

September 6, 2001

MEMORANDUM TO: John A. Grobe, Director  
Division of Reactor Safety  
Region III

FROM: Ledyard B. Marsh, Acting Deputy Director **/RA/**  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

SUBJECT: TASK INTERFACE AGREEMENT 2001-05, FIRE ZONES 11.5-0 AND  
11.6-0 AT THE BRAIDWOOD NUCLEAR POWER PLANT (TAC NOS.  
MB1958 AND MB1959)

By memorandum dated May 7, 2001, Region III requested NRR assistance with technical issues and interim practices associated with evaluating the acceptability of Braidwood Station changing the approved fire protection program by changing two fire zones from being fully compliant with NUREG-0800, Standard Review Plan, Section 9.5-1, Paragraph C.5.b(2) by having redundant trains separated by rated fire barriers to alternative shutdown, Paragraph C.5.b(3). The licensee did not provide the zones with automatic suppression.

NRR has concluded that the licensee did not comply with the approved fire protection program. The change from compliance with 10 CFR Part 50, Appendix R, Section III.G.3, which is incorporated in the approved fire protection program, did not receive prior approval by the NRC, as required by License Condition 2E. By not installing a suppression system, the licensee changed the fire zones from compliance with program barrier separation requirements, as stated in Fire Protection Program, to a condition that did not satisfy 10 CFR Part 50, Appendix R, Section III.G.2, or Section III.G.3, and is not allowed by the Fire Protection Program. This constituted a change from the approved program that required NRC approval prior to implementation. The attachment provides NRR's detailed response to TIA 2001-05.

This completes the response to TIA 2001-05 and closes out TAC Nos. MB1958 and MB1959.

Docket Nos. STN 50-456 and  
STN 50-457

Attachment: As stated

cc: B. Platcheck, RI  
L. Plisco, RII  
K. Brockman, RIV

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Docket Nos. STN 50-456 and  
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Enclosure: As stated  
cc: B. Platcheck, RI  
L. Plisco, RII  
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**ADAMS Accession No.: ML012050008**

\*See previous concurrences

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## **RESPONSE TO TASK INTERFACE AGREEMENT 2001-05 FIRE ZONE 11.5-0 AND 11.6-0 AT BRAIDWOOD STATION**

### **1.0 INTRODUCTION**

During an inspection completed at the Braidwood Station on June 16, 2000, the inspection team determined that the licensee changed two fire zones, Zones 11.5-0 and 11.6-0, from satisfying the criteria in NUREG-0800, "Standard Review Plan," (SRP) Section 9.5-1, Paragraph C.5.b(2), by having redundant trains separated by rated fire barriers, as per the requirements of 10 CFR Part 50, Appendix R, Section III.G.2, to fire zones requiring alternative shutdown, Paragraph C.5.b(3). The licensee did not provide the zones with automatic suppression, consistent with the 10 CFR Part 50, Appendix R, Section III.G.3, as incorporated in the fire protection program.

Braidwood Station Unit 1 received its operating license on July 2, 1987. Unit 2 received its operating license on May 20, 1988. The original safety evaluation reports NUREG-1002, dated November 1983, and NUREG-0876, dated February 1982, accepted the licensee's commitment to conform to the technical requirements for the fire protection program in 10 CFR Part 50, Appendix R, Section II A (BTP CMEB 9.5-1, Section C.1).

The approved fire protection program Section A5.7 incorporates the provision of 10 CFR Part 50, Appendix R, Section III.G.3. Section III.G.3 specifies that a fire area where alternative shutdown is required must have a fire detection and an automatic suppression system.

Braidwood Operating License Condition 2.E states that the licensee shall implement and maintain the approved fire protection program. The Operating License Condition allows the licensee to make changes to the approved fire protection program that do not adversely affect the ability to achieve safe shutdown in the event of a fire.

The two fire zones had been originally accepted by the Nuclear Regulatory Commission (NRC) based on their meeting the guidance of NUREG-0800, "Standard Review Plan," Section 9.5-1 and any deviations from 10 CFR Part 50, Appendix R, were approved by the staff. The original approval for these zones, at the time of licensing, was based on separation of redundant trains of equipment required to achieve safe shutdown conditions by having a rated 3-hour fire barrier protecting one train of equipment, which is consistent with 10 CFR Part 50, Appendix R, Section III.G.2(a), as incorporated in the fire protection program.

The barrier material used to protect the train of equipment was Thermo-lag. As discussed in Generic Letter 92-08, "Thermo-Lag 330-1 Fire Barriers," Thermo-lag material needed additional evaluation to ensure that the barriers remained rated. To resolve these concerns the licensee re-routed, to other fire zones, the protected train cables from the affected fire zones. The licensee did not, however, re-route the cables for the main control room ventilation system. One train of this system was needed to be protected for redundant shutdown. Rather than re-route or protect these cables, the licensee decided to designate these fire zones as alternative shutdown areas. The fire zones did not contain area wide fire suppression systems

as needed to satisfy the approved fire protection program, as incorporated into the operating license, for alternative shutdown fire areas. The licensee responded to this issue by letter dated February 7, 2001.

The fire protection rule, 10 CFR 50.48 and Appendix R, sets forth the requirements for plants licensed to operate prior to January 1, 1979. The Appendix R requirements were incorporated into NUREG-0800, "Standard Review Plan," Revision 3, Section 9.5-1, which was used to evaluate the adequacy of plants currently in the licensing process. During the revision process, the NRC made an editorial error and failed to transfer the guidance into Paragraph C.5.b(3) from Appendix R, Section III.G.3 which required areas designated for alternative shutdown to have a fire suppression system. This error was acknowledged in Generic Letter 86-10, Section 8.11, and it was stated that the SRP would be corrected during the next revision. NUREG-0800, Section 9.5-1 is scheduled for revision in FY-02. Nevertheless, because the approved Byron and Braidwood fire protection program included the provisions of 10 CFR Part 50, Appendix R, Section III.G.3 (see Appendix A5.7-14), the typographical error does not affect License Condition 2E or the licensee's fire protection program.

## 2.0 LICENSING BASIS

10 CFR 50.48 requires nuclear power plants to have a fire protection program. It further requires that plants licensed to operate prior to January 1, 1979, comply with Appendix R to 10 CFR Part 50. Section III.G of Appendix R requires that a licensee have one train of equipment required to achieve and maintain safe shutdown free of fire damage. This section requires that redundant trains of equipment in a fire area be: (1) separated by a rated 3-hour fire barrier, or (2) be separated by a rated 1-hour fire barrier with fire detection and suppression, or (3) be separated by 20 feet with no intervening combustibles with detection and suppression. In areas where these separation requirements are not met, the regulation allows use of alternative shutdown when fire detection and suppression is provided.

Braidwood Station Unit 1 received its operating license on July 2, 1987. Unit 2 received its operating license on May 20, 1988. As a part of the licensing review for Braidwood Station, the NRC required the licensee to conduct a point by point comparison of the station's compliance with the requirements of 10 CFR Part 50, Appendix R and incorporate it into the approved program. This comparison was incorporated into the approved fire protection program in the Braidwood Fire Protection Report, Appendix A5.7. Appendix A5.7-1 of the licensee's program states: "Although Appendix R to 10 CFR Part 50 applies strictly to plants licensed to operate prior to January 1, 1979, the NRC has made conformance to 10 CFR Part 50, Appendix R a licensing requirement for Byron/Braidwood." In addition, the requirements of 10 CFR Part 50, Appendix R, Section III.G.3, are listed verbatim in the fire protection program.

## 3.0 DISCUSSION

The original license review for fire zones 11.5-0 and 11.6-0 (Auxiliary Building 401' and 426' elevations, respectively) evaluated these zones as redundant safe shutdown areas. To protect safe shutdown cables the licensee wrapped the cables in a 3-hour rated Thermo-lag barrier. Subsequent to this approval, industry testing identified that the Thermo-lag testing results were

not accurate and that the designs needed upgrading. Generic Letter 92-08 discusses the Thermo-lag concerns. To resolve the concerns at Braidwood Station, the licensee re-routed most of the cables requiring protection from these fire areas. The licensee did not re-route the cables for the control room ventilation system. In 1996, the licensee changed these fire zones to zones which were designated as requiring alternative shutdown. The licensee did not add a suppression system to the area as specified in 10 CFR Part 50, Appendix R, Section III.G.3 and the fire protection plan, as required by the License Condition 2E.

Subsequent to the NRC inspection, the licensee sent a letter to the NRC dated February 7, 2001, justifying the change. The licensee described certain fire protection features in the zones. The licensee said that the change was made in accordance with License Condition 2E, using Generic Letter 86-10 guidance. The licensee further compared these zones to the control room (CR) and the auxiliary electrical equipment room (AEER) where the NRC, during the licensing process, allowed the licensee to deviate from Appendix R by not having a suppression system for alternative shutdown fire zones.

The staff considered the information in the licensee's letter. Contrary to the licensee's statement, these changes had an adverse effect on the safe shutdown equipment, and thus, prior NRC approval is required in accordance with License Condition 2E. The licensee failed to realize that prior approval for these deviations was required for the CR and the AEER. In addition, the licensee's comparison of the fire zones 11.5-0 and 11.6-0 to the CR and AEER failed to consider that the agency typically granted these deviations for the CR due to continuous manning of the control room. The AEER would have other considerations too as it is adjacent to the CR and has frequent traffic, as access to the CR is through the AEER. Also, the AEER is a small room where transient combustible material and maintenance activities are minimized. Fire zones 11.5-0 and 11.6-0 are large complex fire zones, not continuously manned, where transient combustible materials may be used and maintenance activities are routinely performed.

The fire protection features in the area may lower the risk from the effects of a fire in the zones under consideration and would be considered mitigating factors in a deviation request or if this non-conforming condition was evaluated under the significance determination process. The information contained in the licensee's letter was insufficient to approve a deviation.

#### 4.0 CONCLUSIONS

This licensee, through incorporation of alternative shutdown requirements in their approved fire protection program and the fire protection program change requirements stated in License Condition 2E, is required to comply with the alternative shutdown requirements of 10 CFR Part 50, Appendix R, Section III.G.3.

To comply with the requirements of 10 CFR Part 50, Appendix R, Section III.G.3, the licensee should have area wide fire suppression in the area under consideration. Some of the mitigating factors provided in the licensee's letter of February 7, 2001, would be considered if a deviation had been requested or if this non-conforming condition was evaluated under the significance determination process.

Although, the licensee was licensed to operate after January 1, 1979, the requirements of 10 CFR Part 50, Appendix R, Section III.G.3, were incorporated into the approved fire protection program. In accordance with License Condition 2E, the licensee may change designation of a fire zone from 10 CFR Part 50, Appendix R, Section III.G.2, separation requirements to 10 CFR Part 50, Appendix R, III.G.3, "alternative shutdown," without prior approval, if a licensee remains in compliance with the provisions of the specified requirements in 10 CFR Part 50, Appendix R, as set forth in the fire protection program. Fire protection program changes that adversely affect the ability of the plant to achieve safe shutdown, require prior NRC approval.

The region asked "are nuclear power plants that comply with the guidelines of BTP CMEB 9.5-1 required to have area wide suppression for those fire zones designated as alternative or dedicated shutdown areas?" Licensees are required to implement the approved fire protection plan in accordance with the operating license. The plans are large complex documents. During the licensing process, the staff reviewed alternative shutdown areas and required licensees to have suppression or a deviation, as was granted for the CR at Braidwood. Plants, during this process, were also required to review their program against the requirements of Appendix R. This ensured that all requirements were addressed. The staff acknowledged that there was an editorial error in the SRP, when the provisions of 10 CFR Part 50, Appendix R, were included in the document. The SRP omitted the requirement for a suppression system in alternative shutdown guidance. In Generic Letter 86-10, Section 8.11, it was stated that the SRP would be corrected in the next revision. Licensees of plants, licensed after January 1, 1979, which committed to meet 10 CFR Part 50, Appendix R, or have 10 CFR Part 50, Appendix R, requirements contained in the approved fire protection program, must have a fire suppression system installed in an alternative shutdown fire area.

Principal contributor: Phil Qualls

Date: September 6, 2001