May 29, 2001

Mr. Michael Kansler
Sr. Vice President and Chief
Operating Officer
Entergy Nuclear Operations, Inc.
440 Hamilton Avenue
White Plains, NY 10601

SUBJECT: JAMES A. FITZPATRICK NUCLEAR POWER PLANT - EXEMPTION FROM CERTAIN REQUIREMENTS OF SECTION III.G.2.c OF APPENDIX R TO 10 CFR PART 50 (TAC NO. MB0395)

Dear Mr. Kansler:

The Commission has approved the enclosed exemption from certain requirements of Section III.G.2.c of Appendix R to 10 CFR Part 50 for the James A. FitzPatrick Nuclear Power Plant. This action is in response to a letter dated October 30, 2000, by the Power Authority of the State of New York (PASNY) as supplemented by your letter dated February 7, 2001, that submitted additional details concerning the plant configuration to support the exemption. On November 21, 2000, PASNY's interests in the license were transferred to Entergy Nuclear FitzPatrick, LLC, which is authorized to possess and use FitzPatrick and to Entergy Nuclear Operations Inc., which is authorized to possess, use and operate FitzPatrick. By letter dated January 26, 2001, Entergy Nuclear Operations, Inc. requested that the U.S. Nuclear Regulatory Commission (NRC) continue to review and act on all requests before the Commission which had been submitted by PASNY before the transfer. Accordingly the NRC staff has acted upon the request.

A copy of the exemption and the supporting safety evaluation are enclosed. The exemption has been forwarded to the Office of the Federal Register for publication.

Sincerely,

/RA/

Guy S. Vissing, Senior Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-333

Enclosures: 1. Exemption
2. Safety Evaluation

cc w/encls: See next page

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7590-01-P

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

ENTERGY NUCLEAR FITZPATRICK, LLC

AND

ENTERGY NUCLEAR OPERATIONS, INC.

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

DOCKET NO. 50-333

EXEMPTION

1.0 BACKGROUND

Entergy Nuclear FitzPatrick, LLC and Entergy Nuclear Operations, Inc. are the holders of Facility Operating License No. DPR-59 which authorizes operation of the James A. FitzPatrick Nuclear Power Plant (JAF). The license provides, among other things, that the facility is subject to all rules, regulations, and orders of the U.S. Nuclear Regulatory Commission (NRC, the Commission) now or hereafter in effect.

The facility consists of a boiling-water reactor located in Oswego County in New York.

2.0 PURPOSE

By letter dated October 30, 2000, the Power Authority of the State of New York (PASNY), then the licensee for JAF, submitted a request for exemption from certain technical requirements of Section III.G of Appendix R to 10 CFR Part 50, in accordance with the provisions of 10 CFR 50.12. Specifically, PASNY requested an exemption from Section III.G.2.c in that it requires certain redundant trains of equipment located in the same fire area, where automatic fire detection and automatic fire suppression are provided, to be protected with

a 1-hour rated fire barrier. On November 21, 2000, PASNY's interests in the license were transferred to Entergy Nuclear FitzPatrick, LLC, which is now authorized to possess and use FitzPatrick and to Entergy Nuclear Operations, Inc., which is now authorized to possess, use and operate FitzPatrick. By letter dated January 26, 2001, Entergy Nuclear Operations, Inc. (the licensee) requested that the U.S. Nuclear Regulatory Commission (NRC) continue to review and act on all requests before the Commission which had been submitted by PASNY before the transfer. Accordingly, the NRC staff continued its review. By letter dated February 7, 2001, the licensee provided supplemental information.

Section III.G.2.c of Appendix R Title 10 of the Code of Federal Regulations (10 CFR), Part 50 specifies that certain fire protection features are necessary in order to assure the ability to achieve and maintain hot shutdown conditions. The high-pressure coolant injection (HPCI) for reactor coolant makeup and Train B of residual heat removal (RHR) for suppression pool cooling are credited in the licensee's safe shutdown analysis for achieving and maintaining hot shutdown conditions and Train B of alternate shutdown cooling (ASD) is credited for achieving cold shutdown for a fire in the west cable tunnel (CT-1). A power cable that supports HPCI, Train B RHR and ASD is routed through CT-1. CT-1 also houses the redundant required safe shutdown equipment.

The power cable for HPCI, Train B RHR and ASD in CT-1 has been protected with a fire wrap material to meet Appendix R in order to separate these systems from the redundant systems located in CT-1. However, it was found that this fire wrap material did not meet the requirements of 1-hour fire protection. Thus, an exemption from the requirements of Section III.G.2.c of Appendix R to 10 CFR Part 50 was requested.

3.0 DISCUSSION

Pursuant to 10 CFR 50.12, the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR Part 50,

when (1) the exemptions are authorized by law, will not present an undue risk to public health or safety, and are consistent with the common defense and security; and (2) when special circumstances are present.

A power cable for HPCI, Train B RHR and ASD in CT-1 has been protected with a fire wrap material to meet Appendix R in order to separate these systems from the redundant systems located in CT-1. The licensee intended that the fire barrier material be rated for 1 hour, but the licensee later identified that there was not sufficient evidence to demonstrate that the barrier meets the acceptance criteria for a rated 1-hour fire barrier wrap. Based on fire barrier testing, the barrier exceeded test acceptance criteria at 30 minutes.

The primary in-situ combustible loading in CT-1 is cable, which the licensee states would contribute to a slowly developing cable fire. The originally installed cables for JAF were specified and ordered before IEEE Std. 383-1974, which provides a flame spread rating indicating slow flame spreading, was issued. However, an analysis was performed by the licensee which evaluated the flame retardant capability of the installed cable and it was determined that the installed cable was similar to IEEE 383-1974 rated cable. The only other combustible materials identified in the area are limited quantities of fiberglass associated with a water tank, ladders and piping. The only ignition sources which have been identified are the cables.

An automatic area-wide early warning smoke detection system is installed in CT-1. The system was designed and installed to National Fire Protection Association (NFPA) standards, NFPA-72D, 1979, Proprietary Signaling Systems and NFPA-72E, 1978, Automatic Detectors. In some cases the installed system does not meet the codes of record. These code deficiencies are related to lack of electrical supervision of circuits, lack of recording of alarms, lack of environmental qualification, over loading of fire detection signaling lines, some beam pockets lacking detectors, and power supplies not meeting NFPA standards. The licensee has

determined that the code deviations do not adversely impact safety performance. The majority of the deficiencies would not degrade the performance of the fire detection system but may impact the system's availability. Site administrative procedures control compensatory measures for the detection system in CT-1 in the event that the detection system is unavailable. The code deficiency of lacking smoke detectors in two of the beam pockets may impact the performance of the system. Based on the proximity of the unprotected beam pockets to the fire wrap, over 80 feet away, the licensee concludes that the smoke detectors in the general area are adequate to provide detection of any credible fire which may potentially damage the fire wrap. Based on the information provided by the licensee, the staff concurs that the code deviations and lack of detectors in all beam pockets would not adversely impact the fire detection system's performance in the area of the fire wrap.

An automatic area-wide wet pipe sprinkler system is installed in CT-1. The licensee states that the system meets the design requirements of NFPA-13, 1991, and is designed and installed as an Extra Hazard (Group 1) system. In addition, an in-tray automatic wet pipe water spray system is designed to suppress a tray based fire. The licensee states that the water spray system meets the design requirements of NFPA-15, 1990, Water Spray Systems. Water hose lines and fire extinguishers are available to the fire brigade inside the zone to support manual suppression. In addition, hose stations with additional lengths of hose are available outside of the area if needed.

Transient combustible materials in the area are kept to a minimum based on the administrative limits for the area. Administrative limits may be exceeded only when an evaluation has been performed and a combustible control permit has been issued. All station hot work, including cutting and welding, is controlled by administrative procedures. Special requirements for the CT-1 are that fire protection personnel will approve hot work in this area

and that fire protection personnel will inspect the area during the performance of hot work at least every 2 hours.

The NRC staff examined the licensee's rationale to support the exemption request and believes that reasonable assurance that at least one means of achieving and maintaining safe shutdown conditions will remain available during and after any postulated fire in the plant. Accordingly, the request for an exemption from the requirements of 10 CFR Part 50 Appendix R, Section III.G.2.c with respect to fire area CT-1 meets the special circumstances delineated in 10 CFR Part 50.12(a)(2)(ii), i.e., the application of the regulation in these particular circumstances is not necessary to achieve the underlying purpose of the rule. While the installed fire barrier in CT-1 has less than a 1-hour fire endurance rating, it will provide some resistance to fire. The area where the fire barrier is located has no ignition sources other than cables, has available manual suppression capability, and is equipped with automatic fire suppression and fire detection. Under these circumstances, there is an adequate level of fire safety such that there is reasonable assurance that at least one means of achieving and maintaining safe shutdown conditions will remain available during and after any postulated fire in the plant, and therefore, the underlying purpose of the rule is met.

Based on the NRC staff review, and circumstances described above, the staff concludes that an exemption from the technical requirements of Section III.G.2.c of Appendix R to 10 CFR Part 50 to the extent that it requires the enclosure of cables of one redundant train of safe shutdown equipment in a 1-hour fire rated barrier, is appropriate for fire area CT-1. See the safety evaluation that supports these findings dated May 29, 2001.

4.0 CONCLUSION

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12(a), the exemption is authorized by law, will not present an undue risk to public health and safety, and is consistent with the common defense and security. Also, special circumstances are present.

Therefore, the Commission hereby grants Entergy Nuclear FitzPatrick, LLC and Entergy Nuclear Operations, Inc. the requested exemption from the requirements of Section III.G.2.c of Appendix R to 10 CFR Part 50 for the JAF.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will not have a significant effect on the quality of the human environment (66 FR27540).

This exemption is effective upon issuance.

Dated at Rockville, Maryland, this 29th day of May 2001.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Cynthia A. Carpenter, Acting Director
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

LICENSEE REQUEST FOR EXEMPTION FROM

SECTION III.G.2.C OF APPENDIX R TO 10 CFR PART 50

ENTERGY NUCLEAR FITZPATRICK, LLC, AND ENTERGY NUCLEAR OPERATIONS, INC.

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

DOCKET NO. 50-333

1.0 INTRODUCTION

Appendix R "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979," to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, establishes fire protection features required to satisfy General Design Criterion 3, "Fire protection," of Appendix A to 10 CFR Part 50 with respect to certain generic issues for nuclear power plants licensed to operate prior to January 1, 1979. 10 CFR Part 50.48, “Fire Protection,” requires nuclear power plants licensed to operate prior to January 1, 1979, to implement Sections III.G, III.J, and III.O of Appendix R to 10 CFR Part 50. James A. FitzPatrick Nuclear Power Plant (JAF) was licensed to operate on October 17, 1974.

By letter dated October 30, 2000, the New York Power Authority of the State of New York (PASNY) the holder of the license for JAF at that time, submitted a request for an exemption from certain technical requirements of Section III.G of Appendix R to 10 CFR Part 50. However, on November 21, 2000, PASNY’s interests in the license were transferred to Entergy Nuclear FitzPatrick, LLC, which is now authorized to possess and use FitzPatrick and to Entergy Nuclear Operations, Inc., which is now authorized to possess, use and operate FitzPatrick. By letter dated January 26, 2001, Entergy Nuclear Operations, Inc., (the licensee) requested that the U.S. Nuclear Regulatory Commission (NRC) continue to review and act on all requests before the Commission which had been submitted by PASNY before the transfer. Specifically, the licensee proposed to be exempt from Section III.G.2.c to the extent it requires certain redundant trains of equipment located in the same fire area, where automatic fire detection and automatic fire suppression are provided, to be protected with a 1-hour rated fire barrier. On February 7, 2001, as a result of a request for additional information, sent to the licensee on December 29, 2000, the licensee sent the NRC a letter containing additional details concerning the plant configuration to support the exemption request.

2.0 DISCUSSION

Section III.G.2.c of Appendix R specifies that certain fire protection features are necessary in order to assure the ability to achieve and maintain hot shutdown conditions. The high-pressure coolant injection (HPCI) for reactor coolant makeup and Train B of residual heat removal (RHR)

for suppression pool cooling are credited in the licensee's safe shutdown analysis for achieving and maintaining hot shutdown conditions, and Train B of alternate shutdown cooling (ASD) is credited for achieving cold shutdown for a fire in the west cable tunnel (CT-1). A power cable that supports HPCI, Train B RHR and ASD is routed through CT-1. CT-1 also houses the redundant required safe shutdown equipment.

The power cable for HPCI, Train B RHR and ASD in CT-1 has been protected with a fire wrap material to meet Appendix R in order to separate these systems from the redundant systems located in CT-1. The licensee intended that the fire barrier material be rated for 1 hour, but the licensee later identified that there was not sufficient evidence to demonstrate that the barrier meets the acceptance criteria for a 1-hour rated fire barrier wrap. Based on fire barrier testing, the barrier exceeded test acceptance criteria at 30 minutes.

The primary in-situ combustible loading in CT-1 is cable, which the licensee states would contribute to a slowly developing cable fire. The originally installed cables for JAF were specified and ordered before IEEE Std. 383-1974 on flame spread was issued, which indicates slow flame spreading. However, an analysis was performed by the licensee which evaluated the flame retardant capability of the installed cable and it was determined that the installed cable was similar to IEEE 383-1974 rated cable. The only other combustible materials identified in the area are limited quantities of fiberglass associated with a water tank, ladders and piping. The only ignition sources which have been identified are the cables.

An automatic, area-wide, early warning smoke detection system is installed in CT-1. The system was designed and installed to National Fire Protection Association (NFPA)-72D standards, 1979, Proprietary Signaling Systems and NFPA-72E, 1978, Automatic Detectors. In some cases the installed system does not meet the Codes of record. These Code deficiencies are related to lack of electrical supervision of circuits, lack of recording of alarms, lack of environmental qualification, over loading of fire detection signaling lines, some beam pockets lacking detectors, and power supplies not meeting NFPA standards.

An automatic area-wide wet pipe sprinkler system is installed in CT-1. The licensee states that the system meets the design requirements of NFPA-13, 1991, and is designed and installed as an Extra Hazard (Group 1) system. In addition, an in-tray automatic wet pipe water spray system is designed to suppress a tray based fire. The licensee states that the water spray system meets the design requirements of NFPA-15, 1990, Water Spray Systems. Water hose lines and fire extinguishers are available to the fire brigade inside the zone to support manual suppression. In addition, hose stations with additional lengths of hose are available outside of the area if needed.

Transient combustible materials in the area are kept to a minimum based on the administrative limits for the area. Administrative limits may be exceeded only when an evaluation has been performed and a combustible control permit has been issued. All station hot work, including cutting and welding, is controlled by administrative procedures. Special requirements for the CT-1 are that fire protection personnel will approve hot work in this area and that fire protection personnel will inspect the area during the performance of hot work at least every two hours.

4.0 EVALUATION

The staff was concerned that, in the event of a fire, the lack of a rated one-hour fire barrier between redundant trains of safe shutdown equipment could affect the ability to achieve and maintain post-fire safe shutdown. HPCI for reactor coolant makeup, Train B of RHR for suppression pool cooling and Train B of ASD for cold shutdown and their redundant equipment in CT-1 would be lost in the event of a fire which damaged both the cable protected by the fire wrap in CT-1 and those not protected by the fire wrap in CT-1.

The licensee estimates the rating of the barrier is 30 minutes based on sustaining fire tests at 325 °F which is the E-119 failure criteria established by the American Society of Testing Material (ASTM). The licensee quotes the manufacturer's literature which states that the short circuit rating for the installed Okonite cable is 250°C (482°F). The test results of a group of airdrop cables (one thousand circular mills (MCM) cable, one 7 conductor 12 American wire gauge (AWG) cable, and one 2 conductor 16 AWG cable), indicate that it was more than 52 minutes into the fire when a thermocouple (located on the surface of the 300 MCM cable at a point on the cable near the top of the assembly) reached the short circuit rating temperature (482 °F). Thermocouples were also attached to the other cables, but the thermocouples recording 300 MCM cable temperatures provided the highest temperature results for the assembly. Generic Letter 86-10, Supplement 1, states that based on cable functionality the types of cables installed (thermosetting) retain their electrical properties for temperatures up to 500°F. Based on the above discussed test results the licensee concludes that the fire barrier will remain free of fire damage for at least 30 minutes, and cable functionality would not be challenged until after 52 minutes when exposed to an ASTM E-119 fire test. The staff concurs with this conclusion.

Smoke detectors are installed in the area. Although deficiencies exist in the fire detection system design, these deficiencies have been evaluated by the licensee and determined that they do not adversely impact safety performance. The majority of the deficiencies would not degrade the performance of the fire detection system but may impact the detection systems' availability. Site administrative procedures control compensatory measures for the detection system in CT-1 in the event that the detection system is unavailable. The code deficiency of lacking smoke detectors in two of the beam pockets may impact the performance of the system. Based on the proximity of the unprotected beam pockets to the fire wrap, over 80 feet away, the licensee concludes that the smoke detectors in the general area are adequate to provide detection of any credible fire which may expose the fire wrap. Based on the information provided by the licensee, the staff concurs that the code deviations and lack of detectors in all beam pockets would not adversely impact the fire detection system's performance in the area of the fire wrap.

Automatic fire suppression systems and manual fire suppression are available in the vicinity of the fire wrap. A ceiling mounted fire sprinkler suppression system is installed for the full area, and an in-tray automatic wet pipe water spray system is installed to suppress a tray based fire.

The only significant in-situ combustibles and ignition sources are cables. The cables either meet IEEE-383 flame spread standards or have been tested and evaluated to determine equivalency to IEEE-383 flame spread standards. Based on a review of evaluation provided by the licensee of the flame retardant characteristics of the cables installed, the staff believes that the evaluation demonstrates that the installed cables have similar fire resistance properties as

cables tested to IEEE-383 fire resistance test and therefore it is credible that a fire in the area will propagate slowly.

Administrative controls are in place to limit the transient combustibles and to control ignition sources.

The following are the NRC's defense-in-depth objectives, 1) to prevent fires from starting, 2) to detect rapidly, control and extinguish promptly those that do occur, and 3) to provide protection for structures, systems, and components important to safety so that a fire that is not promptly extinguished by the fire suppression activities will not prevent the safe shutdown of the plant. The fire hazards analysis of CT-1 and the existing protection of the fire wrapped cable in question show that these objectives are adequately met. Supporting the first objective is that there are no in-situ ignition sources other than cables in the area and transient ignition sources are controlled. The second objective is supported by the fact that there is a smoke detection system, two wet pipe sprinkler systems (one area and one in-tray), and manual suppression capability. The third objective is supported by the fire wrap which provides protection from fire damage for 30 minutes and functionality for 52 minutes.

5.0 CONCLUSION

The underlying purpose of the rule is to provide reasonable assurance that at least one means of achieving and maintaining safe shutdown conditions will remain available during and after any postulated fire. Based on the existing fire protection features, the staff concludes that the underlying purpose of the rule is satisfied. Accordingly, the request for an exemption from the requirements of 10 CFR Part 50, Appendix R, Section III.G.2.c with respect to fire area CT-1 meets the special circumstances delineated in 10 CFR Part 50.12(a)(2)(ii), i.e., the application of the regulation in these particular circumstances is not necessary to achieve the underlying purpose of the rule. In addition, the staff finds that the requested exemption is authorized by the law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security. Accordingly, based on the NRC staff review, and circumstances described above, the staff concludes that an exemption from the technical requirements of Section III.G.2.c of Appendix R to 10 CFR Part 50 to the extent that they require the enclosure of cables of one redundant train of safe shutdown equipment in a 1-hour rated fire barrier should be granted for fire area CT-1.

Principal Contributor: D. Frumkin

Date: May 29, 2001