

May 3, 1993

C. T. M. Hall
Darchem Engineering Ltd.
Stillington, Stockton-on-Tees
Cleveland TS21 1LB
England

Dear Mr. Hall:

In an effort to verify NRC commercial reactor licensees' compliance with the NRC's fire protection requirements, the staff is conducting a review of fire barrier systems used by licensees to satisfy these requirements. We have developed a number of technical questions concerning Darchem's fire barriers and their installation and test procedures. To assist us in our review, please provide responses to the enclosed questions. A response within 30 days after the date of this letter would be appreciated.

If you require clarification of the questions, please call Isabel Miller at 301-504-2852.

Sincerely,

Original signed by

Conrad E. McCracken, Chief
Plant Systems Branch
Division of Systems Safety and Analysis

Enclosure:
As stated

1. RETURN TO REGULATORY CENTRAL FILES

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ENCLOSURE

- I. What fire barrier materials and systems are supplied to NRC reactor licensees to meet NRC fire protection requirements and guidance? For each material and system, provide answers to the following questions.
- II. GENERAL QUESTIONS
 - A. To the best of your knowledge, which NRC licensees use the fire barrier material or system to meet NRC fire protection requirements or guidelines?
 - B. List all components required to construct the fire barrier system with a 1-hour and 3-hour (if applicable) fire resistance rating? Identify and discuss any deviations from the specified components or the deletion of components, allowed by installation procedures. Are there any optional components?
 - C. Provide the technical basis which demonstrates the acceptability of the fire barriers identified for an Appendix R application.
 - D. How do the fire barrier systems achieve their fire performance and endurance properties. Discuss all applicable mechanisms, e.g., chemical, physical, and mechanical.
- III. FIRE BARRIER QUALIFICATION
 - A. With respect to fire resistance ratings, what standards and test methods were used to qualify the fire barrier systems for use in nuclear power reactors to meet NRC requirements and guidelines? What specific acceptance criteria were applied?
 - B. Provide all test reports and analyses that document the fire endurance characteristics of the fire barrier. Include test reports that substantiate protection requirements for support systems, e.g., cable tray supports.
 - C. What are the flame spread, fuel contributed, and smoke developed ratings for the fire barrier systems. Provide test results that substantiate the ratings.
- IV. AMPACITY DERATING
 - A. What are the ampacity derating values for the 1-hour and 3-hour (if applicable) fire rated fire barrier systems?
 - B. What standards and test methods were used to qualify the fire barrier systems for use in nuclear power reactors to meet NRC requirements and guidelines? What specific acceptance criteria have been applied?
 - C. Provide all test reports that document the ampacity derating characteristics of the fire barrier.

V. SEISMIC ANALYSES

- A. Provide the material properties of the fire barrier, i.e., density, tensile strength, compressive strength, modulus of elasticity, weight, etc. at 70°F and higher temperatures.
- B. Provide information on seismic tests and analyses, if any, performed for the barrier to demonstrate their integrity during and after seismic events.

VI. CONSTRUCTION AND INSTALLATION

- A. With respect to support systems for the 1-hour and the 3-hour (if applicable) fire barriers, e.g., cable tray supports, what specific support protection is required to ensure the 1-hour and 3-hour (if applicable) rating of the system?
- B. Discuss whether or not the selection of fire barrier components is dependent on the system to be protected or any other factor. For example, does the cable tray size, material of construction, or cable loading influence the choice of components?
- C. Have changes been made to the fire barrier materials, including changes in formulation, since the original development of the system?
- D. Describe how the materials are manufactured.
- E. What cure time, if any, is required for the barrier and any coatings for the finished installation to be considered a rated fire barrier?
- F. List and provide copies of all installation and quality control procedures for the use of the fire barrier systems by the commercial nuclear power reactor industry, including all related documents and procedures that address protection of support systems, e.g., cable tray supports.
- G. Of the procedures listed above, identify those that are currently in effect and discuss any significant changes from previous procedures to the current procedures.
- H. Identify the training and experience requirements for the installation of the fire barrier systems. Provide the training syllabus used in training installers and discuss your role in training and certifying installers.