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

Attention: Mr. Thomas A. Ippolito, Chief
Operating Reactors Branch No. 3
Division of Operating Reactors

Subject: James A. FitzPatrick Nuclear Power Plant
Docket No. 50-333
Revised Response to NRC Concern PF-23
Relating to Fire Protection Program

Reference: Letter, P. J. Early (PASNY) to T. A. Ippolito (NRC)
dated September 5, 1979 (JPN-79-55)

Dear Sir:

Attached is a revised response to NRC Concern PF-23, Crescent Area Fire Protection, which was originally submitted via the above referenced letter. As indicated in the revised response, the Authority will provide a seismic Class I barrier and new manually operated foam system as a backup to the automatic spray system for the HPCI turbine and pump in lieu of the enclosure described in the original response. This change is necessitated by periodic maintenance requirements which include disassembly of the HPCI turbine. In order to preclude serious impediment to such maintenance work, the size of the originally proposed enclosure structure would have to be considerably increased, particularly in height, resulting in interference with conduit and piping associated with the HPCI system and its support auxiliaries as well as with cable trays, motor control centers and catwalks located above the HPCI turbine and pump.

The balance of the revised response, pertaining to the RCIC turbine and pump, remains essentially unchanged from our original submittal.

Very truly yours,

George M. Wetwiding

for Paul J. Early
Vice President and
Assistant Chief Engineer-Projects

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5/11*

THIS DOCUMENT CONTAINS
POOR QUALITY PAGES

JAMES A. FITZPATRICK NUCLEAR POWER PLANT
FIRE HAZARD ANALYSIS
SUPPLEMENTAL DOCKET NO. 50-333

REFERENCE: Commission Letter of September 22, 1978,
Enclosure No. 3

Response to NRC Staff Concern PF-23:

CRESCENT AREA FIRE PROTECT1 N

NRC Staff Concern

The Crescent Area, located adjacent to the torus, contains cable and components of systems required for plant shutdown and systems required to mitigate postulated accidents. A partial steel barrier, approximately 12 ft high, separates the area into two fire zones, each zone containing one division of safety-related components. Potential fire hazards include the steam turbine driven RCIC pump and the steam turbine driven HPCI pump.

The HPCI turbine oil system contains approximately 1,560 lb of lube oil, and the RCIC turbine oil system contains approximately 338 lb of lube oil. The HPCI and RCIC turbines are each protected with rate of rise detectors and manually initiated water spray systems. Other heat detectors have been provided in the area to detect a steam line break.

With a fire alarm indication in the Control Room, the prefire strategies for the area call for a visual verification by one of the shift crew before a fixed water spray system is actuated. A member of the shift crew is dispatched to the area, and he is required to determine if there is a fire, a steam line break, or fault in the detection system causing the alarm.

It is the staff's concern that 1) the response time required to detect a fire and manually initiate a water spray system will allow the fire to continue unnecessarily in an area containing safety-related equipment, and 2) sufficient separation has not been provided between redundant divisions of safety-related equipment to prevent an unmitigated fire from affecting the safe shutdown capability of the plant.

NRC Staff Position

1. Provide a rated fire barrier in the Crescent Area to provide 3 hr barrier separation for the redundant safety-related cables/equipment.
2. Convert the manually actuated water spray system that protects the HPCI and RCIC turbines to automatically actuated systems; or provide an oil collection system for the HPCI and RCIC turbine oil systems to contain lube oil leakage and drain the leaked oil to a safe place.

Response:

The steel barrier referred to in the Staff Concern is not a fire wall. This watertight steel bulkhead was installed to prevent a flood in the Crescent Area from damaging both the RCIC and HPCI pumps and the redundant trains of the core spray and RHR systems. The line of separation for the redundant safety-related cabling does not coincide with the steel flood wall between the RCIC and HPCI pumps. There is no physical location at which the provision of a fire barrier, in strict compliance with the Staff Position, will achieve the degree of separation necessary to assure capability to safely shut down in the event of an unmitigated fire. For these reasons, this report recommends an alternate approach to satisfy the Staff concern with safe shutdown by: confining the major potential source of fire (HPCI and RCIC oil); augmenting fire detection (PF-19) and suppression; and protecting against structural failures due to fire that could destroy redundant cables or equipment.

A 3 hour fire-rated seismically qualified Class I enclosure will be erected surrounding the RCIC turbine and pump, and a seismically qualified Class I barrier will be erected on both sides of the HPCI turbine and pump. The purpose of the enclosure and the barrier walls at the RCIC and HPCI turbines and pumps is to contain any oil fire in the HPCI and RCIC oil systems.

The new seismic Class I enclosure for the RCIC turbine and pump shall have a three (3) hour fire rating as determined by the fire loading study for the RCIC oil system. The enclosure walls will be supported on a concrete curb that will have a retention volume greater than 125 percent of the individual lube oil system. Existing drains will be suitably trapped to contain the oil and drain fire protection water. The present manually-operated water spray system will be changed to an automatic system actuated by abnormal heat. With automatic actuation, protection against unnecessary equipment damage is provided by isolation of the spray within the enclosure. The enclosure will be provided with an exhaust fan system and all ventilation penetrations will have rated fire dampers. A postulated lube oil fire shall thus be confined within the enclosure, and spread of the fire to other safe shutdown systems of the plant will be prevented.

The new seismic Class I barrier for the HPCI turbine and pump will also be supported on a concrete curb to retain more than 125 percent of the lube oil system volume. The present manually-operated water spray system shall be changed to an automatic system actuated by abnormal heat. In addition, a new manually actuated foam system will be provided to function as a backup to the spray system. The existing water spray system as well as the new foam system have been designed to protect against hydraulic control system failures which could result in oil sprays several feet above the floor. The walls of the new barrier around the HPCI turbine and pump will be designed to contain the foam system.

Implementation of these modifications will result in isolation of fire sources from safety-related cables, confinement of oil within the enclosure and barrier, and automatic initiation of fire protection system. Implementation of this recommendation, therefore, will

prevent an unmitigated fire from affecting the safe shutdown capability of the plant.