

50-410



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

September 15, 1994

Mr. B. Ralph Sylvia
Executive Vice President, Nuclear
Niagara Mohawk Power Corporation
Nine Mile Point Nuclear Station
P.O. Box 63
Lycoming, NY 13093

SUBJECT: FOLLOW-UP TO THE REQUEST FOR ADDITIONAL INFORMATION REGARDING
GENERIC LETTER 92-08 ISSUED PURSUANT TO 10 CFR 50.54(f) ON
DECEMBER 22, 1993, NINE MILE POINT NUCLEAR STATION UNIT NO. 2
(TAC NO. M85575)

Dear Mr. Sylvia:

This letter acknowledges receipt of Niagara Mohawk Power Corporation's (NMPC's) letter dated February 10, 1994, which responded to the U.S. Nuclear Regulatory Commission (NRC) staff's request for additional information regarding Generic Letter 92-08, "Thermo-Lag 330-1 Fire Barriers." In addition, we are providing information regarding NRC's course of action to resolve the Thermo-Lag issue and guidance on exemptions.

NMPC's response indicated that NMPC was awaiting the final results of the industry test program sponsored by the Nuclear Energy Institute (NEI), formerly Nuclear Management and Resources Council (NUMARC), in order to determine your final plans and schedules. NEI has completed the industry Thermo-Lag fire endurance test program and has issued its guidance to industry for evaluating Thermo-Lag fire barriers. Although the NRC staff does not intend to review and approve the NEI application guide, it believes that the NEI test results provide a substantial data base to aid in the plant-specific assessment of fire barrier configurations. The NRC staff will review the application of the NEI guide on a plant-specific basis. NMPC is now required to submit the information specified in the 50.54(f) letter for those areas in which NMPC's response was incomplete or wherever NMPC stated that NMPC was relying on the results of the NEI program.

In SECY-94-127 dated May 12, 1994, the staff informed the Commission of four options the staff was considering for resolving the Thermo-Lag fire barrier technical issues. On May 20, 1994, the staff briefed the Commission on the options. The staff recommended continuation of NRC staff and industry efforts to return the plants with Thermo-Lag barriers to compliance with existing NRC fire protection requirements consistent with the staff's Thermo-Lag Action Plan. The staff stated that if the Commission approved this option, the staff would consider plant-specific exemptions from certain technical requirements of Appendix R to 10 CFR Part 50 on a case-by-case basis, provided the licensee submits a technical basis that demonstrates the in-plant condition provides an adequate level of fire safety. In a Staff Requirements Memorandum (SRM) of June 27, 1994, "Options for Resolving the Thermo-Lag Fire Barrier Issues," the

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Commission (with all Commissioners agreeing) approved the NRC staff recommendation to return plants to compliance with existing NRC requirements and to permit plant-specific exemptions where technically justified. In addition, in the SRM, the Commission approved the staff recommendation not to proceed with the development of a performance-based approach to resolve the Thermo-Lag issue.

On the basis of NRC staff review of NMPC's response to the RAI, the information submitted for the following sections was either deferred or incomplete: Section II, "Important Barrier Parameters" and Section III, "Thermo-Lag Fire Barriers Outside the Scope of the NUMARC Program." Section II stated that parameters not specified in the summary sheets attached to NMPC's response will be evaluated for their impact on installed configurations based on relative importance as indicated by NUMARC's Industry Application Guide when it is made available. Section III stated that: (1) the NUMARC Test Program is considered to bound the conduit protection applications, (2) test data would have to be applied to the HVAC enclosure from tests concerned primarily with electrical circuit integrity which is consistent with past industry practice, (3) upgrades/rework of existing installations will be pursued as indicated appropriate based on NUMARC test information and upon guidance provided by the Industry Application Guide, and (4) no plant-specific tests are anticipated. In NMPC's response to Section V of the RAI, NMPC stated that NMPC was considering using a performance-based approach, such as a Probabilistic Safety or Risk Assessment, to achieve compliance with NRC fire protecting requirements in areas that contain Thermo-Lag. Consistent with the SRM of June 27, 1994, the staff will not accept a performance-based approach to resolve the Thermo-Lag issue. Please revise your response to Section V of the RAI accordingly. NMPC is required, pursuant to Section 182a of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f), to submit a written report that contains the required information within 90 days from the date of this letter. Please retain all information and documentation used to prepare NMPC's response onsite for future NRC audits or inspections.

There are unresolved technical issues regarding ampacity derating. However, it is the staff's view that these issues can be resolved independently of the fire endurance issues.

The enclosure presents information regarding plant-specific conditions that may preclude compliance with one or more of the provisions specified in Section III.G of Appendix R to 10 CFR Part 50. The enclosure also presents an overview of the technical information needed to support requests for exemptions and license amendments. Where practicable, existing fire hazards analyses can be used to support new exemption requests. In addition, previously approved exemptions and deviations that relied on Thermo-Lag fire barriers in the technical bases should be reevaluated. If a reevaluation demonstrates that the barrier rating specified in the original exemption basis (generally 1-hour or 3-hour), is needed to assure the safe shutdown capability, the barrier should be replaced or upgraded to achieve the required fire rating. If the reevaluation demonstrates that the safe shutdown capability can be assured with the existing fire barrier, consideration could



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The information collection contained in this request is covered by the Office of Management and Budget clearance number 3150-0011, which expires July 31, 1997. The public reporting burden for this collection of information is covered by the original estimate and previous increase, which totaled 420 person-hours for each addressee's response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information; including suggestions for reducing this burden, to the Information and Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0011), Office of Management and Budget, Washington, DC 20503.

If you have any questions about this matter, please contact the NRC Project Manager for Nine Mile Point Nuclear Station, Donald S. Brinkman at 301-504-1409 or Edward Connell at 301-504-2838.

Sincerely,



Roy P. Zimmerman
Associate Director for Projects
Office of Nuclear Reactor Regulation

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Enclosure: As stated

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FIRE PROTECTION EXEMPTIONS, DEVIATIONS, AND LICENSE AMENDMENTS

1.0 Introduction

The U.S. Nuclear Regulatory Commission (NRC) adheres to the application of a defense-in-depth concept of echelons of safety systems to achieve the high degree of safety required for nuclear power plants. This concept is also applicable to nuclear power plant fire safety. The defense-in-depth approach applied to the fire protection program is designed to achieve an adequate balance in: (1) preventing fires from starting; (2) detecting quickly, controlling, and extinguishing promptly those fires that occur; and (3) protecting structures, systems, and components so that a fire that is not promptly extinguished will not prevent the safe shutdown of the plant. NRC fire protection requirements and guidance implement this defense-in-depth approach and specify a level of fire protection which considers the potential consequences that a fire may have on the safe shutdown of the reactor.

The NRC fire protection regulation is Title 10 of the U.S. Code of Federal Regulations, Part 50, Section 50.48, "Fire protection," (10 CFR 50.48). Section 50.48 states that each operating reactor must have a fire protection program that satisfies General Design Criterion (GDC) 3, "Fire protection," of Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50. The objective of the fire protection program is to minimize both the probability and consequences of fires. Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979," to 10 CFR Part 50 establishes fire protection features required to satisfy GDC 3. The Appendix R requirements of interest here are specified in Section III.G, "Fire protection of safe shutdown capability."

Guidance for implementing NRC fire protection requirements is contained in (1) Branch Technical Position (BTP) Auxiliary and Power Conversion Systems Branch (APCSB) 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants," May 1976, (2) Appendix A to BTP APCSB 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants Docketed Prior to July 1, 1976," August 23, 1976, and (3) Standard Review Plan (NUREG 0800), Section 9.5-1, "Guidelines for Fire Protection For Nuclear Power Plants," July 1981. These documents provide information, staff recommendations, and guidance which may be used by the licensees to meet the requirements of 10 CFR 50.48, Appendix R, and GDC 3. These documents also refer the licensees to such national consensus standards as American Society for Testing and Materials (ASTM) and National Fire Protection Association (NFPA) standards, for detailed guidance on implementing typical industrial fire protection features such as fire detectors, sprinkler systems, and fire barriers.

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2:0 Exemption Bases

Section III.G of Appendix R to 10 CFR Part 50 specifies the fire protection features needed to ensure that at least one means of achieving and maintaining safe shutdown conditions will remain available during and after any postulated fire in the plant. Appendix R specifies the design-basis protective features rather than the design-basis fire.

Section III.G.2 of Appendix R requires that one train of redundant trains of cables and equipment necessary to achieve and maintain safe shutdown be maintained free of fire damage by one of the following means:

- (1) Separation of cables and equipment and associated nonsafety circuits of redundant trains by a fire barrier having a 3-hour rating. Structural steel forming a part of or supporting such fire barriers shall be protected to provide fire resistance equivalent to that required of the barrier.
- (2) Separation of cables and equipment and associated nonsafety circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area.
- (3) Enclosure of cables and equipment and associated nonsafety circuits of one redundant train in a fire barrier having a 1-hour rating. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area.

If these provisions are not met, Section III.G.3 of Appendix R requires that an alternative shutdown capability independent of the fire area of concern be provided. Section III.G.3 also requires that fire detectors and a fixed fire suppression system be installed in the area of concern. These alternative requirements are not deemed to be equivalent; however, they provide adequate fire protection for those configurations in which they are accepted.

Plant-specific conditions may preclude compliance with one or more of the provisions specified in Section III.G. In such a case, the licensee must demonstrate, by means of a detailed fire hazards analysis, that existing protection or existing protection in conjunction with proposed modifications will provide a level of safety equivalent to the technical requirements of Section III.G of Appendix R. Exemptions from fire protection requirements may be requested under 10 CFR 50.12. Generally, the staff will accept an alternate fire protection configuration on the basis of a detailed fire hazards analysis if:

- (1) the alternative ensures that one train of equipment necessary to achieve hot shutdown from either the control room or emergency control stations is free of fire damage; and



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- (2) the alternative ensures that fire damage to equipment necessary to achieve cold shutdown is limited so that it can be repaired within a reasonable time (minor repair using components stored on the site); and
- (3) fire-retardant coatings are not used as fire barriers; and
- (4) modifications required to meet Section III.G would not enhance fire protection safety levels above that provided by either existing or proposed alternatives.

The staff will also accept an alternative fire protection configuration on the basis of a detailed fire hazards analysis when the licensee can demonstrate that modifications required to meet Section III.G would be detrimental to overall facility safety, the alternative configuration satisfies the four aforementioned criteria, and the alternative configuration provides an adequate level of fire safety.

3.0 Exemption Development and Review

Using the NRC guidance and applying the defense-in-depth concept, the licensees determine the fire protection features for plant safety systems and fire areas by analyzing the effects of the postulated fire relative to maintaining the ability to safely shut down the plant. A full fire hazards analysis is performed by the licensee to demonstrate that the plant will maintain the ability to perform safe shutdown functions in the event of a fire. In the fire hazards analysis the licensee must address, as a minimum, the following variables and attributes:

- The NRC fire protection requirements and guidance that apply.
- Amounts, types, configurations, and locations of cable insulation and other combustible materials.
- Fire loading and calculated fire severities.
- In-situ fire hazards.
- Automatic fire detection and suppression capability.
- Layout and configurations of safety trains.
- Reliance on and qualifications of fire barriers, including fire test results, the quality of the materials and system, and the quality of the installation.
- Fire area construction (walls, floor, ceiling, dimensions, volume, ventilation, and congestion).
- Location and type of manual fire fighting equipment and accessibility for manual fire fighting.



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- Potential disabling effects of fire suppression systems on shutdown capability.
- Availability of oxygen (for example, inerted containment).
- Alternative or dedicated shutdown capability.

When the fire hazards analysis shows that adequate fire safety can be provided by an alternative approach (i.e., an approach different from the specified requirement such as the use of a 1-hour fire rated barrier where a 3-hour barrier is specified), licensees that are required to meet Appendix R to 10 CFR Part 50 may request NRC approval of an exemption from the technical requirements of Appendix R to 10 CFR Part 50. Any exemption request must include a sound technical basis that clearly demonstrates that the fire protection defense-in-depth is appropriately maintained and that the exemption is technically justified. As part of its evaluation, the licensee should provide sound technical justification if it does not propose to install or improve the automatic suppression and/or detection capabilities in the area of concern and or to implement other more restrictive fire prevention, detection, or suppression measures.

Similarly, licensees that are not required to comply with Appendix R may need a license amendment or NRC staff approval of a deviation from a specific NRC guideline. The licensee must submit a technical justification for the alternative approach for NRC review and approval with its license amendment or deviation request.

As part of its safety evaluation of the exemption request, deviation, or license amendment, the NRC staff evaluates the fire hazards analysis and the aforementioned variables to ensure that the licensee demonstrated that an alternative approach provides an adequate level of fire protection.



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If you have any questions about this matter, please contact the NRC Project Manager for Nine Mile Point Nuclear Station, Donald S. Brinkman at 301-504-1409 or Edward Connell at 301-504-2838.

Sincerely,

Original signed by:

Roy P. Zimmerman
Associate Director for Projects
Office of Nuclear Reactor Regulation

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Enclosure: As stated

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