May 12, 1988

Docket No. 50-305

REDISTRIBUTED TO CORRECT ERROR OF OMISSION OF AN ATTACHMENT TO THE SE

DISTRIBUTION:
Docket File JGiitter
NRC&Local PDRs OGC-WF1
PDIII-3 r/f EJordan
TMurley/JSniezek JPartlow
FMiraglia TBarnhart(4)
KPerkins ACRS(10)
GHolahan GPA/PA
PKreutzer ARM/LFMB
PDIII-3 Gray File

Mr. D. C. Hintz
Vice President - Nuclear Power
Wisconsin Public Service
Corporation
P.O. Box 19002
Green Bay, Wisconsin 54037-9002

Dear Mr. Hintz:

SUBJECT: EXEMPTION FROM CERTAIN REQUIREMENTS OF 10 CFR PART 50, APPENDIX R, SECTION III G. - KEWAUNEE NUCLEAR POWER PLANT-TAC 65783

The Commission has issued the enclosed Exemption to Appendix R of 10 CFR Part 50 in response to your application dated June 23, 1987. The exemption permits the operation of the Kewaunee Plant without a fixed fire suppression system in the Shield Building Fire Area SB-65 and in the Control Room portion of Fire Area AX-35.

The basis for the exemption is contained in the enclosed Exemption and in the Safety Evaluation which is also enclosed. A copy of the Exemption is being forwarded to the Office of the Federal Register for publication.

Sincerely,

/S/

Joseph G. Giitter, Project Manager
Project Directorate III-3
Division of Reactor Projects - III,
IV, V and Special Projects

Enclosures:
1) Exemption
2) Safety Evaluation

cc: See next page

*SEE PREVIOUS CONCURRENCE

Office:	LA/PDIII-3	PM/PDIII-3	PD/PDIII-3	OGC-WF1
Surname:	*PKreutzer	*JGiitter	*KPerkins	*GBerry
Date:	03/17/88	03/18/88	03/18/88	04/06/88

Office:	AD/DRSP	D/DRSP
Surname:	GHolahan	DCrutchfield
Date:	5/10/88	5/12/88

cc:
David Baker, Esquire
Foley and Lardner
P. O. Box 2193
Orlando, Florida 32082

Glen Kunesh, Chairman
Town of Carlton
Route 1
Kewaunee, Wisconsin 54216

Mr. Harold Reckelberg, Chairman
Kewaunee County Board
Kewaunee County Courthouse
Kewaunee, Wisconsin 54216

Chairman
Public Service Commission of Wisconsin
Hill Farms State Office Building
Madison, Wisconsin 53702

Attorney General
114 East, State Capitol
Madison, Wisconsin 53702

U.S. Nuclear Regulatory Commission
Resident Inspectors Office
Route #1, Box 999
Kewaunee, Wisconsin 54216

Regional Administrator - Region III
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Mr. Robert S. Cullen
Chief Engineer
Wisconsin Public Service Commission
P.O. Box 7854
Madison, Wisconsin 53707

UNITED STATES NUCLEAR REGULATORY COMMISSION

In the Matter of
WISCONSIN PUBLIC SERVICE CORPORATION
Kewaunee Nuclear Plant

Docket No. 50-305

EXEMPTION

I.

The Wisconsin Public Service Corporation (WPSC, the licensee) is the holder of Facility Operating License No. DPR-43 which authorizes operation of the Kewaunee Nuclear Power Plant (the facility), at a steady-state power level not to exceed 1650 megawatts thermal. The facility is a pressurized water reactor located in Kewaunee County, Wisconsin. The license provides, among other things, that the facility is subject to all rules, regulations, and Orders of the Commission now or hereafter in effect.

II.

On November 19, 1980, the Commission published a revised Section 50.48 and a new Appendix R to 10 CFR Part 50 regarding fire protection features of nuclear power plants. The revised Section 50.48 and Appendix R became effective on February 17, 1981. Section III of Appendix R contains 15 subsections lettered A through O, each of which specifies requirements for a particular aspect of the fire protection features at a nuclear power plant.

One of the subsections, III.G, is the subject of the licensee's exemption request. Specifically, Subsection III.G requires specific fire

protection features for structures, systems and components important to safe shutdown of the plant.

III.

By letter dated June 23, 1987, the licensee submitted requests for two exemptions from the technical requirements of Section III.G of Appendix R to 10 CFR Part 50. Section III.G of Appendix R is related to fire protection features for ensuring the availability of necessary systems and associated circuits used to achieve and maintain safe plant shutdown.

The first exemption request pertains to paragraph III.G.2(b) of Appendix R. In areas where cables or associated circuits of redundant trains are located in the same fire area outside primary containment, paragraph III.G.2 of Appendix R requires separation by a 3-hour fire barrier or separation by more than 20 feet with no intervening combustibles and with fire detection and automatic fire suppression. The exemption was requested from the specific requirements of this section to the extent that it requires automatic fire suppression systems to be installed throughout the Shield Building, Fire Area SB-65. The Shield Building consists of a 5-foot annular space between the building's inside wall and the reactor containment vessel. Cables required for alternative and dedicated shutdown are located within the annular space in two separate cable penetration areas. The cable penetration areas are separated by a distance greater than 20 feet free from intervening combustibles.

The fixed combustible loading in Fire Area SB-65 is low, consisting primarily of cable insulation. The overall combustible load is less than 1,500 BTU per square foot. Transient combustibles within the Shield Building are

minimized by strictly controlled access and plant administrative procedures. Ionization smoke detectors are installed within the annular space of the Shield Building. These detectors are located near each cable penetration area. Visual and audible alarms for these detectors are provided in the Control Room. For manual fire fighting within Fire Area SB-65, portable fire extinguishers and hose stations are available in adjacent areas.

The purpose of requiring a fixed fire suppression system is to prevent a fire of significant magnitude from developing and damaging the ability to achieve and maintain safe shutdown. Due to the low combustible loading and the clear spatial separation between penetration areas, a significant fire exposure to alternative and dedicated shutdown cables does not exist. It is expected that, if a fire were to occur, it would develop slowly with an initially low heat release. Ionization detectors located at each of the cable penetration areas would activate annunciators in the Control Room, warning operators of a fire in the particular penetration area of the Shield Building. The fire brigade would then be dispatched to extinguish the fire manually, using the hose lines or portable extinguishers provided in adjacent areas.

Based on the low combustible loading of the area, the passive protection provided by the separation between penetration areas, the installed smoke detectors and the fire brigade's ability to extinguish a fire in the area, there is reasonable assurance that a fire in the Shield Building would not prevent a safe plant shutdown. The staff concludes the installation of fixed fire suppression in the Shield Building will not significantly increase the level of fire protection currently provided. Therefore, the fire protection features currently provided for Fire Area SB-65 are acceptable.

The second exemption request pertains to paragraph III.G.3 of Appendix R, which requires that fire detection and fixed fire suppression systems be provided to areas, rooms, or zones that contain alternative or dedicated shutdown capability.

An exemption was requested from the requirements of Section III.G.3 of Appendix R to the extent that it requires fixed fire suppression throughout the Control Room portion of Fire Area AX-35. Automatic fire suppression systems are not currently installed in the Kewaunee Control Room. The Control Room is located on the 626-foot elevation of the Auxiliary Building in Fire Area AX-53. It contains the normal and engineered safety features control boards for the plant and is continuously manned by trained operators. Combustible materials within Control Room primarily consist of cable insulation and ordinary combustibles. The combustible loading is less than 10,000 BTU per square foot. Fire Area AX-35 is separated from other fire areas within the plant by fire barriers of 3-hour rated construction. The barriers are generally reinforced concrete or concrete block. Openings through the barriers are protected with 3-hour rated opening protectives such as penetration seals and dampers. Ionization smoke detectors are installed in selected panels and consoles in the Control Room. Additionally, a smoke detector is installed within the HVAC return ducting for the room. Portable extinguishers are available in the Control Room with additional extinguishers and hose stations available in adjacent areas. Alternate shutdown capability meeting the criteria of Section III.G.3 has been provided for the Control Room via a dedicated shutdown panel located in Fire Zone TU-95A.

The fire protection in Fire Area AX-35 does not comply with technical requirements of Section III.G.3 of Appendix R because automatic fire suppression is not installed in a zone for which alternative shutdown capability is provided. The purpose of requiring a fixed fire suppression system is to prevent a fire of significant magnitude from developing and damaging the ability to achieve and maintain safe shutdown. Because of the presence of ionization detectors and the continuous manning by trained operators, a fire in the Control Room should be detected early and extinguished by the fire brigade. Additionally, alternative shutdown capability independent of Fire Area AX-35 would be possible by means of a dedicated shutdown panel in Fire Zone TU-95A.

Based on the low combustible loading, the fire detection provided, the continuous manning by trained Control Room operators and the alternative shutdown capability provided, there is reasonable assurance that a fire in the Control Room will not prevent a safe plant shutdown. The staff concludes the installation of fixed fire suppression in the Control Room will not significantly increase the level of fire protection currently provided. Therefore, the fire protection features currently provided for fire area AX-35 are acceptable.

IV.

Accordingly, the Commission has determined, pursuant to 10 CFR 50.12(a), that: (1) the exemption as described in Section III is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security; and (2) special circumstances are present for the exemption in that application of the regulations in this particular

circumstance is not necessary to achieve the underlying purposes of Appendix R to 10 CFR Part 50. Therefore, the Commission grants the exemptions from the requirements of Section III.G. of Appendix R to 10 CFR Part 50 to the extent discussed in Section III above.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will have no significant impact on the environment (53 FR 11155.)

This Exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Dennis M. Crutchfield

Dennis M. Crutchfield, Director
Division of Reactor Projects - III,
IV, V and Special Projects
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland
this 12th day of May 1988

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

WISCONSIN PUBLIC SERVICE CORPORATION

WISCONSIN POWER AND LIGHT COMPANY

MADISON GAS AND ELECTRIC COMPANY

KEWAUNEE NUCLEAR POWER PLANT

DOCKET NO. 50-305

EXEMPTION FROM SECTION III.G OF 10 CFR PART 50, APPENDIX R

INTRODUCTION

By letter dated June 23, 1987, the Wisconsin Public Service Corporation (WPSC), submitted a request for two exemptions from the technical requirements of Section III.G of Appendix R to 10 CFR Part 50. The first exemption was requested from the specific requirements of Section III.G.2(b) to the extent that it requires automatic fire suppression systems to be installed throughout the Shield Building. The second exemption was requested from the specific requirements of Section III.G.3 to the extent that it requires fixed fire suppression throughout the Control Room portion of Fire Area AX-35.

The NRC hired a contractor, Science Applications International Corporation (SAIC), to review the information submitted by WPSC to support their Appendix R exemption requests. By letter dated December 3, 1987, SAIC submitted their Technical Evaluation Report (TER) which is attached. The NRC staff concurs with the TER.

DISCUSSION

A discussion of both exemptions is contained in the TER.

EVALUATION

An evaluation of both exemptions is contained in the TER.

CONCLUSION

Based on the evaluation contained in the TER, which is cited above, the NRC staff concludes that the existing fire protection for the Shield Building and the Control Room portion of Fire Area AX-35 provides a level of fire

protection equivalent to the technical requirements of Section III.G of Appendix R of 10 CFR Part 50. Therefore, the exemption from providing automatic fire suppression for these areas is acceptable and should be granted.

Attachment:
SAIC Technical Evaluation Report-SAIC-87/3096

Date: May 12, 1988

Principal Contributor: Dennis Kubicki

SAIC-87/3096

TECHNICAL EVALUATION REPORT
FOR
KEWAUNEE NUCLEAR POWER PLANT
APPENDIX R EXEMPTION REQUESTS
FOR
FIRE AREAS SB-65 AND AX-35

TAC NUMBER 65783

December 3, 1987

Science Applications International Corporation

Prepared for:

U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Contract NRC-03-87-029

Post Office Box 1303, 1710 Goodridge Drive, McLean, Virginia 22102, (703) 821-4300

FOREWORD

This Technical Evaluation Report (TER) was prepared by Science Applications International Corporation (SAIC) under a contract with the U.S. Nuclear Regulatory Commission (NRC), Office of Nuclear Reactor Regulation for technical assistance and support of NRC operating reactor licensing actions. The technical evaluation was conducted in accordance with criteria established by the NRC.

Mr. Daniel L. Arnold performed the technical review through a subcontract with Rolf Jensen & Associates, Inc.

Section	Title	Page
1.0	INTRODUCTION	
	Purpose of Review	1
	Generic Background.	1
	Plant-Specific Background	2
	Review Criteria	3
2.0	EVALUATION	
	Shield Building Fire Area SB-65 . . .	4
	Control Room Portion of Fire Area AX-35	6
3.0	SUMMARY.	8

1.0 INTRODUCTION

PURPOSE OF REVIEW

This Technical Evaluation Report (TER) documents an independent review of exemption requests to the requirements of Appendix R to 10CFR50 for Fire Area SB-65 and Fire Area AX-35 at the Kewaunee Nuclear Power Plant (Docket No. 50-305) submitted by Wisconsin Public Service Corporation (the Licensee). The evaluation was performed:

1. To assess if each exemption request demonstrates an equivalent level of overall protection of plant safe shutdown capability following a disabling fire event and,

2. To determine the bases for acceptance or denial of each exemption request.

GENERIC BACKGROUND

General Design Criterion 3 (GDC 3), "Fire Protection," of Appendix A to 10CFR50 requires that structures, systems and components important to safety be designed and located to minimize, consistent with other safety requirements, the probability and effects of fires and explosions. Noncombustible and heat resistant materials are required to be used whenever practical. GDC 3 also requires that fire detection and suppression systems of appropriate capacity and capability be provided and designed to minimize the adverse effects of fires on structures, systems and components important to safety. Additionally, fire fighting systems should be designed to ensure that their failure, rupture or inadvertent operation does not significantly impair the safety capabilities of these structures, systems and components.

Either the staff guidance contained in Branch Technical Position (BTP) CMEB 9.5-1 of NUREG 0800, "Standard Review Plan," or the combination of staff guidance contained in Appendix A to BTP APCSB 9.5-1 and the technical requirements set forth in Appendix R to 10CFR50 define the essential elements of an acceptable fire protection program at nuclear power plants for demonstrating compliance with GDC 3. The purpose of the fire protection program is to ensure the capability to shut down the reactor and to maintain it in a safe shutdown condition and to minimize radioactive releases to

the environment in the event of a fire. The above guidance implements the philosophy of defense-in-depth protection against the hazards of fire and its associated effects on safety-related equipment.

Licensees must detail their fire protection program in the Final Safety Analysis Report (FSAR), including plant design features, organization, and administrative controls. The FSAR must include a Fire Hazards Analysis (FHA), which describes plant design and equipment on an area-by-area basis. The FHA should identify fire area boundaries and demonstrate that a fire in any given area will not prevent the plant from safely shutting down. Where any plant design feature deviates from regulatory guidance, it must be identified and demonstrated that the deviation does not adversely affect plant safety.

PLANT-SPECIFIC BACKGROUND

A Safety Evaluation Report (SER) based on the Kewaunee Nuclear Power Plant Appendix R analysis was issued by the staff by letter dated December 22, 1981. Subsequent to issuing the SER, an Appendix R compliance audit was performed. During the audit, the need for the exemptions from the technical requirements of Appendix R was discussed; specifically, the Appendix R requirement for a fixed fire suppression system to be installed in both the Shield Building (Fire Area SB-65) and in the Control Room portion of Fire Area AX-35.

By letter dated June 23, 1987, the Licensee requested specific exemption from paragraphs III.G.2(b) and III.G.3 of Appendix R to the extent it requires fixed fire suppression systems throughout these fire areas.

REVIEW CRITERIA

The criteria for performing the review are from the following documents:

1. Appendix A to Branch Technical Position (BTP) APCSB 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants Docketed Prior to July 1, 1976."

2. Appendix R to 10CFR50, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979."

3. Standard Review Plan, NUREG-0800, Branch Technical Position (BTP), CMEB 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants," Rev. 3, July, 1981.

2.0 EVALUATION

SHIELD BUILDING (FIRE AREA SB-65)

Exemption Requested

An exemption was requested from the specific requirements of Section III.G.2(b) of Appendix R to the extent that it requires automatic fire suppression systems to be installed throughout the Shield Building (Fire Area SB-65).

Discussion

In a letter dated June 23, 1987, the Licensee stated that Fire Area SB-65 does not meet the requirements of Section III.G.2(b) because automatic fire suppression systems are not installed throughout the area.

Fire Area SB-65 is the Shield Building at the Kewaunee Nuclear Power Plant. The Shield Building consists of a 5-foot annular space between the the building's inside wall and the reactor containment vessel (Fire Area RC-60). Access to the annular Shield Building area is strictly controlled from inside the containment air lock entrance assembly.

Fire Area SB-65 contains circuits important to safe shutdown. Cables required for alternative and dedicated shutdown are located within the annular space in two separate cable penetration areas. The cable penetration areas are located at the east and northeast portions of the area separated by a distance greater than 20 feet free from intervening combustibles.

The fixed combustible loading in Fire Area SB-65 is low; consisting primarily of cable insulation. The overall combustible load is less than 1,500 BTU per square foot. Transient combustibles within the Shield Building are minimized by strictly controlled access and plant administrative procedures.

Ionization smoke detectors are installed within the annular space of the Shield Building. These detectors are located near each cable penetration area. Visual and audible alarms for these detectors are provided in the Control Room. For manual fire fighting within Fire Area SB-65, portable fire extinguishers and hose stations are available in adjacent areas.

Evaluation

Section III.G of Appendix R to 10CFR50 is related to fire protection features for ensuring the availability of necessary systems and associated circuits used to achieve and maintain safe plant shutdown. Where safe shutdown assurance for a fire area is achieved by alternative or dedicated shutdown capability, fire detection and a fixed fire suppression system should be installed throughout the area under consideration.

The principle concern with the level of fire protection in Fire Area SB-65 was that because of the lack of a fixed fire suppression system, a fire of significant magnitude could develop and damage the ability to achieve and maintain safe shutdown.

However, the combustible loading for Fire Area SB-65 is low, with the primary combustible consisting of cable insulation. Cable penetration areas are separated by greater than 20 feet free from intervening combustibles.

Due to the low combustible loading and the clear spatial separation between penetration areas, a significant fire exposure to alternative and dedicated shutdown cables does not exist. If a fire were to occur, we expect that it would develop slowly with an initially low heat release.

Ionization detectors are provided at each of the cable penetration areas within the Shield Building. The alarms from these detectors are annunciated in the Control Room. The fire brigade would be dispatched and would extinguish the fire manually using the hose lines or portable extinguishers provided in adjacent areas.

Conclusion

Based on the low combustible loading of the area, the passive protection provided by the separation between penetration areas, the installed smoke detectors and the fire brigade's ability to extinguish a fire in the area, there is reasonable assurance that a fire in the Shield Building would not prevent a safe plant shutdown. In our judgment, the installation of fixed fire suppression in the Shield Building will not significantly increase the level of fire protection currently provided. Therefore, the fire protection features currently provided for Fire Area SB-65 are acceptable.

CONTROL ROOM (FIRE AREA AX-35)

Exemption Requested

An exemption was requested from the requirements of Section III.G.3 of Appendix R to the extent that it requires fixed fire suppression throughout the Control Room portion of Fire Area AX-35.

Discussion

The Licensee has stated that Fire Area AX-35 does not meet the requirements of Section III.G.3 because automatic fire suppression systems are not installed within the Control Room.

The Control Room is located on the 626 foot elevation of the Auxiliary Building in Fire Area AX-35. It contains the normal and engineered safety features control boards for the plant and is continuously manned by trained operators.

Combustible materials within the Control Room primarily consist of cable insulation and ordinary combustibles. The combustible loading is less than 10,000 BTU per square foot.

Fire Area AX-35 is separated from other fire areas within the plant by fire barriers of 3-hour rated construction. The barriers are generally reinforced concrete or concrete block. Openings through the barriers are protected with 3-hour rated opening protectives such as penetration seals and dampers.

Ionization smoke detectors are installed in selected panels and consoles in the Control Room. Additionally, a smoke detector is installed within the HVAC return ducting for the room. Portable extinguishers are available in the Control Room with additional extinguishers and hose stations available in adjacent areas.

Alternate shutdown capability meeting the criteria of Section III.G.3 has been provided for the control room via a dedicated shutdown panel located in Fire Zone TU-95A.

Evaluation

The fire protection in Fire Area AX-35 does not comply with technical requirements of Section III.G.3 of Appendix R because automatic fire suppression is not installed in a zone for which alternative shutdown capability is provided.

The principal concern with the level of fire protection in the Control Room was that, because of the absence of an area-wide fixed suppression system, a fire of significant magnitude could damage redundant safe shutdown systems.

The combustible loading in the main control room is relatively low. The combustibles are primarily cable instulation and ordinary combustibles.

The control room is protected by a fire detection system consisting of ionization smoke detectors located in selected panels and consoles and detectors in the HVAC exhaust ducting. Because of the presence of these detectors and the continuous manning by trained operators, a fire in the Control Room should be detected early and extinguished by the fire brigade.

Additionally, alternative shutdown capability independent of Fire Area AX-35 is provided by a dedicated shutdown panel in Fire Zone TU-95A. This fire zone is separated by the Control Room fire area by 3-hour fire rated barriers.

Conclusion

Based on the low combustible loading, the fire detection provided, the continuous manning by trained control room operators and the alternative shutdown capability provided, there is reasonable assurance that a fire in the Control Room will not prevent a safe plant shutdown. In our judgment, the installation of fixed fire suppression in the control room will not significantly increase the level of fire protection currently provided. Therefore, the fire protection features currently provided for fire area AX-35 are acceptable.

3.0 SUMMARY

These section is provided to consolidate the results of the evaluation contained in Section 2.0 concerning the exemptions requested by the Licensee from the requirements of Section III.G of Appendix R to 10CFR50 for the Kewaunee Nuclear Power Plant. It is not meant as a substitute for the specific conclusions reached in the various subsections of Section 2.0 to which the reader is referred.

Based on the evaluation, the existing fire protection for the following areas provides a level of fire protection equivalent to the technical requirements of Section III.G of Appendix R to the extent discussed; therefore, the following exemptions from the requirements of Section III.G can be granted.

1. Shield Building (Fire Area SB-65) to the extent that a fixed fire suppression system is not installed pursuant to III.G.3.

2. Control Room portion of Fire Area AX-35 to the extent that a fixed fire suppression system is not installed pursuant to Section III.G.3.

2061R:ld:pm