The intent of this specification is to permit the unloading of a significant portion of the reactor core for such purposes as removal of temporary control curtains, control rod drive maintenance, in-service inspection requirements, examination of the core support plate, etc. When the refueling interlock input signal from a withdrawn control rod is bypassed, administrative controls will be in effect to prohibit fuel from being loaded into that control cell.

These operations are performed with the mode switch in the "Refuel" position to provide the refueling interlocks normally available during refueling. In order to withdraw more than one control rod, it is necessary to bypass the refueling interlock on each withdrawn control rod. The requirement that the fuel assemblies in the cell controlled by the control rod be removed from the reactor core before the interlock can be bypassed insures that withdrawal of another control rod does not result in inadvertent criticality. Each control rod essentially provides reactivity control for the fuel assemblies in the cell associated with the control rod. Thus, removal of an entire cell (fuel assemblies plus control rod) results in a lower reactivity potential of the core.

The SRM's are provided to monitor the core during periods of station shutdown and to guide the operator during refueling operations and station startup. Requiring two operable SRM's, one in and one adjacent to any core quadrant where fuel or control rods are being moved, assures adequate monitoring of that quadrant during such alterations. The requirement of 3 counts per second provides assurance that neutron flux is being monitored.

A spiral unloading pattern is one by which the fuel in the outermost cells (four fuel bundles surrounding a control blade) is removed first. Unloading continues by removing the remaining outermost fuel by cell. The last cell removed will be adjacent to a SRM. Spiral reloading is the reverse of unloading. Spiral unloading and reloading will preclude the creation of flux traps (moderator filled or partially filled cells surrounded on all sides by fuel).

During spiral unloading, the SRM's shall have an initial count rate of 3 cps with all rods fully inserted. The count rate will diminish during fuel removal. After all the fuel is removed from a cell and after withdrawing the corresponding control rod, the refueling interlock will be bypassed on that rod. After withdrawal of that rod, one licensed operator and a member of the reactor analysis staff will verify that the interlock bypassed is on the correct control rod. Once the control rod is withdrawn, it will be valved out of service.

Under this special condition of complete spiral core unloading, it is expected that the count rate of the SRM's will drop below 3 cps before all of the fuel is unloaded. Since there will be no reactivity additions, a lower number of counts will not present a hazard. When all of the fuel has been removed to the spent fuel storage pool, the SRM's will no longer be required. Requiring the SRM's to be operational prior to fuel removal assures that the SRM's are operable and can be relied on even when the count rate may go below 3 cps.

ATTACHMENT B

NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT UNIT 1

DOCKET NO. 50-220

DPR-63

SUPPORTING INFORMATION FOR TECHNICAL SPECIFICATION BASES CHANGE TO PAGE 184c

The change to the Technical Specification Bases for Section 3.5.3 revises the description of the sequence of bypassing the refueling interlock for control rods located in an offloaded fuel cell.

Technical Specification 3.5.3.a does not allow the refueling interlock to be bypassed until after the rod is withdrawn from an offloaded fuel cell. The present Bases for this Specification is in conflict in that it describes bypassing the refueling interlock prior to withdrawal of the control rod located within an offloaded fuel cell. Bypassing the refuel interlock of the control rod removes its signal input for the One-Rod-Out protective function. Bypassing prior to control rod withdrawal relies on administrative controls to prevent the simultaneous withdrawal of more than one control rod.

To maintain automatic One-Rod-Out protection, General Electric recommended that refuel interlocks be maintained until after the control rod located within an offloaded fuel cell was fully withdrawn. The interlock for the withdrawn control rod would then be bypassed and independently verified. Failure to bypass the interlock for the withdrawn control rod would maintain the One-Rod-Out interlock Rod Block and prevent further rod movement. Operation in this sequence provides automatic protection from multiple control rod withdrawal which could result in inadvertent criticality. Technical Specification 3.5.3.a correctly requires this sequence. The proposed Bases revision incorporates the General Electric recommendation and will be consistent with the requirements of Technical Specification 3.5.3.a.

Docket File

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

December 22, 1993

Docket No. 50-220

Mr. B. Ralph Sylvia
Executive Vice President, Nuclear
Niagara Mohawk Power Corporation
301 Plainfield Road
Syracuse, New York 13212

Dear Mr. Sylvia:

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION REGARDING GENERIC LETTER 92-08, "THERMO-LAG 330-1 FIRE BARRIERS," PURSUANT TO 10 CFR 50.54(f) - NINE MILE POINT NUCLEAR STATION UNIT NO 1 (TAC NO. M85574)

In your response of April 13, 1993, to Generic Letter (GL) 92-08, "Thermo-Lag 330-1 Fire Barriers," you indicated that actions necessary to restore the operability of these barriers at Nine Mile Point Nuclear Station, Unit No 1 would be based on the results of the industry test program being coordinated by the Nuclear Management and Resources Council (NUMARC). During recent meetings with U.S. Nuclear Regulatory Commission (NRC) staff, the Executive Director for Operations and the Commission, NUMARC described the scope of its Thermo-Lag fire barrier program, the results of the Phase 1 fire tests, and planned Phase 2 tests. The program is limited to certain 1-hour and 3-hour conduit and cable tray fire barrier configurations and the development of guidance for applying the test results to plant-specific fire barrier configurations. However, NUMARC's program is not intended to bound all in-plant Thermo-Lag fire barrier configurations. During a NUMARC-sponsored industry workshop on December 1 and 2, 1993, NUMARC presented the scope of its program and the Phase 1 test results to the licensees.

In view of the limited scope of the NUMARC program and the limited success of the Phase 1 tests, it is clear to the staff that the NUMARC program will not be sufficient to resolve all Thermo-Lag fire barrier issues identified in GL 92-08. Therefore, licensees may need to take additional actions to address fire endurance and ampacity derating concerns with their in-plant Thermo-Lag barriers.

Your response dated August 13, 1993, to our Request for Additional Information dated June 16, 1993, is currently being reviewed. To help ensure timely resolution of the fire barrier issues at Nine Mile Point 1, the staff requires additional information on the configurations and amounts of Thermo-Lag fire barriers installed in the plant and the cable loadings within particular Thermo-Lag configurations. This information is necessary to review NUMARC's guidance for applying the test results to plant-specific barrier configurations and to identify configurations that are outside the scope of NUMARC's test program. For those configurations that are outside the scope of the program or for those configurations that you deem are impractical to upgrade, we request that you provide plans and schedules for resolving the technical issues identified in GL 92-08.





DF01

You are required, pursuant to Section 182(a) of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f), to submit a written report that contains the information specified in the enclosure to this letter within 45 days from receipt of this letter. Your response must be submitted under oath or affirmation. Please submit your response to the undersigned, with a copy to the appropriate Regional Administrator. Please retain all information and documentation used to respond to this request on site for future NRC audits or inspections.

This request is covered by Office of Management and Budget Clearance Number 3150-0011, which expires June 30, 1994. The estimated average number of burden hours of 300 person-hours is anticipated to increase by an additional 120 person-hours for each addressee's response, including the time required to assess the requirements for information, search data sources, gather and analyze the data, and prepare the required letters. This revised estimated average number of burden hours pertains only to the identified response-related matters and does not include the time to implement the actions required to comply with the applicable regulations, license conditions, or commitments. Comments on the accuracy of this estimate and suggestions to reduce the burden may be directed to the Office of Information and Regulatory Affairs (3150-0011), NEOB-3019, Office of Management and Budget, Washington, D.C. 20503, and to the U.S. Nuclear Regulatory Commission, Information and Records Management Branch (MNBB-7714), Division of Information Support Services, Office of Information and Resources Management, Washington, D.C. 20555.

If you have any questions about this matter, please contact Donald S. Brinkman at 301-504-1409 or Patrick Madden at 301-504-2854.

Sincerely,

E. J. Callan
Acting Associate Director for Projects
Office of Nuclear Reactor Regulation

Enclosure:
Request for Additional Information

cc w/enclosure:
See next page

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ENCLOSURE

REQUEST FOR ADDITIONAL INFORMATION
REGARDING GENERIC LETTER 92-08
"THERMO-LAG 330-1 FIRE BARRIERS"
PURSUANT TO 10 CFR 50.54(f)

I. Thermo-Lag Fire Barrier Configurations and Amounts

A. Discussion

Generic Letter (GL) 92-08,"Thermo-Lag 330-1 Fire Barriers," applied to all 1-hour and all 3-hour Thermo-Lag 330-1 materials and barrier systems constructed by any assembly method, such as by joining preformed panels and conduit preshapes, and trowel, spray, and brush-on applications. This includes all fire barriers, all barriers to achieve physical independence of electrical systems, radiant energy heat shields, and barriers installed to enclose intervening combustibles.

B. Required Information

1. Describe the Thermo-Lag 330-1 barriers installed in the plant to

a. meet 10 CFR 50.48 or Appendix R to 10 CFR Part 50,
b. support an exemption from Appendix R,
c. achieve physical independence of electrical systems,
d. meet a condition of the plant operating license,
e. satisfy licensing commitments.

The descriptions should include the following information: the intended purpose and fire rating of the barrier (for example, 3-hour fire barrier, 1-hour fire barrier, radiant energy heat shield), and the type and dimension of the barrier (for example, 8-ft by 10-ft wall, 4-ft by 3-ft by 2-ft equipment enclosure, 36-inch-wide cable tray, or 3-inch-diameter conduit).

2. For the total population of Thermo-Lag fire barriers described under Item I.B.1, submit an approximation of:

a. For cable tray barriers: the total linear feet and square feet of 1-hour barriers and the total linear feet and square feet of 3-hour barriers.

b. For conduit barriers: the total linear feet of 1-hour barriers and the total linear feet of 3-hour barriers.

c. For all other fire barriers: the total square feet of 1-hour barriers and the total square feet of 3-hour barriers.

d. For all other barriers and radiant energy heat shields: the total linear or square feet of 1-hour barriers and the total linear or square feet of 3-hour barriers, as appropriate for the barrier configuration or type.

II. Important Barrier Parameters

A. Discussion

In a letter of July 29, 1993, from A. Marion, NUMARC, to C. McCracken, NRC, NUMARC stated: "Relative to bounded configurations, ... [i]t will be the utilities' responsibility to verify their baseline installations are bounded." Furthermore, NUMARC stated that the parameters of importance for utility use of data from the industry Thermo-Lag fire barrier test program are:

1. Raceway orientation (horizontal, vertical, radial bends)
2. Conduit
3. Junction boxes and lateral bends
4. Ladder-back cable tray with single layer cable fill
5. Cable tray with T-Section
6. Raceway material (aluminum, steel)
7. Support protection, thermal shorts (penetrating elements)
8. Air drops
9. Baseline fire barrier panel thickness
10. Preformed conduit panels
11. Panel rib orientation (parallel or perpendicular to the raceway)
12. Unsupported spans
13. Stress skin orientation (inside or outside)
14. Stress skin over joints or no stress skin over joints
15. Stress skin ties or no stress skin ties
16. Dry-fit, post-buttered joints or prebuttered joints
17. Joint gap width
18. Butt joints or grooved and scored joints
19. Steel bands or tie wires
20. Band/wire spacing
21. Band/wire distance to joints
22. No internal bands in trays
23. No additional trowel material over sections and joints or additional trowel material applied
24. No edge guards or edge guards

Each NUMARC cable tray fire test specimen includes 15 percent cable fills (i.e., a single layer of cables uniformly distributed across the bottom of the cable tray). This approach requires consideration of plant-specific cable information during the assessments of tested configurations and test results in relation to plant-specific Thermo-Lag configurations; for example, cable trays with less thermal mass (cable fill) than the NUMARC test specimens, different cable types, and the proximity of the cables to the Thermo-Lag (e.g., cables may be installed in contact with the unexposed surface

of the Thermo-Lag or may come into contact during a fire if the Thermo-Lag material sags). In its letter of July 29, 1993, NUMARC stated: "Utilities using the results of the NUMARC testing will need to evaluate their installed cable fill and ensure that it is bounded by the tested cable fill." NUMARC is not conducting any cable functionality tests or evaluations and stated that cable functionality evaluations will be performed by utilities using data from the generic program.

The parameters of importance concerning cables protected by fire barriers are:

1. Cable size and type (power, control, or instrumentation).
2. Cable jacket type (thermoplastic, thermoset) and materials.
3. Cable conductor insulation type (thermoplastic, thermoset plastic) and materials.
4. Cable fill and distribution of cables within the protected conduit or cable tray.
5. Proximity of cables to the unexposed (inside) surfaces of the fire barrier.
6. Presence of materials between the cables and the unexposed side of the fire barrier material (for example, Sealtemp cloth, which is used in the NUMARC test specimens).
7. Cable operating temperature.
8. Temperatures at which the cables can no longer perform their intended function when energized at rated voltage and current.

Other parameters that are unique to particular barriers, such as interfaces between Thermo-Lag materials and other fire barrier materials or building features (walls, etc.) and internal supports, are also important. In addition, because of questions about the uniformity of the Thermo-Lag fire barrier materials produced over time, NUMARC stated in its letter of July 29, 1993, that "[c]hemical analysis of Thermo-lag materials provided for the program, as well as samples from utility stock, will be performed, and a test report prepared comparing the chemical composition of the respective samples." The results of the chemical analyses may indicate that variations in the chemical properties of Thermo-Lag are significant and may require additional plant-specific information in the future.

B. Required Information

1. State whether or not you have obtained and verified each of the aforementioned parameters for each Thermo-Lag barrier installed in the plant. If not, discuss the parameters you have not obtained or verified. Retain detailed information on site for NRC audit where the aforementioned parameters are known.

2. For any parameter that is not known or has not been verified, describe how you will evaluate the in-plant barrier for acceptability.

3. To evaluate NUMARC's application guidance, an understanding of the types and extent of the unknown parameters is needed. Describe the type and extent of the unknown parameters at your plant in this context.

III. Thermo-Lag Fire Barriers Outside the Scope of the NUMARC Program

A. Discussion

In your response to GL 92-08, you indicated that actions necessary to restore the operability of these barriers would be based on the results of the NUMARC test program. During recent meetings with the NRC staff, the Executive Director for Operations and the Commission, NUMARC described the scope of its Thermo-Lag fire barrier program, the results of the Phase 1 fire tests, and planned Phase 2 tests. The program is limited to certain 1-hour and 3-hour conduit and cable tray fire barrier configurations and the development of guidance for applying the test results to plant-specific fire barrier configurations. However, NUMARC's program is not intended to bound all in-plant Thermo-Lag fire barrier configurations. In view of the scope of the NUMARC program and the limited success of the Phase 1 tests, it is clear that the NUMARC program will not be sufficient to resolve all Thermo-Lag fire barrier issues identified in GL 92-08. Therefore, licensees may need to take additional actions to address fire endurance and ampacity derating concerns with in-plant Thermo-Lag barriers.

B. Required information

1. Describe the barriers discussed under Item I.B.1 that you have determined will not be bounded by the NUMARC test program.

2. Describe the plant-specific corrective action program or plan you expect to use to evaluate the fire barrier configurations particular to the plant. This description should include a discussion of the evaluations and tests being considered to resolve the fire barrier issues identified in GL 92-08 and to demonstrate the adequacy of existing in-plant barriers.

3. If a plant-specific fire endurance test program is anticipated, describe the following:

   a. Anticipated test specimens.

   b. Test methodology and acceptance criteria including cable functionality.

IV. Ampacity Derating

A. Discussion

NUMARC has informed the staff that it intends to use the Texas Utilities (TU) Electric Company and Tennessee Valley Authority (TVA) ampacity derating test results to develop an electrical raceway component model for the industry. Additional information is needed to determine whether or not your Thermo-Lag barrier configurations (to protect the safe-shutdown capability from fire or to achieve physical independence of electrical systems) are within the scope of the NUMARC program and, if not, how the in-plant barriers will be evaluated for the ampacity derating concerns identified in GL 92-08.

B. Required Information

1. For the barriers described under Item I.B.1, describe those that you have determined will fall within the scope of the NUMARC program for ampacity derating, those that will not be bounded by the NUMARC program, and those for which ampacity derating does not apply.

2. For the barriers you have determined fall within the scope of the NUMARC program, describe what additional testing or evaluation you will need to perform to derive valid ampacity derating factors.

3. For the barrier configurations that you have determined will not be bounded by the NUMARC test program, describe your plan for evaluating whether or not the ampacity derating tests relied upon for the ampacity derating factors used for those electrical components protected by Thermo-Lag 330-1 (for protecting the safe-shutdown capability from fire or to achieve physical independence of electrical systems) are correct and applicable to the plant design. Describe all corrective actions needed and submit the schedule for completing such actions.

4. In the event that the NUMARC fire barrier tests indicate the need to upgrade existing in-plant barriers or to replace existing Thermo-Lag barriers with another fire barrier system, describe the alternative actions you will take (and the schedule for performing those actions) to confirm that the ampacity derating factors were derived by valid tests and are applicable to the modified plant design.

Your response to Section IV.B may depend on unknown specifics of the NUMARC ampacity derating test program (for example, the final barrier upgrades). However, your response should be as complete as possible. In addition, your response should be updated as additional information becomes available on the NUMARC program.

V. Alternatives

A. Discussion

On the basis of testing of Thermo-Lag fire barriers to date, it is not clear that generic upgrades (using additional Thermo-Lag materials) can be developed for many 3-hour barrier configurations or for some 1-hour barriers (for example, 1-hour barriers on wide cable trays, with post-buttered joints and no internal supports). Moreover, some upgrades that rely on additional thicknesses of Thermo-Lag material (or other fire barrier materials) may not be practical due to the effects of ampacity derating or clearance problems.

B. Required Information

Describe the specific alternatives available to you for achieving compliance with NRC fire protection requirements in plant areas that contain Thermo-Lag fire barriers. Examples of possible alternatives to Thermo-Lag-based upgrades include the following:

1. Upgrade existing in-plant barriers using other materials.

2. Replace Thermo-Lag barriers with other fire barrier materials or systems.

3. Reroute cables or relocate other protected components.

4. Qualify 3-hour barriers as 1-hour barriers and install detection and suppression systems to satisfy NRC fire protection requirements.

VI. Schedules

A. Discussion

The staff expects the licensees to resolve the Thermo-Lag fire barrier issues identified in GL 92-08 or to propose alternative fire protection measures to be implemented to bring plants into compliance with NRC fire protection requirements. Specifically, as test data becomes available, licensees should begin upgrades for Thermo-Lag barrier configurations bounded by the test results.

B. Required Information

Submit an integrated schedule that addresses the overall corrective action schedule for the plant. At a minimum, the schedule should address the following aspects for the plant:

1. implementation and completion of corrective actions and fire barrier upgrades for fire barrier configurations within the scope of the NUMARC program,

2. implementation and completion of plant-specific analyses, testing, or alternative actions for fire barriers outside the scope of the NUMARC program.

VII. Sources and Correctness of Information

Describe the sources of the information provided in response to this request for information (for example, from plant drawings, quality assurance documentation, walk downs or inspections) and how the accuracy and validity of the information was verified.

You are required, pursuant to Section 182(a) of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f), to submit a written report that contains the information specified in the enclosure to this letter within 45 days from receipt of this letter. Your response must be submitted under oath or affirmation. Please submit your response to the undersigned, with a copy to the appropriate Regional Administrator. Please retain all information and documentation used to respond to this request on site for future NRC audits or inspections.

This request is covered by Office of Management and Budget Clearance Number 3150-0011, which expires June 30, 1994. The estimated average number of burden hours of 300 person-hours is anticipated to increase by an additional 120 person-hours for each addressee's response, including the time required to assess the requirements for information, search data sources, gather and analyze the data, and prepare the required letters. This revised estimated average number of burden hours pertains only to the identified response-related matters and does not include the time to implement the actions required to comply with the applicable regulations, license conditions, or commitments. Comments on the accuracy of this estimate and suggestions to reduce the burden may be directed to the Office of Information and Regulatory Affairs (3150-0011), NEOB-3019, Office of Management and Budget, Washington, D.C. 20503, and to the U.S. Nuclear Regulatory Commission, Information and Records Management Branch (MNBB-7714), Division of Information Support Services, Office of Information and Resources Management, Washington, D.C. 20555.

If you have any questions about this matter, please contact Donald S. Brinkman at 301-504-1409 or Patrick Madden at 301-504-2854.

Sincerely,

Original signed by:

L. J. Callan
Acting Associate Director for Projects
Office of Nuclear Reactor Regulation

Enclosure:
Request for Additional Information

cc w/enclosure:
See next page

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