UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
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ATLANTA, GEORGIA 30303-8931

January 8, 2001

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 INSPECTION REPORT 50-390/00-08, 50-391/00-08

Dear Mr. Scalice:

On December 8, 2000, the NRC completed a triennial fire protection inspection at your Watts Bar Nuclear Plant Units 1 and 2. The enclosed report documents the inspection findings which were discussed on December 8, 2000, with Mr. D. Kulisek and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures 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/NRC/ADAMS/index.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: NRC Inspection Report 50-390,391/00-08

Attachments: (1) Supplemental Information - NRC's Revised Reactor Oversight Process
(2) List of Documents Reviewed
(3) List of Acronyms Used

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos:	50-390, 50-391
License Nos:	NPF-90 and Construction Permit CPPR-92
Report Nos:	50-390/00-08, 50-391/00-08
Licensee:	Tennessee Valley Authority (TVA)
Facility:	Watts Bar Nuclear Plant, Units 1 and 2
Location:	1260 Nuclear Plant Road Spring City TN 37381
Dates:	December 4-8, 2000
Inspectors:	F. Jape, Senior Project Manager, Region II N. Merriweather, Senior Reactor Inspector, Region II M. Thomas, Senior Reactor Inspector (Lead Inspector), Region II G. Wiseman, Senior Reactor Inspector, Region II F. Wyant, Contractor, Sandia National Laboratory
Accompanying Personnel:	S. Walker, Reactor Inspector (Trainee), Region II
Approved by:	C. Ogle, Chief Engineering Branch Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000390-00-08, IR 05000391-00-08, on 12/04-08/2000, Tennessee Valley Authority, Watts Bar Nuclear Plant, Units 1 and 2. Triennial fire protection baseline inspection.

The inspection was conducted by a regional fire protection team and one contractor. No findings of significance were identified.

Report Details

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems

1R05 FIRE PROTECTION

.01 Systems Required To Achieve and Maintain Post-Fire Safe Shutdown

a. Inspection Scope

The team reviewed the licensee's features for achieving and maintaining post-fire safe shutdown (SSD) conditions. The review was performed to determine whether the licensee's post-fire safe shutdown methodology properly identified the structures, systems, and components (SSCs) necessary to achieve and maintain post-fire SSD conditions. The team focused on the Appendix R performance goals for the shutdown functions (e.g., reactor coolant makeup, reactor heat removal, process monitoring, and the support functions) to ensure that at least one post-fire safe shutdown success path was available in the event of a fire in any of the selected fire areas. The team reviewed the licensee's Fire Protection Report, Supplement No. 18 of the Safety Evaluation Report (SSER-18), electrical one-line drawings, cable routing data, and plant procedures to determine the systems required for post-fire SSD. The team also selected several safe shutdown systems [e.g., auxiliary feedwater (AFW), component cooling (CCS), chemical and volume control (CVCS), essential raw cooling water (ERCW), main steam (MS) and reactor coolant system (RCS)] to review for fire protection adequacy. The team then reviewed the safe shutdown equipment list (SSEL), system flow diagrams, fire hazards analysis, and performed plant walkdowns for the selected fire areas in order to determine the completeness of the SSEL.

The team selected four risk significant fire areas based on the fire risk ranking in the licensee's individual plant examination for external events (IPEEE). The fire areas chosen for review during this inspection were:

- **[Fire Area 8]:** Unit 1 auxiliary building common area (elevation 713) contains the motor driven AFW pumps and the CCS pumps. An Appendix R fire in this area would involve alternative shutdown of the unit from the main control room (MCR).

- **[Fire Area 17]:** Unit 1 auxiliary building Train A 6.9 kilovolts (KV) and 480 volts (V) switchgear room (elevation 757, Room 757.0-A2). An Appendix R fire would involve alternative shutdown of the unit from the MCR using Train B systems and components.

- **[Fire Area 31]:** Unit 1 auxiliary building Train B 6.9KV and 480V switchgear room (elevation 757, Room 757.0-A24). An Appendix R fire would involve alternative shutdown from the MCR using Train A systems and components.

- **[Fire Area 48]:** Control building, all elevations (including the auxiliary instrument rooms, cable spreading room, MCR, etc.). An Appendix R fire would involve MCR evacuation and alternative shutdown from the auxiliary control room (ACR).

b. Findings

No findings of significance were identified.

.02 Fire Protection of Safe Shutdown Capability

.021 Cable and Equipment Separation and Fire Detection Systems

a. Inspection Scope

The team walked down accessible portions of the fire detection and alarm systems in the selected fire areas to observe the material condition, design, and operation of the installed configurations. The team also reviewed documentation such as deviations, detector placement drawings, detector design, spacing criteria, and detector locations for the installed detection systems in the selected fire areas to verify effectiveness of the systems and compliance with the National Fire Protection Association (NFPA) code. In plant areas of redundant trains, the team examined a sampling of SSD equipment cable routing for separation and fire protection features to verify that it was consistent with the requirements of 10 CFR Part 50, Appendix R, Section III.G. and the plant licensing basis.

b. Findings

No findings of significance were identified.

.022 Fixed Fire Suppression Systems

a. Inspection Scope

The team reviewed the adequacy of the design and installation of the carbon dioxide (CO_2) fire suppression systems for Fire Area 48 and the sprinkler systems located in Fire Areas 8, 17, and 31. Team members performed a walkdown of the selected areas to ensure proper placement and spacing of sprinkler heads and the lack of obstructions. The team also reviewed installed CO_2 control equipment to assure accessibility and functionality of the system and associated ventilation system fire dampers. Licensee design calculations and vendor pre-operational test reports were reviewed to ensure that the required quantity of CO_2 for each area was available. Surveillance test procedures for the fire detection and alarm systems, CO_2 fire suppression systems, and selected sprinkler systems were reviewed to determine compliance with the licensee's Updated Final Safety Analysis Report (UFSAR), Technical Specifications (TS) and the Testing and Inspection Requirements (TIR) in the approved fire protection program. Also, 10 CFR 50, Appendix R deviations and engineering evaluations for NFPA code deviations were reviewed and compared against the physical configuration of the selected fire areas. Additionally, the team reviewed flow diagrams, and engineering

evaluations associated with floor drain and heating, ventilation, and air conditioning (HVAC) systems to verify that systems and operator actions required for post-fire safe shutdown would not be inhibited by leakage or flooding from fire suppression activities or rupture of fire suppression systems.

b. Findings

No findings of significance were identified.

.023 Fire Brigade Equipment

a. Inspection Scope

The team performed a walkdown of the fire brigade house and response vehicle to assess the condition of fire fighting equipment. Fire brigade personal protective equipment was reviewed to evaluate equipment accessibility and functionality. The adequacy of the fire brigade self-contained breathing apparatus (SCBA) was reviewed as well as the availability of supplemental breathing air tanks. Team members also performed walkdowns of the selected fire areas and compared associated fire brigade pre-fire strategy plan drawings with as-built plant conditions.

b. Findings

No findings of significance were identified.

.024 Fire Brigade Drill Program

a. Inspection Scope

The team reviewed the fire brigade drill program and observed fire brigade response associated with an unannounced fire brigade drill in Fire Area 17. The team observed the drill to verify that: 1) the fire brigade properly donned their protective clothing and turnout gear; 2) SCBAs were properly worn and used; 3) fire hoses were capable of reaching the location and properly laid out; 4) the fire brigade made a controlled fire area entry; 5) the fire brigade leader's directions were clear; 6) radio communications were effective; and 7) the brigade's response and drill performance met the established drill objectives. The team also verified that the fire brigade performed a search for smoke and/or fire propagation, as well as search activities for fire victims. Previous critiques of other drills and fire brigade training and drill records were reviewed to determine when fire brigade drills had been conducted in the high fire risk plant areas and if the fire brigade personnel qualifications and drill participation met the requirements of the approved fire protection program.

b. Findings

No findings of significance were identified.

.03 Post-Fire Safe Shutdown Circuit Analysis

.031 Circuit Analysis

a. Inspection Scope

On a sample basis, the team reviewed the electrical schematics for control circuits of SSD components and looked for the potential effects of open circuits, shorts to ground, and hot shorts. In addition, the same circuit cable routing information was evaluated for potential damage due to fire in the selected fire areas. This review focused on the cabling of selected components in systems important for safe shutdown. The team's review also included a sampling of components whose inadvertent operation due to fire could adversely affect post-fire SSD capability. The purpose of this review was to determine if a single exposure fire in one of the fire areas selected for this inspection could prevent the proper operation of both safe shutdown trains.

b. Findings

No findings of significance were identified.

.032 Breaker and Fuse Coordination

a. Inspection Scope

The team reviewed the licensee's fuse and breaker coordination analysis for the 6.9KV shutdown boards 1A-A and 1B-B; 480V shutdown boards 1A1-A, 1A2-A, and 1B1-B; and the 480V reactor motor operated valve (MOV) boards 1A2-A and 1B2-B. The purpose of this review was to verify that selective coordination existed between branch circuit protective devices (fuses, breakers, relays, etc.) and the bus feeder breaker/fuse to ensure that in the event of a fire-induced short circuit, the fault would be isolated before the feeder device tripped. The concern was that, if a short to ground fault on an uncoordinated circuit were to occur, it could cause the feeder breaker or fuse to actuate and result in the loss of power to essential SSD equipment. In addition, the licensee's fuse replacement procedure was reviewed to verify that fuse replacements were the correct size and type and were in accordance with the fuse and breaker coordination analysis.

b. Findings

No findings of significance were identified.

.04 Alternative Shutdown Capability

a. Inspection Scope

The team reviewed the electrical isolation and protective fusing in the transfer circuits of ACR components required for alternative safe shutdown to verify that the components were physically and electrically separated from the fire area. The team examined a sample of flow and level indicators used for safe shutdown to verify that electrical isolation was provided. The team also reviewed calibration data packages for the sample of flow and level instruments to verify that the calibrations were being performed

in accordance with procedures. To assess the alternative shutdown methodology developed by the licensee, the team examined the selected fire areas and reviewed the licensee's methodology to determine the identified components and systems necessary to achieve and maintain SSD conditions. This included: (1) verifying that the methodology addressed achieving and maintaining hot and cold shutdown from outside the MCR with or without off-site power available; and (2) verifying that the transfer of control from the MCR to the alternative locations had been demonstrated to not be affected by fire-induced circuit faults. The team also reviewed associated Watts Bar calculations, administrative procedures, abnormal operating procedures, operating surveillance procedures, engineering surveillance procedures and electrical maintenance department surveillance procedures to verify the adequacy of the design and implementation of the alternative shutdown capability.

b. Findings

No findings of significance were identified.

.05 Operational Implementation of Alternative Shutdown Capability

a. Inspection Scope

The team reviewed the licensee's alternative shutdown procedures, training records, and personnel staffing to verify the licensee's capability to achieve and maintain hot and cold shutdown. The team reviewed the alternative shutdown capability for the selected fire areas to verify the following:

- training for licensed operators included alternative or dedicated SSD capability (e.g., simulator training covering transfer of controls from the MCR to the ACR)
- training for the fire brigade leader, fire brigade members, and the incident commander met the requirements of the Fire Protection Report
- personnel required to achieve and maintain the plant in hot standby following a fire using the alternative shutdown systems and components could be provided from normal onsite staff, exclusive of the fire brigade
- the licensee had incorporated the operability of alternative shutdown transfer and control functions into plant TS
- the licensee periodically performed operability testing of the alternative shutdown instrumentation and transfer and control functions, including imposing appropriate compensatory measures during testing when the alternative shutdown capability is declared inoperable

The team reviewed the alternative shutdown procedures to verify that the functions and equipment required for post-fire safe shutdown were included in the procedures. The objective of this review was to assure that the safe shutdown equipment, shutdown procedures, and the post-fire safe shutdown analytical approach were consistent and satisfied the Appendix R reactor performance criteria for safe shutdown. The team also

walked down selected portions of the shutdown procedure (AOI-30.2, Fire Safe Shutdown). The walkdowns were performed to verify that, for an Appendix R fire in Fire Area 48, the procedure could reasonably be performed within the required times with or without offsite power available. The team also considered the effect of a previous reduction in the number of assistant unit operators (AUOs) from seven to five performed by the licensee.

b. Findings

No findings of significance were identified.

.06 Communications for Performance of Alternative Shutdown Capability

a. Inspection Scope

The team observed a fire brigade drill, performed walkdowns of selected sections of Procedure AOI-30.2, and inspected selected shutdown equipment required for remote manual operator actions to verify that adequate communications equipment (e.g., radios) would be available for the personnel performing alternative safe shutdown activities. The team also observed the fire brigade drill critique to verify that deficiencies identified during the drill were appropriately entered in the licensee's corrective action program. Additionally, the team interviewed operations personnel to determine if there were any areas where the radios could not be used.

b. Findings

No findings of significance were identified.

.07 Emergency Lighting for Performance of Alternative Shutdown Capability

a. Inspection Scope

The team reviewed the design and operation of the 8-hour battery powered emergency lighting systems to determine their adequacy. The team performed a walkdown of a sample of remote shutdown equipment identified in Procedure AOI-30.2 for the selected fire areas to verify that emergency lighting lamps were operational and the lighting heads were aimed to provide adequate illumination to perform the required procedure actions.

b. Findings

No findings of significance were identified.

.08 Cold Shutdown Repairs

a. Inspection Scope

The team reviewed the repair procedure for the following components that were subject to fire damage and were needed to achieve cold shutdown:

- 1-FCV-74-2-B, Loop 4 hot leg to RHR suction isolation valve
- 1-FCV-74-9-B, RHR bypass (for valve 1-FCV-74-1-A) suction isolation valve
- 1-MTR-30-176-B, RHR pump 1B-B room cooler motor

The team performed walkdowns to verify that adequate materials for the repairs were available in pre-staged locations (e.g., pre-cut cables of the correct length and type) and consumables such as electrical tape were available onsite.

The team also reviewed the licensee's Appendix R emergency maintenance ventilation procedure and inspected the portable equipment and ventilation ducts stored at a special Appendix R storage area. This review was performed to verify the availability and adequacy of the procedure and equipment used for cooling an electrical equipment room required to reach cold shutdown.

b. Findings

No findings of significance were identified.

.09 Fire Barrier and Fire Area/Zone/Room Penetration Seals

a. Inspection Scope

The team reviewed the selected fire areas to evaluate the adequacy of fire area barrier enclosure walls, ceilings, floors, cable coatings, structural beam support protection, fire barrier penetration seals, fire doors, electrical raceway fire barrier systems, and fire dampers. This was accomplished by observing the material condition and configuration of the installed fire barrier features, as well as, construction details and supporting fire endurance tests for the installed fire barrier features. The team also reviewed the fire loading calculations to verify that the fire loading used by the licensee was appropriate for determining the fire resistive rating of the fire barrier enclosures. In addition, the team reviewed licensing documentation, evaluations of fire barrier features, engineering calculations, and NFPA code deviations to verify that the fire barrier installations met design requirements and licensing commitments.

b. Findings

No findings of significance were identified.

.10 Fire Protection Systems, Features, and Equipment

a. Inspection Scope

The team reviewed flow diagrams and valve lineup procedures associated with the electric and diesel driven fire pumps and fire protection water supply system. These systems are used for manual fire fighting activities and/or water-based fire suppression systems which protect redundant trains of systems for hot shutdown. The review was to

determine whether the common fire protection water delivery and supply components could be damaged or inhibited by fire-induced failures of electrical power supplies or control circuits. Additionally, team members performed a walkdown of the electric and diesel driven fire pumps and portions of the fire protection water supply system in the selected areas. This was done to assess the material condition, operational effectiveness, and whether the design of the fire hose equipment and fire extinguishers were properly reflected in the fire brigade pre-fire plans.

b. Findings

No findings of significance were identified.

.11 Compensatory Measures

a. Inspection Scope

The team reviewed the administrative controls for out-of-service, degraded, and/or inoperable fire protection systems and post-fire SSD systems and components. The review was performed to verify that the risk associated with removing fire protection and/or post-fire systems or components was properly assessed and adequate compensatory measures were implemented in accordance with the licensee's TS and the TIR in the approved fire protection program.

b. Findings

No findings of significance were identified.

.12 Identification and Resolution of Problems

a. Inspection Scope

The team reviewed a sample of problem evaluation reports (PERs) to verify that items related to fire protection were entered in the licensee's corrective action program in accordance with licensee procedural requirements. The items selected were reviewed for classification and appropriateness of the corrective actions taken to resolve the issues. The team reviewed selected operating experience items related to fire protection to determine if they were dispositioned properly. In addition, the team held discussions with licensee performance analysis personnel and reviewed trending data of PERs to determine if any adverse trends had been observed.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA6 Meetings

.01 Exit Meeting Summary

The lead inspector presented the inspection results to Mr. Dave Kulisek, Operations Manager, and other members of licensee management and staff at the conclusion of the inspection on December 8, 2000. The licensee acknowledged the findings presented. Proprietary information is not included in this inspection report.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

W. Baker, Fire Protection Engineer, Fire Operations
J. Bushnell, Licensing Engineer, Licensing and Industry Affairs
T. Davis, Supervisor, Fire Operations
J. Gomez, Electrical Unit Lead, Site Engineering and Support
I. Heatherly, Corporate Fire Protection Engineer
J. Kammeyer, Design Engineering Manager, Site Engineering and Support
R. Kirkpatrick, Fire Protection Engineer, Site Engineering and Support
D. Kulisek, Operations Manager
T. McCollom, Manager, Maintenance and Modifications Support
P. Pace, Licensing and Industry Affairs Manager
J. Sterchi, Fire Protection Engineer, Fire Operations
G. Vickery, Manager, Operations Support
J. West, Site Quality Manager
B. Williams, Fire Protection Specialist, Fire Operations
J. Young, Operations Specialist, Operations Support

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

NRC

C. Ogle, Chief, Engineering Branch, Division of Reactor Safety, Region II
D. Rich, Resident Inspector

ITEMS OPENED, CLOSED, OR DISCUSSED

Opened

None

Closed

None

Discussed

None

NRC's REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) recently revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting and assessing safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

Reactor Safety	Radiation Safety	Safeguards
● Initiating Events	● Occupational	● Physical Protection
● Mitigating Systems	● Public	
● Barrier Integrity		
● Emergency Preparedness		

To monitor these seven cornerstones of safety, the NRC uses two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent very low safety significance. WHITE findings indicate issues that are of low to moderate safety significance. YELLOW findings are issues that are of substantial safety significance. RED findings represent issues that are of high safety significance with a significant reduction in safety margin.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing varying levels of performance and incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections. WHITE corresponds to performance that may result in increased NRC oversight. YELLOW represents performance that minimally reduces safety margin and requires even more NRC oversight. And RED indicates performance that represents a significant reduction in safety margin but still provides adequate protection to public health and safety.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner which regulatory actions should be taken based on a licensee's performance. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings. As a licensee's safety performance degrades, the NRC will take more and

increasingly significant action, which can include shutting down a plant, as described in the Action Matrix.

More information can be found at: http://www.nrc.gov/NRR/OVERSIGHT/index.html.

LIST OF DOCUMENTS REVIEWED

PROCEDURES

AOI-30.1, Plant Fires, Revision 3
AOI-30.2, Fire Safe Shutdown, Revision 7
FPDP-1, Conduct of Fire Protection, Revision 0
FPDP-2, Administration of Pre-Fire Plans, Revision 0
FPDP-4, Fire Emergency Response, Revision 0
FPI-0131, Smoke Removal, Revision 0
MI-0.047, Appendix R Safe Shutdown Repairs, Revision 2
OPDP-7, Fuse Control, Revision 1
PM 1-DRN-040-CB, Cleaning and Inspection of Floor and Equipment Drain Water Traps, Revision 3
PM 1-JB-291-6917, Inventory of Appendix R Repair Equipment in 1-JB-291-6917 or 1-JB-291-6918, Revision 0
1-SI-0-53, 18-Month Verification of Remote Shutdown Transfer Switches for Trains A & B Equipment, completed 10/00
SOI-13.01, Fire Detection System, Revision 16
SPP-3.1, Corrective Action Program, Revision 2
SSP-10.10, Control of Transient Combustibles, Revision 1
SSP-10.11, Control of Ignition Sources, Revision 1
SSP-10.12, Fire Protection Quality Assurance, Revision 0
TI-119, Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting, Revision 11
0-FOR-13-637, Fire Detection and Suppression Test for Panel 637, Revision 3
0-FOR-26-3, Inspection of Fire Protection Sprinkler Systems In Accessible Safety-Related Areas, Revision 3
0-FOR-26-13-A and B, Full Stroke Test of Valves in HPFP System, Revision 1
0-FOR-26-9, Quarterly HPFP Valve Alignment Verification, Revision 2
0-FOR-39-1, Carbon Dioxide Storage Tank Level Verification, Revision 0
0-FOR-304-2, Electrical Raceway Fire Barrier Systems Visual Inspection-Aux Bldg, Revision 0

DESIGN CRITERIA

WB-DC-40-51, Revision 2, Fire Protection of Safe Shutdown Capability

CALCULATIONS

WBN-OSG4-031, Equipment Req'd For Safe Shutdown Per 10CFR50 Appendix R, Revision 31
WBPEVAR9004001, Appendix B, Page 133-F, Revision 9
WBPEVAR9004001, Appendix B, Page 143A, Revision 8
WBPEVAR9004001, Appendix B, Page 144, Revision 8
WBPEVAR9004001, Appendix B, Page 253, Revision R1
WBPEVAR9004001, Appendix B, Page 254, Revision R1
WBPEVAR9004001, Appendix B, Page 255, Revision R1
WBPEVAR9004001, Appendix B, Page 256, Revision 11

WBPEVAR9004001, Appendix B, Page 302, Revision 11
WBPEVAR9004001, Appendix B, Page 303, Revision 11
WBPEVAR9004001, Appendix B, Pages 439- 446, Revision 11
WBPEVAR9004001, Appendix B, Page 457, Revision 11
WBPEVAR9004001, Appendix B, Page 458, Revision 11
WBPEVAR9004001, Appendix B, Page 505, Revision 11
WBPEVAR9004002, Appendix B, Page 140, Revision R1
E31 850221 300, 6.9KV Shutdown Board Normal and Alternate Feeders, February 19, 1997
E31 920108 300, 6.9KV Shutdown Board Feeders to 480V Transformers, June 23, 1995
WBN EEB-MS-TI08-0008, 480V 1E Coordination/Protection, September 25, 2000
WBPEVAR900, Appendix B, Block Diagram No. 4-9, Equipment Volume Control Tank Outlet Valve 1-LCV-62-132-A Separation Relay 112EXA, May 19, 1990
WBPEVAR900, Appendix B, Block Diagram No. 4-10, Equipment Volume Control Tank Outlet Isolation Valve 1-LCV-62-133-B Separation Relay 112DXB, May 19, 1990
WBPEVAR9004001, Appendix B, Block Diagram No. 1 A2, Equipment 1-MTR-62-108-A Centrifugal Charging Pump 1A-A, June 4, 1993
WBPEVAR9004001, Appendix B, Block Diagram No. 1 A10, Equipment 1-MTR-62-104-B Centrifugal Charging Pump 1B-B, June 4, 1993
WBPEVAR9004001, Appendix B, Block Diagram No. 1 A32, Equipment 0-MTR-70-51-S, CCS Pump C-S, February 19, 1995
WBPEVAR9004001, Appendix B, Block Diagram No. 2 3, Equipment FCV-62-93 Charging Flow Control Valve, September 28, 1995
WBPEVAR9004001, Appendix B, Block Diagram No. 2 B3, Equipment 1-FCV-62-91-B Charging Flow Isolation, June 4, 1993
WBPEVAR9004001, Appendix B, Block Diagram No. 7 8, Equipment 1-FSV-68-395-B Reactor Vessel Head Vent Isolation Valve, March 4, 1994
WBPEVAR9004001, Appendix B, Block Diagram No. 7 9, Equipment 1-FSV-68-396-B Reactor Vessel Head Vent Throttle Valve, March 4, 1994
WBPEVAR9004001, Appendix B, Block Diagram No. 7 10, Equipment 1-FSV-68-397-A Reactor Vessel Head Vent Throttle Valve, March 4, 1994
WBPEVAR9004001, Appendix B, Block Diagram No. 9 FF3, Equipment 1-FCV-70-133-A RCP Thermal Barrier Return Cont Isol Valves, February 19, 1995
WBPEVAR9004001, Appendix B, Block Diagram No. 9 FF4, Equipment 1-FCV-70-134-B RCP Thermal Barrier Return Cont Isol Valves, February 19, 1995
WBPEVAR9004001, Appendix B, Block Diagram No. 11 G2, Equipment PCV-3-122-A, PDIC-3-122C Aux Feedwater Pressure Control Valve, February 17, 1995
WBPEVAR9004001, Appendix B, Block Diagram No. 11 G5, Equipment PCV-3-132-B, PDIC-3-132C Aux FW Outlet Pressure Control Valve, February 17, 1995
WBPEVAR9004001, Appendix B, Block Diagram No. 14 J6, Equipment 1-FCV-1-51-S Aux Feed Pump Turbine Trip & Throttle Valve, February 17, 1995
WBPEVAR9004001, Appendix B, Block Diagram No. 14, 15 J12, Equipment AFPT Supply Transfer Separation Relays SST and R5, February 17, 1995
WBPEVAR9004001, Appendix B, Block Diagram No. 26 Q3A, Equipment 1-PCV-1-12 (1-PSV-1-13C-A), March 4, 1993
WBPEVAR9004001, Appendix B, Block Diagram No. 26 Q4A, Equipment 1-PCV-1-23 (1-PSV-1-24C-B), March 4, 1993

WBPEVAR9004001, Appendix B, Block Diagram No. 37 “O” - 1, Equipment 1-MTR-30-190-A (1-FSV-67-162-A), April 15, 1990
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LIST OF ACRONYMS USED

ACR	Auxiliary Control Room
AFW	Auxiliary Feedwater
AOI	Abnormal Operating Instruction
AUO	Assistant Unit Operator
CCS	Component Cooling System
CO_2	Carbon Dioxide
CVCS	Chemical and Volume Control System
ERCW	Essential Raw Cooling Water System
HVAC	Heating, Ventilation, and Air Conditioning
INDMS	Integrated Nuclear Data Management System
IPEEE	Individual Plant Examination for External Events
KV	Kilovolts
MCR	Main Control Room
MOV	Motor Operated Valve
MS	Main Steam
NFPA	National Fire Protection Association
PER	Problem Evaluation Report
RCS	Reactor Coolant System
RHR	Residual Heat Removal
SCBA	Self Contained Breathing Apparatus
SSC	Structures, Systems, and Components
SSD	Safe Shutdown
SSEL	Safe Shutdown Equipment List
SSER	Supplement to the Safety Evaluation Report
TIR	Testing and Inspection Requirements
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
V	Volts