

November 2, 1988

Docket No. 50-289

Mr. Henry D. Hukill, Vice President
and Director - TMI-1
GPU Nuclear Corporation
P. O. Box 480
Middletown, Pennsylvania 17057

Dear Mr. Hukill:

SUBJECT: FIRE PROTECTION EXEMPTIONS FOR TMI-1 (TAC NO. 68331)

By letter dated May 21, 1988, GPU Nuclear requested exemptions to the technical requirements of Section III.G.2 of Appendix R to 10 CFR Part 50. Details of your request and the staff's evaluation are given in the enclosed Exemption. Based upon our evaluation of your submittal, we conclude that the TMI-1 fire protection configuration provides a level of safety equivalent to that called for in Section III.G.2 of Appendix R. Therefore, the exemption request described in the enclosed Exemption is granted.

A copy of the Exemption is being forwarded to the Office of the Federal Register for publication.

Sincerely,

original signed by

Ronald W. Hernan, Senior Project Manager
Project Directorate I-4
Division of Reactor Projects I/II
Office of Nuclear Reactor Regulation

Enclosure:
Exemption

cc w/enclosure:
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Mr. Henry D. Hukill
GPU Nuclear Corporation

Three Mile Island Nuclear Station,
Unit No. 1

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Docketing and Service Section
Office of the Secretary
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

UNITED STATES NUCLEAR REGULATORY COMMISSION

In the Matter of

GPU NUCLEAR CORPORATION, ET AL.

(Three Mile Island Nuclear
Station, Unit No. 1)

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Docket No. 50-289

EXEMPTION

I.

General Public Utilities Nuclear Corporation (GPUN/licensee) and three co-owners hold Facility Operating License No. DPR-50, which authorizes operation of the Three Mile Island Nuclear Station, Unit No. 1 (TMI-1) (the facility) at power levels not in excess of 2568 megawatts thermal. This license provides, among other things, that the facility is subject to all rules, regulations, and Orders of the Nuclear Regulatory Commission (the Commission or the staff) now or hereafter in effect.

The facility is a pressurized water reactor located at the licensee's site in Dauphin County, Pennsylvania.

II.

On November 18, 1980, the Commission published a revised Section 10 CFR 50.48 and a new Appendix R to 10 CFR Part 50 regarding fire protection features of nuclear power plants (45 FR 76602). 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 these 15 subsections, III.G, is the subject of this exemption request. Specifically, Subsection III.G.2.b provides that, "...where cables or equipment, including associated non-safety circuits that could prevent operation or cause maloperation due to hot shorts, open circuits, or shorts to ground, of redundant trains of systems necessary to achieve and maintain hot shutdown conditions are located within the same fire area outside of primary containment, one of the following means of ensuring that one of the redundant trains is free of fire damage shall be provided:

b. Separation of cables and equipment and associated non-safety circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustible or fire hazards. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area."

By letter dated May 21, 1988, the licensee requested exemption from the requirements of Section III.G.2.b of Appendix R, as these requirements apply to separation of 20-feet, free of intervening combustibles, with fire detection or suppression capabilities, for redundant reactor letdown system valves MU-V-2A, 2B,-3,-4 and-5. The acceptability of the exemption request is addressed below.

IV.

The purpose of Section III.G.2 to Appendix R is to ensure that redundant components of safety system, required to achieve and maintain post-fire hot shutdown, are protected in such a way that at least one such component will remain free of damage which could prevent the completion of the safety

function. One such means of protecting these redundant safety components is provided for in Section III.6.2.b, that is, separate the components by at least 20-feet without intervening combustibles or fire hazards, with a fire detection and suppression capability.

At TMI-1, Fire Zones AB-FZ-4 and FH-FZ-1 contain circuits which if damaged by fire, could prevent letdown isolation from the control room. Valves MU-V-2A and 2B, or MU-V-4 and 5, or MU-V-3 can be used to isolate letdown. Although redundant valves exist which allow for letdown isolation, a situation can be postulated in which spurious opening of valve MU-V-5 concurrent with the loss of intermediate cooling to the letdown coolers could result in damage to the low pressure portion of the letdown system

Fire Zone AB-FZ-4 is on elevation 281' of the Auxiliary Building. Fire Zone FH-FZ-1 is on elevation 281' of the Fuel Handling Building. Both zones contain redundant circuitry for letdown isolation valves. In Fire Zone AB-FZ-4, circuits associated with valve MU-V-5 are approximately 40 ft. from cable trays containing MU-V-2A and MU-V-2B. In Fire Zone FH-FZ-1, circuits associated with valve MU-V-3 are 36 ft. from the trays containing MU-V-2A and 2B circuits. The space between the redundant valve combinations contains intervening combustibles in the form of cable trays in both fire zones.

Both fire zones contain area wide smoke detection which alarms in the Control Room. Both zones are provided with area wide suppression covering the floor area and cable trays. Portable fire extinguishers and hose reels are provided throughout both zones. The combustible loading in both zones is less than one hour in equivalent time as compared with the ASTM E119 Time-Temperature Curve.

Fire Zones AB-FZ-4 and FH-FZ-1 are not in compliance with Section III.G.2 of Appendix R to 10 CFR Part 50 since redundant Letdown Isolation circuits are not separated by a distance of 20 feet or greater which is free of intervening combustibles.

However, both areas are provided with detection and suppression in accordance with Section III.G.2 of Appendix R. The intervening combustibles between the redundant circuits are in the form of cables, which if ignited, would be expected to initially burn slowly with limited heat release. The detection provided in both zones would be expected to notify the Control Room of any fire in the zones. Control Room Operators would dispatch the plant fire brigade which would use available extinguishers and hose reels to control the fire. In addition, the automatic suppression provided in both zones gives reasonable assurance that a fire could not travel between redundant letdown isolation valve circuits. Therefore, the current configuration of Fire Zones AG-FZ-4 and FH-FZ-1, including the installed fire protection features, provides a level of protection equivalent to that of Section III.G.2 of Appendix R.

V.

Based on the evaluation above, the level of protection provided in Fire Zones AB-FZ-4 and FH-FZ-1 has been found to be equivalent to that called for in Section III.G.2 of Appendix R. Specifically, the intervening combustibles between redundant Letdown Isolation Valve circuits have been found not to present a level of safety less than that called for in Appendix R.

Accordingly, the Commission has determined pursuant to 10 CFR 50.12(a), that (1) this exemption as described in Section IV 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 this exemption in that application of the regulation in this particular circumstances is not necessary to achieve the underlying purposes of Appendix R to 10 CFR Part 50. Specifically, the underlying purpose of Appendix R, Section III.G.2.b is to assure that a suitable complement of safe-shutdown equipment will be available, post-fire, to achieve and maintain hot shutdown of the reactor. The analysis of valves MU-V-2A and 2B, MU-V-3 and MU-V-4 and-5 indicates that at least one set of valves will be capable of performing its post-fire shutdown role (i.e. isolate the low-pressure letdown piping) without additional fire protection enhancements. Therefore, the Commission hereby grants the exemption request identified in Section IV 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 44247).

Dated at Rockville, Maryland, this 2nd day of November 1988.

FOR THE NUCLEAR REGULATORY COMMISSION



Steven A. Varga, Director
Division of Reactor Projects I/II
Office of Nuclear Reactor Regulation