



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II  
SAM NUNN ATLANTA FEDERAL CENTER  
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ATLANTA, GEORGIA 30303-8931  
NOVEMBER 23, 1999

MEMORANDUM TO: John A. Zwolinski, Director  
Division of Reactor Projects VII

FROM: Loren R. Plisco, Director  
Division of Reactor Projects

SUBJECT: TASK INTERFACE AGREEMENT (TIA 99-028) RESOLUTION OF  
HARRIS PILOT FIRE PROTECTION INSPECTION FIRE  
BARRIER QUALIFICATION ISSUES

Introduction

A pilot fire protection inspection (IP 71111.05) was conducted at the Carolina Power and Light (CP&L) Shearon Harris plant on November 1-5, 1999, and a pre-exit discussion with the licensee was conducted on November 5, 1999. The inspection identified two potential Non-Green issues associated with: (1) the fire resistance ratings and qualification testing of Thermo-Lag, and (2) Heymc one-hour and Promatec "MT" three-hour fire barrier systems not being qualified to meet safe shutdown separation requirements. These two issues require NRR's input to resolve.

Background

Thermo-Lag Fire Barriers

The Thermo-Lag fire barrier issue involves the use of Thermo-Lag as a fire barrier separation between the Switchgear Room B [including the Auxiliary Control Panel (ACP) Room], the Cable Spreading Room A, and Cable Spreading Room B. This material was installed based on the licensee's testing and evaluations described in a 10 CFR 50.54(f) letter to the NRC dated August 29, 1997, regarding NRC Generic Letter 92-08, "THERMO-LAG FIRE BARRIERS," (Serial: HNP-97-170).

Carolina Power & Light Thermo-Lag fire testing conducted in 1994 and 1995 demonstrated that the Thermo-Lag fire barrier assemblies would provide a fire-resistive rating for one hour and 48 minutes rather than the three-hour rating referenced in the FSAR and SER. Carolina Power & Light issued ESR 95-00620, "Evaluation of Area Enclosures; "Calculations FP-0109 and FP-0110; and, a 10 CFR 50.59 evaluation to evaluate the adequacy of the three-hour rated floor/ceiling assemblies in the switchgear room, ACP room, and cable spreading rooms. The ESR identified that the fire barrier rating of the assemblies as established by actual fire testing was one hour and 48 minutes (1.8 hrs.). Also, ESR 97-00562 was issued to add ionization fire detection inside the Thermo-Lag enclosure located in the ACP room. However, based on a review of the FSAR, the licensee's fire loading calculations indicated that a three hour in-situ fire severity loading existed in the area adjacent to the Thermo-Lag fire barriers. Region II has

Enclosure

reached a preliminary conclusion that the Thermo-Lag fire barrier described above does not meet the plant's licensing basis and the fire protection program requirements. The licensee's 10 CFR 50.59 evaluations of the barrier fire assembly rating represented a 40% degradation (derating) of the margin of fire resistance from that established in the approved fire protection program. In addition, the Thermo-Lag fire assemblies were not designed or rated to bound the in-situ fire loading, and no diverse means of fire protection (i.e., automatic sprinklers) were installed in the area.

### **Heymc and Promatec "MT" Electrical Raceway Fire Barrier Systems**

The Heymc and Promatec fire barrier wrap issue involves the use of the systems as qualified one-hour and three-hour fire barriers. The cables for redundant trains of safe shutdown related functions throughout the plant and both trains of onsite diesel generator power cables routed through fire zone 4-A-CHLR (where the offsite power bus ducts are also routed) are wrapped with Heymc and/or Promatec "MT" fire wrap systems.

The CP&L fire barrier test designation CTP-1026, for the Heymc one-hour fire wrap system, and CTP-1071, for the Promatec "MT" three hour fire wrap system, indicated that the licensee fire testing used the acceptance criteria of American Nuclear Insurers (ANI) Bulletin No. 5 (79) to evaluate the performance of these fire barrier systems. However, the ANI test methodology, as specifically noted on the cover letters for these test reports, was used for insurance purposes only and was not considered an equivalent endurance qualification methodology for rating fire barriers.

In addition, in GL 86-10, Supplement 1, "FIRE ENDURANCE TEST ACCEPTANCE CRITERIA FOR FIRE BARRIER SYSTEMS USED TO SEPARATE REDUNDANT SAFE SHUTDOWN TRAINS WITHIN THE SAME FIRE AREA," the NRC concluded that there was uncertainty as to whether or not the ANI test method established a level of fire barrier performance equivalent to that established by the GL 86-10 acceptance criteria. As a result, supplement 1 to GL 86-10 identified to the industry that the use of the ANI test methodology alone was inadequate to demonstrate compliance to GL 86-10 acceptance criteria for testing the fire resistance rating of electrical cable fire barrier enclosure systems.

### **Request**

Regarding the qualification of Thermo-Lag fire barrier assemblies, Region II requests that NRR determine the adequacy of the protection provided by the Thermo-Lag fire barrier assemblies within the Cable Spreading and ACP Rooms. Also, was the licensee's 10 CFR 50.59 evaluation adequate to support the FSAR change without prior NRC approval to change the rating of the fire barriers from "three-hour" to that which is "adequate for the hazard?" The licensee's engineering analysis, calculations, and qualification testing results for the Thermo-Lag fire barrier assemblies were provided to P. Qualls during the inspection to facilitate this request.

Regarding the licensee's use of the Heymc one-hour fire barrier wrap system and the Promatec "MT" three hour fire wrap system, Region II requests that NRR determine whether the licensee's use of the Heymc and Promatec "MT" fire barrier wrap systems as qualified one-hour and three-hour fire barriers is acceptable. The fire testing and acceptance criteria used by the licensee to

evaluate the performance of these fire barrier wrap systems was provided by the licensee to NRR's representative P. Qualls during the inspection.

This request was discussed with P. Qualls and M. Salley during and after the pilot inspection. If you have any questions please contact G. Wiseman at (404) 562-4542.

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