),  
 Rev. 4  
 EC-206-083, Electrical-One Line Diagram Motor Control Center, MTMC-25 EFPB, Rev. 6  
 EC-206-084, Electrical-One Line Diagram Motor Control Center, MTMC-26 EFPB, Rev. 9  
 EC-206-073, Electrical-One Line Diagram Motor Control Center, MUV-23/24 & MUV 25/26  
 MUMC 1 & MUMC 2, Rev. 7  
 EC-206-085, Electrical-One Line Diagram Air Compressor Switchgear MTSW-5, Rev. 5  
 EC-206-013, Electrical-One Line Diagram Generation & Relaying 6900V Bus, Rev. 14  
 EC-206-057, Electrical-One Line Diagram Motor Control Center, ES 3B2-Aux Bldg. 95'-0"  
 MTMC 6, Rev. 38  
 EC-206-017, Electrical-One Line Diagram Generation & Relaying 480V Engineering Safeguard  
 Bus, Rev. 18  
 EC-206-011, Electrical-One Line Diagram Composite, Rev. 55  
 EC-206-041, Electrical-One Line Diagram Vital 120V & Reg. Inst. 120V AC, Rev. 16  
 EC-206-055, Electrical-One Line Diagram Motor Control Center, ES 3A2-Aux Bldg. 119'-0"  
 MTMC 4, Rev. 36  
 EC-206-056, Electrical-One Line Diagram Motor Control Center, ES 3B1-Aux Bldg. 119'-0"  
 MTMC 5, Rev. 57  
 EC-206-058, Electrical-One Line Diagram Motor Control Center, ES 3AB-Aux Bldg. 119'-0"  
 MTMC 7, Rev. 41  
 FD-302-011, Main & Reheat Steam, Sheet 2 of 4, Rev. 61  
 FD-302-011, Main & Reheat Steam, Sheet 3 of 4, Rev. 58  
 FD-302-011, Main & Reheat Steam, Sheet 4 of 4, Rev. 56  
 FD-302-011, Main & Reheat Steam, Sheet 1 of 4, Rev. 61  
 FD-302-081, Feedwater, Sheet 4 of 4, Rev. 13  
 FD-302-081, Feedwater, Sheet 1 of 4, Rev. 73  
 FD-302-081, Feedwater, Sheet 3 of 4, Rev. 60  
 FD-302-081, Feedwater, Sheet 2 of 4, Rev. 60  
 FD-302-082, Emergency Feedwater, Sheet 2 of 3, Rev. 17  
 FD-302-082, Emergency Feedwater, Sheet 3 of 3, Rev. 29  
 FD-302-082, Emergency Feedwater, Sheet 1 of 3, Rev. 60  
 FD-302-101, Condensate, Sheet 3 of 3, Rev. 57  
 FD-302-101, Condensate, Sheet 2 of 3, Rev. 69  
 FD-302-101, Condensate, Sheet 1 of 3, Rev. 68  
 FD-302-282, Emergency Diesel Generator Compressed Starting Air & Engine Exhaust, Sheet 1  
 of 1, Rev. 31  
 FD-302-641, Decay Heat Removal, Sheet 3 of 3, Rev. 59  
 FD-302-641, Decay Heat Removal, Sheet 2 of 3, Rev. 62  
 FD-302-641, Decay Heat Removal, Sheet 1 of 3, Rev. 73  
 FD-302-651, Reactor Coolant, Sheet 1 of 3, Rev. 74  
 FD-302-651, Reactor Coolant, Sheet 3 of 3, Rev. 60  
 FD-302-651, Reactor Coolant, Sheet 2 of 3, Rev. 46  
 FD-302-661, Makeup & Purification, Sheet 5 of 5, Rev. 90  
 FD-302-661, Makeup & Purification, Sheet 4 of 5, Rev. 76

FD-302-661, Makeup & Purification, Sheet 1 of 5, Rev. 65  
 FD-302-661, Makeup & Purification, Sheet 2 of 5, Rev. 74  
 FD-302-661, Makeup & Purification, Sheet 3 of 5, Rev. 76  
 SS-211-004, Electrical-Block Diagram, Turbine Building Power. & Ltg. Distribution, Rev. 4

### Calculations

B&W Document 86-1173989-01, "HPI Cooling (Task AS-5) Transient Information Document," dated February 27, 1989  
 CSE-98-0008A, Safety related busses scenario based steady state voltage drop and load flow analysis from off site power sources, Rev. 3  
 E-91-0035, Auxiliary FWP-7 Motor Feeder Sizing and Voltage Drop, Rev. 1  
 E-91-0041, 4160 V Reactor Aux Bus 3 & Feeding XFMR 3 Protective Relaying Coordination, Rev. 1  
 E-90-0078, 480V Protection Device Coordination Study for ES Bus 3A, ES Bus 3B, and Plant Aux Bus 3, Rev. 3  
 E-92-0214, MOV Operability Assessments, Rev. 19  
 E-90-0077, Safety Related Busses Scenario Based Steady State Voltage Drop and Load Flow Analysis from Offsite Power Sources, Rev. 3  
 E-90-0051, Protective Relays Setting Calculations for 4160V, Safety Related Motors, Rev. 0  
 E-91-0018, Transient Motor Starting and Voltage Drop Analysis During Block Loading and Post Block Loading Period Under Degraded Grid Calc., Rev. 1  
 E-91-0013, Vital Bus Safety-Related Control Circuit Voltage Drop Calculations, Rev. 1  
 E-90-0100, Electrical DC System Voltage, Profile Calculation, Rev. 3  
 H98-0001, Tank Room Ventilation Rate Calc (EFP-3), Rev. 2  
 H98-0002, Battery Room Ventilation Rate Calc (EFP-3), Rev. 3  
 H99-0001, Diesel Pump Room Ventilation Calc (EFP-3), Rev. 0  
 H99-0008, Diesel Driven EFP Radiator Inlet Temperature, Rev. 1  
 I-85-0004, EFW Tank Level Accuracy, Rev. 7  
 I-91-0011, Condensate Storage Tank Level Loop Accuracy, Rev. 2  
 I-91-0012, BWST Level Accuracy, Rev. 5  
 M-90-0021, Building Spray and Decay Heat NPSH, Rev. 12  
 M-95-0004, Make UP Pump NPSH Evaluation During Post-LOCA Cooling and S/O to the RB Sump, Rev. 3  
 M-98-0123, CR3 Hydraulic Analysis (Post 11R Modifications to MU System), Rev. 4  
 M-90-0058, Compressed Air Required to Operate ADVs, Rev. 3  
 M-96-0063, EF System Hydraulic Analysis, Rev. 41  
 M-99-0027, CR-3 Emergency Feedwater System Hydraulic Design Verification Analysis, Rev. 7

### Enhanced Design Basis Documents

EDBD 4-1, Enhanced Design Basis Document for Class 1E AC System, Rev. 9  
 EDBD 4-2, Enhanced Design Basis Document for DC Power System, Rev 8  
 EDBD 6-1, Enhanced Design Basis Document for Reactor Coolant system, Rev. 14  
 EDBD 6-2, Enhanced Design Basis Document for Makeup and Purification System, Rev. 14  
 EDBD 6-3, Enhanced Design Basis Document for Decay Heat System, Rev. 15

EEDB 6-10, Enhanced Design Basis Document for Main Steam System, Rev. 14  
 EEDB 6-13, Enhanced Design Basis Document for Emergency Feedwater, Rev. 13  
 EEDB 6-16, Enhanced Design Basis Document for Auxiliary Steam System, Rev. 3  
 EEDB 6-18, Enhanced Design Basis Document for Main Feedwater System, Rev. 10  
 EEDB 6-23, Enhanced Design Basis Document for Condensate System, Rev. 9

Updated Final Safety Analysis Report, Rev. 27.1

Chapters 4, 7, 8, 9, and 10

UFSAR Section 4, Reactor Coolant System

UFSAR Section 6.1, Emergency Core Cooling Systems

UFSAR Section 6.5, Emergency Feedwater

UFSAR Section 9.1, Makeup and Purification Systems

UFSAR Section 9.4, Decay Heat Removal System

UFSAR Section 10.2, Steam and Power Conversion System - Design and Operation

UFSAR Section 10.5, Steam and Power Conversion System - Emergency Feedwater System

UFSAR Section 10.6, Steam and Power Conversion System - Auxiliary Feedwater

UFSAR Section 10.7, Steam and Power Conversion System - Steam Generator Overfill

UFSAR Section 14.2.2.2, Steam Generator Tube Rupture Accident

Improved Technical Specifications

Section 3.3.11 and Bases, Emergency Feedwater Initiation and Control (EFIC) System

Section 3.3.17 and Bases, Post Accident Monitoring (PAM) Instrumentation

Section 3.7 and Bases, Plant Systems

Section 3.8.4 and Bases, DC Sources Operating

Section 3.8.6 and Bases, Battery Cell Parameters

Section 3.8.7 and Bases, Inverters Operating

Section 3.5.2 and Bases, ECCS - Operating

Completed Maintenance and Tests

MAR 97-02-12-01, High Pressure Injection System Upgrade Project, Functional Flow Testing, completed October 29, 1999

MP-113, Main Steam Isolation Maintenance, completed on MSV-414 on 6/12/96

MP-113, Main Steam Isolation Maintenance, completed on MSV-412 on 11/8/99

MP-122, Disassembly and reassembly of flanged connections, completed on EFV-99 on 3/29/96

MP-402C, Maintenance of Limitorque Valve Actuators Type SMB-0 Thru SMB-4,

MP-402C, Maintenance of Limitorque Valve Actuators Type SMB-0 Thru SMB-4,

MP-402C, Maintenance of Limitorque Valve Actuators Type SMB-0 Thru SMB-4,

MP-402C, Maintenance of Limitorque Valve Actuators Type SMB-0 Thru SMB-4,

MP-402C, Maintenance of Limitorque Valve Actuators Type SMB-0 Thru SMB-4,

MP-402C, Maintenance of Limitorque Valve Actuators Type SMB-0 Thru SMB-4,

MP-402E, Motor Operated Valve Test, Setup and Diagnosis Using MOV Test Equipment, Rev. 17, completed on MUV-23 on October 7, 1999

MP-402E, Motor Operated Valve Test, Setup and Diagnosis Using MOV Test Equipment, Rev. 17, completed on MUV-24 on October 6, 1999

MP-402E, Motor Operated Valve Test, Setup and Diagnosis Using MOV Test Equipment, Rev. 19, completed on MUV-25 on October 12, 2001

MP-402E, Motor Operated Valve Test, Setup and Diagnosis Using MOV Test Equipment, Rev. 17, completed on DHV-3 on October 23, 1999

MP-402E, Motor Operated Valve Test, Setup and Diagnosis Using MOV Test Equipment, Rev. 17, completed on MUV-27 on October 26, 1999

MP-402E, Motor Operated Valve Test, Setup and Diagnosis Using MOV Test Equipment, Rev. 19, completed on MUV-596 on October 3, 2001

MP-402E, Motor Operated Valve Test, Setup and Diagnosis Using MOV Test Equipment, Rev. 17, completed on DHV-4 on October 23, 1999

MP-402E, Motor Operated Valve Test, Setup and Diagnosis Using MOV Test Equipment, Rev. 19, completed on FWV-32 on 10/11/01

MP-402E, Motor Operated Valve Test, Setup and Diagnosis Using MOV Test Equipment, Rev. 20, completed on MUV-26 on February 12, 2003

MP-420, Maintenance of Asco Solenoid - Operated Valves, completed on MSV-412 on 11/8/99

MP-420, Maintenance of Asco Solenoid - Operated Valves, completed on MSV-414 on 6/12/96

MP-420, Maintenance of Asco Solenoid - Operated Valves, completed on MSV-411 on 10/8/99

PM-178A, Preventive Maintenance of Limitorque Actuators 2-year Inspection, completed on MUV-596 on October 3, 2001

PM-178A, Preventive Maintenance of Limitorque Actuators 2-year Inspection, completed on FWV-15 on 10/1/01

PM-178A, Preventive Maintenance of Limitorque Actuators 2-year Inspection, completed on FWV-29 on 10/9/01

PM-178A, Preventive Maintenance of Limitorque Actuators 2-year Inspection, completed on FWV-31 on 10/13/01

PM-178B, Preventive Maintenance of Limitorque Actuators 6-year Inspection, Rev. 5, completed on MUV-23 on October 7, 1999

PM-178B, Preventive Maintenance of Limitorque Actuators 6-year Inspection, completed on FWV-28 on 10/01/01

PM-178B, Preventive Maintenance of Limitorque Actuators 6-year Inspection, completed on FWV-30 on 10/18/01

PM-178B, Preventive Maintenance of Limitorque Actuators 6-year Inspection, Rev. 7, completed on DHV-41 on May 1, 2003

PM-178B, Preventive Maintenance of Limitorque Actuators 6-year Inspection, Rev. 7, completed on MUV-26 on February 11, 2003

PT-411, MUV-18 MOVATS D/P Testing, Rev. 1, completed October 28, 1999

SMB-4T, SMB-5, SB-0 Thru 4, and HBC Units, Rev. 19, completed on FWV-33 on October 12, 2001, SMB-4T, SMB-5, SB-0 Thru 4, and HBC Units, Rev. 19, completed on MUV-27 on October 26, 2001

SMB-4T, SMB-5, SB-0 Thru 4, and HBC Units, Rev. 19, completed on FWV-32 on October 11, 2001

SMB-4T, SMB-5, SB-0 Thru 4, and HBC Units, Rev. 19, completed on MUV-25 on October 12, 2001  
 SMB-4T, SMB-5, SB-0 Thru 4, and HBC Units, Rev. 18, completed on MUV-596 on November 1, 1999  
 SMB-4T, SMB-5, SB-0 Thru 4, and HBC Units, Rev. 18, completed on MUV-18 on October 28, 1999  
 SP-255, Main Steam Isolation Valves Fail-Safe Testing, completed November 8, 1999  
 SP-349A, EFP-1 and Valve Surveillance, Rev. 41 completed June 9, 2002  
 SP-349B, EFP-2 and Valve Surveillance, Rev. 50 completed September 9, 2002  
 SP-349B, EFP-2 and Valve Surveillance, Rev. 50 completed February 2, 2003  
 SP-349B, EFP-2 and Valve Surveillance, Rev. 50 completed November 11, 2002  
 SP-349C, EFP-3 and Valve Surveillance, Rev. 22 completed April 4, 2003  
 SP-349C, EFP-3 and Valve Surveillance, Rev. 10, completed January 1, 2003  
 SP-602, ASME Section XI Relief Valve Testing for EFV-97, completed March 29, 1996  
 SP-602, ASME Section XI Relief Valve Testing for EFV-98, completed October 4, 2001  
 SP-602, ASME Section XI Relief Valve Testing for EFV-99, completed March 29, 1996  
 SP-630, MUP/HPI Check Valves Full Flow Test, Rev. 13, completed October 25, 2001  
 SP-929, HPI Check Valves Closure Test, Rev. 2, completed November 6, 1999  
 SP-929, HPI Check Valves Closure Test, Rev. 3, completed October 20, 2001

#### Modifications

MAR 00-08-03-01, DHV-3 Canopy Seal Enclosure, dated November 30, 2000  
 MAR 99-01-02-01, Auxiliary Feedwater (AFW) Flow Path Upgrade

#### Completed Work Orders (WOs) and Work Requests (WRs)

WO 0027542901, SP522; Station Battery Inspection and Battery Charger Maintenance, August 8, 2002  
 WO 0026892601, SP522; Station Battery Inspection & Battery Charger Maintenance, July 27, 2002  
 WO 0037449201, SP520; Weekly Station Battery Checks, May 5, 2003  
 WO 0037448401, SP 525; EFP-3 Battery Surveillance, May 5, 2003  
 WO 0035112101, SP521; Quarterly Battery Check A-Side, March 6, 2003  
 WO 0035176001, SP0521; Quarterly Battery Check B-Side, March 12, 2003  
 WO 0028323001, RM-A12 monitor drifting high, July 1, 2002  
 WO 0031102501, Pre-amplifier corrosion check, November 7, 2002  
 WO 0031102502, Perform SP-701M, November 7, 2002  
 WO 0031102503, Perform SP-335C for PMT, November 12, 2002  
 WO 0033756501, Perform pre-amplifier corrosion check, April 22, 2003  
 WO 0033756503, Perform SP-335C, April 22, 2003  
 WO 0033756504, Compare high voltage setting to HV pot setting, April 22, 2003  
 WO 0023072701, MU-14-LT2 string calibration, May 14, 2002  
 WO 0023072501, MU-14-LT1 string calibration, May 14, 2002  
 WR 306344, DCP-1B ES Bus 3B Cubicle 3B/DCP-1B, December 29, 1992  
 WR 308986, DCP-1A, 480V 3A BKR, October 1, 1993

WR 318021, Inverter Inspection-Dual Inverter 3A-VBIT-1A NOCS 40103, July 26, 1998  
WR 322464, Inverter Inspection-Dual Inverter 3C-VBIT-1C NOCS 40754, July 1, 1998  
WR 328953, Need to install fuses for indicator lights on vital bus inverter 'E, July 21, 1998  
WR 331780, DCP-1B, 480V ES 3B BKR, November 22, 1995  
WR 341456, Inverter Inspection-Dual Inverter 3B-VBIT-1B NOCS 40754, May 10, 2000  
WR 347609, Perform infrared surveys, May 8, 1998  
WR 351709, Makeup & Pur. PP 3A MUP-1A, January 19, 1998  
WR 351709, Make-up & Purification Pump, January 22, 1999  
WR 351743, Make-up & Purification Pump, January 23, 1999  
WR 353036, Troubleshoot alarms associated with RM-G25, June 5, 1998  
WR 353275, Restore drawer to proper operating condition, May 12, 1998  
WR 358514, Install MAR 86-09-22-14 FCN-6 and support functional test, August 26, 1999  
WR 355142, Perform infrared surveys of electrical equipment., September 8, 1998  
WR 355223, C Inverter frequency high and transfer switches have no sync light, July 29, 1998  
WR 355521, During troubleshooting, it was determined that the oscillator board was not set to free running freq. of 60 Hz, November 19, 1998  
WR 355764, VBIT-1A has high voltage and frequency. 121.7V and 60.4 Hz. Sync lamps are out, August 24, 1998  
WR 356033, Perform infrared surveys of electrical equipment., August 10, 1999  
WR 357665, Alarm inverter a low output voltage came in. Voltage Indication at the inverter was lost., November 16, 1998  
WR 357690, During trouble shooting, determined that meters needed to be replaced-VB-6-EI and VB-6-II, 11/11/98  
WR 366044, Inverter Inspection-Dual Inverter 3D-VBIT-1D NOCS 40754, July 12, 2001  
WR 366369, Inverter Inspection-Dual Inverter 3E-VBIT-1E NOCS 40103, July 20, 2001  
WR 366761, Perform infrared surveys of electrical equipment, July 9, 2001  
WR 368509, Various meters installed were modified to eliminate repetitive failures, March 19, 2001  
WR 369104, Perform infrared surveys of electrical equipment, January 10, 2002  
WR 372569, The In-sync light is out, December 28, 2001  
WR 372949, Meter in warehouse that needs to be fixed, February 5, 2002  
WR 276249 01, RMG-26/27-RI module test lamp is on, September 24, 2002  
WR 357272, HPP-411 calibration of main steam line monitors, February 16, 2000  
WR 365849, Change out the local processing unit in RM-G26, May 18, 2000  
WR 364067, Change out the local processing unit in RM-G26, December 21, 1999  
WR 359456, Install Y2K compliant EPROMs in RM-G26, July 11, 1999  
WR 358514, Incorporate FCN-6 to MAR 86-09-22-14, August 26, 1999  
WR 357462, Calibrate ratemeters for RM-G26 and G27, February 26, 2001  
WR 368585, Change out local processing unit in RM-G27, December 21, 2000  
WR 359457, Install Y2K compliant EPROM in RM-G27, June 11, 1999  
WR 368972, Change out local processing unit in RM-G27, December 6, 2001  
WR 353274, Restore drawer to proper operating condition, May 12, 1998  
WR 372275, Swap RM-A12 detector with RMA-11 detector, February 17, 2001  
WR 371592, Troubleshoot, identify, and correct problem with ratemeter and detector, January 14, 2001

WR 353984, To document work completed by WR 353933, May 12, 1998  
 WR 353933, Performed troubleshooting of RM-A12, May 12, 1998  
 WR 366532, Calibrate ratemeter and provide results to chemistry, July 19, 2001  
 WR 350414, Calibrate ratemeter, January 18, 2000  
 WR 354180, The instruments listed are due for calibration, May 24, 1999  
 WR 228904, EOB Inventory Checks  
 WR 364327, Replace Existing Horizontal Drive Shaft for EFP-3, September 19, 2001  
 WR 371038, EFP-3 Pump Thrust Bearing Replacement, February 5, 2002  
 WR 371928, Investigate EFP-3 Speed Increaser Vibration, November 29, 2001

Completed Surveillance Procedures, Preventive Maintenance (PM), and Test Records

SP-112, Calibration of the Reactor Protection System, Rev. 60, Completed January 9, 2001  
 SP-112, Calibration of the Reactor Protection System, Rev. 61, Completed October 14, 2001  
 SP-112, Calibration of the Reactor Protection System, Rev. 59, Completed October 13, 1999  
 SP-132X, Engineered Safeguards System Transmitter Calibration, Completed  
 November 4, 1999  
 SP-132X, Engineered Safeguards System Transmitter Calibration, Rev. 0, Completed  
 October 18, 2001  
 SP-162, BWST Level String Calibration, Rev. 34, Completed December 21, 1997  
 SP-162, EFW Storage Tank Level Cal Data Sheets, Rev. 40, Completed October 15, 2001  
 SP-162, BWST Level and EFW Storage Tank Level Cal Data Sheets, Rev. 37, Completed  
 September 15, 1999 and October 29, 1999, respectively  
 SP-169G, Make-up Tank Instrumentation Calibration, Rev. 7, Completed May 14, 2002  
 SP-170, Pressurizer Level Instrumentation Calibration, Rev. 28, Completed October 29, 1999  
 SP-193A, EFIC Transmitters Channel Calibration, Rev. 3, Completed October 15, 1997  
 SP-193A, EFIC Transmitters Channel Calibration, Rev. 3, Completed October 15, 1997  
 SP-194X, EFIC Transmitter Calibration, Rev. 0, Completed October 24, 2001,  
 October 11, 1999  
 SP-194D, Rev. 1, String Calibration Data Sheets, Completed September 23, 1999,  
 November 15, 2001  
 SP-194C, Rev. 1, String Calibration Data Sheets, Completed September 25, 1999,  
 November 14, 2001  
 SP-194B, Rev. 2, String Calibration Data Sheets, Completed January 9, 2002  
 SP-194A, Rev. 1, String Calibration Data Sheets, Completed September 28, 1999  
 SP-194B, Rev. 1, String Calibration Data Sheets, Completed September 28, 1999  
 SP-194A, Rev. 2, String Calibration Data Sheets, Completed January 8, 2002  
 SP-300, Operating Daily Surveillance Log, Rev. 184, Completed May 3, 2003  
 SP-321, Power Distribution Breaker Alignment And Power Availability Verification,  
 Rev. 54, Completed May 6, 2003  
 SP-349C, EFP-3 And Valve Surveillance, Rev. 10, Completed January 8, 2003, April 4, 2003  
 SP-349A, EFP-1 And Valve Surveillance, Rev. 41, Completed August 21, 2002,  
 November 11, 2002, February 4, 2003  
 SP-349B, EFP-2 And Valve Surveillance, Rev. 50, Completed September 5, 2002,  
 November 30, 2002, February 19, 2003  
 SP-379, PORV Exercise Test, Rev. 6, Completed October 23, 2001



SP-523, Station Batteries Service Test, Rev. 32, Completed October 18, 1999  
 SP-524, Battery Modified Performance Discharge Test, Rev. 20, Completed October 29, 1999,  
 October 12, 2001  
 SP-701M, RM-A12 Gas Calibration, Rev. 3, Completed April 24, 2002, September 9, 2002

Action Requests (ARs)

00033976 Evaluation to Determine if Additional Cables Could be Added to a Cable T'ray  
 00034063 DHV-122 and DHV-124 Found Out Of Position  
 00035438 Spurious Transfer of VBIT-1B Loads, September 7, 1999  
 00035972 FME Cover Not in Place and Debris found in Elbow on DH System  
 00036428 Lack of FME Control during Installation of a Snubber on DHH-23  
 00037105 VBIT-1B Bypassed alarm, December 6, 1999  
 00037133 Control room received VBIT-1B Bypassed alarm, December 6, 1999  
 00037160 The Work performed on meters within VBIT-1B took 27 hours,  
 December 22, 1999  
 00037188 Recieved VBIT-1B bypass alarm, December 13, 1999  
 00037810 Vender Drawing 2D6590 does not match, May 30, 2000  
 00038042 Current Operations Philosophy Caused Performance of SP Steps Out Of  
 Sequence  
 00038885 During completion of WR 341456 on VBIT-1B, exceeded 20 hrs,  
 January 16, 2001  
 00039094 VBIT-1A Battery Supply Load, No alarms in control room detailed problem  
 description, June 30, 2000  
 00039949 Tears in Outer Layer of Expansion Joint Discovered Without Degradation of  
 Inner Layers  
 00040706 RCS Leakage Discovered from DHV-3  
 00040812 Eddy Current Analysis Software Discrepancy at Vogtle  
 00040915 Intragranular Attack and Intergranular Corrosion Cracking of SG Tubes at  
 Kewanu  
 00041410 Transport Time to Radiation Monitor During SGTR at Sequoyh  
 00043704 SP-172 out of tolerances for CST and hotwell level calibrations  
 00045929 Adverse Trend Existed for Emergency AC Power PI  
 00046283 SG Tube Leak at Byron  
 00046736 Instrument Tubing Installed Incorrectly since Construction  
 00047302 RM-A12 out-of-service due to no flow condition due to debris in rotometer  
 00048115 SG Not Full Depth Expanded at Harris  
 00048402 Boric Acid Residue Buildup at Catawba  
 00048412 Foreign Object Retrieved from SG at Byron  
 00048648 MSV-33 Failed as found Test Criteria for SP-650, September 26, 2001  
 00048796 RM-A12 Detector Replacement Following Erroneous Indication and Failure  
 00050157 MSV-25 Stroke Time in Action Range, dated October 20, 2001  
 00050-311 Switch S-12 was mis-wired during Replacement on Diamond Panel  
 00050413 Severed Plugged Tube Discovered During OTSG Inspection at TMI  
 00051740 RM-A12 Spurious Spikes and Alarms  
 00051874 Tabletop Drill Implementation Improvements Needed

00053256 VBIT-1D In-sync light out, 06/07/02  
 00057745 Determine AP-660 Requirements If Main Turbine Fails To Trip  
 00058152 Update EOP-6, EOP-9, And EOP-14 EOP Supporting Documentation  
 00058469 RM-A12 Detector Replacement Following Failure  
 00061321 SP-521 does not require cleaning specified within ITS Bases  
 00063178 Install EOP/AP Tags On DPDP 8A-17 (ASV-204), MUP-2A, 2B & 2C  
 00064032 RM-A12 Out-of-Service Due To Count Rate Swings  
 00064079 VBIT-1A (WO 222152), 12/18/02  
 00064202 Station Batteries have a non-conforming condition  
 00065133 SP-20-LT Level Signal Reading Low  
 00065442 Revise ECD-02, EOP-2 To TBD Cross Step Document  
 00068148 3B1 Station Batteries have a non-conforming condition  
 00068365 3B2 Station Batteries have a non-conforming condition  
 00073431 Air Handling Panel 13 Not Correctly Tagged  
 00073762 Perform Biennial Procedure Reviews  
 00074938 Loss of VBIT-1E Results in entry into AP-430, November 27, 2002  
 00074987 Cleaning Rag Fell on Fan at top of VBIT-1B Inverter Cabinet, November 6, 2002  
 00075429 VBIT-1B Paint Spill, November 27, 2002  
 00075895 Replace Single Band Hoses with Double Band Hoses  
 00076680 Critique Items For Operator Performance - Plant Trip November 7, 2002  
 00076721 PRI 5 NCR To Track Procedure Comments From Rx Trip  
 00078730 Feedwater Chemistry Shutdown at Vogtle  
 00079788 Discovery of Axial Outside Diameter Cracking at Seabrook  
 00081427 RM-A12 Failed Low Due To Loose IC Chip  
 00082825 Adjustment of VBIT-1E Frequency twice in two months,  
 January 13, 2003  
 00083517 Emergency Operating Procedure Curves  
 00084253 B Atmospheric Dump Valve Erratic Performance  
 00088083 Mis-calibration of OTS Examination Robot at Diablo Canyon  
 00088758 Calculation M-97-0136 Was Not Revised For EOP Changes  
 00090128 Convert EEF99-007 To A Calculation  
 00092809 Deficiencies Found During Inventory Check Of EOB-1

#### Precursor Cards

PC 3-C99-1678, The following tags were out of tolerance: CD-58-LS, CD-60-LS, CD-67-LT1  
 PC 3-C99-3278, SP-112 out of tolerance data for RP-C39, RP-A40  
 PC 3-C99-3639, Charging "B" Battery on Temp Power resulted in multiple breaker trips  
 PC 3-C97-7551, SP-162 out of tolerance data for EF-98-LT, EF-99-LT  
 PC 3-C99-4444, Out of tolerance found during the performance of SP-170  
 PC-99-1710, EFT-2 Recirculation Heatup Evaluation, dated October 20,1999

Action Requests Written Due to this Inspection

## Classified as NCRs:

- 00092768 EOP facing pages do not meet guidelines of AI-402, "Writer's Guide for Abnormal and Emergency Operation Procedures"
- 00092907 Previous MOV Test Out of Tolerances Not Captured in corrective action program
- 00093905 Pages 40 and 45 missing from SP-194X record copy
- 00094036 Incorrect step referenced in SP-701M
- 00094084 SP-347, ECCS and Boration Flowpaths, Rev. 57, Contains Confusing Wording that Could Be Interpreted to Allow Improper Valve Lineup of HPI System
- 00094208 SP-650, ASME Code Safety Valves Test, Rev. 31, Revised Step 5.1.5.1 to Assure a New Cotter Pin is Installed
- 00094221 PM-105 motor inspection change request timeliness
- 00094273 SP-169G, evaluate procedure to add steps to ensure that make-up tank reference legs are full after calibration

## Classified as PRR:

- 00094034 AI-513, need guidance for detecting freezing lines
- 00094084 SP-347, remove word "standby" form Notes 5 and 6 on page 15 following "Selected for ES."
- 00094208 SP-650, revise step 5.1.5.1 to ensure a new cotter pin is installed after maintenance on main steam safety valves

Vendor and Technical Manuals

- Maintenance Instructions for Pilot Operated Safety Relief & Vacuum Breakers Valves, Anderson-Greenwood USA, Inc., Rev. 0
- Instructions for Installation and maintenance for Consolidated Safety Valves, Dresser Industries, Rev. 5
- Installation Operation & Maintenance (for EFW pumps), Ingersoll-Rand Company, Rev. 6
- Emergency Feedwater Pumps, Ingersoll-Rand Company, Rev. 27
- Limiterorque Type SMB Instruction and Maintenance Manual, Limitorque Corporation, Rev. 01/02
- SWP-1A/1B, Electric Machinery MFG. Company, Rev. 3
- MUP-1A/B/C, Make up pumps (Centrifugal), Rev. 24
- Solid State Trip Device, Type 504, Rev. 15
- EFW-1 & 2, Emergency Feedwater Pump, Thru Gear 800HP 4000 Volt Motor, Rev. 4
- ID# 00074-000, DCP-1A/B, LP & LPO Paper Stocks Pumps, Rev. 48
- Book # 2119, VBIT-1A, 1B, 1C & 1D , Solid State Controls, Inc. 30 KVA Inverter, Rev. 5
- Book# 138, VBIT-1E Solid State Controls, Inc. Static Inverter, Rev. 10
- ID# 01914, Auxiliary Feedwater Pump Manual, Installation, Operation & Maintenance, Aux Feed Pump-FWP-7, Rev. 6

Self Assessment Reports

CAP-NGGC-0201, Self-Assessment Report, Assessment Number 80432  
 Special Report 02-01, Results of the OTSG Tube Inservice Program Conducted During  
 Refueling Outage 12, January 22, 2002

Miscellaneous Documents:

Interoffice Correspondence; Subject: Meeting Minutes For EOP And AP Oversight Committee  
 (EAPOC), dated 4/2/03

Task Performance Manual-4-035, Steam Generators

JPM#: 247, Perform Steam Generator Isolation For TRACC Limits Using EOP-14, Enclosure 12

JPM#: 301, Establish Steam Generator Blowdown To The Condenser

DD-01, CR-3 Deviation Document

- Deviation Number: GD-09, RCPs Are Tripped if Adequate SCM Exists and RBIC Occurs
- Deviation Number: GD-26, Mitigation Strategy Deviation for Steam Generator Tube Rupture
- Deviation Number: GD-28, Mitigating Strategy Deviation for LOCA Cooldown

TAP-418, Generic Operations Training Schedules

Work Around Overview And Status, dated 4/29/03

**PARTIAL LIST OF COMPONENTS REVIEWED**

AFW Pump Motor (FWP-7)

DC Pump Motors (DCP-1A, 1B)

EFW Pump Motor (EFP-1)

Make-up Pump Motors (1A, 1B, 1C)

SW Pump Motors (SWP-1A, 1B)

Make-up Valves (MUV-23,24,25,26,58,73)

AFW Control Valves (FWV-216, 217)

EFW Valves (EFW- 11, 14, 32, 33, 55, 56, 57, 58)

Radiation Monitor (RM-A12, RM-G25, 26,27, 28 -RI)

Pressurizer PORV (RCV-11)

Main Steam Valves (MSV-25,26)

Vital Inverters (VBIT-1A, 1B, 1C, 1D, 1E)

SG High Range Level (SP-17-LT thru 24-LT)

SG Low Range Level (SP-25-LT thru 32-LT)

OTSG Steam Presssure (MS-106-PT thru 113-PT)

Narrow Range RCS Pressure (RC-3A-PT1, PT2; RC-3B-PT1, PT2)

Wide Range RCS Pressure (RC-3A-PT3, PT4; RC-3B-PT3)

Low Range RCS Pressure (RC-147-PT, RC-148-PT)

Hot Leg RCS Temperature (RC-4A-TE2, TE3; RC-4B-TE2, TE3)

Pressurizer Level (RC-1-LT1, LT3)

Condensate Storage Tank Level (CD-67-LT)

Emergency Feedwater Tank Level (EF-98-LT, EF-99-LT)

BWST Level (DH-7-LT, DH-37-LT)

Make-up Tank Level (MUT-14-LT1, LT2)