UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
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May 20, 2004

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 TRIENNIAL FIRE PROTECTION INSPECTION REPORT 05000390/2004006 and 05000391/2004006

Dear Mr. Scalice:

On April 16, 2004, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Watts Bar Nuclear Plant Units 1 and 2. The enclosed inspection report documents the inspection findings, which were discussed on that date with Mr. W. Lagergren and other members of your staff. Following completion of additional review in the Region II office, a final exit was held by telephone with Mr. P. Pace of your staff on May 7, 2004, to provide an update on changes to the preliminary inspection findings.

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.

This report documents one NRC-identified finding of very low safety significance (Green) involving a violation of NRC requirements. However, because of the very low safety significance and because it is entered into your corrective action program, the NRC is treating the finding as a non-cited violation (NCV) consistent with Section VI.A of the NRC Enforcement Policy. If you contest the NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator Region 2; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Watts Bar Nuclear Plant.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publically Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Website 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 Nos.: NPF-90, Construction
Permit No. CPPR-92

Enclosure: NRC Triennial Fire Protection Inspection Report 05000390/2004006 and 05000391/2004006 w/Attachment: Supplemental Information

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.:	50-390, 50-391
License Nos.:	NPF-90, Construction Permit CPPR-92
Report No.:	05000390/2004006 and 05000391/2004006
Licensee:	Tennessee Valley Authority (TVA)
Facility:	Watts Bar Nuclear Plant, Units 1 and 2
Location:	1260 Nuclear Plant Road Spring City TN 37381
Dates:	March 29 - April 2, 2004 (Week 1) April 12 - 16, 2004 (Week 2)
Inspectors:	K. O'Donohue, Fire Protection Team Leader (Lead Inspector) P. Fillion, Reactor Inspector G. Wiseman, Sr. Reactor Inspector M. Thomas, Sr. Reactor Inspector
Approved by:	Charles R. Ogle, Chief Engineering Branch 1 Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000390/2004-006, 05000391/2004-006; 03/29 - 04/02/2004 and 04/12 - 16/2004; Watts Bar Nuclear Plant, Units 1 and 2; Triennial Fire Protection.

The report covered an announced two-week period of inspection by four regional inspectors. One Green non-cited violation was identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. A non-cited violation (NCV) of Operating License Condition 2.F, was identified for inadequate implementation of the approved fire protection program (FPP). Specifically, the licensee's process for evaluating the impact of design changes on the FPP (in this case a change to local manual operator actions) was not adequate to ensure that the change would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire. Upon identification, the licensee entered this issue into its corrective action program.

  The finding is greater than minor because it is associated with the protection against external factors attribute and degraded the reactor safety mitigating systems cornerstone objective. This finding was determined to be of very low safety significance because the local manual operator action which prompted this violation was considered within the capability of the operator to perform and could be reasonably accomplished within the 15-minute time specified in the Fire Protection Report. This determination was based on inspector walkdowns. (Section 1R05.05)

B. Licensee-Identified Violations

None

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems and Barrier Integrity

1R05 Fire Protection

The purpose of this inspection was to review the Watts Bar Nuclear Plant fire protection report (FPR) for selected risk-significant fire areas. The FPR includes the fire protection plan (FPP), safe shutdown analysis (SSA), and fire hazards analysis (FHA). Emphasis was placed on verification that the post-fire safe shutdown (SSD) capability [from both the Main Control Room (MCR) and the Auxiliary Control Panels (ACP)] and the fire protection features provided for ensuring that at least one redundant train of SSD systems are maintained free of fire damage. The inspection was performed in accordance with the U.S. Nuclear Regulatory Commission's (NRC) Reactor Oversight Process using a risk-informed approach for selecting the fire areas and attributes to be inspected. The inspectors used the licensee's Individual Plant Examination for External Events and in-plant tours to choose three risk-significant fire areas, and a portion of a fourth, for detailed inspection and review. The fire areas chosen for review during this inspection were:

- Fire Area (FA) 14, Corridor, Rooms 737.0-A1A and 737.0-A1B.
- FA 27, 480-V Shutdown Board Room 1B.
- FA 33, 480V Board Room 1-B.
- FA 48, Control Building, Room 755.0C-12, Main Control Room

The inspectors evaluated the licensee's FPR against applicable requirements, including Operating License Condition 2.F; Title 10 of the Code of Federal Regulations, Part 50 (10 CFR 50), Appendix R; 10 CFR 50.48; commitments to Appendix A of Branch Technical Position Auxiliary and Power Conversion Systems Branch 9.5-1; Watts Bar Plant Updated Final Safety Analysis Report (UFSAR); related NRC safety evaluation reports (SER); and plant Technical Specifications. The inspectors evaluated all areas of this inspection, as documented below, against these requirements.

Specific documents reviewed by the inspectors are listed in the attachment.

.01 Systems Required to Achieve and Maintain Post-fire Safe Shutdown

a. Inspection Scope

The licensee's SSA was reviewed to determine the components and systems necessary to achieve and maintain SSD conditions from the MCR in the event of fire in Fires Areas 14, 27, and 33. The objectives of this evaluation were to:

- Verify that the licensee's shutdown methodology had correctly identified the components and systems necessary to achieve and maintain an SSD condition.

- Confirm the adequacy of the systems selected for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring and support system functions.

- Verify that an SSD can be achieved and maintained without off-site power when it can be confirmed that a postulated fire in any of the selected fire areas could cause the loss of off-site power.

- Verify that local manual operator actions are consistent with the plant's fire protection licensing basis.

The inspectors evaluated whether the SSA properly identified and categorized components in terms of safe shutdown function. In addition, instrumentation known to be necessary for safe shutdown, e.g., pressurizer level indication, was checked. The safe shutdown components which were reviewed for operability during and after a severe fire in either FA 14, FA 27 or FA 33 are listed in the attachment.

The MCR (remote) and in-plant manual operator actions (local) for controlling plant operation, fire response, and achieving an SSD condition in response to a severe fire in FA 14, FA 27, FA 33, and FA 48 (MCR) were reviewed and walked down by the inspectors. The applicable procedures reviewed as part of this effort are listed in the attachment.

Inspectors' reviews of the procedures focused on ensuring that all required functions for post-fire safe shutdown, and the corresponding equipment necessary to perform those functions, were included in the procedures. The inspectors walked down each section of the fire response procedure corresponding to the fire area listed above to verify that local manual operator actions were feasible and could be performed in a timely manner.

b. Findings

No findings of significance were identified.

.02 Fire Protection of Safe Shutdown Capability

a. Inspection Scope

For the selected fire areas, the inspectors evaluated the frequency of or potential for fires, the combustible fire load characteristics, potential exposure fire severity, the separation of systems necessary to achieve SSD, and the separation of electrical components and circuits to ensure that at least one SSD path was free of fire damage. The inspectors reviewed selected portions of the FPR as referenced by the Watts Bar UFSAR. This review was conducted to determine if the licensee's commitments, as established in the fire protection licensing basis documents, were satisfied. The inspectors examined the fire protection barriers and selected indoor transformer combustible oil-retention basins to confirm installation was in accordance with the applicable separation and design requirements stated above.

The inspectors reviewed the licensee's documents which establish and implement controls and practices to prevent fires and to control the storage of permanent and transient combustible materials and ignition sources, to verify that the objectives established by the NRC-approved FPP were satisfied. The documents reviewed are listed in the attachment.

The inspectors toured the selected plant fire areas to observe: (1) the material condition of fire protection systems and equipment, (2) the storage of permanent and transient combustible materials, and (3) the licensee's implementation of the procedures for limiting fire hazards, combustible waste collection, housekeeping practices, and cleanliness conditions. These reviews were accomplished to ensure that the licensee was maintaining the fire protection systems, had properly evaluated in-situ combustible fire loads, controlled hot-work activities, and limited transient fire hazards in a manner consistent with the UFSAR, administrative procedures and other fire protection program procedures.

The inspectors reviewed operator and fire brigade staffing, fire brigade response, fire brigade qualification training and drill program procedures, and fire brigade drill critiques for brigade shifts from January 2001 - May 2003. The reviews were performed to determine whether fire brigade drills had been conducted in high fire risk plant areas and whether fire brigade personnel training, qualifications, drill response, and performance met the requirements of the FPP.

The inspectors walked down the fire emergency equipment storage locations and dress-out areas in the auxiliary and service buildings to assess the operational readiness of fire fighting and smoke control equipment. The fire brigade self-contained breathing apparatuses were reviewed for adequacy as well as the availability of supplemental breathing air bottles and the capability to refill these bottles. Additionally, the on-site fire response vehicle and associated fire brigade personal protective equipment located at the fire brigade house were reviewed to evaluate equipment accessibility and functionality.

The inspectors reviewed fire fighting pre-fire plans for the selected fire areas to determine if appropriate information was provided to fire brigade members to identify SSD equipment and to facilitate suppression of an exposure fire that could impact safe shutdown capability. The inspectors walked down the selected fire areas to compare the associated pre-fire plans and drawings with as-built plant conditions. This was done to verify that fire fighting pre-fire plans and drawings were consistent with the fire protection features and potential fire conditions described in the FPR. In addition, the inspectors performed a review of drawings, engineering calculations, and maintenance instructions for potential fire suppression induced flooding associated with the floor drain systems for the 480-V Shutdown Board Room 1B (FA 27) and the 480V Board Room 1B (FA 33). The review focused on ensuring that those local manual operator actions required for normal redundant train MCR shutdown performed outside the control room would not be inhibited by the effects of the fire event, fire suppression activities, or leakage from automatic or manual fire suppression systems within the fire areas or from an adjacent plant area.

b. Findings

No findings of significance were identified.

.03 Post-fire Safe Shutdown Circuit Analysis

a. Inspection Scope

Using the FPR and the Appendix R Required Components Report, the inspectors reviewed how systems would be used to achieve and maintain reactivity control, over-pressure protection, inventory control with high or low pressure injection systems, and residual heat removal during and following a fire in the areas selected for inspection. The inspection specifically focused on the minimum required systems and equipment necessary to achieve and maintain hot shutdown conditions because damage to these systems could pose a significantly greater risk than damage to systems required to achieve cold shutdown conditions.

The inspectors performed a detailed review of a number of valves, instruments and other equipment relative to a postulated fire in each of the areas selected for inspection. This review included examination of the licensee's Appendix R Required Components Report, which was a matrix of Appendix R Analysis Areas versus important cables, together with statements of resolutions for any cables that did not meet Appendix R, III.G.2 separation criteria. Component power supply, elementary control diagrams, cable schedules with routing information and the cable tray drawings were reviewed as necessary to confirm that the Appendix R Required Components Report was correct. Resolutions for any cables that did not meet Appendix R,III.G.2 separation criteria were verified by such means as field inspection of cable protective wrap or examination of post-fire shutdown procedure steps.

The potential for spurious valve operation or malfunction was considered in the period immediately following a fire and in the period after operator realignment to hot standby mode but before fire extinguishment. The inspectors also utilized this information to determine if the requirements of Appendix R, Section III.G.2 (for protection of control and power cables) were met. In the case of a severe control room fire, alternative safe shutdown capability was considered. The applicable criterion was that a fire would not degrade the ability to safely shutdown from the ACP. The components and equipment included in the review are listed in the attachment. Among the components reviewed, were the pressurizer power operated relief valves (PORV) and the associated flow control valves (PORV block valves). The criteria for this review were that the PORVs would not spuriously open due to a fire and that at least one PORV would be available to operators in either the main control room or the ACP should RCS conditions during the shutdown evolution require manual opening of a PORV.

b. Findings

No findings of significance were identified.

.04 Alternative Shutdown Capability

a. Inspection Scope

The licensee's Fire Protection Report and plant configuration were reviewed to determine the components and systems necessary to achieve and maintain SSD conditions from the ACP in the event of fire in the MCR. The objectives of this evaluation were to:

- Verify that the licensee's alternative shutdown methodology had correctly identified the components and systems necessary to achieve and maintain an SSD condition.
- Confirm the adequacy of the systems selected for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring and support system functions.
- Verify that hot and cold shutdown from outside the MCR can be achieved and maintained with offsite power available or not available.

Design of control circuits, including their overcurrent protective devices, was considered in terms of fire-induced short-circuits in the MCR resulting in loss of SSD capability. In general, the licensee utilized isolation/transfer switches and double fusing of circuits to allow transfer of control for a component from the MCR to the ACP. Specific circuits reviewed were those listed in the attachment. Additionally, the inspector reviewed 6900V Shutdown Board 1A-A offsite power circuit breakers and an undervoltage relay.

b. Findings

No findings of significance were identified.

.05 Operational Implementation of Alternative Shutdown Capability

a. Inspection Scope

The inspectors reviewed the operational implementation of the SSD capability for an Appendix R fire in FA 14, FA 27, FA 33, or FA 48 to verify that: (1) the training program for licensed personnel included MCR and alternative safe shutdown capability; (2) personnel required to achieve and maintain the plant in hot standby, from the MCR or ACR, following a fire could be provided from normal onsite staff, exclusive of the fire brigade; (3) the licensee had incorporated the operability of alternative shutdown transfer and control functions into plant Technical Specifications (TS); and (4) the licensee periodically performed operability testing of the alternative shutdown instrumentation, and transfer and control functions. The inspectors reviewed Abnormal Operating Instruction (AOI) AOI-30.1, Plant Fires; and selected sections of AOI-30.2, Fire Safe Shutdown. The reviews focused on ensuring that all required functions for post-fire safe shutdown, and the corresponding equipment necessary to perform those functions, were included in the procedures for the selected fire areas.

The inspectors also reviewed criteria in the following licensee engineering department standards and design control procedures to verify that plant changes were adequately reviewed for the potential impact on the FPR, fire protection features, SSD equipment, and procedures as required by Watts Bar Unit 1 Operating License Condition 2.F.

- G-73, Installation, Modification, and Maintenance of Fire Protection Systems, Revision 5
- SPP-9.3, Plant Modification and Engineering Change Control, Revision 9
- TI-277, Modification Compliance Review-Fire Protection, Revision 0
- FPDP-3, Management of the Fire Protection Report, Revision 4

b. Findings

Inadequate Evaluation Process for Design Changes Which Could Affect Safe Shutdown in the Event of a Fire

Introduction: The inspectors identified a non-cited violation (NCV) of Operating License Condition 2.F., for inadequate implementation of the approved FPP. Specifically, the licensee's process for evaluating the impact of design changes on the FPP (in this case a change to local manual operator actions) was not adequate to ensure that the changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

Description: The licensee implemented a design change which revised a local manual operator action which had been previously approved by the NRC during Watts Bar Unit 1 licensing in 1995 for a fire in Room 757-A5 (FA 27). The licensee's process for evaluating the impact of design changes on the FPP was addressed in the following procedures:

- G-73, Installation, Modification, and Maintenance of Fire Protection Systems, Revision 5
- SPP-9.3, Plant Modification and Engineering Change Control, Revision 9
- TI-277, Modification Compliance Review-Fire Protection, Revision 0
- FPDP-3, Management of the Fire Protection Report, Revision 4

During review of these procedures, the inspectors noted that the process for evaluating the impact of design changes on FPP local manual operator actions only addressed whether emergency lighting was affected (e.g., changes to emergency light positions or additional emergency lights required). The inspectors noted that an evaluation limited to determining the availability of emergency lighting was not sufficient to determine if the local manual operator actions could be performed within the required time in a satisfactory manner. In addition, these review procedures did not consider other aspects of local manual operator action such as complexity, location of the actions with

respect to the fire, accessibility, or environmental considerations, which could affect the operators' capability to perform the action. The failure to consider factors other than emergency lighting could result in a change to the FPP which impacted the ability to achieve and maintain SSD.

A potential example of this was noted during the inspectors' review of design change notice (DCN) 39742-A. The licensee implemented DCN 39742-A in December 1997, which revised a local manual operator action that had been previously approved by the NRC during Watts Bar Unit 1 licensing in 1995 for a fire in Room 757-A5 (FA 27). The DCN added manual switches to the control circuits for MCR air handling units (AHU) A-A and B-B and identified revised local manual operator actions for restarting the AHUs. The revised local manual operator actions replaced previously approved manual operator actions included in the licensee's Fire Protection Report (FPR).

The licensee performed a safety assessment/safety evaluation (WBPLEE-97-154-0) during implementation of DCN 39742-A to evaluate the impact of the DCN on the FPP. The DCN was evaluated against the design and licensing bases and was found to be acceptable by the licensee. The inspectors noted that this evaluation did not address the impact of the DCN on FPP emergency lighting, as required by Procedure SPP-9.3. More importantly, the inspectors also noted that other conditions which could affect the capability of the operators to perform this revised local manual operator action were not addressed, such as, accessibility, complexity, environmental considerations, etc. The revised local operator manual action for AHU A-A was incorporated into Section C.23 of AOI-30.2.

During in-plant walkdowns of procedure AOI-30.2, Section C.23, the inspectors observed that the new switch for AHU A-A and the associated revised local manual operator action were located in Room 757-A2 of the auxiliary building, which was adjacent to Room 757-A5 (FA 27), the postulated area of the fire. The inspectors initially questioned whether this revised manual action could be accomplished by the operators, based on the potential impact of the fire brigade activities in the immediate vicinity of Room 757-A2, and possible smoke migration from Room 757-A5 into Room 757-A2. After additional walkdowns of AOI-30.2, Section C.23, and discussion of possible scenarios for the fire brigade activities with licensee fire operations personnel, the inspectors concluded that the revised manual operator action could reasonably be accomplished within the time required by the FPR.

Analysis: The finding is greater than minor because it is associated with the protection against external factors attribute and degraded the reactor safety mitigating systems cornerstone objective. The finding degraded the defense-in-depth for fire protection. The inspectors determined that this finding was of very low safety significance (green), because the revised manual operator actions which prompted this violation were considered within the capability of the operator and could be reasonably accomplished within the 15-minute time specified in the FPR. This determination was based on field walkdowns of the Procedure AOI-30.2, Section C.23, and review of pre-fire plans and fire brigade activities for a fire in Room 757-A5.

Enforcement: Operating License Condition 2.F requires that the licensee shall implement and maintain in effect all provisions of the approved fire protection program, as described in the Fire Protection Report for Watts Bar Unit 1, as approved in Supplements 18 and 19 of the SER (NUREG-0847). License Condition 2.F further states that the licensee may make changes to the approved fire protection program without prior NRC approval, only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire. The licensee's process for evaluating the impact of design changes on the FPP was addressed in Procedures FPDP-3, Management of the Fire Protection Report; SPP-9.3, Plant Modifications and Engineering Change Control; TI-277, Modification Compliance Review - Fire Protection and G-73, Installation, Modification, and Maintenance of Fire Protection Systems.

Contrary to the above, on April 15, 2004, when evaluating a licensee change to the FPP, the inspectors observed that the licensee's process for evaluating the impact of design changes on the FPP (e.g., local manual operator actions) was not adequate to ensure that the changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire. The procedures for evaluating the impact of design changes on FPP local manual operator actions only required that the evaluation address whether emergency lighting was affected. The procedures did not consider other conditions such as complexity, location of the manual actions with respect to the fire, accessibility or environmental considerations which could affect whether the manual actions could reasonably be accomplished. This process could result in the licensee inappropriately implementing design changes which may not lead to safe plant conditions and could adversely affect the ability to achieve and maintain safe shutdown in the event of a fire, without receiving prior NRC approval. This finding is a violation of NRC requirements and will be identified as NCV 50-390/2004-006-001, Inadequate Evaluation Process for Design Changes Which Could Affect Safe Shutdown in the Event of a Fire. This finding was entered into the licensee's corrective action program as Problem Evaluation Reports (PER) 34252 and 34259.

.06 Communications

a. Inspection Scope

The inspectors reviewed plant communication capabilities to evaluate the availability of the communication systems to support plant personnel in the performance of manual operator actions for shutdown, fire event notification, and fire brigade fire fighting duties. This included verifying that site paging (PA), and portable radio communication systems were consistent with the licensing basis and would be available during fire response activities.

Walkdowns were performed of AOI-30.2 sections to evaluate the ability of the plant's portable radio communication system to support plant personnel in the performance of SSD functions. In addition, the inspectors reviewed 50 of the most recently completed fire brigade drill critique reports to assess proper operation and effectiveness of the fire brigade command post portable radio communications during fire drills and identify any history of operational or performance problems with radio communications during fire drills.

The inspectors also performed an independent technical review of the licensee's plant change documentation completed in support of DCN 19796-B, performed in 1995, which reconfigured the routing of portable radio repeater antenna system cables to provide at least 20 feet horizontal spatial separation on different elevations of the auxiliary building. This DCN was evaluated in order to assess the radio communication system's vulnerability to a fire in FA 14 and verify that the plant modification was performed consistent with the design control procedures listed in the attachment.

b. Findings

No findings of significance were identified.

.07 Emergency Lighting

a. Inspection Scope

The inspectors reviewed the design, placement, operation, and periodic testing procedures for direct current self-contained battery powered emergency lighting units (ELU) and dedicated, battery powered portable ELUs. The inspectors evaluated the capability of the ELUs to support plant personnel in the performance of SSD functions, including local manual operator actions, and for illuminating access and egress routes to the areas where those manual actions would be performed. The inspectors checked that these battery power supplies were rated with at least an 8-hour capacity, as required by Section III.J of 10 CFR 50, Appendix R. During walkdowns of the plant areas where operators performed local manual actions, the inspectors inspected area ELUs for proper operation and checked the aiming of lamp heads to determine if sufficient illumination would be available to adequately illuminate the SSD equipment, the equipment identification tags, and the access and egress routes thereto, so that operators would be able to perform the actions without needing to use flashlights. The inspectors also reviewed completed surveillance and maintenance procedures and test records to ensure that the licensee properly maintained the lighting equipment.

The inspectors observed whether emergency exit lighting was provided for personnel evacuation pathways to the outside exits as identified in the National Fire Protection Association (NFPA) 101, Life Safety Code, and the Occupational Safety and Health Administration (OSHA) Part 1910, Occupational Safety and Health Standards. This review also included examination of whether backup emergency lighting was provided for the fire emergency storage locations, the fire brigade dress-out areas and fire brigade house in support of fire brigade operations should power fail during a fire emergency.

b. Findings

No findings of significance were identified.

.08 Cold Shutdown Repairs

a. Inspection Scope

The inspectors reviewed and inspected one example of a repair procedure that may be needed to transition from hot standby to cold shutdown. The procedure was contained in Maintenance Instruction MI-0.047, Appendix R Safe Shutdown Repairs. The procedure involved installing a jumper wire in a 6.9 kV switchgear compartment to allow starting two emergency raw water cooling pumps on one diesel generator. Control circuits and wiring diagrams were reviewed to confirm the correct terminal points, and a field inspection was made to verify the as-built configuration and workability of the procedure.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors reviewed the selected fire areas to evaluate the adequacy of the fire resistance of fire area barrier enclosure walls, ceilings, floors, fire barrier mechanical and electrical penetration seals, fire doors, and fire dampers to ensure that at least one train of SSD equipment would be maintained free of fire damage. The inspectors selected several fire barrier features for detailed evaluation and inspection to verify proper installation and qualification. The inspectors walked down the selected fire areas to observe the material condition and configuration of the installed fire barrier features, as well as, reviewed construction details and supporting fire endurance tests for the installed fire barrier features to verify the as-built configurations were qualified by appropriate fire endurance tests. The inspectors also reviewed the FHA to verify the fire loading used by the licensee to determine the fire resistance rating of the fire barrier enclosures.

The inspectors conducted a detailed inspection of two 2-hour fire-rated enclosure walls separating the Unit 1 480V board room and the adjacent rooms to confirm that they had been properly installed and qualified. Additionally, six fire doors in the selected fire areas were reviewed to determine if they were designed, installed, and qualification tested. Engineering evaluations and a summary of completed inspection and maintenance procedures for the selected fire walls and doors were reviewed. These reviews were performed to ensure that the passive fire barriers were properly inspected, maintained, and met the licensing and design bases as described in the licensee submittals, NRC SERs, and the FPR.

The inspectors selected nine penetration fire seals in the 480-V Shutdown Board Room 1B (FA 27) and the 480V Board Room 1B (FA 33) for review. The inspectors conducted a detailed inspection of the seals to confirm that they had been properly installed and qualified. The inspectors reviewed the installation instructions for the selected mechanical and electrical fire barrier penetration seals, the penetration seal detail

drawings, qualification tests, and the fire protection penetration seal deviation analysis for the technical basis of penetration seals to verify that the fire barrier installations met design requirements, license commitments, and standard industry practices. The inspectors also compared the penetration seal ratings with the ratings of the barrier enclosures in which they were installed. In addition, the inspectors reviewed a summary of completed surveillance and maintenance procedures for the selected fire barrier walls to verify the fire seals were being adequately inspected and maintained.

The inspectors reviewed AOI-30.2, selected fire fighting pre-plans, fire damper location and detail drawings, and heating ventilation and air conditioning (HVAC) system drawings to verify that access to shutdown equipment and selected operator manual actions would not be inhibited by smoke migration from one area to adjacent plant areas used to accomplish SSD. The inspectors reviewed the design, installation details, and qualification testing for three mechanical fire dampers in the 480-V Shutdown Board Room 1B (FA 27) to verify that the damper installations met design requirements and license commitments.

b. Findings

No findings of significance were identified.

.10 Fire Protection Systems, Features and Equipment

a. Inspection Scope

The inspectors reviewed SSD calculations, vendor documentation, flow diagrams, cable routing information, system operating instructions, operational valve lineup procedures, and system availability studies, associated with the fire pumps and fire protection water supply system. Using operating and test procedures, the inspectors toured selected fire pumps and portions of the fire main piping system to evaluate material condition, consistency of as-built configurations with engineering drawings, and verify correct system breaker and valve lineups. The review evaluated 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. In addition, the inspectors reviewed periodic surveillance and functional operability flow tests for the fire pumps and fire main loop to assess whether the test program was sufficient to verify proper operation of the fire protection water supply system in accordance with those design requirements and acceptance criteria specified in Section 14, Operating Requirements of the FPP.

The inspectors reviewed the adequacy of the design, installation, and operation of the automatic detection and alarm system for the selected fire areas to actuate in the early stage of a fire. This included walkdowns of the systems and review of the type of installed detectors, detector spacing, and the licensee's technical evaluation of the detector locations and the ceiling reinforcing plans as shown on location drawings. The inspectors also reviewed licensee submittals and the NRC SERs associated with the selected fire areas. These reviews were performed to ensure that the fire detection systems for the selected fire areas were installed in accordance with the design and licensing bases of the plant. Additionally, the inspectors reviewed fire detection

surveillance procedures and the detection system operating requirements specified in the FPP to determine the adequacy of fire detection component testing to ensure that the detection systems could function when needed.

The inspectors reviewed the manual suppression standpipe and fire hose system to verify adequate design, installation, and operation in the selected fire areas. The inspectors examined flow measurement/pressure test data to verify that sufficient pressure and flow volume was available to produce electrically safe and effective fire hose operation within the nozzle manufacturer's specified flow range. The inspectors performed in-plant walk-downs and observed placement of the fire hoses and extinguishers to confirm consistency with the fire fighting pre-plan drawings and fire protection program documents. Additionally, the inspectors checked a sample of manual fire hose lengths to determine whether they would reach the SSD equipment in the selected fire areas. This was done to ensure that manual fire fighting efforts could be accomplished in the selected areas.

b. Findings

No findings of significance were identified.

.11 Compensatory Measures

a. Inspection Scope

The inspectors reviewed the administrative controls for out-of-service, degraded, and/or inoperable, fire protection features. An Out-of-Service Impairment Report for CY 2003, which itemized out-of-service fire protection features, was reviewed. 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 approved fire protection program. The inspectors also performed an independent technical review of the licensee's evaluation documentation completed in support of Impairment Permit Nos. 03-0108, 03-0247, 03-0233, 03-0370, and 03-0409, which opened fire doors to compensate for loss of ventilation cooling for the 480V Board Room 1B (FA 33). Additionally, the inspectors reviewed the adequacy of the licensee's short term compensatory measures to compensate for a degraded function or feature until appropriate corrective actions were taken.

b. Findings

No findings of significance were identified.

.12 Fire Protection Licensing Basis

a. Inspection Scope

The inspectors reviewed licensing basis documents, including Operating License Condition 2.F, to ascertain if the Watts Bar FPP was consistent, and in compliance, with 10 CFR 50.48 and 10 CFR 50, Appendix R. The inspectors evaluated and compared

the licensee's SSD procedures, and various calculations of record against the licensing basis to measure the adequacy and consistency of the program documentation.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems

a. Inspection Scope

Fire brigade response and emergency/incident reports for 2002 and 2003, selected fire safety inspection reports, as well as corrective action program (CAP) PERs resulting from fire, smoke, sparks, arcing, and equipment overheating incidents were reviewed. This review was conducted to assess the frequency of fire incidents and any maintenance-related or material condition problems related to fire incidents. The inspectors also reviewed other CAP documents, including completed corrective actions documented in selected PERs, and operating experience program (OEP) documents to verify that industry-identified fire protection problems potentially or actually affecting Watts Bar were appropriately entered into and resolved by the CAP process. Items included in the OEP effectiveness review were NRC Information Notices, industry or vendor-generated reports of defects and noncompliance under 10 CFR Part 21, and vendor information letters.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

On April 16, 2004, the lead inspector presented the inspection results to Mr. W. Lagergren and other members of his staff who acknowledged the findings. The licensee confirmed that proprietary information was not provided or examined during the inspection. Following completion of additional review in the Region II office, a final exit was held by telephone with Mr. P. Pace on May 7, 2004, to provide an update on changes to the preliminary inspection findings. The licensee acknowledged the findings.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel:

L. Bryant, Plant Manager
T. Davis, Supervisor, Fire Operations
C. Faulkner, Operations Support Manager
J. Gomez, Electrical Unit Lead, Site Engineering and Support
E. Haston, Site Engineering, Fire Protection
M. Heatherly, Corporate Fire Protection Engineer
J. Kammeyer, Site Engineering Manager
R. Kirkpatrick, Fire Protection Engineer, Site Engineering and Support
W. Lagergren, Site Vice President
L. Massinger, Design Engineer
P. Pace, Licensing Engineer, Licensing and Industry Affairs
J. Sterchi, Fire Protection Engineer, Fire Operations
R. Stockton, Licensing Manager
T. Wallace, Operating Manager
J. Young, Operations Specialist

NRC Personnel:

J. Bartley, Senior Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000390/2004006-001	NCV	Inadequate Evaluation Process for Design Changes Which Could Affect Safe Shutdown in the Event of a Fire (Section 1R05.05)

Discussed

None

LIST OF COMPONENTS INSPECTED

Section 1R05.01: Post-fire Safe Shutdown Circuit Analysis and
Section 1R05.03: Post-fire Safe Shutdown Circuit Analysis

Component Identification	Description
1-LCV-62-132-A	Volume control tank outlet valve (MOV)
1-FCV-70-90A	RCP thermal barrier return isolation valve (MOV)
1-FCV-62-93	Charging flow control valve (AOV)
1-LCV-62-136-B	RWST to Charging Pump (MOV)
1-PCV-68-340-A	Pressurizer PORV
1-PCV-68-334-B	Pressurizer PORV
1-FCV-68-333-A	RCS pressure relief flow control valve
1-FCV-68-332-B	RCS pressure relief flow control valve
1-LI-68-326C	Pressurizer level indicator
1-MTR-62-108-A	Charging pump motor
1-MTR-26-1-A	HP electric driven fire pump 1A-A
1-MTR-26-4-B	HP electric driven fire pump 1B-B
2-MTR-26-9-A	HP electric driven fire pump 2A-A
2-MTR-26-11-B	HP electric driven fire pump 2B-B
0-PMP-26-3150	HP diesel driven fire pump

Section 1R05.02: Fire Protection of Safe Shutdown Capability

Documents

Watts Bar Nuclear Plant Fire Protection Report, Revision 26; Part II
SPP-10.7, Housekeeping/Temporary Equipment Control, Revision 1
SSP-10.10, Control of Transient Combustibles, Revision 1
SSP-10.11, Control of Ignition Sources (Hot Work), Revision 2
FPDP-1, Conduct of Fire Protection, Revision 0
TVA Health and Safety Practice 4, Smoking Cessation Policy, Dated January, 2003
WBN Technical Instruction TI-291, Combustible Control Zones and Sensitive Areas
Watts Bar Transient Combustible Evaluations issued from January, 2004

LIST OF DOCUMENTS REVIEWED

Procedures

AOI-30.1, Plant Fires, Rev. 6
AOI-30.2, Fire Safe Shutdown, Rev. 15
SOI-236.01, 125V DC Vital Battery Board 1, Rev. 16
ARI-15-21, Control Power & Fire Protection, Revision 16
DS-M17.2.2, Design Standard for Electrical Raceway Fire Barrier Systems, Revision 5
EPIP-17, Fire Emergency Procedure, Revision 0
Fire Protection Report, Revision 25
FOR-26-9, Quarterly HPFP Valve Alignment Verification, Revision 4
FPDP-1, Conduct of Fire Protection, Revision 0
FPDP-2, Administration of Pre-Fire Plans, Revision 0
FPDP-3, Management of the Fire Protection Report, Revision 4
FPDP-4, Fire Emergency Response, Revision 0
FPS-777-EQUIP, Emergency Equipment Storage Locations, Inspection and Inventory, Revision 12
1-JB-291-6917, Inventory of Appendix R Repair Equipment, Rev 0
G-73, Installation, Modification, and Maintenance of Fire Protection Systems and Features, Revision 5
G-96, Installation, Modification, and Maintenance of Penetration Seals, Revision 1
G-98, Installation, Modification, and Maintenance of Electrical Raceway Fire Barrier Systems, Revision 5
MI-0.047, Appendix R Safe Shutdown Repairs, Rev. 4/13/04
MAI- 4.8, Installation, Modification, and Maintenance of Thermal and Anti-sweat Insulation, Revision 10
MI-13.105, Fire Detector Replacement, Sensitivity Check, and/or Smoke Check, Revision 1
PI-FPU-1.0, Periodic Fire Brigade Training, Revision 1
PM-0-FPS-777-EQIP, Emergency Equipment Storage Inspection and Inventory, Revision 12
RPTR-253-NSS/H, NSS/H Repeater Annual Test, Revision 1
RPTR-253-F2, Repeater Annual Test, Revision 0
SOI-13.01, Fire Detection System, Revision 10
SOI-26.01, High Pressure Fire Protection System, Revision 21
SPP-9.3, Plant Modification and Engineering Change Control, Revision 9
SSP-10.9, Control of Fire Protection Impairments, Revision 2
SSP-10.12, Fire Protection Quality Assurance, Revision 0
TI-211, Fire Protection Weekly Inspection Report, Revision 0
TI-277, Modification Compliance Review-Fire Protection, Revision 0
TI-291, Combustible Control Zones and Sensitive Areas, Revision 0
TRN-32, Ignition Source Fire Watch Training, Revision 2
TRN-33, Fire Protection Employee Qualification, Revision 0

Drawings

41N373-5, Concrete Partition Walls, Outline & Reinforcement, Revision 7
45W724-1, Electrical Wiring Diagram, 6900V Shutdown Power 1A-A Schematic, Revision 22
45W760-26-2, Electrical Wiring Diagram High Pressure Fire Protection System, Revision 12
45W760-211-8, Electrical Wiring Diagram, 6900V Shutdown Power 1A-A Schematic, Revision 13
45W760-211-9, Electrical Wiring Diagram, 6900V Shutdown Power 1A-A Schematic, Revision 16
45W816-7, Conduit and Grounding Fire Detection, El. 755.0, Control Building, Revision 5
45W826-8, Conduit and Grounding, El. 729.0 and 737.0, Auxiliary Building, Revision 56
45W826-21, Conduit and Grounding Fire Detection, El. 737.0, Auxiliary Building, Revision 1
45W828-24, Conduit and Grounding Fire Detection, El. 757.0, Auxiliary Building, Revision 5
45W830-8, Conduit and Grounding Fire Detection, El. 772.0, Auxiliary Building, Revision 3
45A883-39, Electrical Penetration Seal Details, Typical M4, Revision 4
47A472-38, Mechanical Penetration Seal Details, Typical XXXVIII, Revision 4
47A472-46, Mechanical Penetration Seal Details, Typical XLVI, Revision 4
47W200-2, Equipment Plan El. 772.0 & Above, Revision 12
47W200-3, Equipment Plan El. 757.0 & El. 755.0, Revision 12
47W200-4, Equipment Plan El. 737.0 & El. 729.0, Revision 12
47W240-3, Compartment-Fire Cells, Auxiliary Building, Plan El. 737.0, Revision 8
47W240-4, Compartment-Fire Cells, Auxiliary Building, Plan El. 757.0, Revision 9
47W240-5, Compartment-Fire Cells, Auxiliary Building, Plan El. 772.0, Revision 8
47W240-7, Compartment-Fire Cells, Control Building, Plan El. 729.0 & El. 755.0, Revision 8
47W243-2, Thermo-Lag 330-1, Two Layer Design for Conduits 3" and Smaller, Revision 0
47W243-3, Thermo-Lag 330-1, Junction Boxes, Revision 0
47W479-15, Mechanical Drains and Embedded Piping, Revision 12
47W611-26-1, Electrical Logic Diagram High Pressure Fire Protection System, Revision 19
1-47W801-1, Main and Reheat Steam Flow Diagram, Rev. 38
1-47W803-2, Auxiliary Feedwater Flow Diagram, Rev. 49
1-47W809-1, Chemical and Volume Control System Flow Diagram, Rev. 48
1-47W813-1, Reactor Coolant System Flow Diagram, Rev. 39
47W832-2, Flow Diagram Fire Protection, Revision 35
1-47W845-3, Essential Raw Cooling Water Flow Diagram, Rev. 20
47W850-1, Flow Diagram Fire Protection & Raw Service Water , Revision 26
47W852 sheets 3 and 5, Mechanical Flow Diagram Floor and Equipment Drains, Revision 17
1-47W859-1, Component Cooling System Flow Diagram, Rev. 44
1-47W859-2, Component Cooling System Flow Diagram, Rev. 34
47W866-3, Flow Diagram Heating Cooling & Ventilating Air Flow, Revision 37
47W920-601, Mechanical HVAC Duct Insulation, Revision 2
47W920-609, Mechanical HVAC Duct Insulation, Revision 1
Pre-Fire Plan No. AUX-0-737-02, Auxiliary Building, Elevation 737'- 0, Revision 1
Pre-Fire Plan No. AUX-0-757-02, Auxiliary Building, Elevation 757'- 0, Revision 1
Pre-Fire Plan No. AUX-0-757-03, Auxiliary Building, Elevation 757'- 0, Revision 1
Pre-Fire Plan No. AUX-0-757-04, Auxiliary Building, Elevation 757'- 0, Revision 1
Pre-Fire Plan No. AUX-0-772-03, Auxiliary Building, Elevation 772'- 0, Revision 0
Pre-Fire Plan No. CON-0-755-01, Control Building, Elevation 755'- 0, Revision 2

Calculations, Analyses, and Evaluations

EEB-MS-TI07-0005, 125 VDC Vital Control Power Systems Fault Calculation, Rev. 19
EPM-AST-031895, HPFP System Water Supply to the Auxiliary Building Preaction Sprinkler System, Revision 0
EPM-AST-051695, HPFP System Standpipe Water Supply, Revision 1
EPM-DOM-02990, Combustible Load Summary, Revision 0
Fire Protection License Condition Impact Evaluation (LCIE) for SPP-10.10, Revision 2, dated 9/27/2002
FPR Part X, NFPA Code Evaluation, Revision 10
WB-DC-40-51, Fire Protection of Safe Shutdown Capability, Rev. 3
WBN-OSG4-031, Equipment Required for Safe Shutdown Per 10CFR50 Appendix R, Rev. 32
WBP-EVAR-9205004, Appendix R Analysis for Intra-plant Communication Systems, Revision 3
NER No. 03-1207, NRC Information Notice 2003-08: Potential Flooding Through Unsealed Concrete Floor Crack, dated 8/29/2003
TVA System 13, Detection System Compliance Summary Matrix, Revision 10
TVA Fire Protection Sprinkler Walkdown Justification Sheets, Volume 3, Tab 1, Attachments 4 and 5, dated 12/15/1994
Out-Of-Service (OOS) SPP-10.9 Impairment Report for CY 2003, Impairment Permit Nos. 03-0108, 03-0247, 03-0233, 03-0370, 03-0409
WBN-OSG4-031, Equipment Required for Safe Shutdown Per 10 CFR 50 Appendix R, Rev. 30

Audits and Self-Assessments

Fire Brigade Drill Critiques for Brigade Shifts from January 2001 - May 2003.
Site Compliance with 10 CFR 50 Appendix R fire, Dated February 23 - 26, 2004

Completed Surveillance Procedures and Test Records

1-SI-0-53-A, 18-Month Verification of Remote Shutdown Transfer Switches for Train A, Rev. 14
1-SI-0-53-B, 18-Month Verification of Remote Shutdown Transfer Switches for Train B, Rev. 18
Fire Protection Weekly Inspection Reports (TI-211) for period from January 2004
0-FOR-26-2, Work Order 00-10633-00, 3 Year High Pressure Fire Protection Hydraulic Performance Verification, completed 6/27,01
0-FOR-26-7-A, 18 Month Test of High Pressure Fire Protection Pump 1A-A, completed 3/17,04
0-FOR-26-25, 18 Month Diesel Driven Fire Protection Pump Capability Test, completed 4/17,03
0-FOR-228-1A, SPP-8.2 Quarterly Inspection and Testing of Emergency Light Battery Packs, Diesel Building and Control Building, completed 10/08/03
0-FOR-228-1A, SPP-8.2 Quarterly Inspection and Testing of Emergency Light Battery Packs, Auxiliary Building, Elevations 692,729, and 737, completed 11/14/03
0-FOR-228-3B, SPP-8.2 Quarterly Inspection and Testing of Emergency Light Battery Packs, Auxiliary Building, Elevations Above 737, completed 10/29/03

Technical Manuals/Vendor Information

Rubatex Corporation Therma-cel Sheet Insulation Product Technical Bulletins and Product Data, Revision 03/03
Armacell LLC, AP/Armaflex Sheet and Roll Insulation Product Data, Revision 10/03
Elkhart Brass, Friction Loss Data, Friction Loss in Rubber or Vinyl Lined Fire Hose, Revision 12/17/03
Elkhart Brass, Model L-205-EB, Industrial Non-Shock Fog Nozzle Specification, Revision 12/17/03
Task Force Tips, Technical Specification for Model H-VPGI, Handline w/Grip, Instructions for Safe Operation and Maintenance, Revision 4, 11/7/02
Pyrotronics Catalog Number 6119, Technical Specification for Model DI-3 Series Ionization Smoke Detector, dated 04/87
Watts Bar Vendor Manual No. WBN-VM-E353-1840, Exide Electronics Corp. 8-Hour Emergency Lighting Battery Packs, Revision 1

Applicable Codes and Standards

NFPA 13-1975 Automatic Sprinkler Systems
NFPA 14-1974 Standpipe and Hose Systems
NFPA 20-1973 Centrifugal Fire Pumps
NFPA 20-1993 Centrifugal Fire Pumps
NFPA 24-1973 Outside Protection
NFPA 30-1973 Flammable and Combustible Liquids Code
NFPA 72D-1975 Proprietary Protective Signaling Systems
NFPA 72E-1974 Automatic Fire Detectors
NFPA 80-1975 Fire Doors and Windows
NUREG-1552,Supplement 1,Fire Barrier Penetration Seals in Nuclear Power Plants, dated January 1999
OSHA Standard 29 CFR 1910, Occupational Safety and Health Standards,
Underwriters Laboratory, Fire Resistance Directory, designs U904, U905, and U906, dated January 1995
Underwriters Laboratory Standard 555, Standard for Fire Dampers and Ceiling Dampers, dated May 14, 1979
Fire Protection Handbook, 17th Edition

Other Documents

Corrective action program problem evaluation reports (PERs) resulting from fire, smoke, sparks, arcing, and equipment overheating incidents for the calendar Year (CY) period 2001-2003
NRC Information Notice 2003-08, Potential Flooding through Unsealed Concrete Floor Cracks, dated June 25, 2003
Transient Combustible Evaluations (SPP-10.10) issued for 90 day period from January 2004
U. S. Consumer Product Safety Commission, Invensys Building Systems Announce Recall of Siebe Actuators in Building Fire/Smoke Dampers, dated October 2, 2002

Watts Bar Nuclear Plant, Fire Protection System Engineering Status Report, Systems 013 and 026, CYs 2001, 2002, 2003, and 1st Quarter CY 2004, February 18, 2004
Design Change Authorization DCA-M12070, Changes to Conduits and Cables to Meet Appendix R, (Portions relevant to components reviewed) revised on various dates.
Design Change Notice 19796-B, Reconfigure the Radiax Antenna System, May, 16, 1995
Design Change Notice 38919-A, Appendix R Manual Action Requirements
Design Change Notice 39742-A, Add Manual Switches to Resolve Appendix R Control Circuit Interaction
Fire Test ICC0286018, Fire and Hose-Stream Tests for Penetration Seal Systems, April 1986
Fire Test ICC1185020, Penetration Seal Systems in a Concrete Floor Slab Utilizing a Silicone Elastomer Blockout, November, 1985
Fire Test 93-H-72449, 3-Hour Fire Resistance Evaluation of Twelve Fire Penetration Seal Designs Contained in Different Slabs, November, 1993
Fire Test CTP-1142, 3-Hour Fire Qualification Test of Six (6) Inch Depth LDSE w/Aluminum and Steel Penetrants, August, 1987
3-OT-JPMA034, Reset The TDAFW Pump (After Mechanical Overspeed) Per SOI-3.02, Revision 6
3-OT-JPMA015, Local Operation of Turbine Driven AFW Pump Per SOI-3.02, Revision 6
3-OT-JPMA015A, Local Operation of Turbine Driven AFW Pump Per SOI-3.02, Revision 4
3-OT-JPMA015B, Local Reset of AFWT A-S Per SOI-3.02, Revision 0
3-OT-JPMA398, Alignment of ERCW to 1a-a Ccp Lube Oil Heat Exchanger per AOI-15,
3-OT-JPMA155, Bypassing 1-FCV-62-93, CVCS Charging Header Flow, For Local Control
3-OT-JPMA045B, Operate #1 S/G PORV (Locally With N_2) Per SOI-1.01, Revision 0
3-OT-SRT0126, Main Control Room Inaccessibility (simulator scenario), Revision 0
3-OT-SRT0018A, Appendix R Fire (simulator scenario), Revision 0
3-OT-AOI3000, AOI-30.1, 30.2 Plant Fires (lesson plan), Revision 4
3-OT-AOI2700, AOI-27, Main Control Room Inaccessibility (lesson plan), Revision 4
3-OT-SID0012, Auxiliary Control Room Demonstration (simulator instruction), Revision 0

License Basis Documents

Watts Bar Nuclear Plant Fire Protection Report, Revision 26
Letter dated 09/15/93, from W. J. Museler (Tennessee Valley Authority) to U.S. NRC : Watts Bar Nuclear Plant - Submittal of the Revised WBN Fire Protection Report (TAC M63648)
Safety Evaluation Report, Operation of Watts Bar Nuclear Plant Units 1 and 2, SER Supplement 18, Dated October, 1995
Watts Bar Nuclear Plant Technical Specifications

CRs Reviewed

WBN-01-002973, Cracking of Face-Pieces of Self Contained Breathing Apparatus (SCBA)
WBN-01-003748, Potential Degradation of Firefighter Primary Garments
WBN-01-014483, Hydrogen Fire at Nuclear Power Station
WBN-00-016440-000, Revise Note in AOI-30.2, Section C.69, to Be Consistent with the FPR
WBN-02-011625, The High Pressure Fire Protection Detector System Actuated for Elevation 737 in the Auxiliary Building
WBN-02-013342, Smell of Smoke in Main Control Room

WBN-03-000732, Smoke Coming From Ventilation Duct in Operations Turnover Room
WBN-03-012875, Electrical Burning Smell in Main Control Room
WBN-03-018587, Diesel Driven Fire Pump Fill Valve Not in the Locked Open Position

CRs and Work Orders Generated During this Inspection

WBN-04-033650, Basis for certain manual actions contained in AOI-30.2 not identified in design documents
WBN-04-033818, Inconsistencies in Fire Protection Report, analysis volume AV-036, possibly typographical error
WBN-04-033822, AOI-32.2 sketch for room volumes on elevation 737.0 of the auxiliary building incorrect
WBN-04-033881, AOI-30.2 contains inconsistent steps for disablement of centrifugal charging pumps
WBN-04-033898, Combustible Loading of the General Ventilation Chiller Package A Not Included In Calculation EPM-DOM-012990
WBN-04-033985, Evaluate the Need for a Testing Program for the Insulating Oil for the Plant Indoor Fluid Filled Transformers
WBN-04-033888, Redundant steps identified in AOI-30.2
WBN-04-033899, Poor equipment conditions identified during walkdown of AOI-30.2
WBN-04-033900, Blocked floor drain identified during walkdown of AOI-30.2
WBN-04-033926, Training needs (Appendix R) were identified based on interviews with operation personnel
WBN-04-034224, Emergency lighting aim not adequate for manual action contained in AOI-30.2
WBN-04-034241, Appendix R labeling enhancement opportunities identified during walkdown of AOI-30.2
WBN-04-034259, Design change process does not address manual action considerations
Work Order 04-815011-000, Oil Leak Identified on General Ventilation Chiller B
Work Order 04-815090-000, South door of 6.9 KV Unit startup board does not operate properly
Work Order 04-815097-000, Clean floor drain in 6.9KV Shutdown Board Room B-train

LIST OF ACRONYMS

ADAMS	Agency-Wide Documents Access and Management System
ACP	auxiliary control panel
CAP	corrective action program
CCW	component cooling water
CFR	Code of Federal Regulations
CR	condition report
DC	direct current
ELU	emergency lighting unit
FA	fire area
FHA	Fire Hazards Analysis
ft	foot
FPP	Fire Protection Program
FPPR	Fire Protection Program Report
FZ	fire zone
GOP	General Operating Procedure
HVAC	heating, ventilation, and air conditioning
LCV	level control valve
MCR	main control room
MOV	motor operated valve
NCV	non-cited violation
NFPA	National Fire Protection Association
NRC	U.S. Nuclear Regulatory Commission
ONOP	Off-Normal Operating Procedure
OSHA	Occupational Safety and Health Administration
PARS	Publicly Available Records Systems
POC	point of combustion
RCP	reactor coolant pump
RCS	reactor coolant system
RWST	refueling water storage tank
SDP	Significance Determination Process
SER	safety evaluation report
SSAR	Safe Shutdown Analysis Report
SSD	safe shutdown
UFSAR	Updated Final Safety Analysis Report
UL	Underwriter’s Laboratory
URI	unresolved item
V	volt