123 Main Street
White Plains, New York 10601
914-681-6840
914-287-3309 (FAX)

New York Power Authority

William J. Cahill, Jr.
Chief Nuclear Officer

December 18, 1996
JPN-96-054

United States Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station P1-137
Washington, DC 20555

SUBJECT: James A. FitzPatrick Nuclear Power Plant
Docket No. 50-333
Spent Fuel Pool Cooling Safety Issue

Reference: NRC letter, K. R. Cotton to W. J. Cahill, Jr., NYPA, "Resolution of Spent Fuel Storage Pool Safety Issues: Issuance of Final Staff Report and Notification of Staff Plans to Perform Plant-Specific Safety Enhancement Backfit Analysis," dated October 22, 1996.

Dear Sir:

The NRC staff concluded in the referenced letter that the systems for storage of irradiated fuel at the James A. FitzPatrick Nuclear Power Plant provide adequate protection of public health and safety. However, the staff noted that the FitzPatrick design appears to be reliant on infrequently operated backup Spent Fuel Pool Cooling Systems to address long-term loss-of-offsite power events. The letter noted that the staff intends to conduct plant-specific regulatory analysis to evaluate potential safety enhancement backfits, and offered utilities the opportunity to comment on the accuracy of the staff's understanding of the plant design.

The attachment to this letter contains information regarding the heat removal capability of systems available for cooling the FitzPatrick spent fuel pool. This information is being provided to assist the NRC staff with the planned regulatory analysis of this SFP safety issue.

If you have any questions regarding this matter, please contact Ms. Charlene Faison.

Very truly yours,

William J. Cahill, Jr.
Chief Nuclear Officer

Attachment: as stated
cc: next page

A001/1

cc: Regional Administrator
U. S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Office of the Resident Inspector
U. S. Nuclear Regulatory Commission
P.O. Box 136
Lycoming, NY 13093

Ms. Karen Cotton, Acting Project Manager
Project Directorate I-1
Division of Reactor Projects I/II
U.S. Nuclear Regulatory Commission
Mail Stop 14 B2
Washington, DC 20555

James A. FitzPatrick Nuclear Power Plant
Docket No. 50-333

ATTACHMENT TO JPN-96-054

Spent Fuel Pool Decay Heat Removal Systems

System Description

The FitzPatrick spent fuel pool cooling system (SFPCS) consists of two 100 percent capacity pumps, and two 50 percent capacity heat exchangers, for normal decay heat removal. With both heat exchangers in service and supplied by a single SFP cooling pump, the design heat transfer capability is 6.3 E+ 6 BTU/hr at a fuel pool water temperature of 125°F and a Reactor Building Closed Loop System water temperature of 95°F.

During cold shutdown conditions / refueling operations, the SFPCS can be supplemented by using the RHR system in the spent fuel pool cooling assist mode. The SFPC assist mode is activated by removing a blank flange installed in the cross tie between the systems, and opening normally locked shut valves. Any one of the four RHR pumps can be used together with one of the two RHR heat exchangers in this mode. RHR system components are powered from safety-related sources and would be available following a loss of offsite power. Plant Technical Specifications stipulate that the RHR System may be used for the spent fuel pool cooling assist mode only when the reactor coolant temperature is below 212°F. The combined RHR and spent fuel pool cooling systems have a heat removal capacity of 24 E+ 6 BTU/hr which will maintain the pool temperature below 135°F with a full core offload.

The NRC letter noted that FitzPatrick appeared to be reliant on infrequently operated backup SFPCS to address loss of offsite power events. As discussed above, the backup system for FitzPatrick is the RHR system in the SFPC assist mode. Except for the cross-tie manual valves and piping, the portions of the RHR system used for the cooling assist mode are either used intermittently for suppression pool cooling, or are periodically tested in accordance with the surveillance program. The cross-tie piping section meets seismic Class I criteria.

Loss of Spent Fuel Cooling

The thermal-hydraulic analysis performed for the latest spent fuel pool rerack modification (Reference 1) calculated the time elapse before bulk boiling of the pool water occurs if all pool cooling were lost (including the RHR assist mode), and no makeup water added. For the full core offload case, 5.36 hours elapsed before boiling occurred. This is more than adequate time for the operators to provide makeup water to the pool to prevent reduced inventory. The typical SFP heat load during power operations is only about 2 E+ 6 BTU/hr. The elapsed time before boiling occurs, following loss of the SFPCS during power operations, would be substantially more than for the full core offload case.

In the event normal inventory makeup capability to the pool from the condensate transfer system is lost, backup makeup capability is provided by the Fire Protection System using local fire hose stations. When the fuel pool gates are removed, makeup capability is also available from the RHR Service Water System and the Fire Water System through the RHR System. Diesel driven fire pumps maintain makeup capability during a loss of offsite power.

Alternate Decay Heat Removal System

The recently installed alternate Decay Heat Removal System (DHRS) is designed as a non-safety related system, that is physically independent of existing plant systems to the maximum extent feasible, and intended to enhance decay heat removal capabilities during refueling outages.

The DHRS has a nominal heat removal capability of 30 E+ 6 BTU/hr at a SFP temperature of 125°F and an ambient wet bulb temperature of 73°F. One of two DHRS pumps take suction from the SFP, pump through either of two heat exchangers, and discharges back to the SFP. With both pumps and heat exchangers in service, the DHRS has a maximum heat removal capability of 45 E+ 6 BTU/hr. Anti-siphon protection is provided on the suction and discharge lines in the SFPCS. Cooling towers are utilized on the secondary side for heat dissipation. Emergency makeup to the secondary side is provided by the fire water system. There are no connections between the DHR and the RHR systems, nor are there connections between the DHR and the FPC systems.

Electrical power for the DHR system is provided from an off-site 13.2 kV source. Backup power can be provided by a portable diesel generator which is sized to start and carry DHR heat loads in the event of a loss of the normal 13.2 kV power supply.

References

1. NYPA License Amendment Request: "Proposed Changes to the Technical Specifications Regarding Spent Fuel Pool Storage Capability" (JPN-90-043), dated May 32, 1990.