



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

September 10, 2001

MEMORANDUM TO: Ledyard B. Marsh, Acting Deputy Director
Division of Licensing and Project Management
Office of Nuclear Reactor Regulation

FROM: Arthur T. Howell, Director /RA/ 9/10/01
Division of Reactor Safety, Region IV

SUBJECT: TASK INTERFACE AGREEMENT (TIA) - REQUEST FOR RISK
DETERMINATION OF FIRE PROTECTION FINDINGS AT ARKANSAS
NUCLEAR ONE, UNIT 1 (01TIA11)

Background - During the triennial fire protection inspection at Arkansas Nuclear One, Units 1 and 2, which was conducted onsite during the period, June 11 - 22, 2001, Region IV inspectors found that the configurations of Fire Zone 98J (diesel generator corridor) and Fire Zone 99M (north electrical switchgear room) in Unit 1 did not meet the separation requirements specified in 10 CFR Part 50, Appendix R, Section III.G.2. Section III.G.2 requires that cables or equipment of redundant trains of systems necessary to achieve and maintain hot shutdown conditions (including associated non-safety circuits that could prevent operation or cause mal-operation due to hot shorts, open circuits, or shorts to ground) be physically protected from fire damage by one of three methods. These methods are:

- (1) Separation of cables and equipment and associated non-safety circuits of redundant trains by a fire barrier having a 3-hour rating.
- (2) Separation of cables and equipment and associated non-safety circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustible or fire hazards. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area.
- (3) Enclosure of cable and equipment and associated non-safety circuits of one redundant train in a fire barrier having a 1-hour rating. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area.

Region IV found that the licensee had not adopted an approach that provided the protection from fire damage specified in Appendix R. Rather, they relied on manual actions to mitigate the effects of a fire on cables associated with equipment necessary for achieving and maintaining hot shutdown conditions. This constitutes a violation of 10 CFR Part 50, Appendix R, Section III.G.2. Specific details pertaining to these issues are documented in Attachment 1. This determination was made following the issuance of the attached inspection report and upon further review of the licensing basis and discussions with NRR and OGC.

E/S

ANO Fire Protection Finding Summary

Inspection: Triennial Fire Protection; June 2001

Report: 50-313;368/2001-06; August 20, 2001

Finding: In Fire Zones 98J and 99M of ANO, Unit 1, the licensee failed to ensure that one train of cables, equipment, and components was free of fire damage by one of the three means specified in 10 CFR Part 50, Appendix R, Section III.G.2. In lieu of providing this protection, the licensee credited numerous manual actions for restoring fire-affected safe shutdown functions.

Backfit: ANO claimed the violation was a generic backfit. RIV held 2 backfit panels upholding the violation. NRR addressed the generic aspect of this finding, agreeing with RIV.

At issue: The requirements of 10 CFR Part 50, Appendix R, Section III.G.

III.G.1: fire protection features shall be provided for SSCs important to safe shutdown (SSD), and must be capable of limiting fire damage so that one train of systems necessary to achieve and maintain hot shutdown from either the control room or emergency control station(s) is free of fire damage.

III.G.2: where redundant SSD systems are located in the same fire area, one train of SSD systems (including associated circuits) must be free of fire damage by one of three methods:

- (a) separation by a 3-hr fire barrier;
- (b) separation by a horizontal distance of more than 20 feet with no intervening combustible or fire hazards. In addition, automatic fire detection and suppression system shall be installed; or
- (c) enclosure of one train in a 1-hr fire barrier. In addition, automatic fire detection and suppression system shall be installed.

III.G.3: where protection of SSD functions cannot meet III.G.2, alternative or dedicated shutdown capability must be provided.

ANO: ANO claimed that they are only required to meet Section III.G.1 which permits action at emergency control stations.

ANO also claimed that if manual actions could be taken to restore SSD functions manually, then fire-damaged cables are not "necessary" for achieving and maintaining SSD conditions.

Generic: NRC has always permitted the use of manual actions as a method for meeting III.G.2.

Other licensees use manual actions for meeting III.G.2 without prior NRC approval.

Risk:

Phase 2 - [REDACTED]

Phase 3 - [REDACTED] driven primarily by:

- * Loss of MFW, EFW, HPI, emergency ac power
- * Ability of the brigade to suppress the fire before damage to SSD systems
- * uncertainty regarding the operators' ability to accomplish SSD functions in time to prevent core damage.

Differences: NRC assumed higher heat release rates (200-500 kW vs. 70-200 kW)

Time to reach critical temperatures was shorter

Likelihood for success of manual suppression capabilities was reduced.

NRC assumed thermo-plastic cables (damage at 425° F vs. 700° F)

NRC considered the added risk from other fire areas affected by this finding

ANO FP ISSUE TIME LINE

June 11 - 22, 2001	Inspection
August 3, 2001	Exit - issue was characterized as a URI for compliance review and risk significance
August 20, 2001	Report - issue was a URI for compliance review and risk significance
August 31, 2001	Re-Exit - compliance review determined that the use of manual actions for achieving and maintaining hot shutdown conditions was a non-compliance with III.G.2
September 7, 2001	Phase 2 - resulted in [REDACTED]
September 10, 2001	TIA - to HQ requesting a Phase 3
September 28, 2001	Backfit - ANO claimed the violation was a backfit generic to all plants
October 26, 2001	Backfit Panel
January 11, 2002	NEI letter to NRR - generic aspect of using manual actions for complying with Appendix R, III.G.2
January 17, 2002	Backfit Panel - panel denied the backfit, and upheld the violation
April 15, 2002	Backfit Response to ANO - backfit was denied - delayed due to coordination with NRR's response to NEI on the generic portion of the backfit claim
May 16, 2002	NRR letter to NEI - addressing the generic position concerning the use of manual actions for complying with Appendix R, III.G.2.
August 20, 2002	Draft TIA response - NRR's Draft Phase 3 was [REDACTED] however, RIV SRA found errors which resulted in [REDACTED]
September 25, 2002	Final TIA response - NRR's Phase 3 as revised per RIV comments resulted in [REDACTED]
December 10, 2002	SERP - requested RIV look into re-characterizing the violation as a [REDACTED] finding w/o a violation or a compliance backfit
January 24, 2003	Re-SERP - agreed on GREATER-THAN GREEN on [REDACTED]
March 21, 2003	IMC 0609.01 Issued - as requested by RIV, this revision permitted the choice letter to characterize the risk as GREATER-THAN-GREEN
March 25, 2003	Choice letter to ANO informing them the finding was GREATER-THAN-GREEN
April 2, 2003	Additional information requested- by ANO to be provided by April 11, 2003
April 11, 2003	Additional information provided - to ANO via overnight mail