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POWER AUTHORITY OF THE STATE OF NEW YORK

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February 2, 1978
IPO-48

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

Attention: Mr. Robert W. Reid, Chief
Operating Reactors, Branch No. 4

RE: Power Authority of the State of New York
Indian Point 3 Nuclear Power Plant
Docket No. 50-286

Dear Mr. Reid:

As requested by your Mr. P. Erickson via telephone conversation of December 22, 1977, the Power Authority herewith provides clarification of previous responses to NRC inquiries regarding Spent Fuel Pool Modification.

Very truly yours,

George T. Berry
George T. Berry
General Manager and
Chief Engineer

Attachments

cc: (w/att.): Lex K. Larson, Esq.
Hon. George V. Behany
Hendrick Hudson Library

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ATTACHMENT I

RESPONSES TO DECEMBER 22, 1977 REQUESTS BY NRC

Power Authority of the State of New York

1. Provide details of the on-site program to verify the presence of neutron absorber material in the locations assumed in the safety analysis of the modified spent fuel rack design before installation of these modified racks in the spent fuel pit.

Response

Utilization of poison material in the design of replacement spent fuel storage racks for IP-3 necessitates the verification that the poison material is present in the completed storage rack module. The Power Authority's program for poison verification at IP-3 consists of the following:

(1) Primary reliance on in-process inspection and process controls

(2) Performance of poison plate missing criticality analysis.

(3) Performance of neutron attenuation testing program.

We have provided the Commission details of our poison verification program for items (1) and (2). The Authority will conduct a neutron trasmission test utilizing a neutron source plus associated detection and counting equipment.

As prior tests and inspection have verified the uniformity and minimum boron-10 content at the borated stainless steel plate, (which are welded to each storage cell) the purpose of these additional attenuation measurements is to further confirm the results of the QA mapping program previously discussed -- i.e. to provide further assurance that only borated stainless steel plates are attached to the completed storage cells.

The test will be performed by inserting a shielded moderated neutron source into one storage cell and a neutron detector into an adjacent storage cell. Prior to the actual tests performed at IP-3, calibration tests will be performed on an appropriate test fixture which will provide the necessary counting statistics for demonstrating if any poison plates are missing and/or do not contain the boron poison material.

2. Give the value of the stresses experienced by the fuel assemblies inside the fuel racks during a seismic event.

Response

Exxon Nuclear Company has performed a calculation of the maximum stresses developed in a fuel pin as a result of the clearance between a fuel storage cell and fuel assembly. The bending stress developed in the Zircaloy-2 tubing would be approximately one-thirtieth of the material yield strength under seismic loading conditions. The calculation was based on the maximum bowing distortion which could result from the clearance between the fuel assembly and storage cell.

3. Justify the adequacy of the spent fuel pool linerto withstand the thermal stresses due to the increase in the maximum design basis transient temperature due to the increase in fuel pool storage capacity.

Response

The analysis of thermal stresses in the walls of the spent fuel pool is presented in the FSAR, Appendix A, pg. A.4-13. A gradient of 120^{O}F water temperature to 0^{O}F outside temperature results in a maximum liner stress of -2.7 ksi, which is well below the yield of the liner (32ksi). Furthermore, the effect of a thermal gradient would be to compress the liner.

The stresses in the liner as a result of the temperature gradient are of such low magnitude as compared to the yield that a change in the maximum design temperature, from 120^{O}F to 150^{O}F, will not change the results of the analysis in the FSAR.

4. Provide a statement of your inspection program to detect corrosion of the fuel storage rack elements.

Response

Visual inspections will be conducted from the spent fuel pool bridge at every refueling. These inspections are intended to detect any corrosion which has occurred in the fuel storage rack elements.

5. Provide details of the slots provided in the fuel storage rack elements and which are intended to allow for thermal expansion.

Response

The dowel pins shown inserted into the shims of Figure 2.1.6 are 5/8" in diameter, while the slotted holes in the shims are 7/8" x 1-1/8". This oversizing provides adequate thermal expansion capability.

The tests will be performed on a random basis consisting of the following details:

- A 100% storage cell inspection of the first storage module.
- A 10% random sampling of the storage cells in the remaining rack modules.
- Should any one measurement demonstrate that one poison plate is missing and/or does not contain the boron poison material, a 100% inspection program will be conducted on all storage rack modules.

A QA controlled procedure for these tests will be prepared and utilized during the measurements and a permanent record will be generated for each measurement.