September 28, 1995

MEMORANDUM TO: Robert A. Capra, Director
Project Directorate III-2
Division of Reactor Projects III/IV

FROM: José A. Calvo, Chief (Original signed by J. Calvo)
Electrical Engineering Branch
Division of Engineering

SUBJECT: RESPONSE TO THE FOLLOWUP TO THE REQUEST FOR ADDITIONAL INFORMATION REGARDING GENERIC LETTER 92-08 (TAC NOS. M85563 AND M85564)

Plant: LaSalle County Station, Units 1 and 2
Licensee: Commonwealth Edison Company
Review Status: Open

By letter dated June 2, 1995, Commonwealth Edison (ComEd) Company submitted a response to the NRC Request for Additional Information (RAI) dated November 17, 1994, related to Generic Letter (GL) 92-08, "Thermo-Lag 330-1 Fire Barriers" for the LaSalle County Station (LCS). The licensee is planning to use Darmatt KM1 to replace the Thermo-Lag fire barriers at LCS. The Electrical Engineering Branch (EELB) has completed its preliminary review of the licensee's analytical approach as documented in the June 2, 1995, submittal per the Sargent & Lundy Calculation 4266/19G52, and has identified a number of open issues and concerns (attachment) requiring clarification by the licensee.

Please treat the attachment as a request for additional information (RAI), responses to which are needed for resolving our concerns on the ComEd ampacity derating factor determinations for LaSalle County Station, Units 1 and 2. Please forward this RAI to the licensee.

Docket Nos.: 50-373
50-374

Attachment: As stated

CONTACT: R. Jenkins, EELB/DE
415-2985

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NAME	RVJenkins:nkw		ASGill		JACalvo	
DATE	09/28/95		09/28/95		09/28/95	

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Attachment

LASALLE COUNTY STATION, UNITS 1 AND 2
DOCKET NOS. 50-373 AND 50-374
FOLLOWUP REQUEST FOR ADDITIONAL INFORMATION REGARDING
GENERIC LETTER 92-08
"THERMO-LAG 330-1 FIRE BARRIERS"

1. The licensee analysis as documented in Attachment B of the June 2, 1995, submittal, Sargent & Lundy Calculation 4266/19G52, Revision 0, "Ampacity Derating for Combination Thermo-Lag 330-1 Material and Darmatt Firewrap", begins with an assumption that the open top industry ampacity tables provide an accurate representation of the ampacity values which will result in a 90°C cable conductor hot spot temperature in an open top tray. It is generally recognized that for most, although not all cases, the subject tables provide a modest margin on operating ampacity.

   Given this margin, the licensee methodology effectively assumes a lower bound value for the baseline heat load, and hence, would be expected to determine by calculation an upper bound value for the internal cable-to-cable tray thermal resistance factor. This result arises because the external resistance factors are fixed in accordance with the correlations used, and the driving temperature drop is fixed by the assumed values of cable and ambient temperature. Once the value of ampacity, i.e., heat load, is fixed then the internal resistance can be determined for the particular configuration. Hence, using a lower bound ampacity value with a downward bias would have a nonconservative effect because the higher internal resistance estimate would lower the baseline ampacity value thereby lowering the overall ampacity derating factor for the fire barrier system.

   For the subject licensee analysis the effect of this approach would be minimal given the nature of the tray type specified, i.e., the solid bottom cable tray. In fact, the industry ampacity tables provide an accurate estimate of the open top ampacities for a solid bottom tray due to the nature of Stolpe's original experiments.

   The approach used to determine the internal resistance between the cables and the surface of a covered cable tray were based on the referenced 1982 ampacity experiments which used solid bottom cable trays. Therefore, the subject analysis is limited to the solid bottom cable tray application. In fact, the 1982 American Power Conference paper, "Tests at Braidwood Station on the Effects of Fire Stops on the Ampacity Rating of Power Cables", makes note of the fact that the industry ampacity tables were found to be nonconservative for some of the tested configurations.

   Based on the above discussion, the licensee is requested to confirm that all of the cable trays under consideration for LaSalle Station are solid bottom trays of the type used in the original tests performed for Braidwood Station as reported in the subject 1982 paper. If other types

of cable trays are applicable for LaSalle Station then a specific and detailed justification for the applicability of the licensee methodology should be submitted by the licensee.

2. The subject Calculation has the following discrepancies to a similar calculation ComEd Calculation G-63, Revision 2, "Darmatt Firewrap Material Cable Ampacity Derating Factor Calculation" dated 1/23/95:

   a. The subject Calculation does not include a thermal resistance factor associated with an assumed air gap between the firewrap and the cable tray. Calculation G-63 assumes a 1/16 inch air gap between the firewrap and the cable tray.

   b. The input data parameter in the subject Calculation for the thermal conductivity of Thermo-Lag 330-1 material is 0.1 Btu/Hr-Ft-degree R (Rankine). Thermal Science Inc. Brochure 7.14, "Fire Resistive and Fire Retardant Subliming Coating System", specifies a thermal conductivity value of 0.1 Btu/Hr ft^2 $^0F/ft$.

   c. The input data parameter in the subject Calculation for the emissivity of the Darmatt surface is 0.6. Calculation G-63 specifies a emissivity value for the Darmatt surface of 0.7.

   The licensee is requested to address the above apparent discrepancy and to revise its analysis accordingly.