

December 22, 1995



U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attn: Document Control Desk

Subject: LaSalle County Station Units 1 and 2
Response to the NRC Request for Additional Information
Regarding Ampacity Derating Analyses
NRC Docket Numbers 50-373 and 50-374

- References: 1) June 2, 1995, R. E. Querio letter to USNRC
2) October 25, 1995, R.M. Latta letter to D. L. Farrar

Reference (1) provided the calculation that determined the ampacity derating for the Darmatt KM-1 Fire Barrier System installed at LaSalle Co. Station. Reference (2) provided the NRC Request For Additional Information regarding the ampacity derating analyses performed for the LaSalle Co. installations.

The following is the Commonwealth Edison Company's (ComEd) response to this request:

- 1) **Question:** "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 (1982 American Power Conference paper, 'Tests At Braidwood Station on the Effects of Fire Stops on Ampacity Rating of Power Cables')."

Response: All of the cable trays under consideration for LaSalle Co. Station are solid bottom trays of the type used in the original tests performed for Braidwood Station, and are governed by the methodology provided to the NRC Staff in Reference (1).

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- 2) **Question:** "The subject Calculation (Sargent & Lundy Calculation 4266/19G52, Revision 0, 'Ampacity Derating for Combination Thermo-Lag 330-1 Material and Darmatt Firewrap') is inconsistent with a similar calculation, ComEd Calculation G-63, Revision 2, 'Darmatt Firewrap Material Cable Ampacity Derating Factor Calculation', dated 1/23/95, and has the following discrepancies:
- 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 fire wrap and the cable tray.
 - b. The input data parameter in the subject Calculation for the thermal conductivity of the 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 ft² °F/ft.
 - c. The input data parameter in the subject Calculation for the emissivity of the Darmatt surface is 0.6. However, Calculation G-63 specifies an emissivity value for the Darmatt surface of 0.7.

The licensee is requested to address the above apparent discrepancies and to revise the analysis accordingly."

Response:

General:

Calculation 4266/19G52, Revision 0 calculates the ampacity derating factor for a fire barrier installation that models a one-hour fire barrier of Thermo-Lag 330-1 enveloped by an additional one-hour fire barrier of Darmatt KM-1. This was done with the conservative assumption that no Thermo-Lag 330-1 would be removed with the installation of the Darmatt KM-1, when in actuality, essentially all Thermo-Lag has been removed except for some residual amount of the material remaining in Uni-Strut channels. This residual material is covered with the Darmatt material. The ampacity derating evaluation provides the basis to conclude that the affected power cables will perform their intended safety function with a modelled two-hour fire barrier. Accordingly, the calculation is considered to be conservative for the actual LaSalle Co. one-hour fire barrier installation and is considered to acceptably represent this as-installed application.

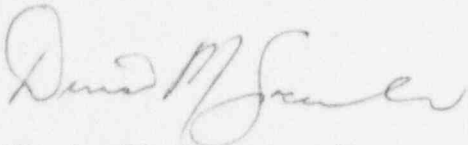
- a. Since the Thermo-Lag has been removed, the use of the Thermo-Lag thermal conductivity value for calculating the equivalent thickness of fire barrier material, results in essentially the same equivalent thickness for a one-hour fire barrier, in comparison to the use of the thermal conductivity of air in Calculation G-63, Revision 2 (i.e., $t = 1.531$ inches vs. $t = 1.508$ inches, respectively). This is considered to be acceptable.
- b. The thermal conductivity input value of $0.1 \text{ Btu/Hr-Ft } ^\circ\text{R}$ was provided in a March 29, 1980, Thermal Science, Inc. letter to S&L, and was accordingly used as input to Calculation 4266/19G52, Revision 0. The units provided are consistent with the heat transfer equations used to determine the resistance of the fire wrap in $^\circ\text{R-ft-hr/Btu}$ in the calculation. These equations were taken from the calculation reference # 4, "Heat Transfer Data Book", Schenectady, New York, General Electric Company, 1977, Kaminsky, D. A.(editor), for calculating the thermal resistance of the Thermo-Lag 330-1. Therefore this input value is acceptable for Calculation 4266/19G52, Revision 0.
- c. The emissivity value of 0.6 was based on early product data provided for the Darmatt KM-1 Fire Protection System, for the LaSalle Co. application, and it was the value specified at the time of Calculation 4266/19G52, Revision 0 preparation(March, 1994). Subsequently, with the continued development of the Darmatt KM-1 Fire Protection System, the product data was revised in July, 1994 to include an emissivity value of 0.7. This was used as input for calculation G-63. The use of 0.6 is conservative in determining the radiation heat transfer from the surface of the wrapped tray for establishing the ampacity derating factor value.

It is recognized that incorporating the new data into the calculation would result in a calculation that may be more current with respect to input values. However, because of the conservatism in the calculation, this would not result in a significant change in the conclusion of the calculation nor a change in the ampacity derating factor determined for LaSalle Co. Station. Therefore, a revision to the calculation is not warranted at this time.

December 22, 1995

If there are any further questions concerning this matter, please contact this office.

Sincerely,

A handwritten signature in cursive script, appearing to read "Denise M. Saccomando".

Denise M. Saccomando
Senior Nuclear Licensing Administrator

cc: H. Miller, Regional Administrator - RIII
P. Brochman, Senior Resident Inspector - LaSalle
D. Lynch, Acting LaSalle Project Manager - NRR
Office of Nuclear Facility Safety - IDNS