

October 20, 2005

Mr. Paul Gunter  
Nuclear Information and Resource Service  
1421 16<sup>th</sup> Street NW., Suite 404  
Washington, DC 20036

Dear Mr. Gunter:

Your petition dated May 12, 2005, submitted on behalf of Nuclear information and Resource Service, Citizens Awareness Network, Indian Point Safe Energy Coalition, North Carolina Waste Awareness and Reduction Network, Alliance for Affordable Energy, and Blue Ridge Environmental Defense League, and addressed to Mr. Luis A. Reyes, Executive Director for Operations of the Nuclear Regulatory Commission (NRC), has been reviewed by the NRC staff pursuant to Section 2.206 of Title 10 of the *Code of Federal Regulations*. The staff's proposed Director's Decision on the petition is enclosed. I request that you provide comments to me on any portions of the petition that you believe to be erroneous or any issues in the petition that you believe have not been fully addressed. The staff will then review your comments and consider them in the final version of the Director's Decision. You will have no further opportunity to comment.

Please provide your comments within 30 days of this letter. Comments should be submitted by letter or e-mail to the petition manager, Chandu Patel (Mailstop 0-8G9 or E-mail CPP@NRC.gov).

Sincerely,

/RA/

Ledyard B. Marsh, Director  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket Nos. 50-244, 50-247, 50-271, 50-286,  
50-313, 50-333, 50-368, 50-369, 50-370,  
50-382, 50-400, 50-413, 50-414, and 50-261

Enclosures: Proposed Director's Decision

cc w/o encl: See next page

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OFFICIAL RECORD COPY

Proposed Director's Decision - Paul Gunter, the Nuclear Information and Resource Service,  
Letter dated May 12, 2005, Re: 2.206 - Request for Emergency Enforcement Action  
under 2.206 to address inoperable Hemyc/MT fire protection systems at multiple plants

DATE: October 20, 2005

Distribution: **G20050379**

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION

James E. Dyer, Director

|                                  |   |
|----------------------------------|---|
| In the Matter of                 | ) Docket Nos. 50-244, 50-247, 50-271,     |
| Carolina Power and Light Company | ) 50-286, 50-313, 50-333, 50-368, 50-369, |
| Duke Power and Light Company     | ) 50-370, 50-382, 50-400, 50-413, 50-414, |
| Entergy Nuclear Operations, Inc. | ) And 50-261                              |
|                                  | )   |
|                                  | )   |
| Plant Names: As Shown Below      | ) License Nos: As Shown Below             |
|                                  | )   |
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DIRECTOR'S DECISION UNDER 10 CFR 2.206

I. Introduction

By letter dated May 12, 2005, Mr. Paul Gunter, on behalf of Nuclear Information and Resource Service, Citizens Awareness Network, Indian Point Safe Energy Coalition, North Carolina Waste Awareness and Reduction Network, Alliance for Affordable Energy, and Blue Ridge Environmental Defense League (the petitioners) filed a petition pursuant to Title 10 of the *Code of Federal Regulations*, Section 2.206. The petitioners requested that the U.S. Nuclear Regulatory Commission (NRC) engage emergency enforcement actions to modify and/or suspend operating licenses for Shearon Harris Nuclear Power Station Unit 1, Docket No. 50-400, License No. NPF-63; H. B. Robinson Unit 2, Docket No. 50-261, License No. DPR-23; McGuire Units 1 and 2, Docket No. 50-369, License No. NPF-9; Catawba Units 1 and 2, Docket Nos. 50-413 and 50-414, License Nos. NPF-35 and NPF-52; Ginna, Docket No. 50-244, License No. DPR-18; James A. FitzPatrick, Docket No. 50-333, License No. DPR-59; Indian Point Units 2 and 3, Docket Nos. 50-247 and 50-286, License Nos. DPR-26

PROPOSED

and DPR-64; Vermont Yankee, Docket No. 50-271, License No. DPR-28; Waterford Unit 3, Docket No. 50-382, License No. NPF-38; and Arkansas Nuclear One Units 1 and 2, Docket No. 50-313 and 50-368, License No. DPR-51 and NPF-6, with regard to potential violations of NRC regulations for fire protection under Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50. Specifically, the petition requested emergency enforcement under 10 CFR 2.206 to include the following actions by the Commission:

- 1) Collect information through generic communication with nuclear industry and specifically with the named reactor sites to determine the extent of condition of the inoperable fire barriers; including the requirement that the licensees conduct a full inventory of the type Hemyc/MT to include the amount in linear and square footage, its specific applications, and the identification of safe shutdown systems, which are currently unprotected by the noncompliance and an assessment of the safety significance of each application;
- 2) the communication should require, at minimum that the above-named sites provide justification for operation in noncompliance with all applicable fire protection regulations; and
- 3) with the determination that any and/or all of the above-mentioned sites are operating in unanalyzed condition and/or that assurance of public health and safety is degraded, promptly order a suspension of the license or a power reduction of the affected reactors until such time as it can be demonstrated that the licensees are operating in conformance with all other applicable fire protection regulations.

As the basis for the requests, the petitioners cited a meeting on April 29, 2005, held by NRC with all stakeholders to discuss the performance of 1-hour (Hemyc) and 3-hour (MT) fire barriers for Electrical Raceways during full scale fire testing. In that meeting the NRC staff informed all stakeholders that the Hemyc/MT electrical raceway fire barrier system (ERFBS) failed to protect electrical cables for 1 hour/3 hours in fire tests that were performed to the

American Society of Testing and Materials (ASTM) Standard E119. The petitioners' request was also based on the following conclusions made by the petitioners: (1) The same Hemyc/MT fire barrier wrap systems as installed in the above nuclear plants fail to assure the protection of the control room operations for achieving safe shutdown of the reactor in the event of a significant fire, (2) NRC has not quantified the full extent of the amount of Hemyc/MT fire barrier material in terms of linear and/or square footage deployed per fire protection regulation, and NRC has not determined the safety significance of this deployment for safe shutdown systems that are not currently protected by these fire barriers, and (3) the petitioners believe that the above listed nuclear power stations are operating in violation of NRC fire protection requirements and in an unanalyzed condition resulting in a degradation of defense-in-depth fire protection and safe shut down in the event of a significant fire.

By teleconference on June 1, 2005, the petitioners provided information to the NRC's Petition Review Board as further explanation and support for their petition. The transcript of this teleconference was treated as a supplement to the petition and is available in the Agencywide Documents Access and Management System (ADAMS) for inspection (Accession No. ML051640452) at the Commission's Public Document Room (PDR), located at One White Flint North, Public File Area O1 F21, 11555 Rockville Pike (first floor), Rockville, Maryland. Publicly available records will be accessible from the ADAMS Public Electronic Reading Room on the NRC Web site <http://www.nrc.gov/reading-rm/adams.html>. Persons who do not have access to ADAMS or who encounter problems in accessing the documents located in ADAMS, should contact the NRC PDR Reference staff by telephone at 1-800-397-4209, 301-415-4737, or by e-mail to [pdr@nrc.gov](mailto:pdr@nrc.gov).

During the teleconference, petitioners also requested that this petition be modified to consider this fire barrier material in context of an overall picture of the extent of condition for fire barrier protection under Section III.G.2 of Appendix R to 10 CFR Part 50 (i.e., not just the

Hemyc/MT ERFBS). As a basis for this request, the petitioners stated that they don't believe it is justifiable for NRC or industry to wait on a potential ruling with regard to operator manual action.

In a letter dated June 27, 2005, the NRC informed the petitioners that their request was received and that the issues in the petition were being referred to the Office of Nuclear Reactor Regulation for appropriate action. However, the petitioners' request for immediate action and the request to expand the scope to cover other fire barriers issues were denied by the NRC. When the Hemyc test results became available, the staff examined whether there was an immediate and significant risk to safety. Because fire detection, prevention, and suppression measures are already in place to minimize both the probability of occurrence and consequences of a fire that could prevent the performance of safe shutdown functions, the staff concluded that continued plant operation while corrective actions are implemented will not pose an undue risk to public health and safety.

## II. Discussion

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.

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 Generic Letter (GL) 92-08, "Thermo-Lag 330-1 Fire Barriers," December 17, 1992, 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.

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; or
- 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 fire endurance tests as a rated fire barrier. 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 reviewed 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 NRC staff raised concerns about the performance of Hemyc and MT fire barriers. Hemyc and MT, manufactured by Promatec, Inc., were installed at Nuclear Power Plants (NPPs) to protect circuits and instrumentation cables in order to meet regulatory requirements and in accordance with plant-specific commitments. 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. In March/April 2005, the NRC conducted confirmatory testing of both materials at the Omega Point Laboratories in San Antonio, Texas. 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 arrangements used in NPPs. The test results indicated that when tested to GL 86-10, Supplement 1, criteria, neither Hemyc nor the MT fire barrier systems would provide their rated fire barrier protection for the configurations tested.

On April 1, 2005, the NRC issued Information Notice (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 NRC 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.

The NRC staff recognizes the concern expressed by the petitioners. The NRC staff 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 or plant specific licensing bases. 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." 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.

The NRC has issued guidance on acceptable methods of satisfying the regulatory requirements of GDC 3 in the Branch Technical Position (BTP), Auxiliary and Power Conversion Systems Branch BTP 9.5-1, Standard Review Plan, Section 9.5-1, and GLs. 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 other guidance, and to implement appropriate compensatory measures and develop plans to resolve any noncompliances within a reasonable timeframe. All licensees should consider the impact of fire

barrier degradation on the operability of affected equipment and assess the impact on plant safety.

If a nonconforming condition is identified, 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, may request an exemption from 10 CFR Part 50, Appendix R, in accordance with the requirements of 10 CFR 50.12, "Specific Exemptions."
- Plants licensed to operate after January 1, 1979, 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. The plants that adopt a risk-informed approach should submit a license amendment in accordance with 10 CFR 50.90.

On July 25, 2005, the NRC staff issued a GL for comments in the *Federal Register*. The comment period expired on September 23, 2005. The NRC staff intends to issue the final GL by March 31, 2006. The GL will request all licensees who credit Hemyc or MT for compliance to 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 will be requested to provide evaluations to support conclusions that they are in compliance with regulatory requirements for the Hemyc and MT applications. Licensees that cannot justify their continued reliance on Hemyc or MT are requested to provide a description of corrective actions taken or planned and a schedule for milestones including when full compliance will be achieved. In addition, licensees will be requested to identify and discuss all applications that are considered degraded but operable, including a basis for this conclusion.

It is expected that the 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 will fully restore compliance with 10 CFR 50.48, and submit the required documentation to the NRC, by December 1, 2007.

### III. Conclusion

The NRC staff shares the concerns identified by the petitioners. The NRC staff is addressing the Hemyc/MT material performance issues in an expeditious manner. In response to Request Nos. 1 and 2, the NRC staff has granted the petitioners' request through the generic communication process. Specifically, as discussed before, the staff is issuing a GL to all licensees asking them to provide detailed information about the use of Hemyc/MT in their NPPs. In response to Request No. 3, the NRC staff is planning to review all affected plants in detail and will take appropriate actions to resolve the issues with the use of Hemyc/MT material commensurate with the safety significance of the protected systems. The GL will be issued after the public comment period expires and after the NRC's internal review process is completed.

A copy of this director's decision will be filed with the Secretary of the Commission for the Commission's review in accordance with 10 CFR 2.206(c). As provided for by this regulation, the decision will constitute the final action of the Commission 25 days after the date of the decision unless the Commission, on its own motion, institutes a review of the decision within that time.

FOR THE NUCLEAR REGULATORY COMMISSION

J. E. Dyer, Director  
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland,

this       day of       2005.

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