

NUCLEAR REGULATORY COMMISSION

Proposed Generic Communication

IMPACT OF POTENTIALLY DEGRADED HEMYC AND MT FIRE BARRIERS ON  
COMPLIANCE WITH APPROVED FIRE PROTECTION PROGRAMS

AGENCY: Nuclear Regulatory Commission.

ACTION: Notice of opportunity for public comment.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is proposing to issue a generic letter (GL) to:

- (1) Request that addressees evaluate their facilities to confirm compliance with the existing applicable regulatory requirements in light of the information provided in this generic letter and, if appropriate, take additional actions. Specifically, although Hemyc and MT fire barriers in nuclear power plants (NPPs) may be relied on to protect electrical and instrumentation cables and equipment that provide safe shutdown capability during a fire, recent NRC testing has revealed that both materials failed to provide the protective function intended for compliance with existing regulations, for the configurations tested using the acceptance criteria in 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."
- (2) Require that addressees submit a written response to the NRC in accordance with NRC regulations in Title 10 of the *Code of Federal Regulations*, Section 50.54(f) (10 CFR 50.54(f)).

This *Federal Register* notice is available through the NRC's Agencywide Documents Access and Management System (ADAMS) under accession number ML051540292.

DATES: Comment period expires [60 days after FRN is published]. Comments submitted after this date will be considered if it is practical to do so, but assurance of consideration cannot be given except for comments received on or before this date.

ADDRESSEES: Submit written comments to the Chief, Rules and Directives Branch, Division of Administrative Services, Office of Administration, U.S. Nuclear Regulatory Commission, Mail Stop T6-D59, Washington, DC 20555-0001, and cite the publication date and page number of this *Federal Register* notice. Written comments may also be delivered to NRC Headquarters, 11545 Rockville Pike (Room T-6D59), Rockville, Maryland, between 7:30 am and 4:15 pm on Federal workdays.

FOR FURTHER INFORMATION, CONTACT: Angie Lavretta at 301-415-3285 or by email [axl3@nrc.gov](mailto:axl3@nrc.gov), Daniel Frumkin at 301-415-2280 or email [dxfl@nrc.gov](mailto:dxfl@nrc.gov), or Chandu Patel at 301-415-3025 or by email at [cpp@nrc.gov](mailto:cpp@nrc.gov).

SUPPLEMENTARY INFORMATION:

NRC GENERIC LETTER 2005-XX

IMPACT OF POTENTIALLY DEGRADED HEMYC AND MT FIRE BARRIERS ON  
COMPLIANCE WITH APPROVED FIRE PROTECTION PROGRAMS

**ADDRESSEES**

All holders of operating licenses for light-water nuclear power reactors, except those who have 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 generic letter to:

- (3) Request that addressees evaluate their facilities to confirm compliance with the existing applicable regulatory requirements in light of the information provided in this generic

letter and, if appropriate, take additional actions. Specifically, although Hemyc and MT fire barriers in nuclear power plants (NPPs) may be relied on to protect electrical and instrumentation cables and equipment that provide safe shutdown capability during a fire, recent NRC testing has revealed that both materials failed to provide the protective function intended for compliance with existing regulations, for the configurations tested using the acceptance criteria in 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."

- (4) Require that addressees submit a written response to the NRC in accordance with NRC regulations in Title 10 of the *Code of Federal Regulations*, Section 50.54(f) (10 CFR 50.54(f)).

## **BACKGROUND**

NRC's concern with the performance of fire barriers at nuclear power plants began with the failure of Thermo-Lag to pass performance tests in October 1989 at Southwest Research Institute. The tests were done for the Gulf States Utilities Company after visually observing degradation of Thermo-Lag at River Bend Station. In June and August 1992, two sets of full-scale fire endurance tests on Thermo-Lag were conducted at Omega Point Laboratories in San Antonio, Texas, by Texas Utilities Electric Company for Comanche Peak Steam Electric Station, with similar results. In July 1992, the NRC sponsored a series of small-scale fire endurance tests at the National Institute of Standards and Technology. The results again indicated that 1-hour-and 3-hour-rated Thermo-Lag barrier material failed to consistently provide its intended protective function.

On August 6, 1991, the NRC issued Information Notice (IN) 91-47, "Failure of Thermo-Lag Fire Barrier Material To Pass Fire Endurance Test," the first in a series of **INs** issued between 1991 and 1995 on performance test failures and installation deficiencies related to Thermo-Lag 330 fire barrier systems.

Because of questions about the ability of 1-hour- and 3-hour-rated Thermo-Lag fire barrier **material** to perform its specified function and because of the widespread use of Thermo-Lag in the nuclear industry, the NRC issued the following generic communications to inform licensees of the Thermo-Lag test results and to request that licensees implement appropriate compensatory measures and develop plans to resolve any noncompliances with 10 CFR 50.48:

- Bulletin 92-01, "Failure of Thermo-Lag 330 Fire Barrier System To Maintain Cabling in Wide Cable Trays and Small Conduits Free From Fire Damage," June 24, 1992
- Bulletin 92-01, Supplement 1, "Failure of Thermo-Lag 330 Fire Barrier System To Perform its Specified Fire Endurance Function," August 28, 1992
- GL 92-08, "Thermo-Lag 330-1 Fire Barriers," December 17, 1992
- Supplement 1 to GL 86-10, "Fire Endurance Test Acceptance Criteria for Fire Barrier Systems Used To Separate Redundant Safe Shutdown Trains Within the Same Fire Area," March 25, 1994

GL 92-08 specifically asked licensees to review any existing fire barrier configurations credited for 10 CFR 50.48 compliance in light of the concerns with Thermo-Lag 330-1 fire barriers.

In response, the licensees reviewed their fire protection safe shutdown plans to determine if corrective actions were needed. Some licensees had made conservative commitments and installed Thermo-Lag in locations where it was not needed to satisfy NRC requirements, therefore no corrective actions were required. Where fire barrier materials were required, licensees took one or a combination of the following corrective actions:

- Rerouted cables through other fire areas so that redundant safe shutdown trains were not located in the same fire area
- Replaced Thermo-Lag, or the affected material, with an alternative rated fire barrier material
- Upgraded the installed fire barriers to a rated configuration
- Concluded that certain Thermo-Lag barriers were no longer required

Subsequently, deficiencies were also identified in other fire barrier materials. In 1993, for example, Kaowool installed as a 1-hour-rated fire barrier was found to be unable to pass circuit integrity tests. In response, the NRC reassessed previous staff reviews of Kaowool fire barriers and informed the industry and the Commission of the potential failure of Kaowool to perform as intended and suggested additional testing of Kaowool (SECY-99-204; ADAMS Accession No. ML992810028). To resolve the issue, the industry took voluntary corrective actions.

In August 1993, the Nuclear Energy Institute (NEI) formed a Fire Barrier Review Ad Hoc Advisory Committee to address the adequacy of fire barrier materials other than Thermo-Lag. The Committee performed reviews of the original testing of the fire barrier, Hemyc (performed in the early 1980s in Spain), and concluded that Hemyc was differently constructed than Thermo-Lag 330-1, and therefore was not subject to the same failure modes as Thermo-Lag 330-1. In May 1994, this review was documented in the NEI report, "Documentation of the Adequacy of Fire Barrier Materials in Raceway Applications Vis-à-vis Failure Characteristics Inherent to the Thermo-Lag 330-1."

However, beginning in late 1999, three plant-specific findings by the staff raised concerns about the performance of Hemyc and MT fire barriers.

- In November 1999, during an inspection at Shearon Harris Nuclear Power Plant (IR 50-400/99-13; ADAMS Accession No. ML003685341), the inspection team noted that the acceptance of the Hemyc and MT fire barrier materials used was based on

American Nuclear Insurers (ANI) Bulletin No. 5 test acceptance criteria, even though the ANI test methodology clearly stated that the tests were done for insurance purposes only and were not intended to be considered the equivalent of fire barrier endurance tests for fire barrier ratings.

- In October and November 2000, during an inspection at McGuire 1 and 2 (IR 50-369/00-09, 50-370/00-09; ADAMS Accession No. ML003778709), the inspection team noted that the licensee was unable to provide documentation demonstrating protection by Hemyc fire barrier material used to separate safe shutdown functions for two trains within a single fire area.
- In September 2000, during an inspection at Waterford 3 (IR 50-382/00-07; ADAMS Accession No. ML003773900), the inspectors noted that the Hemyc materials were installed in configurations which typically would not be bounded by the existing tests.

In June 2001, the NRC initiated confirmatory fire tests in response to Task Interface Agreement 99-028 (ADAMS Accession No. ML003736721), after concluding that existing testing was likely insufficient to qualify Hemyc or MT as rated fire barriers. The NRC tests were based on ASTM E119 Standard time-temperature conditions and the current NRC guidance in GL 86-10, Supplement 1, for typical Hemyc and MT installations used in U.S. NPPs. The test results indicated that Hemyc and MT fire barriers did not pass the GL 86-10, Supplement 1, criteria to achieve a 1-hour fire rating for Hemyc or a 3-hour fire rating for MT, for the configuration tested. On April 1, 2005, the NRC issued IN 2005-07, "Results of Hemyc Electrical Raceway Fire Barrier System Full Scale Fire Testing." This IN describes the results of the NRC-sponsored confirmatory testing of Hemyc. However, the staff recognized that additional evaluations would be needed to determine whether regulatory compliance exists in light of the concerns identified in IN 05-07.

On April 29, 2005, the staff held a public meeting with licensees and interested members of the public to discuss the Hemyc and MT test results and the staff's intentions to take prompt additional regulatory action to ensure that appropriate measures are under way for compliance with 10 CFR 50.48 requirements at affected plants. This generic letter is the follow-on to IN 05-07.

The NRC has established a Web page to keep the public informed of the status of the Hemyc/MT fire barrier issue at

*<http://www.nrc.gov/reactors/operating/ops-experience/fire-protection/technical-issues.html#fire>.*

This page provides links to information on related fire protection issues, along with documentation of NRC interactions with industry (including generic communications, industry submittals, meeting notices, presentation materials, and meeting summaries). The NRC will continue to update this Web page as new information becomes available.

Hemyc Construction—Hemyc fire barrier material consists of mats of 2-inch Kaowool ceramic fiber insulation inside an outer covering of Refrasil<sup>1</sup> high-temperature fabric. The mats are custom-sized for the electrical raceway and machine-stitched to produce the factory mats. Hemyc mats, which are installed over a metal frame to provide the 2-inch air gap design, are identical except that 1½-inch Kaowool is used instead of the 2-inch material.

MT Construction—MT used with conduits has four layers. The first layer, closest to the conduit, is 1 inch of Kaowool ceramic fiber blanket wrapped in a fiberglass fabric. The second layer is a 2-mil sheet of stainless steel. The third layer is a hydrate packet. This packet is made by stitching together packets of aluminum trihydrate in a fiberglass-coated fabric. The fourth and outermost layer is a 1½-inch Kaowool blanket wrapped in Refrasil. The configuration is slightly

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<sup>1</sup> Refrasil was used during NRC tests. Siltemp and Refrasil were tested by the NRC and determined to be essentially equivalent (ADAMS Accession No. ML051190055).

different for air drops and structural supports. Air drops use a 3-inch blanket of Kaowool as the inner layer. Structural supports do not have the hydrating packet layer or the stainless steel sheet.

## **DISCUSSION**

Hemyc and MT, manufactured by Promatec, Inc, were installed at NPPs to protect circuits and instrumentation **cables** in order to meet regulatory requirements and in accordance with plant-specific commitments. The NRC conducted confirmatory testing of both materials at the Omega Point Laboratories in San Antonio, Texas. The test results indicated that when tested to GL 86-10, Supplement 1, criteria, neither the Hemyc nor the MT fire barrier system would provide its rated fire barrier protection.

The staff noted at least three failure modes in the limited test program. Two failure modes resulted from shrinkage of outer material (Refrasil), causing the barrier to open and exposing the interior surfaces or layers to the fire. The third failure mode resulted from failure to adequately protect steel members intruding into the barrier. The standard used by some utilities required protection of 3 inches of intruding steel for the Hemyc 1-hour fire barrier and 18 inches of intruding steel for the MT 3-hour fire barrier. The test results indicated that additional protection of intruding steel was required to achieve a 1-hour or 3-hour fire rating.

Based on these test results, the NRC is concerned that the Hemyc and MT fire barriers may not provide the level of fire endurance intended by licensees and that licensees that use Hemyc or MT may not be complying with NRC regulations. Section 50.48 of 10 CFR Part 50 requires that each operating NPP have a fire protection plan that satisfies General Design Criterion (GDC) 3, "Fire Protection," of 10 CFR Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants." The NRC Regulation in 10 CFR 50.48 states that each operating nuclear power plant (licensed before or after issuance of GDC 3) must have a fire protection plan that satisfies

Criterion 3 of Appendix A. GDC 3 requires that structures, systems, and components important to safety be designed and located to minimize, in a manner consistent with other requirements, the probability and effect of fires and explosions. Fire protection features required to satisfy 10 CFR 50.48 include features to limit fire damage to structures, systems or components important to safety so that the capability to shut down the plant safely is ensured. One means of complying with this requirement is to separate one safe shutdown train from its redundant train with rated fire barriers. The duration of fire resistance required of the barriers, usually 1 hour or 3 hours, depends on the other fire protection features provided in the fire area.

The NRC issued guidance on acceptable methods of satisfying the regulatory requirements of GDC 3 in the branch technical positions (BTPs) and generic letters identified below in the Applicable Regulatory Guidance section of this generic letter. GL 92-08 specifically included the staff's expectation that licensees would review existing fire barrier configurations credited for 10 CFR Part 50, Appendix R, compliance, based on earlier concerns with Thermo-Lag. Licensees of plants licensed to operate before January 1, 1979, must comply with their fire protection requirements as specified in 10 CFR 50, Appendix R, and licensees of plants licensed to operate after January 1, 1979, must comply with the approved fire protection program incorporated into their operating license. The staff expects licensees to reevaluate their fire protection programs in light of information provided in IN 05-07 and this generic letter and to implement appropriate compensatory measures and develop plans to resolve any noncompliances within a reasonable timeframe.

For guidance in addressing any degraded or nonconforming Hemyc and MT fire barrier configurations, licensees should consult the guidance in Revision 1 to GL 91-18, "Information to Licensees Regarding NRC Inspection Manual Section on Resolution of Degraded and Nonconforming Conditions," dated October 8, 1997. Licensees are encouraged to review Regulatory Issue Summary 2005-07, "Compensatory Measures To Satisfy the Fire Protection

Program Requirements,” in determining the appropriate compensatory measures to meet fire protection program requirements for the degraded or nonconforming fire barrier installations. All licensees should consider the impact of fire barrier degradation on the operability of affected equipment and assess the impact on plant safety.

NRC regulations do not require fire detectors and automatic fire suppression systems when 3-hour fire barriers are used. NRC regulations do require fire detectors and automatic fire suppression systems when 1-hour-rated fire barriers are used; however, the staff has approved plant-specific requests for exceptions (i.e., exemptions or amendments) for specific areas of the plant based on detailed evaluations of the area configuration and combustible loading. Hemyc and MT fire ratings are expected to provide time to extinguish fires before safe shutdown systems are damaged.

If a nonconforming condition is identified, then licensees can use at least two methods, individually or in combination, to restore compliance. One way is to make plant modifications such as replacing the Hemyc or MT fire barriers with an appropriately rated fire barrier material, upgrading the Hemyc or MT to a rated barrier, or rerouting cables or instrumentation lines through another fire area. Another way to address the issue is to perform a technical evaluation that considers defense-in-depth and safety margins as follows:

- Plants licensed to operate before January 1, 1979, that do not plan to perform a plant modification must request an exemption from 10 CFR Part 50, Appendix R, that demonstrates that the configuration as installed meets the requirements of 10 CFR 50.12, “Specific Exemptions.” If the plant proposes to use a risk-informed approach to

justify an exception in accordance with 10 CFR 50.12, then this approach should follow the guidance of Regulatory Guide (RG) 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis."

- Plants licensed to operate after January 1, 1979, that do not plan to perform a plant modification must meet the fire protection requirements in the operating license condition. The standard license condition allows a licensee to make changes to the approved fire protection program without prior staff approval "if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire." GL 86-10, "Implementation of Fire Protection Requirements," provides guidance on performing and documenting these changes.

Plants licensed after January 1, 1979, that adopt a risk-informed approach, must submit a license amendment in accordance with 10 CFR 50.90. The exception to 10 CFR 50.90, provided in the standard license condition and in 10 CFR 50.48(f)(3), does not apply because the risk assessment approaches used by plants deviate from the approved deterministic approaches used in their licensing bases. Furthermore, the licensees' risk assessment tools have not been reviewed or inspected against quality standards found acceptable to the NRC staff. Consequently, the staff is not confident that a risk-informed approach "would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire," at this time. Because this approach fails to meet the exception criteria for an exception to 10 CFR 50.90, a license amendment is required for the change to the license condition, in accordance with 10 CFR 50.90.

## **APPLICABLE REGULATORY REQUIREMENTS**

NRC regulations in 10 CFR 50.48 and 10 CFR Part 50, Appendix A, GDC 3, require each operating nuclear power plant (licensed before or after issuance of GDC 3) to have a fire protection plan providing post-fire safe shutdown. That is, a means must be provided to limit fire damage to structures, systems or components important to safety so that the capability to shut down the plant safely is ensured. The regulation in 10 CFR 50.90 requires a licensee who desires to amend their license, to submit an amendment request to the NRC.

All NPPs licensed to operate before January 1, 1979, are required to comply with 10 CFR Part 50, Appendix R, paragraph III.G, "Fire Protection of Safe Shutdown Capability." All NPPs licensed to operate after January 1, 1979, are required to comply with 10 CFR 50.48(a), which requires that each operating nuclear power plant have a fire protection plan that satisfies GDC 3. The fire protection plan is incorporated into the operating license for each post-1979 plant as a license condition. This license condition specifically cites the staff SER on the licensee's fire protection plan, to demonstrate that the license condition has been met (although licensees may modify their fire protection plan as long as there is no adverse effect on safe shutdown).

## **APPLICABLE REGULATORY GUIDANCE**

The NRC issued guidance on acceptable methods of satisfying the regulatory requirements of GDC 3 in Auxiliary and Power Conversion Systems Branch (APCSB) BTP 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants," May 1, 1976; Appendix A to APCS BTP 9.5-1, February 24, 1977; and Chemical Engineering Branch (CMEB) BTP 9.5-1, "Fire Protection for Nuclear Power Plants," July 1981. In response to licensees' questions, the staff provided additional guidance on fire barriers in GL 86-10. The staff issued additional guidance as Supplement 1 to GL 86-10.

In the BTPs and in GL 86-10, the staff states that the fire resistance ratings of fire barriers should be established in accordance with National Fire Protection Association (NFPA) Standard 251, "Standard Methods of Fire Tests of Building Construction and Materials,"<sup>2</sup> by subjecting a test specimen that represents the materials, workmanship, method of assembly, dimensions, and configuration for which a fire rating is desired to a "standard fire exposure." Supplement 1 to GL 86-10 provides guidance for fire barrier endurance testing and for evaluating deviations from tested configurations. This guidance is repeated in RG 1.189, "Fire Protection for Operating Nuclear Power Plants."

### **REQUESTED ACTIONS**

Within 60 days of the date of this letter, all addressees are requested to determine whether or not Hemyc or MT fire barrier material is installed and relied on for separation and/or safe shutdown purposes to satisfy applicable regulatory requirements.

Addressees who credit Hemyc or MT for compliance should provide information regarding the extent of the installation; whether the material is degraded or nonconforming; and any compensatory actions in place to provide equivalent protection and maintain the safe shutdown function of affected areas of the plant in light of the recent findings of potential degradation of Hemyc and MT. **Licensees should** provide evaluations to support conclusions that they are in compliance with regulatory requirements for the Hemyc and MT applications. Licensees that can not justify their continued reliance on Hemyc or MT shall provide a description of corrective actions taken or planned and a schedule for milestones including when full compliance will be achieved. In addition, licensees should identify and discuss all applications that are considered degraded but operable, including a basis for this conclusion.

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<sup>2</sup> American Society for Testing and Materials (ASTM) E-119, "Fire Test of Building Construction Materials," and NFPA 251 are essentially equivalent.

Compensatory and corrective actions shall be implemented in accordance with existing regulations commensurate with the safety significance of the degraded or nonconforming condition. The NRC expects that all licensees shall fully restore compliance with 10 CFR 50.48, and submit the required documentation to the NRC, by December 1, 2007.

### **REQUESTED INFORMATION**

All addressees are requested to provide the following information:

1. Within 60 days of the date of this generic letter, provide a statement on whether Hemyc or MT fire barrier material is used at their NPPs and whether it is relied on for separation and/or safe shutdown purposes in accordance with the licensing basis, including whether Hemyc or MT is credited in other analyses (e.g., exemptions, license amendments, GL 86-10 analyses).
2. Within 60 days of the date of this generic letter, addressees who have installed Hemyc or MT fire barrier materials should discuss the following in detail:
  - a. The extent of the installation (e.g., linear feet of wrap, areas installed, systems protected),
  - b. Whether the Hemyc and/or MT installed in their plants continues to comply with 10 CFR 50.48, in light of recent findings,
  - c. The compensatory measures that have been implemented to provide equivalent protection and maintain the safe shutdown function of affected areas of the plant in light of the recent findings of potential degradation Hemyc and MT, including evaluations to support the addresses' conclusions and a discussion of the impact on plant risk,

- d. A general description of, and implementation schedule for, all corrective actions to restore the fire protection program to compliance with the licensing basis, including a description of any licensing actions or exemption requests needed to support changes to the plant licensing basis.
3. No later than December 1, 2007, addressees that have degraded or nonconforming Hemyc and/or MT and rely on it for separation and/or safe shutdown purposes should provide the following information upon implementing corrective actions:
    - a. Confirmation that the fire protection program is in compliance with the regulatory requirements listed in the Applicable Regulatory Requirements section of this generic letter once all corrective actions for regulatory compliance have been completed and the licensing basis has been updated to reflect the actions taken.
    - b. A summary of the evaluation used to determine the susceptibility of the fire protection program to the adverse effects of potentially degraded Hemyc or MT fire barriers. (The submittal may reference a guidance document, e.g., GL 86-10, or another approach previously submitted to the NRC. The documents submitted or referenced should include the results of any supporting Hemyc or MT tests or evaluations performed to obtain pertinent information used in the determination.)
    - c. A description of the existing programmatic controls that will ensure that other fire barrier types will be assessed for potential degradation and resultant adverse effects. Addressees may reference their responses to GL 92-08 to the extent that the responses address this specific issue.

## **REQUIRED RESPONSE**

In accordance with 10 CFR 50.54(f), in order to determine whether a facility license should be modified, suspended, or revoked, or whether other action should be taken, an addressee is required to respond as described below.

Within 30 days of the date of this generic letter, an addressee is required to submit a written response if it is unable to provide the information or it cannot meet the requested completion date. The addressee must address in its response any alternative course of action that it proposes to take, including the basis for the acceptability of the proposed alternative course of action.

The required written response should be addressed to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, 11555 Rockville Pike, Rockville, Maryland 20852, under oath or affirmation under the provisions of Section 182a of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f). In addition, a copy of the response should be submitted to the appropriate regional administrator.

## **REASON FOR INFORMATION REQUEST**

The recent confirmatory testing of the Hemyc and MT fire barriers revealed that similar barriers installed at NPPs may not perform their intended protective function during a fire.

The NRC staff will review the responses to this generic letter and will notify affected addressees if concerns are identified regarding compliance with NRC regulations. The staff may also conduct inspections to determine addressees' effectiveness in addressing the generic letter.

## **RELATED GENERIC COMMUNICATIONS**

4. Regulatory Issue Summary 05-07, "Compensatory Measures To Satisfy the Fire Protection Program Requirements," April 19, 2005

5. Information Notice 05-07, "Results of Hemyc Electrical Raceway Fire Barrier System Full Scale Fire Testing," April 1, 2005
6. Information Notice 99-17, "Problems Associated with Post-Fire Safe-Shutdown Circuit Analysis," June 3, 1999
7. Information Notice 95-52, Supplement 1, "Fire Endurance Test Results for Electrical Raceway Fire Barrier Systems Constructed from 3M Company Interam Fire Barrier Materials," March 17, 1998
8. Information Notice 95-49, Supplement 1, "Seismic Adequacy of Thermo-Lag Panels," December 10, 1997
9. Generic Letter 91-18, "Information to Licensees Regarding NRC Inspection Manual Section on Resolution of Degraded and Nonconforming Conditions," Revision 1, October 8, 1997
10. Information Notice 97-70, "Potential Problems With Fire Barrier Penetration Seals," September 19, 1997
11. Information Notice 97-59, "Fire Endurance Test Results of Versawrap Fire Barriers," August 1, 1997
12. Information Notice 94-86, Supplement 1, "Legal Actions Against Thermal Science, Inc., Manufacturer of Thermo-Lag," November 15, 1995
13. Information Notice 95-52, "Fire Endurance Test Results for Electrical Raceway Fire Barrier Systems Constructed from 3M Company Interam Fire Barrier Materials," November 14, 1995
14. Information Notice 95-49, "Seismic Adequacy of Thermo-Lag Panels," October 27, 1995
15. Information Notice 95-32, "Thermo-Lag 330-1 Flame Spread Test Results," August 10, 1995

16. Information Notice 95-27, "NRC Review of Nuclear Energy Institute, "Thermo-Lag 330-1 Combustibility Evaluation Methodology Plant Screening Guide," May 31, 1995
17. Information Notice 94-86, "Legal Actions Against Thermal Science, Inc., Manufacturer of Thermo-Lag," December 22, 1994
18. Information Notice 94-34, "Thermo-Lag 330-660 Flexi-Blanket Ampacity Derating Concerns," May 13, 1994
19. Information Notice 94-28, "Potential Problems With Fire Barrier Penetration Seals," April 5, 1994
20. Generic Letter 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," March 25, 1994
21. Information Notice 94-22, "Fire Endurance and Ampacity Derating Test Results for 3-Hour Fire-Rated Thermo-Lag 330-1 Fire Barriers," March 16, 1994
22. Information Notice 93-41, "One Hour Fire Endurance Test Results for Thermal Ceramics Kaowool, 3M Company FS-195 and 3M Company Interam E-50 Fire Barrier Systems," May 28, 1993
23. Information Notice 93-40, "Fire Endurance Test Results for Thermal Ceramics FP-60 Fire Barrier Material," May 26, 1993
24. Generic Letter 92-08, "Thermo-Lag 330-1 Fire Barriers," December 17, 1992
25. Information Notice 92-82, "Results of Thermo-Lag 330-1 Combustibility Testing," December 15, 1992
26. Bulletin 92-01, Supplement 1, "Failure of Thermo-Lag 330 Fire Barrier System To Perform its Specified Fired Endurance Function," August 28, 1992
27. Information Notice 92-55, "Current Fire Endurance Test Results for Thermo-Lag Fire Barrier Material," July 27, 1992

28. Bulletin 92-01, "Failure of Thermo-Lag 330 Fire Barrier System To Maintain Cabling in Wide Cable Trays and Small Conduits Free from Fire Damage," June 24, 1992
29. Information Notice 92-46, "Thermo-Lag Fire Barrier Material Special Review Team Final Report Findings, Current Fire Endurance Tests, and Ampacity Calculation Error," June 23, 1992
30. Information Notice 91-79, "Deficiencies in the Procedures for Installing Thermo-Lag Fire Barrier Materials," December 6, 1991
31. Information Notice 91-47, "Failure of Thermo-Lag Fire Barrier Material To Pass Fire Endurance Test," August 6, 1991
32. Information Notice 88-56, "Potential Problems With Silicone Foam Fire Barrier Penetration Seals," August 4, 1988
33. Generic Letter 88-12, "Removal of Fire Protection Requirements from Technical Specifications," August 2, 1988
34. Generic Letter 86-10, "Implementation of Fire Protection Requirements," April 26, 1986
35. Generic Letter 83-33, "NRC Position on Certain Requirements of Appendix R to 10 CFR Part 50," October 19, 1983
36. Generic Letter 81-12, "Fire Protection Rule (45 FR 76602, November 19, 1980)," February 20, 1981

### **BACKFIT DISCUSSION**

Under the provisions of Section 182a of the Atomic Energy Act of 1954, as amended, 10 CFR 50.109(a)(4)(I) and 10 CFR 50.54(f), this generic letter asks addressees to evaluate their facilities to confirm compliance with the existing applicable regulatory requirements as discussed in this generic letter. Specifically, although Hemyc and MT fire barriers in NPPs may be relied on to protect electrical and instrumentation cables and equipment that provide safe

shutdown capability during a fire, recent NRC testing has revealed that both materials failed to provide the protective function intended for compliance with existing regulations.

For plants licensed to operate before January 1, 1979, licensees are required to comply with 10 CFR Part 50, Appendix R, which requires protection of safe shutdown capabilities. One means of complying with this requirement is to separate one safe shutdown train from its redundant train using rated fire barriers, as cited in Appendix R, paragraph III.G.2(a). Recent test results indicated that Hemyc and MT fire barriers did not pass the GL 86-10, Supplement 1, criteria to achieve a 1-hour fire rating for Hemyc or a 3-hour fire rating for MT. Therefore, for any such plant that relies on Hemyc and/or MT for compliance, compliance with Appendix R is in question and the information requested by this generic letter is a compliance exception to the rule in accordance with 10 CFR 50.109(a)(4)(I).

For plants licensed to operate after January 1, 1979, licensees are required to comply with 10 CFR 50.48(a), which requires that each operating nuclear power plant have a fire protection plan that satisfies GDC 3. The fire protection plan is incorporated into the operating license for each post-1979 plant as a license condition and may rely on fire barriers such as Hemyc and MT to provide the required protection. The license condition specifically cites the staff SER on the licensee's fire protection plan, to demonstrate that the license condition has been met (although licensees may modify their fire protection plan as long as there is no adverse effect). However, recent test results indicated that Hemyc and MT fire barriers did not pass the GL 86-10, Supplement 1, criteria to achieve a 1-hour fire rating for Hemyc or a 3-hour fire rating for MT. Therefore, for any such plant where the staff-approved fire protection plan relies on Hemyc and/or MT for compliance with their license condition, compliance with the license condition is in question and the information requested by this generic letter is a compliance exception to the rule in accordance with 10 CFR 50.109(a)(4)(I).

**FEDERAL REGISTER NOTIFICATION**

A notice of opportunity for public comment on this generic letter was published in the Federal Register (XX FR XXXXX) on July XX, 2005.

**SMALL BUSINESS REGULATORY ENFORCEMENT FAIRNESS ACT**

In accordance with the Small Business Regulatory Enforcement Fairness Act of 1996, the NRC has determined that this generic letter is not a major rule and has verified this determination with the Office of Information and Regulatory Affairs of the Office of Management and Budget (OMB).

**PAPERWORK REDUCTION ACT STATEMENT**

This generic letter contains information collection requirements that are subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). These information collections were approved by the Office of Management and Budget, clearance number 3150-0011, which expires February 28, 2007.

The burden to the public for these mandatory information collections is estimated to average 300 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection. The U. S. Nuclear Regulatory Commission is seeking public comment on the potential impact of the information collections contained in the generic letter and on the following issues:

1. Is the proposed information collection necessary for the proper performance of the functions of the NRC, including whether the information will have practical utility?
2. Is the estimate of burden accurate?
3. Is there a way to enhance the quality, utility, and clarity of the information collected?

4. How can the burden of the information collection be minimized, including the use of automated collection techniques?

Send comments on any aspect of these information collections, including suggestions for reducing the burden, to the Records and FOIA/Privacy Services Branch (T-F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet electronic mail to [INFOCOLLECTS@NRC.GOV](mailto:INFOCOLLECTS@NRC.GOV); and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0011), Office of Management and Budget, Washington, DC 20503.

#### Public Protection Notification

The NRC may not conduct or sponsor, and an person is not required to respond to, an information collection unless the requesting document displays a currently valid OMB control number.

**CONTACT**

Please direct any questions about this matter to the technical contacts or the Lead Project Manager listed below, or to the appropriate Office of Nuclear Reactor Regulation (NRR) project manager.

Bruce A. Boger, Director  
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Office of Nuclear Reactor Regulation

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Note: NRC generic communications may be found on the NRC public Web site, <http://www.nrc.gov>, under Electronic Reading Room/Document Collections.

END OF DRAFT GENERIC LETTER

Documents may be examined, and/or copied for a fee, at the NRC's Public Document Room at One White Flint North, 11555 Rockville Pike (first floor), Rockville, Maryland. Publicly available records will be accessible electronically from the Agencywide Documents Access and Management System (ADAMS) Public Electronic Reading Room on the Internet at the NRC Web site, <http://www.nrc.gov/NRC/ADAMS/index.html>. If you do not have access to ADAMS or

if you have problems in accessing the documents in ADAMS, contact the NRC Public Document Room (PDR) reference staff at 1-800-397-4209 or 301-415-4737 or by e-mail to [pdr@nrc.gov](mailto:pdr@nrc.gov).

Dated at Rockville, Maryland, this 18<sup>th</sup> day of July 2005.

FOR THE NUCLEAR REGULATORY COMMISSION

*/RA/*

Patrick L. Hiland, Chief  
Reactor Operations Branch  
Division of Inspection Program Management  
Office of Nuclear Reactor Regulation