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Docket No. 50-220

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Niagara Mohawk Power Corporation
ATTN: Mr. Gerald K. Rhode
Vice President - Engineering
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Gentlemen:

We have reviewed your December 7, 1976 request for Technical Specification changes for the Nine Mile Point Unit No. 1 Spent Fuel Pool Modification and your April 13, 1977 letter entitled, "Responses to February 11, 1977 Nuclear Regulatory Commission Questions". We have concluded that we need additional information to complete our review.

Please provide responses to the items of information identified in the enclosure.

If you have any questions, please contact us.

Sincerely,

Original signed by

George Lear, Chief
Operating Reactors Branch #3
Division of Operating Reactors

Enclosure:
Request for Additional Information
(Q-2) Spent Fuel Pool Modification

OFFICE➤	ORB#3	ORB#3				
SURNAME➤	SNowicki:acr	GLear				
DATE➤	6/30/77	6/30/77				

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ENCLOSURE

REQUEST FOR ADDITIONAL INFORMATION (Q-2)

NINE MILE POINT UNIT 1

SPENT FUEL POOL MODIFICATION

DOCKET NUMBER 50-220

1. Provide a summary of the stresses and safety margins in the diagonal braces across the bottom of the refueling canal, the shear blocks and the snubbers, and the bearing stresses and safety margins where the snubbers contact the fuel pool walls. In addition, figures 1.3 through 1.5 of the response to February 11, 1977 NRC question 1 indicate that the shear blocks, diagonal braces, and snubbers are not physically connected to the rack base legs. This may be unacceptable since friction should not be relied upon to fasten these components under a seismic event. Also, consider the possibility of lateral instability of the diagonal braces affecting their load carrying capacity.

2. Your response to the February 11, 1977 NRC question 2 is not complete. Provide the following information:

   a. Indicate the damping valves utilized for the OBE and SSE analyses seperately since the utilization of a structural damping value of 2.5% was specified.

   b. Your utilization of structural damping values corresponding to bolted structures is not acceptable. The connecting mechanism between two structural components is more rigid for a weld than for a bolt due to the clearances between the bolts and the bolt holes. Therefore, use damping values corresponding to those for a welded structure.

   c. Provide a summary of the natural frequencies, mode shapes and corresponding participation factors for all modes with frequencies less than 33 Hz to substantiate your statement that only the first mode of vibration contributes significantly to the response of the rack modules.

   d. Compare numerically the zero period accelerations of mass point 4 of the reactor building seismic model utilized for the seismic analysis of the fuel rack modules with the zero period accelerations of the corresponding mass point in the original seismic analysis of the reactor building.

   e. Provide the analytical model utilized for the calculation of stresses within the fuel rack modules.

3. Your responses to the February 11, 1977 questions concerning the impacting of the fuel racks with the bottom of the fuel pool and the impacting of the fuel assemblies within the cans are inadequate. Therefore:

   a. Quantify the kinetic energy of a dropped rack module, and the energy absorption capacities of the rack bases and fuel pool floor for the case of a rack module impacting on either of these structures with its corner or edge. State the effects on the structural integrity of the rack base, and fuel pool liner and floor.

   b. Discuss and quantify the local and gross effects on the rack modules, and fuel pool liner and floor for the following three cases of a dropped fuel assembly:

      1. a straight drop on the top of a rack module

      2. an inclined drop on the top of a rack module

      3. a straight drop through a can with the fuel assembly impacting the bottom of the can.

      Include the kinetic energies and the height of drop considered for each of the three cases. In addition, consider the effects of the loading which will result from a fuel assembly sticking inside a can. (This loading is defined in ANSI Standard N210-197). The upward loading should be the maximum force the crane is allowed to exert on a fuel assembly.

4. In your response to February 11, 1977 NRC question number 7, no temperature loading was considered for the case of a temperature gradient across a rack module (e.g., consider the case of an empty module with a full rack module on one side and an empty rack module on the opposite side).

5. Provide the details of the procedures and the methods utilized in the testing of the welds to establish the ultimate weld stresses referenced in your response to February 11, 1977 NRC questions 8 and 9.

6. There is a conflict between Figures 3 and 5 of your original submittal and Figure 9.1 of your response to February 11, 1977 NRC question 9. Figure 9.1 indicates that a plate was considered seperating two adjacent fuel assemblies within a can, whereas, no plate is illustrated in Figure 3 and 5. If no plate is provided between two assemblies within a can, perform the impact analysis without the plate indicated in Figure 9.1 for an earthquake in the direction of the axis between the centers of the assemblies within a can. Also, perform the impact analysis considering only one assembly within a can for an earthquake in the opposite direction. Discuss the local as well as gross effects on the rack modules and fuel assemblies themselves.

7. Provide a summary of the uplift forces and overturning moments, along with the safety margins against overturning of the critical rack module for the load combinations considered.

8. Provide the water chemistry which will be maintained in the spent fuel pool. Include the boron concentration, pH, chloride, fluoride and any heavy metal concentrations.