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New York Power Authority

John C. Brons
Executive Vice President
Nuclear Generation

December 5, 1990
JPN-90-072

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Stop P1-137
Washington, DC 20555

Subject: James A. FitzPatrick Nuclear Power Plant
Docket No. 50-333
Request for Additional Information -
Proposed Changes to the Technical Specifications
Spent Fuel Pool Storage Capacity (JPTS 90-035)

References:
1. NYPA letter, J.C. Brons to NRC, dated May 31, 1990 (JPN-90-042), "Proposed Changes to the Technical Specifications Regarding Spent Fuel Pool Storage Capacity."
2. NRC letter, D.E. LaBarge to J.C. Brons, dated September 5, 1990, "Request for Additional Information - Spent Fuel Pool Storage Capacity Increase."

Dear Sir:

In Reference 1, the Authority applied for an amendment to change Specification 5.5.B, page 246 and Bases page 246a, regarding the spent fuel storage capacity. Specifically, the changes will increase the number of spent fuel assemblies that can be stored in the spent fuel pool from 2,244 to 2,797. In Reference 2, the NRC Staff requested additional information needed to complete their review.

Attachment I to this letter contains the Authority's response to this request for information.

If you have any questions, please contact Mr. J.A. Gray, Jr.

Very truly yours,

John C. Brons
Executive Vice President
Nuclear Generation

cc: see next page

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ATTACHMENT I TO JPN-90-072

REQUEST FOR ADDITIONAL INFORMATION
SPENT FUEL POOL STORAGE CAPACITY INCREASE

(JPTS-89-035)

New York Power Authority

JAMES A. FITZPATRICK NUCLEAR POWER PLANT
Docket No. 50-333

RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION
SPENT FUEL POOL STORAGE CAPACITY INCREASE

NRC Question # 1. "The proposed methods, resources, and techniques to be utilized for rack installation are not clear. If divers are to be utilized, describe the procedures and controls which will be employed to minimize radiation exposures and to prevent radiation overexposures."

NYPA Response: The Authority intends to perform the spent fuel pool rack installation using remote tooling. The use of divers is not planned. If the use of divers becomes necessary, the following actions will be taken:

A. Spent fuel and irradiated components will be located no closer to 8 feet from the area in which divers will work without further evaluation by RES personnel.

B. The location of spent fuel and irradiated components will be independently verified prior to diving operations.

C. A physical barrier, such as a net, will be provided to limit the diver's movement and prevent close contact with spent fuel or irradiated components.

D. The diver will be equipped with multiple dosimeters (TLD and pocket ionization chamber) located on various portions of the body to monitor any non-uniform exposures. In addition, continuous remote indication of the dose rates encountered by the diver will be displayed and monitored by radiation protection personnel on the refuel floor.

E. Underwater radiation surveys of the work area will be performed prior to diving and at least daily during diving operations. Additional surveys will be performed following activities that could change radiological conditions in the work area.

NRC Question # 2.

"With regard to estimated radiation exposures resulting from activities related to rack installation, additional information is needed. First, if divers are to be utilized in this rack installation effort, their estimated exposures needs to be addressed."

"Secondly, the total estimated exposure for this project is 2 person-rem which is significantly below industry averages for similar work. Please provide a detailed breakdown of required work activities and resultant estimated radiation doses for each work item."

NYPA Response:

The Authority does not expect to use divers for the installation of the new racks. All work is expected to be completed using remote tools.

The estimated 2 person-rem is less than the industry average because the activities related to the installation are for a partial rerack.

The following is a breakdown of all required work activities to install the five additional racks at FitzPatrick and the resultant radiation doses for each work item:

1. Set up floor (1 week)

   - (4 men)(8hrs/day)(5 days)
     (0.62 UF*)(0.001 R/hr)
     = 0.100 man-rem

2. Remove obstructions from the east wall in the fuel pool
   (2 weeks)

   - Refuel Floor Supervisor (1 man)(8 hrs/day)
     (10 days)(0.62 UF*) (0.001 R/hr)
     = 0.050 man-rem

   - Radiation Protection Personnel (work area)
     (2 men)(8 hrs/day)(10 days)
     (0.62 UF*)(0.003 R/hr)
     = 0.300 man-rem

   - Radiation Protection Personnel (floor)
     (1 man)(8 hrs/day)(10 days)
     (0.62 UF*)(0.001 R/hr)
     = 0.050 man-rem

   - Craft
     (5 men)(8 hrs/day)(10 days)
     (0.62 UF*)(0.003 R/hr)
     = 0.750 man-rem

3. Install/Level Racks (2 weeks)

- Refuel Floor Supervisor
  (1 man) (8 hrs/day) (10 days)
  (0.62 UF*) (0.001 R/hr)
  = 0.050 man-rem

- Radiation Protection Personnel (work area)
  (2 men) (8 hrs/day) (10 days)
  (0.62 UF*) (0.003 R/hr)
  = 0.300 man-rem

- Radiation Protection Personnel (floor)
  (1 man) (8 hrs/day) (10 days)
  (0.62 UF*) (0.001 R/hr)
  = 0.050 man-rem

- Craft
  (5 men) (8 hrs/day) (10 days)
  (0.62 UF*) (0.003 R/hr)
  = 0.750 man-rem

- Mechanic (Crane Operator)
  (1 man) (8 hrs/day) (10 days)
  (0.62 UF*) (0.001 R/hr)
  = 0.050 man-rem

4. Demobilize (1 week)

- Craft/Other
  (4 men) (8 hrs/day) (5 days) (0.62 UF*)
  (0.001 R/hr)
  = 0.100 man-rem

Personnel required to perform the above work are as follows:

5 Craft laborers

3 Radiation Protection Personnel

1 Refuel Floor Supervisor

1 Mechanic (Crane Operator)

4 Other

* UF- Utilization Factor = $\frac{\text{hours per day signed in on RWP}}{\text{hours per day available for work}}$

NRC Question # 3. "At present, it is our understanding that the area of the spent fuel pool to be utilized for the additional racks contains control rod blades and other debris which must be removed. Describe your plans to address this issue, and provide your estimate of the expected radiation exposures."

NYPA Response: The irradiated material currently stored in the spent fuel pool consists of control rod blades, LPRMs, and dry tubes. Much of this material is located in the east side of the pool where the additional racks will be installed. This material will first be radiologically characterized to determine the curie content. Then it will be processed, packaged, removed from the pool and shipped to a waste disposal site. The pool floor will then be vacuumed and prepared for the new rack installation.

The clean-up effort detailed above will be performed as much as possible prior to rack installation.

Based upon the current scope of work, our preliminary estimate of the expected radiation dose rate is 13.5 man-rem. This estimate includes area setup (construction of a hot particle area and cask washdown platform), the cutting up of control rod blades, LPRMs, and dry tubes, the vacuuming of the spent fuel pool floor and other miscellaneous work.

This task which involves the removal of irradiated material from the spent fuel pool will need to be completed even if the new racks are not installed. Therefore, the exposure of 13.5 man-rem is not directly attributed to the new rack installation.

NRC Question #4. "The amendment indicates that Boral plates are seal welded in the cavity between adjacent fuel assemblies. Describe how gases generated by Boral off-gasing is vented from the cavity to prevent swelling and bulging due to pressure buildup."

NYPA Response: The construction of the new rack is described in Section 3.2 of Attachment III to the proposed Technical Specification change, and uses a picture frame sheathing attached to the side of the box with the Boral poison material installed in the sheathing cavity. The sheathing is welded to the box at the top and bottom and at staggered positions along the longitudinal length. The sheathing is not seal welded to the box. Pool water is free to enter the cavity, and hydrogen gas produced by the water-aluminum reaction from exposure of the Boral aluminum cladding to pool water is free to escape. The vented construction represented by the new racks is typical of most current spent fuel rack designs being licensed and experience indicates that swelling and bulging are not encountered.

NRC Question #5. "Describe spent fuel pool water chemistry limits to maintain pool purity and optical clarity (conductivity, chlorides, heavy metals, and pH range)."

NYPA Response: The plant operating limits are as follows:

Analysis	Achievable	Action Level
Control Parameters		
Conductivity (S/cm)	1.5	5.0*
Chlorides (ppb)	20	500*
Turbidity (FTU)	1	10
Gamma Isotopic (Ci/ml)	1E-5	1E-3

* The action levels of conductivity and chlorides during refueling or reactor flood up (with the reactor cavity open to the spent fuel pool) are 2.0 S/cm and 100 ppb respectively because of reactor shutdown limits.

The following corrective actions will be taken if the above chemistry action levels are exceeded:

A. Work in the spent fuel pool will be stopped until parameters are below the action levels.

B. A Chemistry Incident Report will be initiated as per Radiological and Environmental Services Department Standing Order No. 11 for control parameters above achievable or action level limits.

C. The sample or samples for the appropriate diagnostic parameters will be analyzed as soon as possible.

Diagnostic Parameters

pH
Decontamination Factor
Cations (ppb)
Sulfate (ppb)
Nitrate (ppb)
Fluoride (ppb)
Other Anions (ppb)