

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
Washington, D.C. 20555

JUL 22 1983

MEMORANDUM FOR: D. Eisenhut  
Division of Licensing

FROM: R. Mattson, Director  
Division of systems integration

SUBJECT: TASK INTERFACE AGREEMENT #83-53  
"PHYSICAL INDEPENDENCE OF ELECTRICAL SYSTEMS"  
TAC NO. 51567

REFERENCE: Memo to D. Eisenhut, dated 4/13/83, "Physical Independence  
of Electrical Systems"

In the reference memorandum it was pointed out that several licensees and NRC Region II personnel have questioned the need for both 10 CFR 50 Appendix R and Regulatory Guide 1.75 separation requirements. In response to the subject TIA and the reference memorandum, the following response is provided.

Item (1) of the reference memorandum requested that a staff position be established on the minimum separation requirements between all redundant trains and division components.

As stated in the introduction section of Appendix R, "Because fire may affect safe shutdown systems and because the loss of function of systems used to mitigate the consequences of design basis accidents under post fire conditions does not per se impact public safety, the need to limit fire damage to systems required to achieve and maintain safe shutdown conditions is greater than the need to limit fire damage to those systems required to mitigate the consequences of design basis accidents. Three levels of fire damage limits are established according to the safety functions of the structure, systems or components.

Hot Shutdown - One train of equipment necessary to achieve hot shutdown...must be maintained free of fire damage by a single fire including an exposure fire.

Cold Shutdown - Both trains of equipment necessary to achieve cold shutdown may be damaged by a single fire, including an exposure fire, but damage...can be repaired or made operable within 72 hours...

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Design Basis Accident - Both trains of equipment necessary for mitigation of consequences following design basis accidents may be damaged by a single exposure fire.

Redundant systems used to mitigate the consequences of other design basis accidents but not necessary for safe shutdown may be lost to a single exposure fire. However, protection shall be provided so that a fire within only one such system will not damage the redundant system. Therefore, the separation criteria of Appendix R applies only to the electrical cabling needed to support the systems which are used for safe shutdown. All other redundant Class 1E and associated electrical cables must at least meet the separation criteria of Regulatory Guide 1.75.

Whereas the more stringent separation requirements of Appendix R for safe shutdown systems are based on exposure fires, the separation requirements of R.G. 1.75 are based on fire initiated by faults and failures internal to the electrical equipment or circuits only.

In cases, where the electrical cabling is covered by separation criteria required for both safe shutdown and accident mitigation, the more stringent criteria of Appendix R apply. Note that compliance with Appendix R may be achieved without separation of redundant Class 1E cabling by providing alternate or dedicated shutdown capability, however, this does not preclude the minimum separation requirements of R.G. 1.75 for redundant Class 1E and associated cables used in accident mitigation. Therefore, in response to item (1) of the reference memorandum, the staff considers the separation requirements of Regulatory Guide 1.75 and Appendix R of 10 CFR 50 to be compatible and establish minimum separation requirements of redundant trains and divisional components for different postulated events.

Item 2 of the reference memorandum requests the staff to "establish whether the fire barrier separation requirements of Regulatory Guide 1.75 are included as part of the fire barrier section of the Technical Specifications." We believe that the design features permitted by Regulatory Guide 1.75 whether they be fire barriers or separation distance are physical design features of the plant and as such are not normally included in the Technical Specifications.

While 10 CFR 50.36 does permit design features to be incorporated into the Technical Specifications they should be limited to those of first order of safety importance whose failure represents a significant threat to the health and safety of the public. We do not believe the physical separation barriers of R.G. 1.75 represent a first order of safety importance. More significant

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are those fire barriers of Appendix R which provide protection against an exposure fire affecting redundant safe shutdown capability and as such are included in the Technical Specifications. Therefore, we do not believe the physical separation barriers of R.G. 1.75 should be included in the Technical Specifications.

From time to time we have been receiving inquiries from other Regions regarding this subject. We, therefore, request that a response be disseminated to all the Regions.

This response has been coordinated with members of the CMEB of the Division of Engineering.

Original signed by Roger J. Mattson

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