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U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Gentlemen:

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

GPU Nuclear has identified additional Appendix R fire conditions which could adversely affect valves required for shutdown. The valves involved are: pressurizer spray valve RC-V-1; intermediate cooling valves IC-V-3 and IC-V-4; makeup valves MU-V-217, MU-V-16 A/B/C/D, MU-V-18, and letdown valves MU-V-3, and MU-V-2A/2B; and valves MU-V-2A/2B, MU-V-3, MU-V-4, and MU-V-5 for letdown isolation. NRC Region I personnel were verbally informed on October 22, 1987 of the conditions involving valves RC-V-1, IC-V-3, and IC-V-4, and the corrective actions taken. Letdown isolation valves MU-V-2A/2B, MU-V-3, MU-V-4, and MU-V-5 were not discussed since this condition was still under evaluation. These conditions were identified as a result of the same review effort which identified earlier noncompliances. The condition concerning makeup valves MU-V-217, MU-V-16 A/B/C/D, MU-V-18, and letdown valves MU-V-3 and MU-V-2A/2B were recently identified as a result of ongoing maintenance of the fire hazards analysis.

The following discussion documents previously described corrective action for valves RC-V-1, IC-V-3 and IC-V-4, and documents the results of our evaluation for the makeup valves and for the letdown isolation valves. This letter forwards an exemption request to allow credit for adequate physical separation, area wide detection and automatic suppression in lieu of protection of cables for the above letdown isolation valves, in fire areas AB-FZ-4 and FH-FZ-1.

Pressurizer Spray Valve RC-V-1

A fire in CB-FA-1 could cause spurious opening of pressurizer spray valve RC-V-1 resulting in a depressurization of the reactor coolant system. The pressurizer spray block valve, RC-V-3, is not protected for a fire in CB-FA-1 and the reactor coolant pump DC trip control circuits for all four pumps may

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be damaged. The required manual action is to trip the reactor coolant pumps at the 6900 V switchgear at Elevation 322 in the Turbine Building to mitigate the depressurization transient. The time available for this manual action is 45 minutes and adequate manning is available to accomplish this action. Therefore, there is reasonable assurance that it can be accomplished without affecting the capability to safely shutdown the plant. The emergency procedure for CB-FA-1 already directed the operator to trip the RCP's at the 6900 V switchgear if unable to trip from the control room. This procedure has been further revised to direct the operator to trip the RCP's from the 6900 V switchgear if RC-V-1 spuriously opens and the ability to close block valve RC-V-3 or trip the RCP's from the control room is lost. Procedural revision has corrected the above condition. Credit for normal occupancy of CB-FA-1 is no longer required for the RC-V-1 issue. No exemption is required as this action is interpreted as being "emergency control station(s)" per 10 CFR 50 Appendix R, Section III.G.1(a).

Intermediate Cooling Valves IC-V-3 and IC-V-4

A deficiency regarding the mitigating action to correct ESAS spurious operation due to a fire in CB-FA-1, CB-FA-2a, CB-FA-2b and CB-FA-2f had been identified. Spurious reactor building isolation initiated by the ESAS system may lead to spurious closing of intermediate cooling valves IC-V-3 and IC-V-4. To re-establish RCP thermal barrier cooling, the reopening of IC-V-3 and IC-V-4 is required. The Appendix R analysis had identified compensatory manual actions of using the Remote Shutdown System Transfer Switches for Intermediate Cooling system components to isolate ESAS circuits for these fire areas. However, it has been determined that for fires in CB-FA-1, CB-FA-2d and CB-FA-2f for both valves IC-V-3 and IC-V-4, and in CB-FA-2a for valve IC-V-3 only, the remote shutdown transfer switch power supplies may be damaged which would preclude isolation of the ESAS contacts.

To correct this situation, a modification will be implemented during the 7R refueling outage to rewire the Intermediate Cooling system transfer switches in Remote Shutdown Transfer Switch Panels A and B. The modification will allow isolation of ESAS contacts to the IC-V-3 and IC-V-4 solenoids by the use of the manual control switch contacts instead of auxiliary relay contacts (which requires external control power). No exemption is required.

As a compensatory measure for the interim, the existing moving fire watch and normal occupancy provides reasonable assurance that a fire would be discovered in its formative stages and controlled such that significant fire damage in these areas would not occur. In addition, emergency procedures advise the operator that the RCP's may have to be tripped at the 6900V switchgear in the Turbine Building and that IC-V-3 and IC-V-4 must be opened locally.

Makeup Valves MU-V-217, MU-V-16 A/B/C/D, MU-V-18, and Letdown Valves MU-V-3 and MU-V-2A/2B

A fire in CB-FA-1, CB-FA-2a, CB-FA-2d or CB-FA-2f may spuriously actuate ESAS train A, while a fire in CB-FA-2b, CB-FA-2c, CB-FA-2e and CB-FA-2g could cause a spurious actuation of ESAS train B due to loss of two vital power supplies for the control logic. This spurious actuation initiates HPI, starting respectively the train A or train B makeup pump and opening its associated HPI valves (i.e. MU-V-16A and 16B or MU-V-16C and 16D).

A fire in CB-FA-2d or CB-FA-2e could additionally cause spurious opening of MU-V-217 and render MU-V-18 inoperable from the Control Room.

These spurious operations can be corrected by tripping the makeup pump(s) at the 1D or 1E 4160V switchgear or by tripping the switchgear in CB-FA-3a or CB-FA-3b, respectively. Since the time available is approximately one hour and adequate manning is available, there is reasonable assurance that this manual action can be accomplished without affecting the capability to shutdown the plant.

Additionally, spurious ESAS actuation due to a fire in CB-FA-2f or CB-FA-2g may respectively close the letdown valves MU-V-3 or MU-V-2A and 2B. Since letdown can be delayed for up to 4 hours these valves can be manually operated.

It should be mentioned that manual operation of MU-V-3 due to loss of air during a fire in CB-FA-2f and of MU-V-18 for mitigating the spurious opening of MU-V-217 during a fire in CB-FA-2e were previously identified in the FHAR Rev. 9.

The fire emergency procedure is being revised to incorporate these manual actions in the fire zones mentioned above. These manual actions are interpreted as being "emergency control stations" per 10 CFR 50 Appendix R, Section III G.1(a), and therefore no exemption is required.

Letdown Isolation Valves MU-V-2A/2B, MU-V-3, MU-V-4 and MU-V-5

The following exemption is requested:

Exemption Requested

Exemption is requested from the requirements of Section III.G.2 of 10 CFR 50, Appendix to the extent that it requires redundant shutdown related components be separated by 20 ft. with no intervening combustibles, for fire areas AB-FZ-4 and FH-FZ-1.

Justification

A fire in AB-FZ-4 or FH-FZ-1 could damage circuits for the letdown valves, which would preclude letdown isolation from the control room. Letdown can be isolated by any of the following redundant valves:

- a. MU-V-2A and 2B, or
- b. MU-V-4 and 5, or
- c. MU-V-3

Spurious opening of MU-V-5 concurrent with loss of intermediate cooling to the letdown coolers could result in damage to the low pressure portion of the letdown system. Loss of the letdown function is acceptable for the first 4 hours based on holding the reactor coolant temperature constant while reactor coolant pump (RCP) seal injection adds inventory to the reactor coolant system. Letdown isolation can be accomplished since there is adequate separation and sufficient mitigating features to compensate for intervening combustibles between redundant valve circuits as described below. Within 4 hours, RCP thermal barrier cooling will be reestablished and RCP seal injection will be secured. Once the seal injection is secured, the letdown function is not required for an Appendix R shutdown event.

In AB-FZ-4, the circuits associated with MU-V-5 are approximately 40 ft. away from the cable trays used for MU-V-2A and 2B circuits; MU-V-4 and its circuits are located outside of this zone. In FH-FZ-1, the MU-V-3 circuits are separated by approximately 36 ft. from the trays used for MU-V-2A and 2B.

Both fire zones are provided with area wide ionization smoke detection and automatic suppression systems protecting the entire floor and the cable trays. The intervening space between the valve circuits contains combustible materials primarily in the form of cables in trays. A fire involving cable insulation would initially burn slowly with much smoke but with low heat release. The fire detection system is capable of alarming during the formative stages of the fire before serious damage would result. The fire brigade would be dispatched and would put out the fire using manual fire fighting equipment which includes portable extinguishers and hose lines from nearby hose reel stations. Control of transient combustibles in this area is provided through administrative controls.

If the fire spread rapidly and significant temperature rise occurred, the automatic sprinkler system would actuate to control the fire. Pending actuation of the sprinkler system and/or arrival of the fire brigade, the horizontal distance between the valve circuits in either AB-FZ-4 and FH-FZ-1, specified above, provides reasonable assurance that at least one redundant valve combination would be free of fire damage. The presence of combustible materials in the intervening space between the valves is not significant.

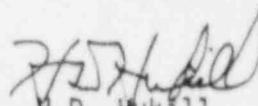
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Circuits for functionally redundant valves MU-V-2A and MU-V-2B, and MU-V-4 and MU-V-5 in AB-FZ-4; and MU-V-2A and MU-V-2B, and MU-V-3 in FH-FZ-1 are adequately separated by distance with sufficient mitigating features to compensate for the existence of intervening combustibles to preclude damage to redundant valve circuits. The basis for this exemption request is analagous to that previously accepted by NRC in the letter dated December 30, 1986, Enclosure I, Part III.4.

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. The rule requires fire protection for circuits and components associated with shutdown-related valves. In the areas where exemption is requested, adequate separation as well as area wide detection and automatic suppression assure that any single fire will not result in the loss of safe shutdown capability. Thus, the underlying purpose of the rule is satisfied by providing adequate separation, area wide detection and automatic suppression in AB-FZ-4 and FH-FZ-1. Therefore, the exemption being requested meets the special circumstances delineated in 10 CFR 50.12(a)(2)(iii), in that application of the regulation in this particular circumstance is not necessary to achieve the underlying purpose of the rule. In addition, the special circumstances of 10 CFR 50.12(a)(2)(iii) apply in that providing additional protection features, required by the regulations, would not result in a significant increase in the level of protection provided and would result in undue hardship and cost significantly in excess of those incurred by others similarly situated. These costs consist of additional engineering, procurement of material, fabrication and installation costs.

NRC review and approval of the above exemption is requested. If any additional information is required, please contact us.

Sincerely,



H.D. Hukill

Vice President and Director, TMI-1

HDH/DJD/jbw:1171A

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