



NUCLEAR ENERGY INSTITUTE

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Mr. John N. Hannon  
Plant Systems Branch Chief  
Office of Nuclear Reactor Regulation  
U. S. Nuclear Regulatory Commission  
Mail Stop O11-A11  
Washington, DC 20555-0001

**SUBJECT:** Promatec Hemyc 1-Hour and MT 3-Hour Fire Barrier Systems

**PROJECT NUMBER:** 689

Dear Mr. Hannon:

In March 2001 the NRC proposed a meeting with licensees that use Hemyc or MT fire barrier products to discuss (1) technical issues concerning the Hemyc/MT fire barrier system, (2) the applicability of the issues to the affected plants, and (3) the ultimate resolution of the issue. Further discussions with NRC staff resulted in a staff request to provide additional information on Hemyc use by licensees. The licensees requested that NEI respond with a summary of information related to testing protocols used, tests conducted, plant applications, and plant licensing basis. We provide this summary information below.

### **Test Protocols**

The Hemyc fire barrier system was tested and qualified in the early 1980s using the protocols outlined by ANI/MAERP Bulletin No. 5, *Standard Fire Endurance Test Method to Qualify a Protective Envelope for Class 1E Electrical Circuits*. NRC accepted this protocol as a basis for qualifying Hemyc/MT wrap as a fire barrier. This qualification predates the requirements of Generic Letter 86-10 *Implementation of Fire Protection Requirements*, dated April 24, 1986, and 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*, dated March 25, 1994. GL 86-10, Supplement 1, provides guidance to be used by the NRC Staff "to review and evaluate the adequacy of fire endurance tests

and fire barrier systems proposed by licensees or applicants in the future to satisfy existing NRC fire protection rules and regulations." GL 86-10, Supplement 1, states its preference for the ASTM E-119 test over the ANI test used to qualify Hemyc due to two additional test criteria, including the cold-side temperature criterion. However, GL 86-10, Supplement 1, consistently notes that the guidance is to be applied to future evaluations. The document requests no action by licensees with existing fire wrap materials. In the "Backfit Discussion," the GL makes clear that no "generic or plant-specific backfitting is intended or approved at this time in connection with issuance of this review guidance."

### Tests and Evaluations

The following tests and evaluations were performed using the ANI/MAERP protocol noted above:

1. CTP-1026 on June 1, 1982, at the Central Nuclear de Asco in Tarragona, Spain, *One (1) Hour Fire Test Qualification*. Reissued December 8, 1982, with comments.
2. CTP-1077 on December 12, 1984, at SWRI in San Antonio, Texas, *One (1) Hour Fire Test on 3" Conduit for NES*. Reissued March 10, 1986, with Analysis of test data.
3. CTP-1071 on January 6, 1986, at SWRI, *Three (3) Hour Fire Test for Conduit Circuits*
4. CTP-1100A on June 4, 1986, at SWRI, *Three (3) Hour Fire Test for Cable Tray Circuits*

In addition, in August 1993, NEI established a Fire Barrier Review Ad Hoc Advisory Committee to address the adequacy of fire barrier enclosure materials other than Thermo-Lag in response to GL 92-08. In May 1994, results of the review were documented in an 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.*" The Hemyc material is described as not being affected physically (i.e. material properties remain unchanged) when subjected to fire test conditions, nor is it consumed. Joint failures observed in Thermo-Lag applications did not apply to the Hemyc material because of its greater flexibility and differences in the design envelopes. No similar problems were identified with Hemyc material that had caused structural failures with the Thermo-Lag material.

## **Plant Applications**

The Hemyc material is utilized in 1-hour fire barrier applications and as radiant energy shields. Since the NRC comments were associated with the 1-hour fire barrier applications, NRC representatives have stated informally that the latter issue is not of concern. The types of 1-hour applications most often used include protection of conduits, cable tray, air drops, and junction boxes.

The MT material is installed as a 3-hour fire barrier. The types of 3-hour fire barrier applications most often used include conduit and junction boxes.

## **Licensing Basis**

The Hemyc fire barrier system test reports were submitted to the NRC on a specific licensee's docket and the Hemyc fire barrier system was ultimately approved for use in 1983. This included the review and approval of the use of the ANI/MAERP Bulletin No. 5 test protocol for fire barrier enclosures. Examples where NRC approved licensee applications include the following:

- NRC issued the Waterford SER, Supplement 5, in June 1983, and found the Waterford fire protection system acceptable and in compliance with regulatory requirements.
- NRC stated in a Catawba (Unit 1 and 2) Inspection Report in June 1984, that test reports for cable wrap (Hemyc) had been reviewed by NRR/CMEB and found to be acceptable.
- Ginna submitted an exemption request on October 4, 1984, because in certain locations it was recognized that the fire-rated barrier material could not be installed according to tested configurations. The NRC SER dated March 21, 1985, concluded that "based on our evaluation this exemption request was not needed since the materials installed in conjunction with automatic fire detection and suppression is sufficient to achieve compliance with Section III.G.2.c."
- NRC issued the Harris SER, Supplement 4, in October 1986, and stated its final acceptance of the Harris fire protection program after the issue of the adequacy of fire barrier testing was litigated before the Atomic Safety and Licensing Board (ASLB). The ASLB found that "the qualification methods to be used by the Applicants represent equivalent or more rigorous tests of cable tray fire barriers than would be experienced under actual plant conditions."
- NRC approved Appendix R exemptions that endorsed Hemyc fire barriers

for Duane Arnold in October 1987, based in part on a technical evaluation of testing qualifications by the Franklin Research Institute.

- As recently as October 1999, NRC approved an exemption request for Arkansas Nuclear One, Unit 2, which specifically identified Hemyc as the one-hour rated fire barrier.

As a result of the Staff approvals of fire barrier applications, these approvals became part of the plant-licensing basis. As noted above, the subsequent issue of GL 86-10 Supplement 1 did not require any backfitting of new test requirements on previously approved materials. In addition, following the issue of GL 92-08 in late 1992, the NRC conducted an evaluation of several fire barrier materials including Hemyc to determine if concerns commensurate with those identified for Thermo-Lag 330-1 existed. This included soliciting fire test information from manufacturers and performance of research type fire testing. While generic communications were issued on other fire wrap materials as the result of this evaluation, no communications were issued on the Hemyc/MT materials.

## Conclusion

NRC staff has recently raised concerns with Hemyc test protocols and possible impacts on licensee compliance with regulatory requirements. Licensees using the Hemyc material have stated to NEI their belief that they are complying with their licensing bases as supported by prior NRC acceptance of the test protocol and use of these fire wrap applications, and that their licensing bases demonstrate adequate protection.

This letter is an initial step toward resolution of NRC concerns related to this matter. While an industry initiative is not planned at this time, NEI and industry representatives are available, after NRC consideration of this information, to discuss the NRC views further. Please contact Fred Emerson at 202-739-8086, [fae@nei.org](mailto:fae@nei.org) or me to schedule further discussions.

Sincerely,



Alexander Marion

FAE/maa

c: Mr. Eric W. Weiss, U. S. Nuclear Regulatory Commission  
Mr. Richard J. Laufer, U. S. Nuclear Regulatory Commission