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May 17, 1986
5211-86-2066

Office of Nuclear Reactor Regulation
Attn: Mr. J. F. Stolz, Director
PWR Projects Directorate No. 6
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Stolz:

Three Mile Island Nuclear Station Unit 1 (TMI-1)
Operating License No. DPR-50
Docket No. 50-289
Exemption Request to 10CFR50 Appendix R

GPU Nuclear Corporation (GPUN) requests exemptions from 10CFR50, Appendix R in accordance with 10CFR50.12. These exemptions modify previous exemptions requested in GPUN's submittal dated November 7, 1985, letter no. 5211-85-2177, "Fire Hazards Analysis Report and Appendix R Section III.G Safe Shutdown Evaluation," Rev. 7. The technical justification for the requested exemptions is provided in the enclosure.

The underlying purpose of the rule is to accomplish safe shutdown in the event of a single fire and maintain the plant in a safe condition. This is accomplished by assuring that sufficient undamaged equipment is available to support safe shutdown assuming a fire within the area of concern. In the areas for which an exemption is being requested, passive as well as active fire protection features assure that any single fire will not result in the loss of safe shutdown capability. These features include separation distance, fire barriers, sealed penetrations, water spray to preclude propagation, and manual actions where a minimum of two hours is available to accomplish such action.

The fire protection features, in conjunction with low combustible loadings, provide a high degree of assurance that a single fire will not result in the loss of safe shutdown capability. Also, the reliance on manual actions where time is available has been an accepted method of assuring shutdown capability. Providing additional protection features, as would be required to meet the regulations, would not result in a significant increase in the level of protection provided and would result in undue hardship and costs significantly in excess of those incurred by others similarly situated. These costs would consist of additional engineering, procurement of materials, fabrication and installation costs.

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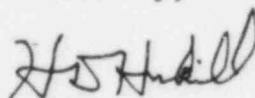
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The exemptions being requested meet the special circumstances delineated in 10CFR50.12(a)(2)(ii) and (iii) as discussed above.

These exemptions will be reflected in Revision 8 to the Fire Hazards Analysis, to be submitted at a later date.

Sincerely,



H. D. Hukill
Director, TMI-1

HDH:GB:dam

Attachment

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ATTACHMENT

Exemption 1

The TMI-1 Fire Hazards Analysis Report and Appendix R Section III.G Safe Shutdown Evaluation, Revision 7, requested exemption from the requirements of Appendix R to permit manual operation of valve MU-V14A in support of achieving hot shutdown. GPUN has identified a shutdown scenario in which the time available for manual operation of this valve is unacceptably short, and does not allow for fire suppression activity in fire zone AB-FZ-4 prior to entering the fire zone and accomplishing the manual operation. In order to eliminate this condition, we propose the following:

For a fire in fire zone AB-FZ-4 either seal injection or thermal barrier cooling is being assured for the reactor coolant pump seal protection. Make-up from the borated water storage tank will be available in the event that intermediate cooling valve IC-V3 is lost due to a fire in this zone. Thermal barrier cooling is being made available for a fire in fire zone AB-FZ-6 and seal injection will be relied upon for a fire in fire zone AB-FZ-7. This will be accomplished by protecting circuitry required for automatic operation of MU-V14A in fire zone AB-FZ-4, protecting power cables for EG-CCESV-1A which serve MU-V14A and are located in fire zone AB-FZ-4, protecting intermediate cooling system cables in fire zone AB-FZ-4, a change of the control switch for valve IC-V3, and protection of intermediate cooling system cables in fire zone AB-FZ-6.

Automatic suppression is being provided to protect the opening between fire zones AB-FZ-6 and AB-FZ-7 which will preclude a single fire from adversely impacting required equipment in both fire zones. The sprinkler protection previously committed to in Revision 7 of the Appendix R Analysis between fire zones AB-FZ-6 and FH-FZ-2 is no longer required, since MU-V20 located in FH-FZ-2 is no longer required to be operable in case of a fire in AB-FZ-6.

The cable protection being provided in fire zone AB-FZ-4 provides adequate separation within the fire zone such that the availability for automatic operation of IC-V3 or MU-V14A is maintained for a fire in fire zone AB-FZ-4. The automatic operation of MU-V14A precludes the exemption request for manual operation as presented in paragraph 3.14.2 (2) of Revision 7 of the Appendix R Analysis. However, since the valve operators for IC-V3 and MU-V14A are not protected from fire damage a new exemption is requested for separation of the functionally redundant valves.

Auxiliary Building Fire Zone AB-FZ-4 Exemption Requested

Exemption is requested from the requirements of section III.G.2 of 10 CFR 50, Appendix R to the extent that it requires redundant shutdown related components be separated by 20 ft. with no intervening combustibles.

Justification

This fire zone is provided with ionization smoke detection throughout and a manual deluge sprinkler system which will be changed to an automatic preaction sprinkler system with heat responsive fusible sprinklers. Valves IC-V3 and MU-V14A are separated within the fire zone by a line of sight distance exceeding 33 ft. and a wall separating the fire zones into north and south sections. Cables required for automatic operation of both valves are being protected in the fire zone.

The principal combustible in this zone is cable insulation in open cable trays. Transient combustibles loading is 13,000 BTU/ft². Combustible load in the fire zone corresponds to a fire severity on the ASTM E-119 time-temperature curve of 40 minutes. The fire zone is protected by a zone-wide fire detection system and a zone-wide water type suppression system which is being converted to automatic operation. A fire hose station is provided in the fire zone and additional hose stations and portable fire extinguishers are available in adjacent fire zone AB-FZ-5. A fire in this zone would be slow in development due to lack of concentrated combustibles and the slow burning characteristics of cable insulation. The suppression and detection systems assure that fires in this zone will be extinguished during the early stages of development.

A full height reinforced concrete wall exists in the fire zone which extends from the west boundary of fire zone AB-FZ-4 approximately 12 ft. west into fire zone AB-FZ-5 and eastward through fire zone AB-FZ-4 to within 5 ft. of the fire rated east boundary of fire zone AB-FZ-4. This wall effectively divides fire zone AB-FZ-4 into two sections, with the existing detection and suppression system on both sides. Valve MU-V14A is located approximately 19ft. south of the wall and 3 ft. above the floor slab. Valve IC-V3 is located approximately 14 ft. north of the wall and 11 ft. above the floor slab.

Based on the fire detection features, the slowly developing type of fire, the automatic suppression being provided and availability of manual fire fighting equipment for the fire brigade, it is expected that a fire in fire zone AB-FZ-4 would be detected and extinguished. The protection being provided for redundant system cables, and the separation of valves MU-V14A and IC-V3 by distance as well as a substantial full height reinforced concrete wall preclude a conflagration within fire zone AB-FZ-4 capable of causing damage to both valve operators from a single fire.

Therefore we conclude, functionally redundant valves MU-V14A and IC-V3 are adequately separated by distance, with sufficient mitigating features to compensate for the existence of intervening combustibles to preclude damage to both valve operators. Protection of the valve operators would not augment or materially enhance the safety of the plant.

Exemption 2

The TMI-1 Fire Hazards Analysis Report and Appendix R Section III.G Safe Shutdown Evaluation, Revision 7 identified in paragraph 1.2.10. ee a new fire rated wall to divide fire zone IB-FZ-8 into two fire zones, IB-FZ-8 and 8a. The two fire zones contain redundant cables required to achieve safe shutdown in the event of a fire and the fire barrier created separation of redundant cables. In addition, by locating the new barrier directly below the existing zone boundary separating IB-FZ-2 and IB-FZ-3 the potential of an exposure fire from below impacting both of these fire zones was eliminated without the need to seal penetrations in the floor.

GPUN has re-evaluated the proposed new fire barrier and determined that safe shutdown from a fire can be achieved without the new fire barrier. In so doing, an exemption request submitted in the TMI-1 FHAR and Appendix R Section III.G SSE, Rev. 7 is expanded to allow manual actions in lieu of fire barrier protection for cables in IB-FZ-8 and 8a.

Intermediate Building Fire Zone IB-FZ-8 Exemption Requested

The exemption requested in paragraph 3.14.2.6 of the TMI-1 Fire Hazards Analysis Report and Appendix R Section III.G Safe Shutdown Evaluation, Revision 7 to allow manual actions in lieu of fire barrier protection for cables and components is expanded to include cables located in IB-FZ-8.

Justification

Deletion of the new fire barrier between fire zones IB-FZ-8 and 8a combines both fire zones into a single fire zone, IB-FZ-8. This single fire zone contains cables RF144, RL56, RL47 and RL57 for Emergency Feedwater Valves EF-V30A, EF-V30B, EF-V30C and EF-V30D, respectively. The fire zone contains a low combustible loading. Manual fire fighting is supported by portable fire extinguishers and hose provided outside this zone near access routes as well as outdoor fire hydrants.

Non-combustible seals will be provided for openings in the floor slab of IB-FZ-2 which communicate to fire zone IB-FZ-8 to eliminate the possibility of an exposure fire in fire zone IB-FZ-8 from impacting both IB-FZ-2 and IB-FZ-3.

Valves EF-V30A, 30B, 30C and 30D are located in fire zone IB-FZ-3. This fire zone has a low combustible loading and ionization type smoke detection which actuates alarms in the Control Room. The time available before manual operation of the valves is required is two hours. Due to notification of a fire condition from the detection system and the low combustible loading in fire zone IB-FZ-3, fire brigade response and subsequent extinguishment, entrance into the fire zone to accomplish the required manual valve operations after isolating their control circuitry at the remote shutdown station will be accomplished well within the time available.

Justification (Cont'd.)

An exemption has previously been approved for manual alignment of valves in IB-FZ-3 to establish Emergency Feedwater.

Based on the low combustible loading and notification of a fire in fire zone IB-FZ-3, fire suppression activity will be rapid, allowing manual operation of valves to establish Emergency Feedwater well within the time available. A fire in IB-FZ-8 which impacts cables required for automatic valve operation will not adversely affect the capability to manually operate valves in IB-FZ-3 to establish Emergency Feedwater. Therefore, we conclude, separation of redundant cables for Emergency Feedwater valves EF-V30A, 30B, 30C and 30D in IB-FZ-8 would not augment or materially enhance the safety of the plant.