



William J. Cahill, Jr.
Chief Nuclear Officer

January 12, 1996
JPN-96-001

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Station P1-137
Washington, DC 20555

SUBJECT: James A. FitzPatrick Nuclear Power Plant
Docket No. 50-333
**Request for Exemption From 10 CFR 50, Appendix R Regarding
Use of Low Pressure Injection Systems to Achieve Safe Shutdown**

REFERENCE: NRC letter, C. E. Carpenter, Jr. to W. J. Cahill, Jr., dated September 5,
1995, regarding "Safety Evaluation of Safe Shutdown Capability
Reassessment for James A. FitzPatrick Nuclear Power Plant" (TAC No.
M84780)

Dear Sir:

This letter transmits an exemption request to allow the use of low-pressure injection systems to achieve safe shutdown in six fire areas. An exemption request for five fire areas was recommended in the Reference letter. The Authority is requesting an exemption for the sixth fire area to ensure consistent licensing basis for the fire protection rule at the FitzPatrick Plant. This request satisfies the criteria of 10 CFR 50.12 as described in the Attachment to this letter.

If you have any questions, please contact Ms. C. D. Faison.

Very truly yours,

A handwritten signature in cursive script that reads 'William J. Cahill, Jr.'.

William J. Cahill, Jr.
Chief Nuclear Officer

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cc: Next Page

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Attachment: As stated

cc: Regional Administrator
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REQUEST FOR EXEMPTION FROM 10 CFR 50, APPENDIX R
REGARDING USE OF LOW PRESSURE INJECTION SYSTEMS
TO ACHIEVE SAFE SHUTDOWN

EVALUATION PURSUANT TO 10 CFR 50.12 CRITERIA

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

NEW YORK POWER AUTHORITY

JANUARY 12, 1996

1.0 INTRODUCTION

The Authority is requesting an exemption from the requirements of 10 CFR 50, Appendix R as they apply to the James A. FitzPatrick Nuclear Power Plant so that low-pressure injection systems may be used to achieve safe shutdown in six fire areas. An exemption request for five fire areas was recommended by the NRC letter dated September 5, 1995. The Authority is requesting an exemption for the sixth fire area to ensure consistent licensing basis for the fire protection rule at the FitzPatrick Plant.

2.0 BACKGROUND

By letter dated October 26, 1992 and supplemented by letter dated July 22, 1994, the Authority submitted the FitzPatrick Safe Shutdown Capability Reassessment (Reference 7.1). This report detailed the Authority's four methods (Methods 1, 2, 3, and 4) for achieving hot shutdown in the event of a fire.

By letter dated September 5, 1995 (Reference 7.2) the NRC transmitted its safety evaluation of the FitzPatrick Safe Shutdown Capability Reassessment. In this letter, the NRC concluded that the Authority's Method 3, use of Low-Pressure Injection Systems (LPIS), does not satisfy the requirements of Appendix R for five fire areas (IX, X, XI, XVII, and XVIII). The specific issues are (1) the use of LPIS does not meet the technical requirements of Section III.G.1 of Appendix R, to the extent that LPIS will not allow hot shutdown conditions to be maintained, and (2) the use of LPIS does not satisfy the shutdown system performance criteria of Section III.L of Appendix R. As a result of these issues, the NRC recommended that the Authority seek an exemption for the five fire areas.

By letter dated September 10, 1992 (Reference 7.6) the NRC issued a revised exemption from the requirements of 10 CFR 50, Appendix R, Sections III.G.2, III.G.3, and III.L, such that neither separation of redundant safe shutdown circuits nor alternate shutdown capability is required for the Torus Room (Fire Area XV). The Authority's associated exemption request (Reference 7.9) stated that the High Pressure Coolant Injection and Reactor Core Isolation Cooling Systems would be considered disabled for a postulated fire in the Torus Room and that LPIS would be available for safe shutdown. However, the Authority did not explicitly request an exemption to allow use of LPIS; therefore the Authority is also including the Torus Room in this exemption request to allow the use of LPIS to achieve safe shutdown.

3.0 EXEMPTION REQUEST

In accordance with the provisions of 10 CFR 50.12(a), the New York Power Authority requests an exemption from the requirements of 10 CFR 50, Appendix R, Sections III.G.1, III.L.1, and III.L.2 as they apply to the James A. FitzPatrick Nuclear Power Plant so that LPIS may be used to achieve safe shutdown for Fire Areas IX, X, XI, XV, XVII, and XVIII.

Fire Areas/Fire Zones Affected

Fire Area	Fire Zone	Area Description
IX	RB-1A	Reactor Building East Side - El. 272'; Southeast Quadrant - El. 300'; and Entire Floor - El. 326', 344', and 369'
	SG-1	Standby Gas Filter Room - El. 272'
X	RB-1B	Reactor Building West Side - El. 272' and Southwest Quadrant - El. 300'
XI	CT-3	South Cable Tunnel - El. 286'
XV	SU-1	Torus Room
XVII	RB-1E	Reactor Building East Crescent Area - El. 227'
XVIII	RB-1W	Reactor Building West Crescent Area - El. 227'

4.0 PHYSICAL ARRANGEMENT AND FIRE PROTECTION FEATURES

Subsections 4.1 through 4.6 provide a description of each fire area, along with fire detection and suppression capability. The term "three-hour fire rated barriers" as used in these subsections includes unrated and/or unsealed penetrations that were evaluated and determined to be adequate in accordance with NRC Generic Letter 86-10 (Reference 7.4).

Based on the types and amounts of combustibles in Fire Areas IX, X, XI, XVII, and XVIII, and the administrative control of combustibles, the detection and suppression capability is adequate to provide early detection and extinguishment of the anticipated fire. The detection and suppression systems alarm both visually and audibly in the Control Room thereby providing reasonable assurance that a fire would be detected in its initial stages before significant damage occurred. The fire would be extinguished either by the automatic suppression systems or by the fire brigade using manual fire fighting equipment. If the fire propagated beyond the immediate point of origin, the walls, floors and ceilings would confine the damage to the affected zone. At the common fire zone boundaries where no physical barriers exist, the water spray curtain systems will prevent fire spread into the horizontally or vertically adjoining fire zones.

Based on the types and amounts of combustibles in Fire Area XV and the administrative control of combustibles, the anticipated fire is expected to be contained within the Torus and not jeopardize safe shutdown capability.

4.1 Fire Area IX

Fire Area IX consists of Fire Zones RB-1A and SG-1. Fire Zone RB-1A includes Reactor Building East Side, Elevation 272'; Reactor Building Southeast Quadrant, Elevation 300'; and the 326', 344', and 369' Elevations of the Reactor Building. Fire Zone SG-1 encompasses the Standby Gas Filter Room on Elevation 272' of the Reactor Building.

Automatic water spray curtain systems, approved for use by exemption to the requirements of Appendix R (Reference 7.3), and three-hour fire rated barriers separate Fire Zone RB-1A from adjacent fire zones. Manually activated water spray suppression systems are provided for Standby Gas Filter Trains A and B in Fire Zone SG-1. Manual fire hose stations and portable fire extinguishers are provided for both fire zones.

Ionization smoke detectors provide area-wide coverage for Fire Zone SG-1 and provide coverage for areas containing safe shutdown equipment in Fire Zone RB-1A. Additional fire detection capability is provided by rate compensated heat detectors for each filter plenum in the Standby Gas Filter Room. Local rate compensated heat detectors actuate the water spray curtains in Fire Zone RB-1A.

4.2 Fire Area X

Fire Area X consists of a single Fire Zone, RB-1B. Fire Zone RB-1B includes the Reactor Building West Side, Elevation 272'; and the Reactor Building Southwest Quadrant, Elevation 300'.

Automatic water spray curtain systems, approved for use by Reference 7.3, and three-hour fire rated barriers separate Fire Zone RB-1B from adjacent fire zones. Manual fire hose stations and portable fire extinguishers are provided for Fire Zone RB-1B.

Area-wide coverage by ionization smoke detectors is provided for Fire Zone RB-1B. Local rate compensated heat detectors actuate the water spray curtains.

4.3 Fire Area XI

Fire Area XI consists of a single Fire Zone, CT-3, which encompasses the South Cable Tunnel, Elevation 286'.

Automatic total flooding CO₂ fire suppression is provided for Fire Zone CT-3. Manual suppression capability is provided by a portable fire extinguisher and a fire hose station.

Area-wide coverage by ionization smoke detectors and rate compensated heat detectors is provided for Fire Zone CT-3. The heat detectors also actuate the suppression system.

4.4 Fire Area XV

Fire Area XV consists of a single Fire Zone, SU-1, which encompasses the Torus Room, Elevation 227'.

The Torus Room has neither an automatic fire detection system nor an automatic fire suppression system. Due to the area configuration and the combustible loading, this area was exempted (Reference 7.6) from the requirements necessitating these systems. Manual fire suppression capability is provided by fire hose stations.

4.5 Fire Area XVII

Fire Area XVII consists of a single Fire Zone, RB-1E, which encompasses the Reactor Building East Crescent Area, Elevation 227'.

Automatic water spray curtain systems, approved for use by Reference 7.3, and three-hour fire rated barriers separate Fire Zone RB-1E from adjacent fire zones. Fire suppression for the High Pressure Coolant Injection (HPCI) pump and turbine is provided by an automatic water spray system and a manually activated foam fire suppression system. Manual fire suppression capability is provided by a manual fire hose station and portable fire extinguishers. In addition, certain design features of the HPCI System, such as shielding of the turbine casing, insulated piping, and trouble alarms, reduce the likelihood of a lubricating oil fire.

Area-wide coverage by ionization smoke detectors is provided for Fire Zone RB-1E. Local rate compensated heat detectors actuate the HPCI water spray system and water spray curtain systems.

4.6 Fire Area XVIII

Fire Area XVIII consists of a single Fire Zone, RB-1W, which encompasses the Reactor Building West Crescent Area, Elevation 227'.

An automatic water spray curtain system, approved for use by Reference 7.3, and three-hour fire rated barriers separate Fire Zone RB-1W from adjacent fire zones. The physical arrangement and fire protection features associated with the HPCI pump and turbine, which straddles the boundary of Fire Zones RB-1E and RB-1W, are described in Subsection 4.5. Fire suppression for the Reactor Core Isolation Cooling (RCIC) pump and turbine is provided by an automatic water spray system. Manual fire suppression capability is provided by a manual fire hose station and portable fire extinguishers. In addition, certain design features of the RCIC System, such as insulated piping and trouble alarms, reduce the likelihood of a lubricating oil fire.

Area-wide coverage by ionization smoke detectors is provided for Fire Zone RB-1W. Local rate compensated heat detectors actuate the RCIC water spray system and water spray curtain systems.

5.0 JUSTIFICATION FOR EXEMPTION

10 CFR 50.12(a) states that the Nuclear Regulatory Commission may grant exemptions from the requirements of the regulations contained in 10 CFR 50 provided that:

- The exemption is authorized by law;
- The exemption does not present an undue risk to the public health and safety;
- The exemption is consistent with the common defense and security;
- Special circumstances are present as defined in 10 CFR 50.12(a)(2).

The requested exemption satisfies the 10 CFR 50.12 criteria as stated below:

A. The requested exemption is authorized by law.

10 CFR 50.12(a) authorizes the Nuclear Regulatory Commission to grant this exemption.

B. The requested exemption does not present an undue risk to the public health and safety.

Section III.G.1.a of 10 CFR 50, Appendix R requires one train of systems necessary to achieve and maintain hot shutdown conditions to remain free of fire damage. Additionally, the safe shutdown system performance criteria specified in Sections III.L.1 and III.L.2 of Appendix R require, in part, that during the post-fire shutdown, the reactor coolant makeup function be capable of maintaining reactor coolant level above the top of the core.

High-Pressure Injection Systems (HPIS) would normally be used to achieve and maintain hot shutdown in the event of a fire in Fire Area IX, X, XI, XV, XVII, or XVIII. In the unlikely event that a fire in one of these fire areas prevented use of the HPIS, LPIS would be used to achieve and maintain cold shutdown. Section III.G.1 of 10 CFR 50, Appendix R requires that at least one train of systems necessary to achieve and maintain hot shutdown be free of fire damage, and at least one train of systems necessary to achieve and maintain cold shutdown be restored within 72 hours. Hot shutdown duration was discussed in NRC Generic Letter 86-10 (Reference 7.4) in response to Question 5.3.3 (Generic Letter 86-10, Enclosure 2, Page 23). The response states:

"Section III.G.1 requires that the one train of systems needed to achieve and maintain hot shutdown be free of fire damage. Thus, the systems needed are to be completely protected from the fire regardless of time. If the intent of the question concerns how long these systems must operate, these systems must be capable of operating until systems needed to achieve and maintain cold shutdown are available."

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This response is consistent with the ultimate objective of Appendix R which is safe shutdown, i.e. cold shutdown. There is no need to, or safety benefit associated with, maintaining hot shutdown for any longer than necessary to restore cold shutdown capability. At FitzPatrick, the availability of LPIS is assured in the event of a fire in Fire Area IX, X, XI, XV, XVII, or XVIII due to the fire protection features present and the physical configuration of the plant; therefore, fire safety is not enhanced by assuring the availability of HPIS.

As discussed above, LPIS would only be used when HPIS are unavailable. Although the use of LPIS could result in short-term uncovering the core, this condition does not pose a threat to fuel cladding integrity and has been previously evaluated and approved by the NRC.

By letters dated September 15, 1986 (Reference 7.5) and September 10, 1992 (Reference 7.6) the NRC issued exemptions which permitted the reactor coolant level to drop below the top of the core during the use of alternate safe shutdown procedures following control room evacuation. The basis for these exemptions was an analysis which demonstrated that the short-term core uncovering due to delayed operator actions would not challenge fuel cladding integrity. The analysis is bounding for the short-term core uncovering that could occur in the event of a fire in Fire Area IX, X, XI, XV, XVII, or XVIII concurrent with a complete loss of high pressure makeup capability.

In addition to FitzPatrick-specific exemptions, the NRC has previously evaluated BWR short-term core uncovering during the use of LPIS. NRC Memorandum from L. S. Rubenstein to R. J. Mattson (Reference 7.7) indicates that the uncovering time is short enough and the amount of fuel uncovered is small enough, that cladding integrity would not be threatened. Furthermore, NRC Inspection Procedure 64100 (Reference 7.8) Section 02.01.a.2 indicates that the NRC has approved short-term core uncovering while using LPIS, and that the use of LPIS eliminates the need to maintain hot shutdown conditions.

Therefore, the requested exemption does not present an undue risk to the public health and safety.

C. The requested exemption is consistent with the common defense and security.

The common defense and security are not affected by this exemption request.

D. Special circumstances are present as defined in 10 CFR 50.12(a)(2).

10 CFR 50.12(a)(2) states, in part: "The Commission will not consider granting an exemption unless special circumstances are present. Special circumstances are present whenever- (ii) Application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is it necessary to achieve the underlying purpose of the rule; or (iii) Compliance would result in undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted, or that are significantly in excess of those incurred by others similarly situated."

This exemption request satisfies criterion (ii) of 10 CFR 50.12(a)(2) in that the use of LPIS will assure safe shutdown is achieved and maintained, and will not pose a threat to fuel cladding integrity; and the modifications necessary to assure the availability of HPIS would not enhance fire safety above that provided by existing fire protection.

This exemption request satisfies criterion (iii) of 10 CFR 50.12(a)(2) in that the high cost associated with modifications to assure the availability of HPIS would present undue financial hardship to the Authority.

6.0 CONCLUSION

The Authority concludes that this exemption request is warranted under the provisions of 10 CFR 50.12, in that it is authorized by law, does not present an undue risk to the public health and safety, is consistent with the common defense and security, and special circumstances are present.

7.0 REFERENCES

- 7.1 Safe Shutdown Capability Reassessment 10 CFR 50 Appendix R, James A. FitzPatrick Nuclear Power Plant, November 1992
- 7.2 NRC letter, C. E. Carpenter, Jr. to W. J. Cahill, Jr., dated September 5, 1995, regarding "Safety Evaluation of Safe Shutdown Capability Reassessment for James A. FitzPatrick Nuclear Power Plant"
- 7.3 NRC letter, Domenic B. Vassallo to Corbin A. McNeill, dated January 11, 1985, regarding "Exemptions Requests - 10 CFR 50.48 Fire Protection and Appendix R to 10 CFR Part 50"
- 7.4 NRC Generic Letter 86-10, Implementation of Fire Protection Requirements
- 7.5 NRC letter, Robert M. Bernero to John C. Brons, dated September 15, 1986, regarding "Exemption From Appendix R to 10 CFR 50 Concerning Core Uncovery During Alternate Safe Shutdown"
- 7.6 NRC letter, Robert A. Capra to Ralph E. Beedle, dated September 10, 1992, regarding "Issuance of Exemptions From Requirements of 10 CFR Part 50, Appendix R, for the James A. FitzPatrick Nuclear Power Plant"

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- 7.7 NRC Memorandum, L. S. Rubenstein to R. J. Mattson, dated December 3, 1982, regarding "Use of the Automatic Depressurization System (ADS) and Low Pressure Coolant Injection (LPCI) to Meet Appendix R, Alternate Shutdown Goals"
- 7.8 NRC Inspection Procedure 64100, Postfire Safe Shutdown, Emergency Lighting and Oil Collection Capability at Operating and Near-Term Operating Reactor Facilities
- 7.9 NYPA letter JPN-92-043, Ralph E. Beedle to NRC, dated July 31, 1992, regarding "Revision to Exemption From 10 CFR 50, Appendix R"