Docket files

Docket No. 50-333

APR 26 1983

Mr. J. P. Bayne
Executive Vice President,
Nuclear Generation
Power Authority of the State
of New York
123 Main Street
White Plains, New York 10601

Dear Mr. Bayne:

SUBJECT: ALTERNATE SAFE SHUTDOWN CAPABILITY, MODIFICATIONS AND EXEMPTIONS TO MEET APPENDIX R OF 10 CFR PART 50 - FIRE PROTECTION

Re: James A. FitzPatrick Nuclear Power Plant

We have completed our review of your submittals regarding your proposed alternate safe shutdown capability, including necessary modifications, for the James A. FitzPatrick Nuclear Power Plant. We have concluded that your proposed modifications and alternate safe shutdown capability meet the requirements of Section III.G.3. and III.L of Appendix R to 10 CFR Part 50 within the control room, cable spreading room and relay room and are therefore, acceptable. The bases for our finding are contained in the enclosed Safety Evaluation. Based on this approval, the required schedule for implementation is as given in Paragraph 50.48 (c)(4) of 10 CFR Part 50.

Concurrent with this action, the Commission has issued the enclosed Exemption from certain requirements of Section 50.48 and Appendix R to 10 CFR Part 50 regarding exemptions requested by you as part of your submittals on this subject. In your submittals, you requested exemption from the requirements of: Section III.G.2 concerning three-phase AC and two-wire DC circuits; Section III.G.1.a, III.G.2, III.G.3 and III.L for pulling of low-voltage fuses; and Section III.L.4 and III.L.5 concerning restoration of offsite power within 72 hours.

Based on our evaluation, we find that the first two exemption requests pertaining to AC and DC circuits and fuse pulling result in a level of fire protection equivalent to that required by Appendix R and that exemption

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from the requirements should be granted. For the third exemption pertaining to restoration of offsite power within 72 hours, we find that no exemption request is necessary. The bases for these findings are also contained in the enclosed Safety Evaluation.

A copy of the Exemption is being filed with the Office of the Federal Register for publication.

Sincerely,

Original signed by
D. B. Vassallo
Domenic B. Vassallo, Chief
Operating Reactors Branch #2
Division of Licensing

Enclosures
1. Exemption
2. Safety Evaluation

cc w/enclosure
See next page

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Mr. J. P. Bayne
Executive Vice President
Nuclear Generation
Power Authority of the State of New York

cc:

Mr. Charles M. Pratt
Assistant General Counsel
Power Authority of the State
of New York
10 Columbus Circle
New York, New York 10019

U. S. Environmental Protection
Agency
Region II Office
Regional Radiation Representative
26 Federal Plaza
New York, New York 10007

Mr. Corbin A. McNeill, Jr.
Resident Manager
James A. FitzPatrick Nuclear
Power Plant
P. O. Box 41
Lycoming, New York 13093

Director, Technical Development
Programs
State of New York Energy Office
Agency Building 2
Empire State Plaza
Albany, New York 12223

Mr. Robert Burns
Manager - Nuclear Licensing
Power Authority of the State
of New York
123 Main Street
White Plains, N.Y. 10601

Mr. Robert P. Jones, Supervisor
Town of Scriba
R. D. #4
Oswego, New York 13126

Mr. Leroy W. Sinclair, Pres.
PASNY
10 Columbus Circle
New York, N. Y. 10019

Resident Inspector
c/o U.S. NRC
P. O. Box 136
Lycoming, New York 13093

Mr. A. Klausmann
Vice President-Quality Assurance
Power Authority of the State
of New York
10 Columbus Circle
New York, New York 10019

Mr. George Wilverding, Chairman
Safety Review Committee
Power Authority of the State
of New York
123 Main Street
White Plains, N.Y. 10601

Mr. M. C. Cosgrove
Quality Assurance Superintendent
James A. FitzPatrick Nuclear
Power Plant
P.O. Box 41
Lycoming, New York 13093

Ronald C. Haynes
Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	Docket No. 50-333
	)	
POWER AUTHORITY OF THE STATE OF NEW YORK	)	
	)	
(James A. FitzPatrick Nuclear Power Plant)	)	

EXEMPTION

I.

The Power Authority of the State of New York (the licensee) is the holder of Facility Operating License No. DPR-59 which authorizes the licensee to operate the James A. FitzPatrick Nuclear Power Plant (the facility) at power levels not in excess of 2436 megawatts thermal. The facility is a boiling water reactor (BWR) located at the licensee's site in Oswego County, New York. The license provides, among other things, that it is subject to all rules, regulations and Orders of the Commission now or hereafter in effect.

II.

Section 50.48 of 10 CFR Part 50 requires that licensed operating reactors be subject to the requirements of Appendix R of 10 CFR Part 50. Appendix R contains the general and some of the specific requirements for fire protection programs at licensed nuclear facilities. On February 17, 1981, the fire protection rule for nuclear power plants, 10 CFR 50.48 and Appendix R, became effective. This rule required all licensees of plants licensed prior to January 1, 1979, to submit by March 19, 1981: (1) plans and schedules for meeting the applicable requirements of Appendix R, (2) a design description of any modifications proposed to provide alternative safe shutdown capability pursuant to Paragraph III.G.3 of Appendix R, and (3) exemption requests for which the tolling provision of Section 50.48(c)(6) was to be invoked.

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The licensee responded to these requirements by letter dated March 19, 1981, and supplemented its response by information contained in letters dated June 22, 1981, February 26, 1982, and November 23, 1982.

In these submittals, the licensee requested certain exemptions from the requirements of Section III.G and III.L of Appendix R to 10 CFR Part 50. Section III.G of Appendix R requires that one train of cables and equipment necessary to achieve and maintain safe shutdown be maintained free of fire damage by one of three means described in that section. If the conditions of Section III.G are not met, the section requires an alternate shutdown capability independent of the fire area of concern. Section III.L states the requirements for alternative and dedicated shutdown capability.

The exemption requests we found to be acceptable are as follows:

1. The licensee requested an exemption from the provisions of Section III.G.2 of Appendix R for three-phase AC and two-wire DC circuits "to the extent that this would require further analysis and modifications to provide protection against the extremely unlikely occurrence of a two conductor (DC) or three conductor (three phase AC) power cable being severed by a fire and then reconnecting to cause maloperation of systems or equipment."

   The licensee justified the exemption by stating the following: for the case of the three-phase AC circuits, the licensee indicated that two circuits - one energized, one deenergized - would need to be damaged by the fire such that power would be supplied to the non-energized circuit. The licensee indicated that this event was not considered credible because of the extreme unlikelihood of fire-damaged cables reconnecting in the proper sequence.

For the case of the two-wire DC circuits, the licensee indicated that two circuits - one energized, one deenergized - would both need to be damaged by the fire and reconnect such that power would be supplied to the non-energized circuit. Since the DC power system is a non-grounded system, the short of the two circuits would have to occur prior to one of the circuits being shorted to ground. This event is considered highly unlikely.

We have reviewed the licensee's submittals and agree with the licensee's evaluation that the AC and DC circuits described above do not meet the requirements of Section III.G.2 of Appendix R. However, based on the extremely unlikely occurrence of a three phase circuit short or a two-wire DC power circuit short before grounding, we conclude that the licensee's exemption request is acceptable and should be granted.

2. The licensee has requested an exemption from Sections III.G.1.a, III.G.2, III.G.3, and III.L of Appendix R to the extent that repairs are considered to include low voltage fuse pulling, lifting of leads, and cable cutting.

   The licensee justified the exemption by stating that: procedures would identify the necessary corrective actions; that the actions can be accomplished in a timely manner (i.e., before unrecoverable plant conditions exist); and that the electrical connections are low voltage.

   We have reviewed the licensee's submittals and have identified two areas for which this exemption request is justified: Fire Area CT-3, Cable Tunnel, and Fire Area CT-4, Cable Tunnel. For Fire

Area CT-3, a RCIC logic control power fuse must be removed to prevent spurious signals from affecting the use of RCIC. For Fire Area CT-4, a HPCI logic control must be removed to prevent spurious signals from affecting the use of HPCI. In each case, the repair is limited to the removal of a single fuse located in a panel in the relay room.

Based on the licensee's commitment to provide procedures detailing these repairs and the licensee's statement that the repairs can be accomplished in a timely manner, and that the repairs are performed on low voltage circuits, we conclude that the licensee's exemption request for Fire Area CT-3 and CT-4 is acceptable and should be granted.

III.

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12, an exemption is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest. Therefore, the Commission hereby approves the following exemption requests:

1. Exemption is granted from the provisions of Section III.G.2 of Appendix R for three-phase AC and DC circuits such that no further analysis or modifications are required to provide protection for these circuits to prevent maloperation of systems or equipment.
2. Exemption is granted from Section III.G and III.L of Appendix R to 10 CFR Part 50 to the extent that repairs are considered to include low voltage fuse pulling in Fire Area CT-3 and Fire Area CT-4.

The NRC staff has determined that the granting of this exemption will not result in any significant environmental impact and that pursuant to 10 CFR 51.5(d)(4), an environmental impact appraisal need not be prepared in connection with this action.

FOR THE NUCLEAR REGULATORY COMMISSION

Darrell G. Eisenhut, Director
Division of Licensing
Office of Nuclear Reactor Regulation

Dated at Bethesda, Maryland
this 26th day of April 1983.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

APPENDIX R TO 10 CFR PART 50, SECTIONS III.G.3 AND III.L

-- POWER AUTHORITY OF THE STATE OF NEW YORK

JAMES A FITZPATRICK NUCLEAR POWER PLANT

DOCKET NO. 50-333

Introduction

On February 17, 1981, the fire protection rule for nuclear power plants, 10 CFR 50.48 and Appendix R to 10 CFR Part 50, became effective. This rule required all licensees of plants licensed prior to January 1, 1979, to submit by March 19, 1981: (1) plans and schedules for meeting the applicable requirements of Appendix R, (2) a design description of any modifications proposed to provide alternative safe shutdown capability pursuant to Section III.G.3 of Appendix R, and (3) exemption requests for which the tolling provision of Section 50.48(c)(6) was to be invoked. Section III.G of Appendix R is a retrofit item to all pre-1979 plants regardless of previous safety evaluation positions and resolutions. The criteria contained in Section III.L of Appendix R are used for those cases where licensees are incorporating alternate or dedicated shutdown capability.

Our previous fire protection Safety Evaluation Report (SER) dated August 1, 1979 concerning Branch Technical Position APCSB 9.5-1 indicated that in certain plant areas redundant systems could be damaged by a single fire which would affect safe shutdown. We requested the Power Authority of the State of New York (licensee) to provide alternative shutdown capability for areas which could not be protected by fire barriers, fire detection and fire suppression systems. The SER specifically indicated that the relay room and the cable spreading room should be provided with alternative shutdown capability.

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By submittal dated July 13, 1982, the licensee provided the descriptions of the proposed modifications to the Fitzpatrick plant to meet the requirements of Appendix R to 10 CFR 50, Section III.G. The proposed modifications will also resolve the open items from our previous SER dated August 1, 1979. Additional information and clarification was provided by submittals dated October, 1980; March 19, 1981; June 22, 1981; February 26, 1982; and November 23, 1982; and was obtained during a meeting with the licensee on October 28, 1982. Our evaluation of these modifications and actions follows.

SYSTEMS USED FOR POST-FIRE SAFE SHUTDOWN

A. Systems Required for Safe Shutdown

Safe shutdown is initiated from the control room by a manual scram of the control rods. Reactor scram can also be initiated manually by deenergizing the reactor protection system buses. Reactor coolant inventory can be maintained by either the reactor core isolation cooling system (RCIC), the high pressure coolant injection system (HPCI); or the low pressure coolant injection system (LPCI) or the core spray system (CS) in conjunction with the automatic depressurization system (ADS). Reactor coolant system pressure is controlled by either the RCIC, the HPCI or ADS in conjunction with the residual heat removal system (RHR) in the steam condensing mode. Decay heat removal is provided by either the RHR in the shutdown cooling mode; or the LPCI or the CS in conjunction with the RHR in the suppression pool cooling mode.

The support systems required for safe shutdown include the RHR service water system, the emergency service water system, the essential ventilation systems, the emergency diesel generators and the essential electrical distribution system, The above system will be monitored and controlled from the control room or the remote shutdown planel and local control stations.

B. Areas Where Alternative Safe Shutdown is Proposed

In our previous fire protection SER, we requested the licensee to provide alternative shutdown capability for areas which could not be protected by fire barriers, fire detectors and fire suppression system. By submittal dated July 13, 1982, the licensee committed to provide alternative shutdown capability in accordance with the requirements of Sections III.G.3 and III.L of Appendix R for the main control room, the relay room and the cable spreading room.

C. Remaining Plant Areas

By submittal dated July 13, 1982, the licensee indicated that all areas/zones outside the reactor building will meet the requirements of Section III.G.2 of Appendix R. For fire zones inside the reactor building, the licensee has requested a number of exemptions from Section III.G.2 of Appendix R. Additionally, the licensee requested an exemption from Section III.G.2 of Appendix R for three phase AC and DC circuits, "to the extent that this would require further analysis and modifications to provide protection against the extremely unlikely occurrence of a two conductor (DC) or three conductor (three phase AC) power cable being severed by a fire and then reconnecting to cause maloperation of systems or equipment."

For the case of the three phase circuits, the licensee indicated that two power circuits, one of which is energized and the other is non-energized, would need to be damaged by the fire such that power would be supplied to the non-energized circuit. The licensee

indicated that for three phase circuits, this failure was unlikely. For the case of the two-wire DC power circuits, the licensee indicated that the two power circuits, one of which is energized and the other is non-energized would need to be damaged by the fire such that power would be supplied to the non-energized circuit. Since the DC power system is a non-grounded system, the short of the two circuits would have to occur prior to one of the circuits being shorted to ground. Based on the unlikely occurrence of a three phase circuit short and a two-wire DC power circuit short before grounding, we conclude that the licensee's exemption request is acceptable.

D. Alternative Safe Shutdown Systems

The alternative shutdown capability will consist of a new auxiliary shutdown panel, local control and isolation switches, and alternate control power feeders. The new auxiliary shutdown panel will be located in the reactor building on elevation 300 feet. The alternative shutdown capability will utilize six safety relief valves and the low pressure coolant injection system (LPCI). The safety relief valves will be controlled from the manual automatic depressurization system (ADS) panel located in the reactor building. The LPCI and the supporting RHR service water pump will be controlled from the new auxiliary shutdown panel. The instrumentation for the alternative shutdown capability will be provided at the new auxiliary shutdown panel and a local instrument rack. The power supply for the alternative shutdown equipment will be supplied by the emergency

diesel generators. The emergency diesel generators will be manually isolated from the fire areas and locally started by breakers and controls located in the east electrical bay area, the emergency diesel generator switchgear room and the emergency diesel generator room.

The design of the new auxiliary shutdown panel and the ADS panel will include control/isolation switches which when activated will electrically isolate the panel from the control room, cable spreading room and relay room and will transfer control of the shutdown equipment to the panels. A fire at the auxiliary shutdown panel or the ADS panel will result in loss of control for only the equipment controlled from the panel. One train of systems needed for safe shutdown will be available and controllable from the main control room.

EVALUATION

A. Performance Goals

For post-fire shutdown, the performance goals of the alternative safe shutdown capability will be met utilizing six safety-relief valves and the low pressure coolant injection system (LPCI). Reactivity control will be provided by a manual scram of the control rods from the control room. Six safety relief valves will be manually controlled to reduce reactor coolant system pressure. After depressurization, the LPCI will provide reactor inventory makeup. The LPCI will be

used to establish a cooling path by allowing the reactor vessel water level to rise until water flows through the safety relief lines into the suppression pool. This cooling path provides reactor inventory control, suppression pool cooling and initial decay heat removal. Extended decay heat removal will be accomplished by the residual heat removal system (RHR) in the shutdown cooling mode. The RHR will require additional personnel to manually line up the system. The LPCI is capable of providing sufficient cooling until the RHR system is initiated.

Process monitoring for safe shutdown will be provided by the instrumentation at the auxiliary shutdown panel and local instrument rack. The following instrumentation will be available at these panels: reactor water level, reactor pressure, suppression pool temperature, suppression pool level, drywell temperature, injection flowrate, LPCI pump discharge pressure and RHR service water flow rate. The support systems available include the RHR service water system, the emergency diesel generators and the essential electrical distribution system.

B. 72-Hour Requirement

The alternative shutdown systems have the capability of achieving cold shutdown within 72 hours. The alternative shutdown systems can accomplish cold shutdown using only onsite power sources.

The licensee has requested an exemption from Sections III.L.4 and III.L.5 of Appendix R, "to the extent that if offsite power is lost, it must be restored within 72 hours." The licensee justified its exemption request by indicating that the alternative shutdown systems are power from onsite power sources, that the onsite power sources (emergency diesel generators) have a 7-day fuel supply and that additional fuel is available from offsite locations.

Section III.L.3 of Appendix R states that the alternative shutdown capability shall accommodate post-fire conditions where offsite power is available and where offsite power is not available for 72 hours. For conditions where the cold shutdown equipment is not available because of fire damage, Sections III.L.4 and III.L.5 of Appendix R provide additional guidance. For these conditions, the hot shutdown equipment and subsequent cold shutdown equipment used prior to 72 hours after the fire, shall be provided with an independent onsite power system, if the equipment will not be capable of being powered by both onsite and offsite power systems. Additionally, cold shutdown equipment used after 72 hours may be powered by offsite power only. We conclude that the licensee's alternative shutdown capability meets these sections of Appendix R. Additionally, the staff concludes that Appendix R does not require offsite power to be restored within 72 hours. Thus, the licensee's exemption request is not needed.

C. Repairs

The design of the alternative shutdown system does not utilize repairs to achieve safe shutdown.

The licensee has requested an exemption from Sections III.G.1.a, III.G.2, III.G.3 and III.L of Appendix R, "to the extent that repairs are considered to include low voltage fuse pulling, lifting of leads and cable cutting." This exemption request was not utilized for the alternative shutdown capability. The licensee justified the exemption request by indicating that the procedures would identify the necessary actions, the actions can be accomplished before unrecoverable plant conditions exist and the electrical connections are of low voltage. The licensee's exemption request did not identify the fire areas for which this exemption applied.

Our review of the licensee's submittal identified two areas for which this exemption applied: Fire Area CT-3 Cable Tunnel and Fire Area CT-4 Cable Tunnel. For fire area CT-3, an RCIC logic control power fuse must be removed to prevent spurious signals from affecting the use of RCIC. For fire area CT-4, an HPCI logic control must be removed to prevent spurious signals from affecting the use of HPCI. In each case the repair is limited to the removal of a single fuse located in a panel in the relay room. Other than a few manual operations, safe shutdown would be achieved from the control room

using equipment separate from the fire areas. Based on the licensee's commitment to provide procedures outlining these repairs and the licensee's statement that the repairs can be accomplished before an unrecoverable plant condition exists, we conclude that the licensee's exemption request is acceptable for fire areas CT-3 and CT-4.

D. Associated Circuits

The licensee provided the results of their associated circuits review for the control room, the cable spreading room and the relay room. The results identified the associated circuits of concern in these areas and the proposed methods for protecting the safe shutdown capability from fire-induced failures of these circuits. The proposed methods for protecting the safe shutdown capability are consistent with the guidelines provided by us.

1. Power Source Case - The licensee's analysis concluded that all power circuits which share a common power bus with the power circuits of the alternative shutdown equipment are provided with coordinated breakers or fuses.

2. Spurious Signal Case - The licensee's analysis identified a number of circuits whose fire-induced failures may adversely affect the safe shutdown capability. The licensee has proposed methods for protecting the safe

shutdown capability consistent with the severity of the problem. As part of the control room evacuation procedures in the event of a fire in the control room, cable spreading room or relay room, an operator will manually isolate the essential electrical distribution system and the diesel generator from the fire area. The isolation switches will protect the electrical distribution system and the diesel generator from spurious signals resulting from the fire. The procedures, also, indicate that an operator will isolate the "control rod drive air header" air supply to the scram valves, thereby providing protection against spurious control rod actuations. Additionally, the alternative shutdown capability provides a number of local isolation/control switches and local valve position indications. The local isolation/control switches are used to isolate alternative shutdown equipment from spurious control signals resulting from the fire and are used to transfer control of the shutdown equipment to a local station. The local valve position indications are used to verify proper valve alignment and to identify valves that require manual operation to overcome spurious signals resulting from the fire. Further, for prevention of a possible fire induced LOCA, the power for one of the redundant electrically controlled valves at the high/low pressure interface of the reactor coolant loop and RHR pump suction line, will be disconnected prior to raising the pressure of the reactor coolant.

3. Common Enclosure Case - The licensee's analysis identified no instances where associated circuits share a common enclosure with alternative shutdown circuits and are not electrically protected by circuit breakers, fuses or similar devices.

E. Safe Shutdown Procedures and Manpower

The licensee has implemented procedures for the alternate shutdown capability using presently installed equipment. These procedures will be revised as the new alternative shutdown equipment is available. The manpower necessary for safe shutdown using the alternative shutdown capability will be available. No fire brigade members are included in the shutdown manpower requirements.

The licensee will submit Technical Specifications for the alternative shutdown equipment upon completion of the modifications.

CONCLUSION

Based on our review, we conclude that the licensee's request for exemption from Section III.G.2 of Appendix R concerning three phase Ac and DC circuits is acceptable. The licensee's request

for exemption from Sections III.G.1.a, III.G.2, III.G.3, and III.L of the Appendix R concerning the pulling of low voltage fuses is acceptable for fire areas CT-3 and CT-4 only. The licensee's request for exemption from Section III.L.4 and III.L.5 concerning restoring offsite power within 72 hours is not needed. Additionally we conclude that the performance goals for accomplishing safe shutdown in the event of a fire, i.e., reactivity control, inventory control, decay heat removal, pressure control, process monitoring and support functions are met by the proposed alternative shutdown capability. Therefore, we conclude that the licensee's alternative shutdown capability for the control room, the cable spreading room and the relay room complies with the requirements of Section III.G.3 and III.L of Appendix R.

Dated: APR 26 1983

Principal Contributor: N. Fioravante