

**WATTS BAR TRIENNIAL FIRE PROTECTION INSPECTION REPORT INPUT Rev. 2 5/10/04**

Inspector: M. Thomas  
Report No.: 50-390,391/2004-006  
Inspection Dates: 3/29 - 4/2/2004 and 4/12-16/2004

**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). 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. 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 was considered within the capability of the operator and could be reasonably accomplished within the 15-minute time specified in the Fire Protection Report. This determination was based on field walkdowns of Procedure AOI-30.2, Section C.23, and review of pre-fire plans and fire brigade activities for a fire in Room 757-A5. (Section R05.b)

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## 1. REACTOR SAFETY

### CORNERSTONES: Initiating Events, Mitigating Systems, and Barrier Integrity

#### 1R05 Fire Protection (71111.05T)

#### .05 Operational Implementation of Post-Fire Safe Shutdown Capability

##### a. Inspection Scope

The inspectors reviewed the operational implementation of the SSD capability for an Appendix R fire in Fire Areas 14, 27, 33, or 48 to verify that: (1) the training program for licensed personnel included main control room (MCR) and alternative safe shutdown capability; (2) personnel required to achieve and maintain the plant in hot standby, from the MCR or auxiliary control room (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.

##### b. Findings

**Introduction:** The inspectors identified a non-cited violation (NCV) of Operating License Condition 2.F., for inadequate implementation of the approved fire protection program (FPP). 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.

**Description:** The licensee implemented a design change 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 (Fire Area 27). 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; and TI-277, Modification Compliance Review - Fire Protection. 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 evaluating the availability of emergency lighting alone was not sufficient to determine if the local manual operator actions could be performed within the required time in a satisfactory manner. The procedures did not consider other conditions such as location of the manual actions with respect to the fire, complexity, accessibility, environmental

considerations, etc., which could affect the operators' capability to perform the action. This process could result in the licensee inappropriately implementing changes to the FPP which may not lead to a safe plant condition and could adversely affect the ability to achieve and maintain safe shutdown in the event of a fire, without receiving prior NRC approval.

An example of this process 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 (Fire Area 27). The DCN added manual switches to the control circuits for MCR air handling units (AHU) A-A and B-B and identified new local manual operator actions for restarting the AHUs. The new manual actions replaced previous 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. The inspectors further noted that other conditions which could affect capability of the operators to perform this new manual action were not addressed, such as, accessibility, complexity, environmental considerations, etc. The new manual operator 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 new local manual operator action were located in Room 757-A2 of the auxiliary building, which was adjacent to Room 757-A5 (Fire Area 27). The inspectors initially questioned whether this new manual action was within the capability of the operator performance, 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 new 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 manual operator action was 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; and TI-277, Modification Compliance Review - Fire Protection.

Contrary to the above, 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 location of the manual actions with respect to the fire, complexity, accessibility, environmental considerations, etc., 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, Evaluation Process for Design Changes Which Could Affect Safe Shutdown in the Event of a Fire Without Obtaining Prior NRC Approval. This finding was entered into the licensee's corrective action program as PERs 34252 and 34259.

### **SUPPLEMENTARY INFORMATION**

#### **KEY POINTS OF CONTACT**

##### Licensee

T. Davis, Fire Operations Support  
J. Young, Operations Specialist

Other licensee employees contacted included operations, security, and radiation protection personnel.

## 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  
 FPDP-3, Management of the Fire Protection Report, Rev. 4  
 SPP-9.3, Plant Modifications and Engineering Change Control, Rev. 9  
 TI-277, Modification Compliance Review - Fire Protection, Rev. 0

### Completed Surveillance Procedures

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

### Lesson Plans/Job Performance Measures (JPM)

**TO BE ADDED BY KATHLEEN**

### Problem Evaluation Report (PER)

WBN-00-016440-000, Revise Note in AOI-30.2, Section C.69, to be consistent with the FPR

### Drawings

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  
 1-47W845-3, Essential Raw Cooling Water Flow Diagram, Rev. 20  
 1-47W859-1, Component Cooling System Flow Diagram, Rev. 44  
 1-47W859-2, Component Cooling System Flow Diagram, Rev. 34

### Calculations

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

### Miscellaneous Documents

Technical Specification 3.3.4, Remote Shutdown System Instrumentation  
 DCN 38919-A, Appendix R Manual Action Requirements  
 DCN 39742-A, Add Manual Switches to Resolve Appendix R Control Circuit Interaction