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

August 5, 2003

Tennessee Valley Authority
ATTN: Mr. J. A. Scalice
Chief Nuclear Officer and
Executive Vice President
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: WATTS BAR NUCLEAR PLANT - NRC SAFETY SYSTEM DESIGN AND PERFORMANCE CAPABILITY INSPECTION REPORT 05000390/2003007 AND 05000391/2003007,

Dear Mr. Scalice:

On July 11, 2003, the NRC completed a safety system design and performance capability inspection at your Watts Bar 1 & 2 reactor facilities. The enclosed report documents the results of that inspection. The results were discussed with Mr. Larry S. Bryant and other members of your staff during an exit meeting on July 11, 2003.

This 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 inspectors reviewed selected procedure and records, observed activities, and interviewed personnel.

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

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

Sincerely,

/RA/

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

Docket Nos.: 50-390, 50-391
License No.: NPF-90 and Construction
Permit No.: CPPR-92

Enclosure: (See page 2)

Enclosure: Inspection Report 05000390, 391/2003007
w/Attachment Supplement Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.:	50-390, 50-391
License Nos.:	NPF-90, CPPR-92
Report No.:	05000390/2003007 and 05000391/2003007
Licensee:	Tennessee Valley Authority (TVA)
Facility:	Watts Bar Nuclear Plant, Units 1 & 2
Location:	1260 Nuclear Plant Road Spring City TN 37381
Dates:	June 23-27, 2003 and July 7-11, 2003
Inspectors:	F. Jape, Senior Project Manager (lead) M. Merriweather, Reactor Inspector S. Walker, Reactor Inspector M. Maymi, Reactor Inspector B. Holland, Contractor
Approved by:	Charles R. Ogle, Chief Engineering Branch 1 Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000390/2003-007, IR 05000391/2003-007; 06/23-27/2003 and 07/07-11/2003; Watts Bar Nuclear Plant, Units 1 and 2; Safety System Design and Performance Capability Inspection.

This inspection was conducted by regional reactor inspectors and a contractor. 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," Rev. 3, dated July 2000.

A. Inspector 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)

This team inspection included review of 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), main feedwater (MFW), auxiliary feedwater (AFW), steam generator (SG) blowdown (SGBD), emergency core cooling (ECCS), reactor coolant system (RCS), and radiation monitoring (RM) systems were included. The inspection also covered supporting equipment, equipment that 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 safety analysis.

.1 System Needs

.11 Process Medium

a. Inspection Scope

The team reviewed selected ECCS and AFW net positive suction head and water source calculations, licensing and design basis information, drawings, vendor manuals, operating/lineup procedures, and surveillance procedures. The team walked down accessible portions of the systems in the plant. The reviews and walkdowns were conducted to verify that system design, Technical Specifications (TS), and Updated Final Safety Analysis Report (UFSAR) assumptions were consistent with the actual capability of systems and components required to mitigate a SGTR event. This review included the refueling water storage tank (RWST) and its refill capability, the condensate storage tank (CST) and its refill capability, the essential raw cooling water (ERCW) supply to the AFW pumps, and mini-flow flow paths for AFW and ECCS pumps. The review also included the ability of the steam generator power-operated relief valves (SG PORVs) and the steam dump valves to support RCS cooldown, and the ability of the charging pumps and pressurizer power-operated relief valves (PORVs) and safety valves to provide feed and bleed cooling to the RCS.

The team also reviewed performance curves and NPSH information for the safety injection pumps to verify there was adequate NPSH for these pumps when taking suction from the RWST, and to verify the adequacy of design assumptions.

The team reviewed maintenance and calibration records for the radiation monitoring channels listed below:

- Condenser Vacuum Pump Air Exhaust (1-LRP-90-119)
- Steam Generator Blowdown (1-LRP-90-120, -121)
- Main Steam (1-LRP-90-421,-422,-423,-424)

The maintenance and calibration records were reviewed to determine the current performance capability of the radiation detection equipment. The setpoints for the radiation monitor alarms were reviewed to verify that they were established in accordance with setpoint guideline procedures and design output documents. The surveillance and annunciator response procedures were also reviewed to determine if they were adequate for monitoring steam generator tube rupture leakage.

The team reviewed instrument installations associated with the CST level, RWST level, and AFW suction pressure to verify that the instruments were designed, constructed and operated in accordance with design and licensing basis documents. The team conducted field inspections of the instrument installations to verify that the instrument tubing, sensors, and supports were in good material condition and that heat tracing was installed when required. The location of the instruments was checked against scaling and setpoint documents. The team also reviewed appropriate design basis documents, TS, 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.

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 event to verify that selected portions of the system alignments were consistent with the design basis assumptions, performance requirements, and system operating procedures. The team verified by control room walkdowns and equipment status reviews that required energy sources were available for mitigation of the SGTR event. Among the lineups reviewed were the steam supply to the turbine driven AFW pump, selected valve alignments for the AFW and SI systems, and electrical alignments for the 6.9 kilo volt (KV) shutdown boards.

The team reviewed SG PORVs nitrogen backup supply sizing calculations, corrective maintenance history, related problem evaluation reports (PERs) and surveillance testing to verify the accessibility and reliability of the nitrogen backup supply; and to verify the adequacy of their design and maintenance.

The team also reviewed the turbine driven AFW pumps' steam supply trap inspections to verify the reliability of the steam supply, and the adequacy of maintenance.

The team reviewed voltage drop calculations for a sample of safety-related buses and loads such as motors, valve operators and respective controls, inverters, and chargers to verify that adequate voltage would be available at the end device during worst case minimum grid operating voltage conditions. The team also reviewed surveillance

records for bus voltage readings to verify that these checks were being performed in accordance with the requirements specified in design and license basis documents. Additionally, the team conducted walkdown inspections of selected electrical equipment (see Attachment) including the 120 volt alternating current (ac) vital inverters, 125 volt direct current (dc) distribution boards, 125 volt dc station batteries and associated battery chargers to verify that the equipment was operable and in good material condition, with no alarms present, and the voltage indications were within the normal expected band. The ground detection system of the 125 volt dc system was also examined on the dc distribution boards to verify that there were no grounds on the system. The specific components reviewed are listed below:

- AFW Pump Motors (1A & 1B)
- ERCW Pump Motor (A-A, B-A, F-B, E-B)
- Charging Pump Motors (1A & 1B)
- Vital Battery Chargers I through V
- Spare Battery Chargers VI & VII
- Main Steam Isolation Valves (MSIV; 1-FCV-1-4, 11)
- MSIV Bypass Valves (1-FCV-1-147 & 149A, -148 & 149B)
- DC Distribution Boards
- MFW Isolation Valves (1-FCV-3-33A & -47B)
- Steam Flow to TDAFW Isolation Valves (1-FCV-1-17A & -18B)
- BIT Outlet Valves (1-FCV-63-25B & -26A)
- Steam Generator Blowdown Valves (1-FCV-1-181 & 183A, -182 &184B)
- Vital Inverters
- 125 VDC Vital Batteries

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 TS. 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, were entered into the corrective action program.

- SG Narrow Range Level (1-L-3-38, 39, 42)
- SG Wide Range Level (1-L-3-43)
- Steam Generator Pressure (1-P-1-2A)
- Reactor Coolant System Pressure (1-P-68-63)
- Pressurizer Level (1-L-68-320)
- Hot and Cold Leg RCS Temperature (1-T-68-1, 18)
- Refueling Water Storage Tank Level (1-L-63-50, 51)

- Condensate Storage Tank Level (1-LT-2-230, 233)
- Pressure Switches (1-PS-3-139A, B, D, and 1-PS-3-144A, B, D)
- AFW Flow (1-F-3-147A,B)
- High Pressure Injection Flow (1-F-63-170)
- Pressure Switches (1-PS-46-13, -40)
- Pressurizer Pressure (1-LPP-68-322, -340)

The team reviewed electrical control schematics of the control systems for AFW, steam generator PORVs, and pressurizer PORVs to verify that the control systems were in accordance with their design bases, and would be functional to 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 instructions (EOIs) , abnormal operating instructions (AOIs), and annunciator response instructions (ARIs) that would be used in the identification and mitigation of a STGR event. The procedure review was done to verify that the procedures were consistent with the UFSAR description of a SGTR event and the owner's group guidelines, 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 lesson plans pertaining to SGTR events to ensure that training was consistent with the procedures. In addition, the team observed a simulator scenario of a SGTR event to verify that operator training and procedural guidance were adequate to identify a SGTR event and implement post-event mitigation strategies. Operator action times for performance of SGTR event mitigation activities were compared to the times assumed in accident analysis.

b. Findings

No findings of significance were identified.

.15 Heat Removal

a. Inspection Scope

The team reviewed operator actions that may have to be performed to assure that adequate heat removal capability would be available to mitigate a SGTR event. Examples of procedures reviewed included those for refilling of the CST and RWST.

The team reviewed documentation for selected equipment to assess the reliability and availability of cooling for equipment required to mitigate a SGTR event. The equipment reviewed included the lube oil coolers used to cool the safety injection pumps (SIPs) and AFW pumps. AFW pumps' lube oil coolers surveillance testing results, lube oil cooler vendor manual, lube oil preventive maintenance records, and cooler corrective maintenance history were reviewed to verify the adequacy of the maintenance and surveillance acceptance criteria. The team also reviewed SIPs lube oil cooler inspection, cleaning and eddy current testing (ECT) maintenance records to verify adequacy of maintenance and frequency.

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 and electrical components including the SIPs, AFW pumps, steam dump valves, main steam isolation valves (MSIVs), main steam safety valves (MSSVs), SG PORVs, chemical and volume control system (CVCS), ERCW, and feedwater (FW) regulating valves. The purpose of the walkdowns was to assess general material condition and identify any degraded condition 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 tornados. The team also inspected selected controls and indicators for these systems for appropriate human factors such as labeling, arrangement, and visibility.

b. Findings

No findings of significance were identified.

.22 Operation

a. Inspection Scope

The team reviewed system operating and lineup procedures, system drawings and walked down selected portions of the MS, MFW, AFW, SGBD, CVCS, SI, RM, RHR, controlled air (CA), and electrical power 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 walked

down procedure performance, with radiological control technicians and chemistry personnel, that would be used to help operators identify the SG involved in the SGTR event; and walked down, with an operator, the EOI requirement to manually isolate a stuck open SG PORV on the ruptured SG by closing the appropriate block valve.

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 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 (1-LT-2-230, -233)
- Refueling Water Storage Tank Level (1-LT-63-50, -51)
- AFW Suction Pressure (1-PS-3-139A, -B, -D, and 1-PS-3-144A, -B, -D)
- Condenser Vacuum Pump Exhaust Rad Monitor (1-LRP-90-119)
- Steam Generator Discharge Rad Monitor (1-LRP-90-421, -422, -423, -424)

The team reviewed two temporary plant modification packages (1-01-010-003 & 1-02-2-68) to verify that the changes had been appropriately reviewed for impact on plant safety and approved in accordance with the change control program and that the changes did not impact plant performance.

The team reviewed selected operations procedures associated with SGTR event response and mitigation to verify design and licensing assumptions were incorporated, as appropriate, into procedures. One example was procedural guidance to isolate the ruptured SG if the MSIV for the faulted SG failed to close by closing the remaining three MSIVs for the intact SGs.

The team reviewed calculations, corrective maintenance, and preventive maintenance for the RCS, AFW, 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. These included the review of the AFW pump mini-flow orifice design adequacy. The team reviewed AFW pump mini-flow orifice and ERCW strainer

sizing documentation to verify ERCW strainer size was smaller, which prevents the possibility of AFW pump mini-flow orifice clogging.

The team reviewed analytical limits calculations for the AFW pump pressure switches, which perform the ERCW swap over function, to verify that the AFW pump suction transfer set point is adequate and to verify these were designed and operated in accordance with design and licensing basis documents.

b. Findings

No findings of significance were identified.

.24 Testing and Inspection

a. Inspection Scope

The team reviewed selected TS and records of completed surveillance tests, performance tests, inspections, and preventive maintenance; and walked down selected components of the MS, MFW, AFW, SGBD, CA, RM, CVCS, SI, and RHR to verify the tests and inspections were appropriately verifying that the assumptions of the licensing and design basis were being maintained. This review included, in part, quarterly testing of AFW, CVCS, SI, and RHR pumps, pump discharge pressures, valve stroke times, check valve operation, and analysis of pump and motor bearing vibration indications.

The team reviewed records of completed surveillance tests, performance tests, inspections, and preventive maintenance; and walked down the 125 VDC vital station batteries and the emergency diesel generator (EDG) 125VDC 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. Engineering standards and vendor manuals were referenced to ensure proper methodologies were being incorporated into the licensee's program. Additionally, the team conducted interviews and reviewed several procedures to verify requirements established by the TS and bases were identified and met.

b. Findings

No findings of significance were identified.

.3 Selected Components

.31 Component Degradation

a. Inspection Scope

Instrumentation

The team reviewed the 5-year maintenance history for the instrument components listed below to determine their current performance capability to mitigate a steam generator tube rupture event.

- SG Narrow Range Level (1-L-3-38, 39, 42)
- SG Wide Range Level (1-L-3-43)
- Steam Generator Pressure (1-P-1-2A)
- Reactor Coolant System Pressure (1-P-68-63)
- Pressurizer Level (1-L-68-320)
- Hot and Cold Leg RCS Temperature (1-T-68-1, 18)
- Condensate Storage Tank Level (1-LT-2-230, 233)
- Refueling Water Storage Tank Level (1-L-63-50, -51)
- Pressure Switches (1-PS-3-139A, B, D, and 1-PS-3-144A, B, D)
- AFW Flow (1-F-3-147A,B)
- HPI Flow (1-F-63-170)
- Annunciator Inverter (1-PNL-055-L236)
- Pressure Solenoid Valves (1-PSV-1-6A, -6B, -6C)
- Level Control Valve (1-LCV-3-164)

Specifically, the team reviewed each component's maintenance history by reviewing selected 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.

Mechanical Components

The team reviewed system health reports as well as, preventive and corrective maintenance records to verify that components that could be relied upon to mitigate a SGTR event were not degrading to unacceptable performance levels and were monitored for degradation. Problem event reports, performance trending, and system testing for selected components were also reviewed to assess the licensee's actions to verify and maintain the safety function, reliability and availability of selected components.

Selected components included the SG PORVs, MSIVs, MSIVs pressure regulators, MSSVs, steam dump valves, SG blowdown valves, and pressurizer PORVs. Specifically the team reviewed selected components' related PERs, corrective maintenance work orders and history, completed surveillance testing procedures, functional testing, and in service testing (IST) trending. These were reviewed to verify surveillance requirements

were being met, to verify the adequacy of the acceptance criteria, to verify valves and their design were being maintained and problems were being identified and addressed.

Electrical Components

The team reviewed system status reports, corrective maintenance records, problem evaluation reports, and performance trending of the 480 V switchgear and motor control centers (MCCs), and 120 VAC and 125 VDC vital electrical systems to verify that components that could be relied upon to mitigate a SGTR event were not degrading to unacceptable performance levels.

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

- ERCW Pumps (A-A, B-A, F-B, E-B)
- ERCW Pump Feeder Breakers
- Charging Pump Motors (1A & 1B)
- AFW Pump Motor (1A & 1B)
- BIT Outlet Valves (1-FCV-63-25B & -26A)
- 6.9 kV Shutdown Board Switchgear
- Main Steam Isolation Valves (MSIV; 1-FCV-1-4, 11)
- MSIV Bypass Valves (1-FCV-1-147 & 149A, -148 & 149B)
- Pressurizer PORVs (1-PCV-68-334 & -340A)
- MFW Isolation Valves (1-FCV-3-33A & -47B)
- Steam Generator Blowdown Valves (1-FCV-1-181 & 183A, -182 &184B)
- ERCW to Motor Driven Pump (MDP) Suction (1-FCV-116A & B)
- ERCW to Turbine Driven Pump (TDP) Suction (1-FCV-136A & B, -179A & B)

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. The team specifically verified, by procedure review and component walkdown that appropriate freeze protection was provided for CST-A and the RWST.

The team reviewed main steam line break peak pressure, and mass and energy release analyses for the valve vaults where the SG PORVs, MSSVs, and MSIVs are located to verify equipment design assumptions were adequate.

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 team specifically reviewed recent operator lesson plans to verify that applicable significant operating experience report insights were being incorporated into operator lesson plans and training. The specific operator training plans reviewed are listed in the Miscellaneous Documents section of the Attachment to this report.

b. Findings

No findings of significance were identified.

.35 Steam Generator Inservice Inspection

a. Inspection Scope

The team performed a limited-scope review of the inservice inspection program for the SGs to verify that SG tubes were being inspected as required by TS and procedures.

b. Findings

No findings of significance were identified.

.36 Foreign Material Exclusion (FME) Control Program

a. Inspection Scope

The team reviewed procedural guidelines and performance records for the loose parts monitoring system to verify this system was operational and being used to monitor for loose parts in the RCS.

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, self-assessment reports, and problem evaluation reports to verify that conditions adverse to quality for systems, structures, components, and/or processes that would be associated with mitigation of a SGTR event were being identified and entered into the licensee's corrective action program.

Other examples of issues reviewed included trip mechanisms on the 480 V switchgear, and resistance measurements for vital and EDG batteries. In addition, the team reviewed work orders on risk significant equipment to evaluate failure trends (e.g., ERCW feeder breakers). 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

4OA6 Meetings, Including Exit

The lead inspector presented the inspection results to Mr. L. Bryant, and other members of the licensee staff, at an exit meeting on July 11, 2003. The licensee acknowledged the findings presented. Proprietary information is not included in this inspection report.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel:

L. Bryant, Plant Manager
J. Bushnell, Licensing
R. Evans, Operations Training
D. Hall, RADCON
B. Hunt, Shift Manager
B. Mays, Licensing
P. Pace, Licensing Manager
R. Rieger, System Engineer
S. Robertson, Design Engineering
R. Scarlett, Unit Supervisor
B. Selewski, System Engineer
S. Tuthill, Chemistry
T. Wallace, Operations Manager
J. Young, Operations

NRC personnel: (attended exit meeting)

H. Christensen, Deputy Director, Division of Reactor Safety, NRC Region II
M. King, Acting Senior Resident Inspector
J. Reece, Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

None.

Attachment

LIST OF DOCUMENTS REVIEWED

Instructions/Procedures

AOI-7.01, Maximum Probable Flood, Revision (Rev.) 12
AOI-8, Tornado Watch or Warning, Rev. 25
AOI-33, Steam Generator Tube Leak, Rev. 27
AOI-39, Rapid Load Reduction, Rev. 6
AOI-43.01, Loss of Unit 1 Train A Shutdown Boards, Rev. 1
ARI-62-F, SG Blowdown to CTBD Closed, Rev. 10
ARI-92-A, Pressurizer Level High/Low, Rev. 13
ARI-175-B, Vacuum Pump Exhaust 1-RM-119 Radiation High, Rev. 32
ARI-178-A, SG Blowdown 1-RM-120/121 Liquid Radiation High, Rev. 32
ARI-265-C, SG 1 Discharge RE-421 Radiation High, Rev. 5
ARI-266-C, SG 2 Discharge RE-422 Radiation High, Rev. 5
ARI-267-C, SG 3 Discharge RE-423 Radiation High, Rev. 5
ARI-268-C, SG 4 Discharge RE-424 Radiation High, Rev. 5
Chemistry Manual Chapter 5.01, Primary to Secondary Leak Rate Methods, Rev. 13
Chemistry Manual Chapter 6.61, Steam Generator Sampling in Hot Sample Room (Modes 1-4), Rev. 3
Chemistry Manual Chapter 9.09, Effluent Radiation Monitor Alarm Response Guidelines, Rev. 5
Chemistry Manual Chapter 9.71, Gaseous Effluent Grab Sampling, Rev. 26
E-0, Reactor Trip or Safety Injection, Rev. 20
E-3, Steam Generator Tube Rupture, Rev. 17
FR-H.1, Loss of Secondary Heat Sink, Rev. 15
GO-5, Unit Shutdown from 30% Reactor Power to Hot Shutdown, Rev. 10
GOI-7, Generic Equipment Operating Guidelines, Rev. 26
RCI-104, Radiological Response to Abnormal Plant Conditions, Rev. 3
SOI-1.01, Main Steam System, performance copy of checklists 1 and 2, Rev. 21 dated March and April 1999
SOI-1.01, Section 8.2.3, Local Operation with Emergency Control Station, Rev. 32
SOI-59.01, Demineralized Water System, Rev. 19
SOI-62.01, CVCS-Charging and Letdown, performance copy of checklists 1 and 2, Rev. 25, dated April 3, 1999
SOI-62.02, Boron Concentration Control, Rev. 33
SSP-3.1, Corrective Action Program, Rev. 4
SSP-6.6, Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting, Rev. 6
MI-57.030, Adjustment of Magnetic Reed Switches and Replacement of Associated Parts on Target Rock Valves, Revision 9
SOI-236.05, System Operating Procedure, 125 VDC Vital Battery Board V, Rev. 13
0-SI-236-1, 125 VDC Vital Battery Weekly Inspection, Rev. 7
0-SI-236-31, 125 VDC Vital Battery I Annual Inspection, Rev. 2
0-SI-236-32, 125 VDC Vital Battery II Annual Inspection, Rev. 2
0-SI-236-35, 125 VDC Vital Battery V Annual Inspection, Rev. 3
0-SI-236-45, 125 VDC Vital Battery V 18 Month Service Test, Rev. 4

0-SI-236-42, 125 VDC Vital Battery II 18 Month Service Test and 125 VDC Vital Battery Charger II Test, Rev. 3
0-SI-215-32-B, Diesel Generator 1B-B Battery Annual Inspection, Rev. 2

Drawings

1-15E500-2, Key Diagram Station Aux Power System, Rev. 24
1-47W610-90-1, Electrical Control Diagram - Radiation Monitoring System, Rev. 31
1-47W610-90-2, Electrical Control Diagram - Radiation Monitoring System, Rev. 44
1-47W610-90-5, Electrical Control Diagram - Radiation Monitoring System, Rev. 32
1-47W801-1, Flow Diagram - Main & Reheat Steam, Rev. 38
1-47W801-2, Flow Diagram - Steam Generator Blowdown System, Rev. 25
1-47W803-1, Flow Diagram - Feedwater, Rev. 40
1-47W803-2, Flow Diagram - Auxiliary Feedwater, Rev. 49
1-47W803-3, Flow Diagram - Main and Auxiliary Feedwater, Rev. 26
1-47W809-1, Flow Diagram - Chemical & Volume Control System, Rev. 40
1-47W811-1, Flow Diagram - Safety Injection System, Rev. 32
1-47W845-1, Flow Diagram - Essential Raw Cooling Water System, Rev. 46
1-47W845-2, Flow Diagram - Essential Raw Cooling Water System, Rev. 36
1-47W845-3, Flow Diagram - Essential Raw Cooling Water System, Rev. 20
1-47W845-4, Flow Diagram - Essential Raw Cooling Water System, Rev. 28
1-47W845-5, Flow Diagram - Essential Raw Cooling Water System, Rev. 30
1-47W845-7, Flow Diagram - Essential Raw Cooling Water System, Rev. 14
1-47W846-1, Flow Diagram - Control and Service Air System, Rev. 25
1-47W848-1, Flow Diagram - Control Air, Rev. 21
1-47W848-10, Flow Diagram - Control Air, Rev. 21
1-47W610-2-3, Electrical Control Diagram Condensate System, Rev. 17
1-47W610-3-3, Electrical Control Diagram Auxiliary Feedwater System, Rev. 22
DCA 51125-01, Rev. 0
1-45W600-55-22, Annunciator System Key Diagram, Rev. 24
1-45W600-55-46, Annunciator System Key Diagram, Rev. 3
1-45W600-55-1, Annunciator System Key Diagram, Rev. 15
1-15E500-2, Key Diagram Station Auxiliary Power System, Rev. 24
1-45W700-1, Key Diagram, 120 VAC & 125 VDC Vital Plant Control Power System, Rev. 14
1-45W703-9, Wiring Diagram, 125 VDC Vital Battery Board V, Single Line, Rev. 7
1-45W703-1, Wiring Diagram, 125 VDC Vital Battery Board I, Single Line, Rev. 42
1-45W709-8, Wiring Diagram, Chargers, Inverters, & Misc. Equipment Connection Diagram, Rev. 1
1-45W709-9, Wiring Diagram, Chargers, Inverters, & Misc. Equipment Connection Diagram, Rev. 0
1-45W600-1-2, Wiring Diagram, Main Steam System, MSIV Bypass, Rev. 14
1-45W600-1-3, Wiring Diagram, Main Steam System, Steam Generator Blowdown, Rev. 14
1-45W760-1-1, Wiring Diagram, Main Steam System, TDAFW Steam Supply, Rev. 12
1-45W760-1-2, Wiring Diagram, Main Steam System, TDAFW Steam Supply, Rev. 10
1-45W600-1-5, Wiring Diagram, Main Steam System, MSIVs, Rev. 7
1-45W600-1-6, Wiring Diagram, Main Steam System, MSIVs, Rev. 4

1-45W600-1-7, Wiring Diagram, Main Steam System, MSIVs, Rev. 4
1-45W760-3-3, Wiring Diagram, Main & Auxiliary Feedwater System, ERCW to MDP, Rev. 15
1-45W760-3-4, Wiring Diagram, Main & Auxiliary Feedwater System, ERCW to MDP, Rev. 15
1-45W760-3-5, Wiring Diagram, Main & Auxiliary Feedwater System, ERCW to TDP, Rev. 11
1-45W760-3-6, Wiring Diagram, Main & Auxiliary Feedwater System, MFW Isolation, Rev. 17
1-45W760-3-1, Wiring Diagram, Main & Auxiliary Feedwater System, Rev. 2
1-45W760-3-1A, Wiring Diagram, Main & Auxiliary Feedwater System, Rev. 23
1-45W760-63-3, Wiring Diagram, Safety Injection System, BIT Outlet, Rev. 11
1-45W760-67-1, Wiring Diagram, ERCW System, ERCW Pumps , Rev. 20
1-45W760-67-2, Wiring Diagram, ERCW System, ERCW Pumps , Rev. 13
1-45W760-62-1, Wiring Diagram, CVCS System, Charging Pumps , Rev. 14

Calculations

WBNAPS3-048, Range and Accuracy Requirements and Demonstrated Range of Instrumentation Provided to Measure Reg Guide 1.97 Type Variables, Rev. 13
WBN EEB-MS-TIO3-0012, Diesel Generator Loading Analysis, Current Rev. 59
WBN EEB-MS-TI11-0004, 125 VDC Voltage Analysis, Current Rev. 55
WBN EEB-EDQ1999-010001, Auxiliary Power System Analyses, Current Rev. 10

Design Basis Documents

Setpoint and Scaling Document (SSD) 1-R-90-119, Rev. 3
SSD 1-L-63-50, Rev. 5
SSD 1-L-63-51, Rev. 5
SSD 0-L-2-230, Rev. 2
SSD 0-L-2-233, Rev. 2
SSD 1-R-90-120, Rev. 3
SSD 1-R-90-421, Rev. 1
SSD 1-P-68-322, Rev. 4
SSD 1-P-68-340, Rev. 5
N3-1-4002, Main Steam System, Rev. 10
N3-3A-4002, Main Feedwater, Feedwater Control and Injection Water, Rev. 9
N3-3B-4002, Auxiliary Feedwater System, Rev. 9
N3-15-4002, Steam Generator Blowdown System, Rev. 10
N3-62-4001, Chemical and Volume Control System, Rev. 17
N3-63-4001, Safety Injection System, Rev. 12
N3-68-4001, Reactor Coolant System, Rev. 16
N3-74-4001, Residual Heat Removal System, Rev. 10
N3-82-4002, Standby Diesel Generator System, Rev. 11
N3-99-4003, Reactor Protection System, Rev. 15
WB-DC-30-31, Loose Parts Monitoring System, Rev. 3
WB-DC-40-24, Radiation Monitoring, Rev. 13
WB-CD-40-64, Section 4.13, Steam Generator Tube Rupture
WB-DC-30-27, AC and DC Control Power Systems, Rev. 24
WB-DC-30-28, Low and Medium Voltage Power Systems, Rev. 19

Updated Final Safety Analysis Report, Amendment 3

UFSAR Section 6.3, Emergency Core Cooling System
UFSAR Section 7.5, Instrumentation Systems Important to Safety
UFSAR Section 7.6.7, Loose Parts Monitoring System (LPMS) Description
UFSAR Section 8.2, Offsite (Preferred) Power System
UFSAR Section 8.3, Onsite (Standby) Power System
UFSAR Section 9.2.1, Essential Raw Cooling Water (ERCW)
UFSAR Section 9.2.2, Component Cooling System (CCS)
UFSAR Section 9.2.6, Condensate Storage Facilities
UFSAR Section 9.2.7, Refueling Water Storage Tank
UFSAR Section 9.3.1, Compressed Air System
UFSAR Section 9.3.2, Process Sampling System
UFSAR Section 9.3.4, Chemical and Volume Control System
UFSAR Section 10.3, Main Steam Supply System
UFSAR Section 10.4.8, Steam Generator Blowdown System
UFSAR Section 10.4.9, Auxiliary Feedwater System
UFSAR Section 11.4, Process and Effluent Radiological Monitoring and Sampling System
UFSAR Section 15.4.3, Steam Generator Tube Rupture

Technical Instructions

TI-119, Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting 10 CFR 50.65, Rev. 18
TI-12.04, User's Guide for Abnormal and Emergency Operating Instructions, Rev. 2
TI-12.06, Writer's Guide for Abnormal and Emergency Operating Instructions, Rev. 1
TI-34.01, Loose Parts Alarm Response, Rev. 7 (Performance copy dated June 16, 2003)

Technical Specifications

Section 3.4.10 and Bases, Pressurizer Safety Valves
Section 3.4.11 and Bases, Pressurizer Power Operated Relief Valves (PORVs)
Section 3.4.13 and Bases, RCS Operational LEAKAGE
Section 3.3.16 and Bases, RCS Specific Activity
Section 3.5.2 and Bases, ECCS - Operating
Section 3.5.4 and Bases, Refueling Water Storage Tank (RWST)
Section 3.7.1 and Bases, Main Steam Safety Valves (MSSVs)
Section 3.7.2 and Bases, Main Steam Isolation Valves (MSIVs)
Section 3.7.3 and Bases, Main Feedwater Isolation Valves (MFIVs), Main Feedwater Regulation Valves (MFRVs), and Associated Bypass Valves
Section 3.7.4 and Bases, Atmospheric Dump Valves (ADVs)
Section 3.7.5 and Bases, Auxiliary Feedwater (AFW) System
Section 3.7.6 and Bases, Condensate Storage Tank (CST)
Section 3.7.7 and Bases, Component Cooling System (CCS)
Section 3.7.8 and Bases, Essential Raw Cooling Water (ERCW) System
Section 3.7.14 and Bases, Secondary Specific Activity

Section 3.8.1 and Bases, AC Sources - Operating
Section 3.8.3 and Bases, Diesel Fuel Oil, Lube Oil, and Starting Air
Section 3.8.4 and Bases, DC Sources - Operating
Section 3.8.6 and Bases, Battery Cell Parameters
Section 3.8.5 and Bases, DC Sources - Shutdown

Work Orders (WOs)

WO 03-011522-000, Handswitch Close Pushbutton Is Broken and Missing Green Lens Cover
WO 010588900, 18 Month Channel Calibration Pressurizer Pressure Channel I Loop 1-LPP-68-340 (P-455), Completed 3/4/02
WO 010600500, 18 Month Channel Calibration Pressurizer Pressure Channel IV, Loop 1-LPP-68-322 (P-458), Completed 3/1/02
WO 010588901, 18 Month Channel Calibration Pressurizer Pressure Channel I, Loop 1-LPP-68-340 (P-455), Completed 1/30/02
WO 010585200, 18 Month Channel Calibration, TADOT And Response Time Test AFW Initiation From Main Feed Pump Turbine 1A Trip, Completed 3/15/02
WO 010599200, 18 Month Channel Calibration, TADOT And Response Time Test AFW Initiation From Main Feed Pump Turbine 1B Trip, Completed 3/15/02
WO 010611200, 18 Month Channel Calibration Steam Generator 1 Narrow Range Level Channel II, Loop 1-LPL-3-38 (L-519), Completed 3/5/02
WO 010611201, 18 Month Channel Calibration Steam Generator 1 Narrow Range Level Channel II, Loop 1-LPL-3-38 (L-519), Completed 12/10/01
WO 000078300, 18 Month Channel Calibration Steam Generator 1 Narrow Range Level Channel II Loop 1-LPL-3-38 (L-519), Completed 9/17/00
WO 000078301, 18 Month Channel Calibration Steam Generator 1 Narrow Range Level Channel II, Loop 1-LPL-3-38 (L-519), Completed 7/27/00
WO 010594500, 18 Month Channel Calibration Steam Generator 1 Narrow Range Level Channel III Loop 1-LPL-3-39 (L-518), Completed 3/5/02
WO 010594501, 18 Month Channel Calibration Steam Generator 1 Narrow Range Level Channel III Loop 1-LPL-3-39 (L-518), Completed 12/31/01
WO 000060500, 18 Month Channel Calibration Steam Generator 1 Narrow Range Level Channel III Loop 1-LPL-3-39 (L-518), Completed 9/18/00
WO 000060501, 18 Month Channel Calibration Steam Generator 1 Narrow Range Level Channel III Loop 1-LPL-3-39 (L-518), Completed 8/17/00
WO 010595400, 18 Month Channel Calibration Steam Generator 1 Narrow Range Level Channel IV Loop 1-LPL-3-42 (L-517), Completed 3/7/02
WO 010595401, 18 Month Channel Calibration Steam Generator 1 Narrow Range Level Channel IV Loop 1-LPL-3-42 (L-517), Completed 1/14/02
WO 000061500, 18 Month Channel Calibration Steam Generator 1 Narrow Range Level Channel IV Loop 1-LPL-3-42 (L-517), Completed 9/18/00
WO 000061501, 18 Month Channel Calibration Steam Generator 1 Narrow Range Level Channel IV Loop 1-LPL-3-42 (L-517), Completed 8/28/00
WO 010597300, 18 Month Channel Calibration Steam Generator 1 Wide Range Level Channel III, Loop 1-LPL-3-43 (L-501), Completed 3/6/02

WO 000063800, 18 Month Channel Calibration Steam Generator 1 Wide Range Level Channel III, Loop 1-LPL-3-43 (L-501), Completed 9/19/00
WO 000063801, 18 Month Channel Calibration Steam Generator 1 Wide Range Level Channel III, Loop 1-LPL-3-43 (L-501), Completed 8/17/00
WO 030428600, 18 Month Channel Calibration Steam Generator 1 Main Steam Header Pressure Channel I Loop 1-LPP-1-2A (P-514), Completed 6/9/03
WO 010944600, 18 Month Channel Calibration Steam Generator 1 Main Steam Header Pressure Channel I Loop 1-LPP-1-2A (P-514), Completed 1/23/02
WO 010944601, 18 Month Channel Calibration Steam Generator 1 Main Steam Header Pressure Channel I Loop 1-LPP-1-2A (P-514), Completed 1/23/02
WO 000080400, 18 Month Channel Calibration RCS Loop 1 Wide Range Pressure Channel I, Loop 1-LPP-68-63 (P-406), Completed 10/5/00
WO 010613100, 18 Month Channel Calibration RCS Loop 1 Wide Range Pressure Channel I, Loop 1-LPP-68-63 (P-406), Completed 3/18/02
WO 000063700, 18 Month Channel Calibration Pressurizer Level Channel III Loop 1-LPL-68-320 (L-461), Completed 9/21/00
WO 000063701, 18 Month Channel Calibration Pressurizer Level Channel III Loop 1-LPL-68-320 (L-461), Completed 6/21/00
WO 010597201, 18 Month Channel Calibration Pressurizer Level Channel III Loop 1-LPL-68-320 (L-461), Completed 1/28/02
WO 010597200, 18 Month Channel Calibration Pressurizer Level Channel III Loop 1-LPL-68-320 (L-461), Completed 3/8/02
WO 990826400, 18 Month Channel Calibration RCS Loop 1 Wide Range Hot Leg Temperature Loop 1-LPT-68-1 (T-413A), Completed 8/10/99
WO 020145600, 18 Month Channel Calibration RCS Loop 1 Wide Range Hot Leg Temperature Loop 1-LPT-68-1 (T-413A), Completed 8/8/02
WO 990825000, 18 Month Channel Calibration RCS Loop 1 Wide Range Cold Leg Temperature Loop 1-LPT-68-18 (T-413B), Completed 8/12/99
WO 020144000, 18 Month Channel Calibration RCS Loop 1 Wide Range Cold Leg Temperature Loop 1-LPT-68-18 (T-413B), Completed 8/8/02
WO 952367700, Centrifugal Charging Pump Flow Calibration, Completed 4/9/96
WO 980150580, Centrifugal Charging Pump Flow Calibration, Completed 2/23/99
WO 001057300, 18 Month Channel Calibration, RWST Level, Channel I, Loop 1-LPL-63-50 (L-913), Completed 10/30/00
WO 011164100, 18 Month Channel Calibration, RWST Level, Channel I, Loop 1-LPL-63-50 (L-913), Completed 3/22/02
WO 000907400, 18 Month Channel Calibration, RWST Level, Channel II, Loop 1-LPL-63-51 (L-914), Completed 10/10/00
WO 011146300, 18 Month Channel Calibration, RWST Level, Channel II, Loop 1-LPL-63-51 (L-914), Completed 3/8/02
WO 001526600, 18 Month Channel Calibration Steam Generator 3 Auxiliary Feedwater Flow Loop 1-LPF-3-147A, Completed 2/1/01
WO 020489200, 18 Month Channel Calibration Steam Generator 3 Auxiliary Feedwater Flow Loop 1-LPF-3-147A, Completed 7/17/02
WO 001526700, 18 Month Channel Calibration of Post Accident Remote Shutdown Monitoring Auxiliary Feedwater Flow Loop 1-LPF-3-147B, Completed 2/2/01

WO 020489400, 18 Month Channel Calibration of Post Accident Remote Shutdown Monitoring Auxiliary Feedwater Flow Loop 1-LPF-3-147B, Completed 7/18/02
WO 010158690, Condensate Storage Tank A Level Calibration, Completed 12/17/02
WO 010075220, Condensate Storage Tank B Level Calibration, Completed 10/19/01
WO 020123390, Condensate Storage Tank B Level Calibration, Completed 3/5/03
WO 001566600, 18 Month Channel Calibration Auxiliary Feedwater Pump 1A-A Suction Header Pressure Switches, Completed 3/21/01
WO 020486600, 18 Month Channel Calibration Auxiliary Feedwater Pump 1A-A Suction Header Pressure Switches, Completed 8/7/02
WO 001484700, 18 Month Channel Calibration Auxiliary Feedwater Pump 1B-B Suction Header Pressure Switches, Completed 1/17/02
WO 020301700, 18 Month Channel Calibration Auxiliary Feedwater Pump 1B-B Suction Header Pressure Switches, Completed 8/28/02
WO 980150580, Centrifugal Charging Pump Flow Periodic Calibration for 1-LPF-63-170, Completed 2/23/99
WO 980106160, Pressurizer Level Not Being Controlled at 60% for 100 % Tav, Completed 8/14/98
WO 990109590, Hot and Cold Leg Loop 1 Pen #2 would not calibrate, Completed 9/7/99
WO 010259400, 18 Month Channel Calibration (Source Cal) of the General Atomic Noble Gas Radiation Monitoring Loops (1-LPR-90-119), Completed 9/18/01
WO 020910600, 18 Month Channel (Source Cal) of the General Atomic Noble Gas Radiation Monitoring Loops, Completed 10/16/02
WO 001186000, 18 Month Channel Calibration (Source Cal) of the Steam Generator Blowdown Liquid Sample Radiation Monitor Loops 1-LPR-90-120, Completed 12/14/00
WO 020125100, 18 Month Channel Calibration (Source Cal) of the Steam Generator Blowdown Liquid Sample Radiation Monitor Loops 1-LPR-90-120, Completed 8/23/02
WO 020127200, 18 Month Channel Calibration (Source Cal) of the Steam Generator Blowdown Liquid Sample Radiation Monitor Loops 1-LPR-90-121, Completed 8/21/02
WO 001187900, 18 Month Channel Calibration (Source Cal) of the Steam Generator Blowdown Liquid Sample Radiation Monitor Loops 1-LPR-90-121, Completed 12/11/00
WO 010052990, Radiation Calibration, Completed 3/20/02
WO 990166010, 18 Month Channel Calibration of Steam Line Radiation Monitor Loop 1-LPR-90-421, Completed 9/14/00
WO 010053000, 18 Month Channel Calibration of Steam Line Radiation Monitor Loop 1-LPR-90-422, Completed 3/15/02
WO 010053010, 18 Month Channel Calibration of Steam Line Radiation Monitor Loop 1-LPR-90-423, Completed 3/18/02
WO 990167120, 18 Month Channel Calibration of Steam Line Radiation Monitor Loop 1-LPR-90-423, Completed 9/17/00
WO 010053020, 18 Month Channel Calibration of Steam Line Radiation Monitor Loop 1-LPR-90-424, Completed 3/15/02
WO 990165990, 18 Month Channel Calibration of Steam Line Radiation Monitor Loop 1-LPR-90-424, Completed 9/14/00
WO 990167290, 18 Month Channel Calibration of Steam Line Radiation Monitor Loop 1-LPR-90-422, Completed 9/18/00

WO 010053000, 18 Month Channel Calibration of Steam Line Radiation Monitor Loop 1-LPR-90-422, Completed 3/17/02
WO 020110410, Repair or Replace 1-TR-68-1, Completed 8/26/02
WO 01015780005, Backfill 1-PT-1-2A, Completed 3/13/03
WO 010039220, Flow indicator is reading 660 gpm with no flow - repair indicator, Completed 3/30/01
WO 0215411000, ERCW Pump F-B Breaker 067-0051 Tripped on TOC, November 11,2002
WO 9713664000, ERCW Pump H-B Breaker 067-0059 Failed to Test Close, September 16, 1997
WO 9714081000, ERCW Pump B-A Breaker 067-0032 Tripped Open, October 5, 1997
WO 9810059000, ERCW Pump H-B Breaker 067-0059 Failed to Test Close, August 4, 1998
WO 0312591000, 125 V Battery 1A-A Resistance Measurements, July 9, 2003
WO 0312577000, 125 V Vital Battery V Resistance Measurements, July 9, 2003

Design Change Notices/Modifications

F-33273-A, Install EPROMS in RM-80s to Correct 10CFR21 Error

Periodic/Surveillance Instructions

1-ODI-90-25, Condenser Vacuum Exhaust Release, Rev. 12
1-PI-OPS-1-FP, Freeze Protection, Rev. 18
1-PI-CEM-1.0, Monthly Response Checks of 1-RE-90-119 AND 1-RE-90-120A/121, Rev. 10
1-SI-0-2A-01, 1900 - 0700 Shift and Daily Surveillance Log - Mode One, Rev. 19, performed June 22 - 23, 2003
1-SI-0-2B-01, 0700 - 1900 Shift and Daily Surveillance Log - Mode One, Rev. 31, performed June 22, 2003
1-SI-3-901-A, Motor Driven Auxiliary Feedwater Pump 1A-A Quarterly Performance Test, Rev. 7, performed June 9, 2003
1-SI-3-901-B, Motor Driven Auxiliary Feedwater Pump 1B-B Quarterly Performance Test, Rev. 7, performed May 9, 2003
1-SI-3-902, Turbine Driven Auxiliary Feedwater Pump 1A-S Quarterly Performance Test, Rev. 13, performed April 10 - 12, 2003
1-SI-62-901-A, Centrifugal Charging Pump 1A-A Quarterly Performance Test, Rev. 13, performed April 22 - 23, 2003
1-SI-62-901-B, Centrifugal Charging Pump 1B-B Quarterly Performance Test, Rev. 13, performed April 30 - May 2, 2003
1-SI-63-901-A, Safety Injection Pump 1A-A Quarterly Performance Test, Rev. 8, performed March 28, 2003
1-SI-63-901-B, Safety Injection Pump 1B-B Quarterly Performance Test, Rev. 8, performed April 10 - 12, 2003
1-SI-68-50, Secondary Coolant Specific Activity, Rev. 5
1-SI-74-901-A, Residual Heat Removal Pump 1A-A Quarterly Performance Test, Rev. 9, performed April 24 - 25, 2003
1-SI-74-901-B, Residual Heat Removal Pump 1B-B Quarterly Performance Test, Rev. 6, performed June 1 - 2, 2003

0-SI-215-32-B, Diesel Generator 1B-B Battery Annual Inspection, Completed November 13, 2001
0-SI-215-32-B, Diesel Generator 1B-B Battery Annual Inspection, Completed October 15, 2002
0-SI-215-31-A, Diesel Generator 1A-A Battery Annual Inspection, Completed November 26, 2001
0-SI-215-31-A, Diesel Generator 1A-A Battery Annual Inspection, Completed October 29, 2002
0-SI-215-34-B, Diesel Generator 2B-B Battery Annual Inspection, Completed January 14, 2002
0-SI-215-34-B, Diesel Generator 2B-B Battery Annual Inspection, Completed December 16, 2002
0-SI-215-33-A, Diesel Generator 2A-A Battery Annual Inspection, Completed November 5, 2001
0-SI-215-33-A, Diesel Generator 2A-A Battery Annual Inspection, Completed November 4, 2002
0-SI-236-1, 125 VDC Vital Battery Weekly Inspection, Completed May 27, 2003
0-SI-236-31, 125 VDC Vital Battery I Annual Inspection, Completed April 14, 2003
0-SI-236-31, 125 VDC Vital Battery I Annual Inspection, Completed June 11, 2001
0-SI-236-32, 125 VDC Vital Battery II Annual Inspection, Completed January 7, 2003
0-SI-236-35, 125 VDC Vital Battery V Annual Inspection, Completed March 19, 2002
0-SI-236-45, 125 VDC Vital Battery V 18 Month Service Test, Completed September 6, 2002
0-SI-236-42, 125 VDC Vital Battery II 18 Month Service Test and 125 VDC Vital Battery Charger II Test, Completed November 15, 2002

Problem Evaluation Reports

PER 00-007756-000,(SEQ) OE-11813, Transport Time to Radiation Monitor During SGTR
PER 01-011978-000, MSIV 1-FCV-1-4 Failed to Fully Close During Unit Shutdown on June 29, 2001
PER 01-017357-000, Review of WBN Calculations to Assure Appropriate RCS Activity is Included and Condenser Vacuum Pump Air Exhaust Monitor 1-RM-90-119 is Properly Set.
PER 03-011279-000, Potential Fuel Leak Indication Based on Chemistry Analysis
PER 03-012114-000, RCS Gas Sample Not Consistent With Previous Result
PER 01-000909-000, 1-FI-3-147A out of tolerance.
PER 02-011043-000, 1-TR-68-1 out of tolerance.
PER 00-012732-000, 1-LCV-3-164 failed to move.
PER 00-012994-000, Blue insulated terminal lugs.
PER 00-013780-000, Problems with B train SOVs.
PER 00-015024-000, PORV for #1 SG opened.
PER 00-015679-000, #1 SG PORV opened.
PER 01-004535-000, Loop calibration interval
PER 01-007415-000, 1-PCV-1-5 spuriously opened.
PER 02-010758-000, 1-PIC-1-62 has been replaced twice in 2002.
PER 02-011812-000, Incorrect assumption in calculation EPM-SMC-110292.
PER 03-001415-000, Two valves failed to remain open during SGBD system restoration.

PER 01-014170-000, Train B AFW failed to auto start following reactor trip.
PER 02-003409, 1-BKR-212-B2/4B Failed to Transfer During Testing, August 29, 2002
PER 02-011766, 125 V Vital Battery Charger II Float / Equalize Switch, March 7, 2002
PER 03-004549, Watts Bar has not established a formal 480V Breaker Rebuild Schedule, March 5, 2003

Problem Evaluation Reports Written Due to this Inspection

WBN PER 03-012096-000, N3-1-4002, Paragraph 4.1 Makes an Incorrect Statement
WBN PER 03-012118-000, Generic Review of SEQ Inspection Report
WBN PER 03-012122-000, TI-12.04, Section 2.7.A, Step 8 Direction Incomplete
WBN PER 03-012155-000, Delete Reference to Q List in SSD
WBN PER 03-012504-000, Procedure Correction for 1-PI-CEM-1.0
WBN PER 03-012510-000, Enhancements to RCI-104
WBN PER 03-012539-000, Potentially Misleading Action Listed in Step 5 of E-3
WBN PER 03-012540-000, No TI Evaluation Found
WBN PER 03-012575-000, WO in EDMS not Located
WBN PER 03-012579-000, Correctly Testing Fifth Vital Battery
WBN PER 03-012585-000, Enhancements Identified During Operator Walkdown
WBN PER 03-012676-000, 1-RE-90 Setpoints
WBN PER 03-012690-000, Discrepancy with Wording in Paragraph 3.3.3.1 of N3-15-4002
WBN PER 03-012691-000, DG Battery
WBN PER 03-012693-000, Lesson Plan 3-OT-EOP0300
WBN PER 03-012699-000, Calc Does Not Address MSSV Setpoint Tolerance
WBN PER 03-012704-000, SOI-1.01, Section 8.2.3 Enhancements
WBN PER 03-012705-000, E-3 Step 5 Procedure Enhancement
WBN PER 03-012707-000, Evaluate Need for Procedural Guidance
WBN PER 03-12722, 000, Annunciator Inverter Preventive Maintenance

Vendor and Technical Manuals

WBN-VTD-W120-0220, Instructions for Westinghouse Large AC Motors - Life-Line D Horizontal Induction Motor (Pub. # I.L. 3100-D1) , Rev. 5
WBN-VTD-W120-0580, Westinghouse Instructions for Large AC Motors - Life-Line D Vertical Induction Motor (Pub. # I.L. 3030-D1), Rev. 3
WBN-VTD-C173-0030, C&D DCU- Lead Calcium / DU- Lead Antimony Stationary Batteries, Rev. 1
WBN-VTD-5250-0040, Solid State Controls, Inc. Recommended Maintenance Guide Ferroresonant UPS Systems, Rev. 0
WBN-VTD-52500-0050, Instructions & Operating Manual with Drawings for Solidstate Controls, Inc. Inverter, Rev. 1

Self Assessment Reports

WBN-CEM-02-005, Primary to Secondary Leak Program, November 5 - 7, 2001
WBN-CEM-03-004, Primary to Secondary Leak (PSL) Program, May 12 - June 5, 2003

Miscellaneous Documents

3-OT-EOP-0300, E-3 Steam Generator Tube Rupture Training, Rev. 11
3-OT-JPMA054, Isolate a Steam Generator Tube Leak (MSIV Fails To Close) Per AOI-33, Rev. 1
3-OT-JPMR017, Isolate a Ruptured Steam Generator (MSIV Fails to Close) per E-3, Rev. 8
3-OT-SIT-0026, Steam Generator Tube Leak/Rupture Training, Rev. 2
3-OT-SRT0091C, Licensed Requalification (SGTR) Training, Rev. 0
Letter from William J. Museler, Watts Bar Site Vice President to U. S. Nuclear Regulatory Commission, Subject - Watts Bar Nuclear Plant (WBN) - Steam Generator Tube Rupture (SGTR) Analysis - Proposed License Condition 41 (TAC M77569)
Maintenance Rule Expert Panel - Meeting Minutes for meeting held on January 30, 2003
Maintenance Rule Expert Panel - Meeting Minutes for meeting held on May 8, 2003
Offsite Dose Calculation Manual (ODCM), Table 1.1-2, Radioactive Gas Effluent Monitoring Instrumentation, Rev. 10
OE11813, Transport Time to Radiation Monitor During SGTR, August 25, 2000
Watts Bar Nuclear Plant (WBN) - Component Failure Trending Program - Trend Evaluation Report dated April 4, 2003
Watts Bar System Status - 2nd QUARTER FY 03
Westinghouse Owners Group Emergency Response Guideline E-0, Rev. 1C
Westinghouse Owners Group Emergency Response Guideline E-3, Rev. 1C

Codes & Standards

IEEE 450, Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications, 1995 & 2002

PARTIAL LIST OF COMPONENTS REVIEWED

AFW Pumps (1A-A, 1B-B)
Turbine Driven AFW Pump (1A-S)
CVCS Pumps (1A-A, 1B-B)
SI Pumps (1A-A, 1B-B)
RHR Pumps (1A-A, 1B-B)
Condensate Storage Tank (CST-A)
Refueling Water Storage Tank (Tank-63-46)
Condenser Vacuum Pump Exhaust Rad Monitor (1-RE-90-119)
SGBD Liquid Rad Monitor (1-RE-90-120/121)
Main Steam Line Rad Monitors (1-RE-90-421, 422, 423, 424)
Main Steam Isolation Valve (FCV-1-4)
MFW Regulating Valves (FCV-3-35, 48, 90, 103)
AFW Pump Motors (1A-A , 1B-B)
Charging Pump Motors (1A, 1B)
ERCW Pump Motors
ERCW To MDAFW Pump Suction Valves (1-FCV-3-116A, -116B, -126A, 126B)

ERCW To TDAFW Pump Suction Valves (1-FCV-3-136A, -136B, -179A, 179B)
AFW Turbine Steam Supply Valve (FCV-01-15)
AFW Trip & Throttle Valve (FCV-01-51)
Main Feedwater Isolation Valve (1-FCV-3-87)
Radiation Monitors (1-LRP-90-119, -120, -121)
Main Steam Isolation Valves (1-FCV-1-11, -22)
BIT Outlet Valves (1-FCV-63-25, -26)
Vital Inverters and Battery Chargers
Condensate Storage Tank Level (1-LT-2-230 & 1-LT-2-233)
RWST Level (1-L-63-50, -51)
Pressure Switches (PS-3-139A, -B, -D and PS-3-144A, -B, -D)
125 Volt DC Station Batteries and Battery Charges
250 Volt DC Batteries and Battery Chargers
EDGs and EDG Batteries
6.9 KV Shutdown Boards