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May 19, 1983

JPN-83-44

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Director of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Subject: James A. FitzPatrick Nuclear Power Plant
Docket No. 50-333
Draft Safety Evaluation of Appendix R
Exemption Requests

- References:
1. PASNY letter, J.P. Bayne to H.R. Denton,
dated July 13, 1982 (JPN-82-61).
 2. NRC letter, D.B. Vassallo to L.W. Sinclair,
dated February 2, 1983.
 3. PASNY letter, J.P. Bayne to H.R. Denton,
dated March 1, 1983 (JPN-83-16).
 4. PASNY letter, J.P. Bayne to H.R. Denton,
dated April 5, 1983 (JPN-83-30).

Dear Sir:

In Reference 1, the Power Authority submitted a reassessment of the fire protection features of the FitzPatrick plant, for conformance to the specific requirements of Appendix R to 10 CFR 50. Reference 2 transmitted the NRC's Draft Safety Evaluation Report (SER), which addresses the majority of the Power Authority's Appendix R exemption requests. In Reference 3, the Authority commented on the Draft SER and committed to install water sprays across fire zone interfaces to preclude the spread of a postulated fire across the interface. The Authority confirmed this commitment in Reference 4 and, further committed to formally amend our exemption requests to include the water sprays.

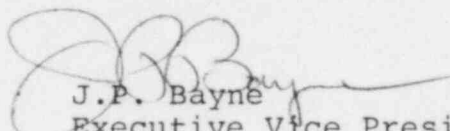
Attachment 1 to this letter provides the Authority's amended exemption requests. The Authority considers that the proposed water sprays, in conjunction with existing fire protection features, offer protection equivalent to that which would result from strict compliance with the rule.

A description of the proposed water sprays is provided in Attachment 1 as part of the amended exemption requests. The proposed sprays were discussed with your staff on May 11, 1983. The sprays were acceptable to your staff based on the information provided during that discussion and a commitment to supply the additional information which they requested. This additional information is provided in Attachment 1 as part of the description of the water sprays.

Attachment 2 to this letter provides information from our fire protection consultant. This information was also requested by your staff during the May 11th discussion.

The Authority is confident that the proposed zone boundary water sprays will allow the NRC to approve our exemption requests. The Authority's staff is available to discuss the enclosed exemption requests and information at any time. If you have any questions, please contact Mr. J.A. Gray, Jr. of my staff.

Very truly yours,


J.P. Bayne
Executive Vice President
Nuclear Generation

cc: Mr. J. Linville
Resident Inspector
U.S. Nuclear Regulatory Commission
P.O. Box 136
Lycoming, N.Y. 13093

THE POWER AUTHORITY OF THE STATE OF NEW YORK
JAMES A. FITZPATRICK NUCLEAR POWER PLANT

PROPOSED FIRE PROTECTION FEATURES IN SUPPORT
OF EXEMPTION REQUESTS TO 10CFR50 APPENDIX R

MAY 1983

ENCLOSURE TO PASNY LETTER JPN-83-44

I INTRODUCTION

The Power Authority submitted, on July 13, 1982, a report entitled "Reassessment of the James A. FitzPatrick Nuclear Power Plant for conformance to the Requirements of Appendix R to 10 CFR 50". This report included a number of requests for exemption from certain specific provisions of the rule. The NRC staff reviewed the submittal and recommended, in a draft safety evaluation report, that certain exemption requests relating to separation of redundant equipment should be denied. The Power Authority held several telephone conversations with the NRC staff to fully determine their concerns and develop an acceptable alternative approach. The purpose of this document is to describe the approach currently proposed by the Power Authority as the basis for the exemption requests previously submitted.

II BACKGROUND

In a previous submittal the Power Authority requested an exemption from certain requirements of 10 CFR 50 Appendix R Sections III.G.2, III.G.3 and III.L for the following Reactor Building fire zones:

RB-1E and RB-1W

(zone interface on Elev. 227'-6" and 242'-6")

RB-1A and RB-1B

(zone interface on Elev. 272'-0")

RB-1B and RB-1C

(zone interface on Elev. 300'-0")

RB-1A and RB-1B

(zone interface on Elev. 300'-0")

The Authority requested exemptions based on the fact that the FitzPatrick plant, meets the requirements of Section III.G.2 except for area wide fire protection. To eliminate the intervening combustibles, primarily cables, the Authority proposed to install a sprinkler system to protect the cable trays within the 20 feet separation. In lieu of an area wide fire suppression system, the proposed equivalent protection was provided by: area wide fire detection systems; standpipes and fire hose stations; and localized automatic suppression; and, administrative fire protection measures.

The NRC staff did not concur with the approach described above. The NRC staff's main concern is the damage of redundant equipment due to hot gases, smoke or fire propagating from one zone to another. The staff recommended a water curtain across the boundary of each fire zone. Consequently, the Authority through the use of a consultant developed an alternative approach consistent with the NRC staff recommendation. The exemption requests previously submitted are herein amended such that instead of providing sprinkler systems for the intervening cable trays within the 20 feet separation, a sprinkler system will be provided across the boundary of each fire zone as described below.

In addition, rather than providing one hour fire rated enclosures for the stairways, a sprinkler system in accordance with applicable fire codes will be installed. This change is also described below.

III POWER AUTHORITY ALTERNATIVE APPROACH

For the fire zone boundaries noted in Section II above, a "Sprinkler System" will be engineered in accordance with NFPA 13 section 4-48.2.3. This system as shown in Figure 1 (typical for each zone boundary) will consist of a row of sprinklers along the width of the boundary. The sprinklers will be installed at ceiling level within shrouded sheet metal baffles to ensure that a uniform water density is achieved. The sprinkler heads will be installed 6 feet on center with a water density design flow of 3 gpm per linear foot of boundary. For situations where intervening obstructions greater than 24" in width exists below the sprinkler system an additional individual riser will be run such that the continuity of the water curtain is maintained.

Temperature detectors will be installed on both sides of the boundary to initiate the system in the event of a fire. The methods being considered for actuation of the system are as follows:

- (a) temperature detectors set to actuate at a given temperature

(b) Rate of rise temperature detectors with suitable parameters (T per unit time) to achieve satisfactory protection.

(c) A differential temperature detection system.

A study will be performed to determine which of the above noted systems is best suited to provide sufficiently adequate response time while simultaneously minimizing the potential for spurious actuation of the system.

The system will be activated by detecting high temperature rather than smoke. The reason for this approach is that smoke detectors are more susceptible to spurious actuation than heat detectors. Smoke damage to safety related components is unlikely due to the high ceilings involved, (the ceiling height ranges from approximately 28 to 45 feet). Hot smoke that would cause any damage would rise to the ceiling and trigger the proposed sprinkler system. At floor level, where all of the safety related equipment required for safe shutdown is located, there would be little if any smoke. The presence of smoke will be detected by the existing fire detection system which alarms in the control room.

In addition to automatic actuation, manual stations to activate the system locally will be installed. Actuation of the system will be annunciated in the control room. The

system will be designed with a bypass feature to disable the system in order to perform maintenance, testing and surveillance activities. The use of this bypass feature will be controlled administratively.

In addition to the water curtain design for the fire zone boundaries, the Authority is proposing a change in the stairways protection from that noted in the submittal referenced in section I. Originally, one hour rated fire boundaries were to be installed in the stairway areas. Instead of this approach, the Authority currently plans to install sprinkler systems in the following stairways:

RB-1E and RB-1A

(stairway from Elev. 227'-6" to 272'-0")

RB-1A and RB-1C

(stairway from Elev. 272'-0" to 300'-0")

RB-1C and RB-1A

(stairway from Elev. 300'-0" to 326'-0")

RB-1B and RB-1A

(stairway from Elev. 300'-0" to 326'-0")

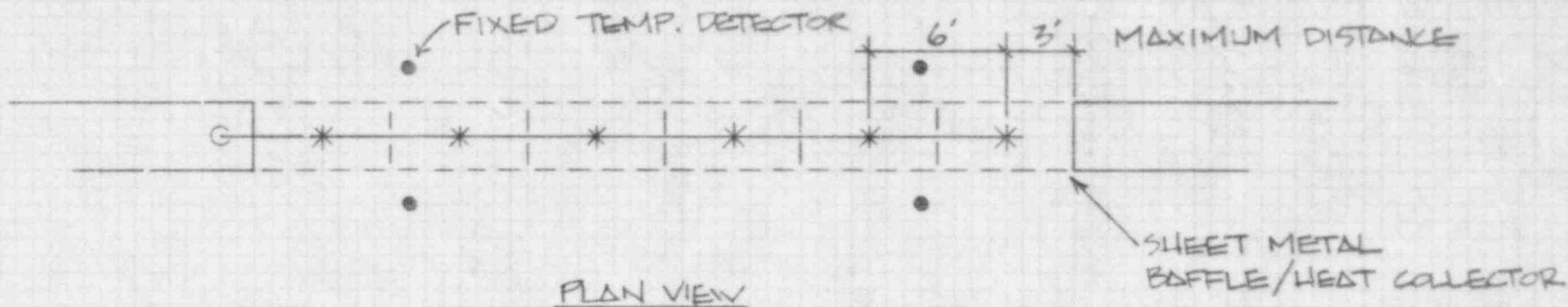
The design will consist of a spray header designed to deliver 3 gpm per linear foot to the stairways area. This will allow personnel to utilize the stairways for exiting purposes during a fire.

IV SCHEDULE AND INSTALLATION IMPACT

The proposed fire protection system will be installed during the next refueling outage which is currently anticipated to begin about April 1, 1985. Installation during a refueling outage is necessary due to several factors noted below.

1. In order to install the water curtains, some of the existing fire protection systems would have to be disabled during installation, which would leave the plant vulnerable to a fire while it is in operation. This also would require fire watches resulting in increased radiation exposure.
2. Due to the significant amount of scaffolding that would have to be erected in order to install these water sprinklers and sheetmetal baffles, extensive measures will have to be implemented to minimize the potential for damaging safe shutdown related systems due to falling materials or tools. Nevertheless, there will be a potential for damage of safety related components. Additional controls will prolong the installation time further increasing radiation exposure and ALARA concerns.

3. The fire zone boundary located at Elev. 227' 6" is located within the "crescent area" adjacent to the torus not normally inaccessible. Installation of the proposed system at this location would result in deviation from the ALARA guidelines.
4. This effort will require a significant work force involving various labor crafts. It is inadvisable to have a large number of construction personnel working this sensitive area in the plant while the plant is operating.



HYDRAULICALLY DESIGN TO
3 GPM/LIN. FT. OF OPENING.

FIG. 1

PREPARED BY
SCHIRMER ENGINEERING CORPORATION
FIRE PROTECTION CONSULTANTS
707 LAKE COOK ROAD DEERFIELD, ILLINOIS 60015

WATER CURTAIN
DESIGN DETAIL

ENGINEER
G.W.O.

DATE
4/29/83

SCALE
NONE

Schirmer

SCHIRMER ENGINEERING CORPORATION
707 LAKE COOK ROAD
DEERFIELD, ILLINOIS 60015
(312) 272-8340

FIRE PROTECTION ENGINEERS
SAFETY ENGINEERS
CODE CONSULTANTS

May 4, 1983

Mr. Leon Guaquil
Director
Project Engineering - BWR
New York Power Authority
123 Main Street
White Plains, NY 10601

Re: Water Curtain Protection
James A. Fitzpatrick
Nuclear Power Plant
SEC Job No. 830482

Dear Mr. Guaquil:

This will confirm our discussion at our meeting of April 21, 1983, regarding the proposed use of water curtains for boundary definitions as required per the NRC Improvement Report.

As discussed, water curtain protection will be utilized in conjunction with other fire protection improvements that have been proposed to create zone boundaries at this facility.

After reviewing photographs of the areas involved, it is our opinion that water curtain protection in the form of deluge water curtain design in accordance with the requirements of NFPA 13, Section 4-4.8.2.3 can be considered acceptable. It is our recommendation that the release mechanism for this deluge system be through the use of fixed temperature detectors, located on each side of the "boundary".

In addition, a manual device should be provided at each deluge control valve to allow for operation of the system.

The enclosed sketch indicates the basic design parameters to be considered for protection of these openings. The sheet metal heat collector - baffle arrangement would allow for close spacing of the sprinklers and control of the discharge from the sprinklers to allow formation of a "water curtain".

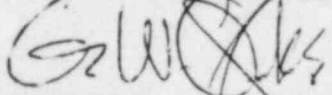
May 4, 1983

I have previously used similar design concepts to protect openings at fire walls where fire doors could not be utilized due to operational equipment traveling through the openings. Considering the use of other fire protection systems to aid in the extinguishment, the use of this water curtain protection for boundary definition will satisfy the intent of the NRC requirement.

Should you have any further questions, please call.

Yours truly,

SCHIRMER ENGINEERING CORPORATION

A handwritten signature in dark ink, appearing to read "GWO", is written over the printed name of Gerald W. O'Rourke.

Gerald W. O'Rourke, P.E.
Manager, Sprinkler Department

bd
Enclosure

cc: Mr. Jack Schoenbaum