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UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, D.C. 20555-0001

March 17, 1998

NRC INFORMATION NOTICE 95-52, SUPPLEMENT 1: FIRE ENDURANCE TEST RESULTS FOR ELECTRICAL RACEWAY FIRE BARRIER SYSTEMS CONSTRUCTED FROM 3M COMPANY INTERAM FIRE BARRIER MATERIALS

Addressees

All holders of operating licenses for nuclear power reactors except those who have permanently ceased operations and have certified that fuel has been permanently removed from the reactor vessel.

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this supplement to Information Notice (IN) 95-52, to inform addressees of the results of fire endurance tests for electrical raceway fire barrier systems constructed from 3M Company Interam fire barrier materials. It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate, in their review of Interam fire barriers. However, suggestions contained in this information notice are not NRC requirements; therefore, no specific action or written response is required.

Background

In 1995, Peak Seals, Incorporated, initiated a test program to qualify 3M Interam fire barrier designs to Generic Letter (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 first objective of Peak Seals was to qualify 3M designs that existed before GL 86-10, Supplement 1, to the new requirements. The 3M designs that did not meet the acceptance criteria of GL 86-10, Supplement 1, were modified by Peak Seals and retested. IN 95-52 provided the results of 1-hour and 3-hour fire endurance tests that were conducted by Peak Seals at Omega Point Laboratories, San Antonio, Texas. The tests were full-scale fire endurance tests for electrical raceway fire barrier systems constructed from 3M Company Interam fire barrier material.

Through correspondence with 3M and Peak Seals, the staff recently obtained the results of two additional 3-hour fire endurance tests of Interam fire barrier configurations conducted by Peak Seals. The following descriptions are based on information provided to the staff by 3M Fire Protection Products (Accession number 9802040360) and a letter dated October 3, 1997, from Peak Seals (Accession number 9802040354). The staff did not witness these fire endurance tests and has not reviewed the fire test reports.

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Description of Circumstances

The information provided to the staff indicated that the 3-hour fire endurance tests described below were conducted in accordance with American Society for Testing and Materials (ASTM) Standard E-119, "Fire Test of Building Construction and Materials." The acceptance criteria for temperature specified in GL 86-10, Supplement 1, state that the unexposed side of the barrier, as measured on the exterior surface of the raceway or component, must not exceed an average temperature greater than 250 °F above its initial temperature, or a maximum single point temperature 30 percent greater than the allowable maximum temperature rise, or 325 °F above its initial temperature. For these tests, the ambient temperature reading on the thermocouples is considered to be the starting temperature.

The first fire endurance test was conducted on November 28, 1995. The test assembly included 1-inch, 3-inch, and 5-inch conduits; a 2-inch air drop; a 12-inch by 12-inch by 8-inch junction box; a 24-inch by 4-inch cable tray; and a 6-inch by 4-inch cable tray. All the items tested were protected with five layers of Interam E54A material. Some temperatures in all of the configurations, with the exception of the 2-inch airdrop, exceeded the temperature rise acceptance criteria specified in GL 86-10, Supplement 1. The second fire endurance test was conducted on December 7, 1995. Four 1-inch electrical conduits wrapped with Interam fire barrier material were tested. Two conduits were wrapped with five layers of Interam E54A material, one conduit with the ends sealed, and the other without the ends sealed. One conduit was wrapped with six layers of Interam E54A material without the ends sealed, and the fourth was wrapped with seven layers of Interam E54A without the ends sealed. The conduit with seven layers of Interam material was the only assembly with a temperature rise that met the temperature rise acceptance criteria specified in GL 86-10, Supplement 1.


Discussion

NRC requirements and guidelines for fire barriers are specified in various documents: 10 CFR Part 50, Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979;" Branch Technical Position APCS 9.5-1, Appendix A, "Guidelines for Fire Protection for Nuclear Power Plants Docketed Prior to July 1, 1976;" NUREG-0800, "Standard Review Plan;" and GL 86-10, "Implementation of Fire Protection Requirements." The extent to which these requirements or guidelines are applicable to a specific nuclear power plant depends on the age of the plant, commitments established by the licensee in developing the fire protection plan, the staff safety evaluation reports and supplements, and the license conditions pertaining to fire protection. These requirements and guidelines provide reasonable assurance that fire barriers will remain in place and retain their integrity when exposed to a fire. By so doing, there is reasonable assurance that the effects of a fire will be limited to discrete fire areas and that one train of systems and components required to achieve and maintain safe shutdown will remain free of fire damage.

On March 25, 1994, the NRC issued Supplement 1 to GL 86-10 to (1) clarify the applicability of the test acceptance criteria in GL 86-10 to raceway fire barrier systems, (2) specify a set of fire endurance test acceptance criteria that are acceptable for demonstrating that fire barrier systems can perform the required fire-resistive function and maintain the protected safe shutdown train free of fire damage, (3) specify acceptable options for hose stream testing, and (4) specify criteria for cable functionality testing when a deviation is necessary, such as when the fire barrier temperature rise criteria are exceeded or the test specimen cables sustain visible damage.

These positions are used by the NRC staff to review and evaluate fire endurance tests and fire barrier systems proposed by licensees or applicants to satisfy existing NRC fire protection rules and regulations. Some temperatures observed during the tests in November 1995 and December 1995, previously described herein, exceeded the maximum allowable temperature acceptance criteria of Supplement 1 to GL 86-10. In accordance with this supplement, an engineering evaluation could be performed to determine the acceptability of an in-plant Interam fire barrier that was bounded by a deviating test specimen configuration. Information about such evaluations can be found in Supplement 1 to GL 86-10.

This information notice establishes no new NRC requirements; therefore, no specific action or written response is required by this notice. However, recipients are reminded that they are required by 10 CFR 50.65 to take industry-wide operating experience (including information presented in NRC information notices) into consideration, where practical, when setting goals and performing periodic evaluations. If you have any questions about the information in this notice, please contact the technical contact listed below or the appropriate Office of Nuclear Reactor Regulation project manager.

for 
Jack W. Roe, Acting Director
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

Technical contact: Chris Bajwa, NRR
301-415-1237
E-mail: csb1@nrc.gov

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**LIST OF RECENTLY ISSUED
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Information Notice No.	Subject	Date of Issuance	Issued to
98-10	Probable Misadministrations Occurring During Intravascular Brachytherapy With The Novoste Beta-Cath System	3/9/98	All Medical Licensees
98-09	Collapse Of An Isocam II Dual-Headed Nuclear Medicine Gamma Camera	3/5/98	All Medical Licensees
98-08	Information Likely To Be Requested If An Emergency Is Declared	3/2/98	All Parts 30, 40, 70, 72, and 76 licensees and certificate holders required to have a Nuclear Regulatory Commission-approved Emergency Plan.
98-07	Offsite Power Reliability Challenges from Industry Deregulation	2/27/98	All holders of operating licenses for nuclear power reactors
98-06	Unauthorized Use of License to Obtain Radioactive Materials, And Its Implications Under The Expanded Title 18 of the <u>U.S. Code</u>	2/19/98	All NRC licensees authorized to possess licensed material
97-45, Supp. 1	Environmental Qualification Deficiency for Cables and Containment Penetration Pigtailes	2/17/98	All holders of operating licenses for nuclear power reactors except those licensees who have permanently ceased operations and have certified that the fuel has been permanently removed from the reactor vessel
98-05	Criminal History Record Information	2/11/98	All holders of operating licenses for power reactors
98-04	1997 Enforcement Sanctions for deliberate Violations of NRC Employee Protection requirements	2/9/98	All U.S. Nuclear Regulatory Commission licensees

OL = Operating License
 CP = Construction Permit

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/s/ by D. Matthews
 FOR

Jack W. Roe, Acting Director
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 Office of Nuclear Reactor Regulation

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 E-mail: csb1@nrc.gov

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