



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

December 21, 2001

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

SUBJECT: WATTS BAR NUCLEAR PLANT - NRC INSPECTION REPORT 50-390/01-07,
50-391/01-07

Dear Mr. Scalice:

On November 29, 2001, the Nuclear Regulatory Commission (NRC) completed an inspection at your Watts Bar Nuclear Plant, Units 1 and 2. The enclosed report documents the inspection findings which were discussed on November 30, 2001, with Mr. D. Kulisek, Assistant Plant Manager, and others of your staff.

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

No findings of significance were identified during the inspection.

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

Sincerely,

/RA/

Charles R. Ogle, Chief
Engineering Branch
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
Nos. 50-390/01-07 and 50-391/01-07 w/Attachment

cc w/encl:
Karl W. Singer
Senior Vice President
Nuclear Operations
Tennessee Valley Authority
Electronic Mail Distribution

Jon R. Rupert, Vice President (Acting)
Engineering and Technical Services
Tennessee Valley Authority
Electronic Mail Distribution

William R. Lagergren
Site Vice President
Watts Bar Nuclear Plant
Tennessee Valley Authority
Electronic Mail Distribution

General Counsel
Tennessee Valley Authority
Electronic Mail Distribution

Robert J. Adney, General Manager
Nuclear Assurance
Tennessee Valley Authority
Electronic Mail Distribution

Mark J. Burzynski, Manager
Nuclear Licensing
Tennessee Valley Authority
Electronic Mail Distribution

Paul L. Pace, Manager
Licensing and Industry Affairs
Watts Bar Nuclear Plant
Tennessee Valley Authority
Electronic Mail Distribution

Larry S. Bryant, Plant Manager
Watts Bar Nuclear Plant
Tennessee Valley Authority
Electronic Mail Distribution

(cc w/encl cont'd - See page 3)

(cc w/encl cont'd)
 County Executive
 Rhea County Courthouse
 375 Church Street, Suite 215
 Dayton, TN 37321-1300

County Executive
 Meigs County Courthouse
 Decatur, TN 37322

Lawrence E. Nanney, Director
 TN Dept. of Environment & Conservation
 Division of Radiological Health
 Electronic Mail Distribution

Ann Harris
 341 Swing Loop Road
 Rockwood, Tennessee 37854

John D. White, Jr., Director
 Tennessee Emergency Management Agency
 Electronic Mail Distribution

Distribution w/encl:

A. P. Hodgdon, OGC
 B. J. Keeling, GPA/CA
 M. A. Satorius, OE
 R. E. Martin, NRR
 H. N. Berkow, NRR
 RIDSNRRDIPMLIPB
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NAME	JAPE	BALDWIN	FILLION	MAXEY	MOORE	FREDRICKSON	
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U. S. NUCLEAR REGULATORY COMMISSION
REGION II

Docket Nos.: 50-390, 50-391

License Nos.: NPF-90 and Construction Permit No. CPPR-92

Report Nos.: 50-390/2001-07, 50-391/2001-07

Licensee: Tennessee Valley Authority (TVA)

Facility: Watts Bar Nuclear Plant, Units 1 and 2

Location: 1260 Nuclear Plant Road
Spring City, TN 37381

Dates: November 5-9, 2001, and November 26-30, 2001

Inspectors: R. Baldwin, Senior Operations Engineer
P. Fillion, Reactor Inspector
K. Maxey, Reactor Inspector
R. Moore, Reactor Inspector
F. Jape, Senior Project Manager, Lead

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

Enclosure

SUMMARY OF FINDINGS

IR 05000390-01-07, 05000391-01-07, on November 5-9, 2001, and November 26-29, 2001, Tennessee Valley Authority, Watts Bar Nuclear Plant, Units 1 and 2, Safety System Design and Performance Capability.

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

No findings of significance were identified.

Report Details

1. **REACTOR SAFETY** **Cornerstones: Mitigating Systems, Barrier Integrity**

1R21 Safety System Design and Performance Capability

.1 System Needs

.11 Process Medium

a. Inspection Scope

The team performed a design review of risk significant systems and components required to ensure successful mitigation of a loss of Essential Raw Cooling Water (ERCW) to verify they would be capable of performing their design functions. The team reviewed calculations to verify the voltage adequacy of the risk significant equipment during worst-case loading conditions. The team reviewed design drawings to verify that the redundant divisions of ERCW pumps and valves were energized from separate power sources and distribution systems.

The team reviewed the post-accident monitoring instrumentation associated with the ERCW system with regard to the design and qualification criteria contained in Regulatory Guide 1.97, Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident. Display and recording of flow and temperature in the main control room were examined. Problem Evaluation Reports (PERs) and work orders were reviewed to determine whether there had been any problems with these instruments.

The team reviewed the availability and reliability of the water source for the ERCW system including the supply and discharge paths between the Tennessee river and the plant. This included licensee actions to monitor silt build up in the intake canal. This review included design documentation, drawings, calculations, vendor manuals, test documentation, surveillance and operating procedures and installed equipment.

b. Findings

No findings of significance were identified.

.12 Operator Actions

a. Inspection Scope

The team reviewed selected emergency, abnormal, and system operating instructions associated with the ERCW system to verify that the procedures specified appropriate operator actions consistent with the requirements during normal, maintenance, and accident conditions. The inspectors discussed selected tasks (i.e., qualification cards and simulator guides) with training and operations personnel to understand operator actions and important equipment functions. Operator actions were also evaluated for consistency with events described in the Updated Final Safety Analysis Report

(UFSAR), Section 9.2, "Water System." The inspectors used the plant reference simulator to review specific scenarios of interest, including all six cases delineated in AOI-13, Loss of Essential Cooling Water" and the annunciator response instructions (ARIs). The team performed a walkdown of selected operator and maintenance actions depicted in abnormal operating instructions (AOIs), ARIs, and maintenance instructions (MIs) for coping with events that could cause a loss of ERCW or for plant preparation in anticipation of a flood. Selected actions included the alignment of ERCW to coolant charging pump (CCP) 1A-A lube oil cooler within 12 minutes in order to maintain integrity of the 1A-A CCP following a loss of the component cooling system (CCS).

b. Findings

No findings of significance were identified.

.13 Controls

a. Inspection Scope

The team reviewed the instrumentation and controls for the traveling screens to determine whether they would provide the desired control as described in the UFSAR and system description. Failure modes and capability to detect failures were evaluated.

The team reviewed the control circuit for the ERCW pumps to determine whether it would implement the automatic operation as described in the UFSAR and system description.

The team reviewed the instrument set points for the ERCW strainer differential pressure instrument loop and associated calibration procedures to check these were consistent with the design basis.

b. Findings

No findings of significance were identified.

.2 System Condition and Capability

.21 Installed Configuration

a. Inspection Scope

The team examined the installed configuration of the traveling screen differential pressure instrumentation for consistency with design documents and observed the readings of various meters and gauges in the instrumentation air system.

The team walked down the intake pumping station (IPS) to evaluate the installed configuration in terms of vulnerability to internal and environmental flood scenarios. Flood related design aspects such as sprinkler systems, electrical ductlines and sleeves, electrical manhole water level detectors, common drains, and location of sump pumps were evaluated. A sample of electrical sleeve seals installed to contain flood water were

examined for material condition. The licensee's surveillance of these seals was also reviewed.

The team examined a sample of circuit breakers which control valves in the ERCW system to check the configuration (i.e. locked open or energized) for consistency with the published system configuration.

The team reviewed surveillances, calibrations and operator rounds checks related to the traveling screens. Historical computer data of traveling screen differential pressure and ERCW flow were reviewed. Preventive maintenance procedures for the intake pumping station sumps and calibration records for ERCW pump motor over current relays were reviewed. The team reviewed PERs related to instances where 6.9 kilovolt circuit breakers failed to trip or close on demand covering the last three years.

The team performed field walkdowns of ERCW equipment in the IPS and auxiliary building to assess material condition, identify degraded conditions and verify the installed configuration was consistent with the design drawings and design inputs to calculations. Additionally the team reviewed the location of flood detection devices to verify the capability to detect ERCW induced internal flooding in the IPS and auxiliary building.

b. Findings

No findings of significance were identified.

.22 Design

a. Inspection Scope

Design and test documentation were reviewed to determine the ERCW flow requirements for safety related equipment. The team reviewed performance monitoring of the ERCW to assure the design capability was maintained. The team reviewed the availability of ERCW equipment during design basis flood conditions. The net positive suction head and lift requirements were reviewed with respect to the lowest anticipated river levels, for the ERCW and screen and strainer backwash pumps. The freeze protection measures for exposed ERCW piping were reviewed. This review included design documentation, drawings, calculations, vendor manuals, test documentation, surveillance and maintenance procedures, and installed equipment.

The team reviewed cable data sheets to verify adequate cable ampacity. The team reviewed cable routing information for associated ERCW pumps and performed a field review of the ERCW cables to check for physical separation between redundant divisions of control cables. The over current protection relay setpoints for ERCW pump motors were reviewed.

b. Findings

No findings of significance were identified.

.3 Selected Components

.31 Component Degardation

a. Inspection Scope

The team reviewed maintenance and testing documentation, performance trending information, and equipment history to assess the licensee's actions to verify and maintain the safety function, reliability, and availability of selected ERCW components. The selected equipment included pumps, traveling screens, strainers, backwash systems, and a risk-based selection of critical valves.

b. Findings

No findings of significance were identified.

.32 Design Changes

a. Inspection Scope

The team reviewed recent modifications to the ERCW system to determine that the modifications had not reduced system performance or introduced additional risk into the design. The team reviewed the technical adequacy of the licensee's design change documentation associated with increasing the breaker setting of the supply breaker to component cooling heat exchanger C discharge valve, and component level design changes accomplished using the procurement process to verify the system and equipment function were appropriately evaluated and maintained.

b. Findings

No findings of significance were identified.

.4 Identification and Resolution of Problems

a. Inspection Scope

The team reviewed PERs and work orders (WOs) on risk significant equipment related to the ERCW and support systems for the past five years to evaluate failure trends and to assess the adequacy of corrective actions for identified problems. The team also verified that the licensee was identifying procedural deficiencies at an appropriate threshold, was entering the deficiencies into the corrective action program, and that corrective actions were being taken for the identified deficiencies.

b. Findings

No findings of significance were identified.

4. **OTHER ACTIVITIES**

4OA6 Management Meeting

The lead inspector presented the inspection results to Mr. D. Kulisek, Assistant Plant Manager, and other members of TVA management at the conclusion of the inspection on November 29, 2001. The licensee acknowledged the findings presented. Proprietary information was not included in the inspection report.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

M. Brickey, Engineering Design Manager
J. Bushnell, Licensing Engineer
S. Casteel, RadCon and Chemistry Manager
M. Earles, Operations Shift Manager
R. Gray, System Engineer
R. Johnson, Engineering Support Manager
J. Kammeyer, Engineering and Support Manager
M. King, Chemistry Manager
F. Koontz, Senior Engineering Specialist
K. Parker, Maintenance and Modifications Manager
J. Roden, Operations Superintendent
P. Smith, Systems Engineering
R. Stockton, Licensing Engineer
J. Tortora, Scheduling Manager
C. Touchstone, Licensing Engineer
G. Vickery, Operations Support Manager

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

NRC

J. Bartley, Senior Resident Inspector
C. Ogle, Chief, Engineering Branch 1, Division of Reactor Safety
D. Rich, Resident Inspector

ITEMS OPENED, CLOSED, OR DISCUSSED

None

LIST OF DOCUMENTS REVIEWED

DRAWINGS

- 1-15E500-1, Key Diagram Station Auxiliary Power System, Rev. 28
- 1-15W880-8, Conduit & Grounding Conduit Bank Node Diagram, Rev. 1
- 1-35W800-1, Conduit & Grounding Elevation 711.0 & 722.0 Plan & Details, Rev. 28
- 1-35W800-5, Conduit & Grounding Details, Rev. 22
- 1-35W800-6, Conduit & Grounding Details, Rev. 19
- 1-35W880-2, Conduit & Grounding Node Diagram, Rev. 1
- 1-45B655-15B, Main Control Room Annunciator Inputs, Rev. 5
- 1-45B655-27A, Main Control Room Annunciator Inputs, Rev. 1
- 1-45W724-1, Wiring Diagram 6900V Shutdown Board 1A-A Single Line, Rev. 21
- 1-45W724-2, Wiring Diagram 6900V Shutdown Board 1B-B Single Line, Rev. 21
- 1-45W724-3, Wiring Diagram 6900V Shutdown Board 2A-A Single Line, Rev. 20
- 1-45W724-4, Wiring Diagram 6900V Shutdown Board 2B-B Single Line, Rev. 19
- 1-45W751-4, Wiring Diagram 480V Reactor MOV BD 1A2-A & 2A2-A Single Line Sh-1, Rev. 37
- 1-45W751-5, Wiring Diagram 480V Reactor MOV BD 1A2-A & 2A2-A Single Line Sh-2, Rev. 29
- 1-45W751-6, Wiring Diagram 480V Reactor MOV BD 1A2-A & 2A2-A Single Line Sh-3, Rev. 39
- 1-45W751-10, Wiring Diagram 480V Reactor MOV BD 1B2-B & 2B2-B Single Line Sh-1, Rev. 36
- 1-45W751-11, Wiring Diagram 480V Reactor MOV BD 1B2-B & 2B2-B Single Line Sh-2, Rev. 46
- 1-45W756-1, Wiring Diagram 480V Cont & Aux Building Vent Board 1A1-A & 2A1-A Single Line Sh-1, Rev. 53
- 1-45W756-2, Wiring Diagram 480V Cont & Aux Building Vent Board 1A1-A & 2A1-A Single Line Sh-2, Rev. 64
- 1-45W756-6, Wiring Diagram 480V Cont & Aux Building Vent Board 1B1-B & 2B1-B Single Line Sh-2, Rev. 70
- 1-45W760-67-1, Wiring Diagram ERCW System Schematic Diagram, Rev. 20
- 1-45W760-67-2, Wiring Diagram ERCW System Schematic Diagram, Rev. 13
- 1-45W760-67-3, Wiring Diagram ERCW System Schematic Diagram, Rev. 11
- 1-45W760-67-4, Wiring Diagram ERCW System Schematic Diagram, Rev. 15
- 1-45W760-67-9, Wiring Diagram ERCW System Schematic Diagram, Rev. 6
- 1-45W826-9, Conduit & Grounding Elevation 729.0 & 737.0 Ceiling Plan and Details, Rev. 47
- 1-45W828-7, Conduit & Grounding Elevation 757.0 Ceiling Plan and Details, Rev. 35
- 1-45W828-18, Conduit & Grounding Elevation 757.0 Details, Rev. 15
- 1-45W883-4, Conduit & Grounding Penetration Sealing and Fire Stop Details, Rev. 4
- 1-45W888-20, Conduit & Grounding Cable Tray Node Diagram, Elevation 737.0, Rev. 6
- 1-45W888-51, Conduit & Grounding Cable Tray Node Diagram, Elevation 735.0, Rev. 3
- 1-47W610-32-1, Electrical Control Diagram Control [P&ID] Air System, Rev. 13
- 1-47W610-67-1, Electrical Control Diagram [P&ID] ERCW System, Rev. 20
- 1-47W610-67-1A, Electrical Control Diagram [P&ID] ERCW System, Rev. 8
- 1-47W611-67-1, Electrical Logic Diagram Essential Raw Cooling Water, Rev. 5
- 1-47W611-67-2, Electrical Logic Diagram Essential Raw Cooling Water, Rev. 4
- 1-47W611-67-4, Electrical Logic Diagram Essential Raw Cooling Water, Rev. 4
- 1-47W611-67-5, Electrical Logic Diagram Essential Raw Cooling Water, Rev. 7

1-47W845-2, Mechanical Flow Diagram, ERCW System, Rev. 32
 3BN215, Miscellaneous Steel ERCW IPS Crane Boom Support, Rev.4
 3BN219, ERCW Intake Pumping Station (IPS) Equipment Supports, Rev. 7
 34N310, Handling Pedestal Crane Arrangement and Details, Rev. 0
 17772, SP Engineers Inc., 24 inch Model A Strainer, Miscellaneous Details, Rev. 0
 48N1248-1, Auxiliary Building Miscellaneous Steel Frames and covers, Rev. 10
 17993, SP Kinney Engineers Inc., 24 inch Model A Self Cleaning Strainers - Fabricated Design,
 Rev. C

Problem Evaluation Reports (PERs) And Work Orders (WOs)

PER 9600030, Mis-position of ERCW Supply Valve DG1B-B
 PER 960271, Breaker Positions Not Locked as Required
 PER 960757, Adverse Flow Indication on EDG 1B Discharge due to Plugged Line in Flow Indicator
 PER 970822, Watts Bar Review for Applicability of Sequoyah Manual Operated Gate Valve Failure
 PER 980890, Failure of Circuit Breaker for ERCW pump H-B
 PER 994897, Breaker Tripping when Valve is Closed
 PER 9914414, 2-PDI-67-62 Over-ranged By Performance of 2-FOR-67-2
 PER 000149, ERCW Flow to SIS Pump 1A-a, Room Cooler Below Design Requirement.
 PER 000393, Flow Control Valves for ESF Coolers, Limit Switches Out of Position
 PER 006390, ERCW Pump C-A Shaft Material Defects
 PER 006401, Local Differential Pressure Instrumentation for 2-FI-67-61 Found Isolated
 PER 006894, Low ERCW Flow to 1-B CS Pump Room Cooler and 1-B RHR Room Cooler
 PER 01-855, Periodic Calibration of Traveling Screen Differential Pressure Transmitter Loop
 PER 01-012634, 2-FT-67-61 Sensing Line Clogged
 PER 01-0814, C-A ERCW Pump Failed SI on Low Flow
 PER 01-12591, When taking loop data computer point Y2204A for header flow was OOT
 PER 01-14736, Periodic Calibration of FIC-67-433A
 PER 01-2532, Failure of Circuit Breaker 211-1828
 PER 01-3099, Unable to Achieve Normal Flow Through C CCS Heat Exchanger
 PER 01-5799, Intake Pumping Station Control Air Gas Purifier Weekly Inspection
 PER 01-7613, White Breaker Disagreement Light did not clear
 PER 01-7615, Charging motor mounting bolt loose circuit breaker 211-1912
 PER 01-7763, Flow indicator reads zero when there is approximately 1000 GPM flow
 WO 97-006147, IPS Train A Pump Bay Inspection
 WO 97-006194, IPS Train B Pump Bay Inspection
 WO 97-006242, Intake Pumping Station Forebay Inspection
 WO 98-006146, IPS Train A Pump Bay Inspection
 WO 98-009268, Intake Pumping Station Forebay Inspection
 WO 98-009267, IPS Train B Pump Bay Inspection
 WO 99-004828, Valve Breaker Trips While Closing Valve
 WO 99-014375, Freeze Protection Insulation Removed Without Appropriate Tracking
 WO 99-016757, IPS Train A Pump Bay Inspection
 WO 99-016758, IPS Train B Pump Bay Inspection
 WO 99-016759, Intake Pumping Station Forebay Inspection

WO 01015498, 1A-A Traveling Screen, Portion of Screen Partially Detached
 WO 01-015073, Flood Mode Spool Piece Inspection Multi-Equipment PMUG 1033V

Abnormal Operating Instructions

AOI-7.01, Maximum Probable Flood, Rev. 9
 AOI-7.09, Flood Mode Transfer Switch Alignment, Rev. 2
 AOI-13, Loss of Essential Raw Cooling Water, Rev. 21
 AOI-15, Loss of Component Cooling Water (CSS), Attachment 1, Rev. 18
 AOI-22, Break Of Upstream Dam, Rev. 14
 AOI-27, Main Control Room Inaccessibility, Rev. 16
 AOI-35, Loss of Offsite Power, Rev. 23
 AOI-40, Station Blackout, Rev. 3

Annunciator Response Instructions

ARI 223-A, ERCW HDR A SUP PRESS LO, Rev. 2
 ARI 223-B, ERCW PMP A-A DISCH PRESS LO, Rev. 2
 ARI 223-C, ERCW HDR 1A STRAINER Δ P HI, Rev. 2
 ARI 223-D, TRAV SCRNS 1A-A & 2A-A Δ P HI, Rev. 2
 ARI 223-E, TR-A ERCW PMPs PRELUBE & COOLING WATER PRESS LO, Rev. 2
 ARI 224-B, ERCW PMP B-A DISCH PRESS LO, Rev. 2
 ARI 224-C, ERCW HDR 1B STRAINER Δ P HI, Rev. 2
 ARI 224-D, TRAV SCRNS 1A-A ABNORMAL, Rev. 2
 ARI 224-E, SCRNS WASH PMP A-A PRELUBE & COOLING WATER PRESS LO, Rev. 2
 ARI 225-B, ERCW PMP C-A DISCH PRESS LO, Rev. 2
 ARI 225-D, TRAV SCRNS 2A-A ABNORMAL, Rev. 2
 ARI 225-E, TR-A/B ERCW TO C&SS COMPR FLOW HI, Rev. 2
 ARI 226-B, ERCW PMP D-A DISCH PRESS LO, Rev. 2
 ARI 226-D, ERCW PMP MOTOR OVERLOAD, Rev. 2
 ARI 226-E, ERCW/CCS MOTOR TRIP-OUT, Rev. 2
 ARI 227-A, ERCW PMP E-B DISCH PRESS LO, Rev. 2
 ARI 227-B, ERCW PMP F-B DISCH PRESS LO, Rev. 2
 ARI 227-C, ERCW HDR 2A STRAINER Δ P HI, Rev. 2
 ARI 227-D, TRAV SCRNS 1B-B & 2B-B Δ P HI, Rev. 2
 ARI 228-B, ERCW PMP G-B DISCH PRESS LO, Rev. 2
 ARI 228-C, ERCW HDR 2B STRAINER Δ P HI, Rev. 2
 ARI 228-D, TRAV SCRNS 1B-B ABNORMAL, Rev. 2
 ARI 228-E, SCRNS WASH PMP B-B PRELUBE & COOLING WATER PRESS LO
 ARI 229-A, ERCW B HEADER B SUP PRESS LO, Rev. 2
 ARI 229-B, ERCW PMP H-B DISCH PRESS LO, Rev. 2
 ARI 229-D, TRAV SCRNS 2B-B ABNORMAL, Rev. 2
 ARI 229-E, TR-B ERCW PMPs PRELUBE & COOLING WATER PRESS LO, Rev. 2

Emergency Operating Instructions

E-0, Reactor Trip or Safety Injection, Appendix A, Rev. 17A

Emergency Plan Implementation Procedures

EPIP-6, Activation and Operation of the Technical Support Center, Appendix X, Rev. 19

General Procedures

0-PI-OPS-17.1, Rev 6, dated 11/2/00, "Periodic Instruction 18-Month Locked Breaker Verification"
 0-PMP-040-0003A, Rev 0 and Rev 1, "Cleaning, Inspection and Testing of Sump and Related Components"
 0-PMP-040-0066A, Rev 0, "Cleaning, Inspection and Testing of Sump and Related Components"
 0-PMP-040-0002, Rev 1, "Cleaning, Inspection and Lubrication of Sump and Related Components"
 0-SI-67-901A, ERCW Pump A-A Performance Test, Rev.11
 0-SI-67-903A, ERCW C-A Performance Test, Rev. 11
 0-SI-67-906A, ERCW Screen Wash Pump 2A-A Quarterly Performance Test, dated 10/13/01
 0-SI-67-909-A, Check Valve Testing During Plant Operation - ERCW Supply to DG 1A-A, Rev. 4
 0-SI-82-3, 18 Month Loss of Offsite Power With Safety Injection Test - DG1A-A, Rev. 16
 1-PI-OPS-1-FP, Freeze Protection, Rev. 12
 1-PI-OPS-OS, Rev 6, dated 5/5/00, "Plant Instruction Outside AUO Work Station Responsibilities" (Record of readings taken 11/27/01 at IPS)
 1-SI-3-21, 18 Month Channel Calibration AFW Pump 1A-A Suction Header Pressure Switches, Rev.9
 1-SI-57-1-B, Rev 13, dated 9/15/00, "Surveillance Instruction 18-Month Unit 1 B Train ESF Load Sequence and Reset Timer Test"
 1-TRI-0-3, 18 Month A Train MOV Thermal Overload Relay Bypass Circuit Functional Test, Rev.9
 NEDP-8, Technical Evaluation for Procurement of Materials and Services, Rev. 6
 PM-1-LS-040-0017, Functional Check and Calibration of Flood Mode Switches, Rev. 0
 PM-1-LS-040-0019, Functional Check and Calibration of Flood Mode Switches, Rev. 3
 PTI-067-02, Pre-operational Test Instruction, ERCW Flow Balance, Rev. 0
 TI-31.08, Flow Balancing Valves Set Point Positions, Rev. 29
 TI-67.0001, Component Flow Blockage Testing, Train A ERCW, Rev. 0
 TI-100-006, Inservice Testing Program, Rev. 6

Maintenance Instructions

MI 17.20, Flood Preparation-Sample Heat Exchanger Spool Pieces, Rev. 5
 MI-17.21, Installation of Spool Pieces Between ERCW System and Component Cooling System, Rev. 6

Operations Procedures

1-PI-PS-1-OS, Outside AUO Work Station Responsibilities, Rev. 6
 SOI-67.01, Essential Raw Cooling Water System, Rev. 35

Plant Administrative Instructions

PAI-2.20, Replacement and Upgrade of Plant Component Identification Tagging and Labeling

Qualification Procedures

TRN-3, Administration of On-The-Job Training (OJT) and Task Performance Evaluation (TPE), Rev. 7
 3-OT-OJTRAOI, Task Qualification Standard, Reactor Operator, Abnormal Operating Instructions, Rev. 7
 3-OT-OJTRAAOI, Task Qualification Standard, Nuclear Auxiliary Unit Operator, Abnormal Operating Instructions, Rev. 1

Technical Instructions

TI-49, Compliance Instruments, Rev. 26

Calculations

0-PDS-67-431A, 447A & 1,2-PDS-67-9AA/B, 10AA/B”
 1,2-PDT-67-9A, Rev 5, dated 4/30/97, “Demonstrated Accuracy Calculation for Loops 1,2-PDT-67-9A-A and 1,2-PDT-67-10A-B”
 3C3B-1086-001, Moderate Energy Line Break Flood Levels for the IPS, rev. 0
 EPM-JFL-120285, ERCW System Flow Requirements, rev. 9
 EPM-JFW-080789, ERCW System Design Pressure and Temperature, rev. 8
 EPM-IVS-011092, Failure Modes and Effects Analysis of ERCW, rev. 2
 EPM-JFL-060395, ERCW Pump Lift Clearances, rev. 0
 EPM-RCT-121490, ERCW Maximum Rejected Heat Load Requirement, rev. 9
 EPM-WUC-072489, NPSH Available for ERCW Screen Backwash Pumps, rev. 1
 EPM-PTC-120594, ERCW Pressure Drop Calculation, rev. 5
 WBPEVAR9003002, Intake Pumping Station Underground Duct Bank Analysis, Rev. 4
 WBPEVAR8909010, Cable Ampacity-NV4 and NV5 Cables in Class 1E Raceways, Rev. 55
 WBPEVAR9003002, Intake Pumping Station Underground Duct Bank Analysis, Rev. 4
 WBPEVAR8909010, Cable Ampacity-NV4 and NV5 Cables in Class 1E Raceways, Rev. 55
 WBN-67-D053, Rev 4, dated 10/23/92, “Analytical/Operational Limits for ERCW Instruments:
 WCG-1-564-900917B-0006, Loss of Downstream Dam, dated 4/25/78

Design Changes

DCN-W-40004-A, Bypass Closed Torque Switch Bypass circuit on ERCW Strainer Isolation Valve, 1-FCV-62-22A, dated 10/2/98

DCN-D-50296, Increase Breaker Set Point for MOV FCV-67-152B, dated 5/10/00

DCN-D-50548, Replace Obsolete Robert Shaw Model 117-B1-A2-A Safety Related Transmitter, dated 3/28/00

Completed Surveillance Procedures and Test Records

0-FOR-304-1, Fire Barrier/Mechanical, Conduit, Cable Tray, and Fire Damper Penetration Visual Inspection, Rev. 5

UFSAR

Section 9.2.1, Essential Raw Cooling Water (ERCW)

Technical Specifications

TS Section 3.7.8, Essential Raw Cooling Water (ERCW) System

TS Section 7.2, Flood Protection Plan, Rev. 17

Design Criteria

WB-DC-40-29, Flood Protection Provisions

System Description

N3-67-4002, Essential Raw Cooling Water System, System 67, Issue Date: March 2, 1993

Plant Training Materials

3-OT-SYS067A, Essential Raw Cooling Water, Rev. 6

Miscellaneous

Procurement PEG PKG BYW291C, Commercial Grade Dedication of 3/8 inch round head Bolt, dated 4/16/01

PEG PKG BYW289Y, Commercial Grade Dedication of 3/8 inch hex head nut, dated 4/16/01

PEG PKG G3010-2-228, Commercial Grade Dedication, ERCW Pump Motor Over Running Clutch, dated 3/14/00

PEG PKG G5920-2-1386, Class 1E Fuses Procured as Commercial Grade, dated 3/18/99

PEG PKG 2001-08665A, Commercial Grade Procurement/dedication of ERCW Travel Screen Fasteners, dated 10/18/01

N3-67-4002, System Description, ERCW System, Rev. 9

Scaling and Set Point Document for Traveling Screen Differential Pressure Loop, ERCW
Supply Header Temperature and Supply Header Flow

Vendor Manual WBN-VTM-B580-0120, Byron Jackson ERCW Pumps, Rev. 10

Vendor Manual, WBN-VTM-E243-0010, Envirex Traveling Water Screen Service Manual, Rev.6

Vendor Manual, WBN-VTM-J105-0020, ERCW Screen Wash pumps - Johnston Vertical
Pumps, Rev. 1

Vendor Manual WBN-VTM-1T03-0050, "ITT Conoflow Instruction Manual for Fixed Differential
Regulator" [bubbler]