DUKE POWER COMPANY
P.O. BOX 33189
CHARLOTTE, N.C. 28242

HAL B. TUCKER
VICE PRESIDENT
NUCLEAR PRODUCTION

TELEPHONE
(704) 373-4531

July 16, 1984

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Ms. E. G. Adensam, Chief
Licensing Branch No. 4

Re: McGuire Nuclear Station
Docket Nos. 50-369, 50-370

Dear Mr. Denton:

Please find attached additional information concerning the McGuire Nuclear Station spent fuel pool two region rerack modifications. This additional information is provided in response to a telephone conference call held on July 12, 1984 between Duke, Franklin Research Center, and the NRC which concerns the spent fuel rack design and analysis. If there are further questions regarding this matter, please contact us.

Very truly yours,

H. B. Tucker /BJS

Hal B. Tucker

WHM/rhs

cc: Mr. J. P. O'Reilly, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30303

Mr. W. T. Orders
Senior Resident Inspector
McGuire Nuclear Station

A001
1/1

DUKE POWER COMPANY
McGuire Nuclear Station
Spent Fuel Pool Rerack Modifications
Additional Information

Request 1: With respect to fuel assembly impact damping, was conservatism of the seismic dynamic analysis maintained since the upper bound value (15%) of the impact damping range was used in lieu of the 10% lower bound?

Response: In determining the fuel assembly impact damping, B & W performed a series of tests. The upper and lower bounds for the tests are reported as .1462 and .1650 respectively with a median value for all tests of .1565. B & W Topical Report 10133P Rev. 1, filed with the NRC on 5/31/79, gives a fuel assembly impact damping value of 16% for a Mark C assembly. The report also notes that B & W Mark C characteristics are similar to the B & W Mark B assembly characteristics which are stored at McGuire, thus, the results are directly comparable. The Applicant maintains that use of a damping value of 15% is appropriate and the conservatisms of the analytical results used in the design of the proposed racks are preserved.

Request 2: Two horizontal seismic response spectra were available, of which one was used for time history analysis. It is not clear if the spectrum used for the time history analysis provided the most conservatism.

Response: Of the two horizontal seismic response spectra, the E-W spectrum has larger acceleration values than the N-S spectrum in the frequency range of the fuel rack, (4-8 H_z). Thus, the seismic analysis was conservatively performed with the E-W response spectrum, the E-W hydrodynamic mass (maximum hydrodynamic mass), and the minimum support pad spacing (N-S in region 2 and E-W in region 1), to obtain the maximum fuel rack response.

Request 3: Provide analysis supporting the conclusion regarding the 234-inch fuel assembly accidental drop.

Response: Analysis has been performed which shows that the 234 inch fuel assembly accidental drop satisfies the design criteria of not resulting in perforation of the pool liner. In the analysis it is shown that the energy of the falling fuel assembly is satisfactorily absorbed by the crushing of the fuel rack base plate and the deformation of the lower portion of the fuel assembly (lower fitting and lower portion of the guide tubes and instrument tube). The load transmitted to the pool liner is such that the stress developed in the liner does not result in perforation. It should be noted that the analysis performed is conservative in that the fuel assembly is assumed to be under free fall (water resistance within the cell, is neglected), and it is assumed that no energy is dissipated by the breaking of welds which hold the base plate to the rest of the rack.

Request 4: Provide the description of the analytic model used for the spent fuel pool floor in Unit 2.

Response: As stated in section 3.1, paragraph 4, of the license submittal, the Unit 2 pool floor is supported continuously on bedrock. All dead, live and seismic loads are transmitted directly through the floor to the bedrock foundation. In response to an earlier question concerning the model and loading system used in the analysis of the spent fuel pool floor (reference response to Question no. 1, letter dated June 19, 1984), reference was made only to the Unit 1 pool floor slab. The Unit 2 pool floor slab analysis was not addressed since the Unit 1 pool floor represented the limiting condition.

Request 5: Provide additional discussion relative to the effect of fuel densification on the seismic response of the Spent Fuel Pool Floor Slab.

Response: The McGuire Auxiliary Building is a poured in place reinforced concrete structure as stated in Section 3.8.4.1.1 of the McGuire FSAR. Contained in this building are auxiliary systems, control rooms, and spent fuel pools for both units along with related piping and electrical cables. The mass added as a result of fuel densification is negligible compared to the mass of the structures and equipment comprising the Auxiliary Building, thus, the seismic response spectra applicable to the spent fuel pool floor slab is not altered. The method of dynamic analysis is described in Section 3.7.2.1 of the McGuire FSAR.