UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	Docket No. 50-155
CONSUMERS POWER COMPANY	)	
	)	Spent Fuel Pool Modification
(Big Rock Point Nuclear Power Plant)	)	

NRC STAFF PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW ON O'NEILL CONTENTION II.C.

I. BACKGROUND

This is a decision on an application from Consumers Power Company (Licensee) to amend its operating license to modify its spent fuel storage pool at Big Rock Point Nuclear Power Plant. The application for amendment is contested by Christa-Maria et al. and John O'Neill (Intervenors) who have submitted a number of contentions opposing the proposed modification of the spent fuel pool. This decision is limited to subcontention II.C of John O'Neill which deals with the possibility of a rupture in the spent fuel pool from the dropping of a spent fuel transfer cask or an overhead crane.

II. O'NEILL CONTENTION II.C.

Having found that the original wording of the Contention did not raise any genuine issues of fact, O'Neill Contention II.C., was reworded by the Licensing Board in its Memorandum and Order (Concerning Motions for Summary Disposition) dated February 19, 1982 (Order), to the following form:

> Is the spent fuel pool safe from a rupture which might be caused by a drop of a spent fuel transfer cask or of the overhead crane? (Order, p. 47).

The Board also determined inter alia that there was a genuine issue of material fact as to whether it is necessary for the safety of the enlarged spent fuel pool that 200 gallons per minute of makeup water be available to protect the pool from the consequences of a drop of a spent fuel transfer cask or the crane.[1/] Id.

Based on the following reasons the Board has determined that the uncontroverted testimony of the Staff and the Licensee is adequate to support a finding that there is reasonable assurance the fuel transfer cask will not drop into the spent fuel pool. Therefore, the Board need not make a finding on the adequacy of the makeup water system in the event of a pool rupture caused by the fuel transfer cask.

III. STATEMENT OF APPLICABLE LAW

Is there reasonable assurance that the activities authorized by the operating license, specifically, the movement of the fuel transfer cask, can be conducted without endangering the health and safety of the public, pursuant to 10 C.F.R. § 50.57(a)(3)(i)?

1/ During the evidentiary hearing, testimony was not presented on the other issues of material facts: whether the overhead crane used for handling fuel assemblies and casks is seismically safe, whether the threading on fire water system piping is seismically safe. These issues will be addressed when the hearing reconvenes.

IV. OPINION

At the outset, it should be noted that neither the Staff nor the Licensee analyzed the amount of makeup water required to protect the pool in the event of a fuel transfer cask drop. Mr. Richard Emch, the Project Manager for Big Rock Point and witness for the NRC Staff, testified on why the Staff did not analyze the consequences (i.e. rupture of the fuel pool) of a drop of a fuel transfer cask. (Tr. 2435-36). He stated such an analysis had been done in the original SER. At the conclusion of a later review, however, the Staff decided that the likelihood of a cask drop was small enough that the accident no longer needed to be analyzed. (Tr. 2436). Mr. Clemenson, a witness for the Staff whose present duties include the review of the proposed modifications at Big Rock Point, concurred with Mr. Emch. Id. As a result of this later review the issue of the necessity of 200 gpm of makeup water being available to protect the pool in the event of a drop of a spent fuel transfer cask no longer needed to be analyzed since the cask drop itself was of insufficient likelihood. Id.

The Intervenors did not directly challenge the Staff's decision not to analyze a pool rupture either by direct testimony or on cross-examination.

The issue thus before the Board was whether the overhead crane from which the fuel transfer cask is suspended, and any other incorporated safety features, are adequate to prevent a drop of the fuel transfer cask which could cause a rupture of the pool.

Counsel for the Licensee presented witnesses John W. Johnson, Charles R. Norman, John J. Popa, and A. Davis Mullholand, Jr., who testified on the adequacy and qualifications of the crane used to transport the 24-ton

spent fuel transfer cask. (Testimony of Johnson, Norman, Popa, and Mullholand ff. Tr. 2419).

Mr. Johnson, a registered mechanical engineer who was principally responsible for the preparation of the 1980 M.P.R. Analysis, described in detail the fuel transfer cask safety sling assembly which is used at Big Rock Point. (Testimony of John W. Johnson ff. Tr. 2419, pp. 1-11). As a result of an evaluation by the Whiting Corporation the fuel transfer cask, redundant support system, and crane were evaluated for a maximum dynamic loading of 150 tons. (Johnson, p. 10). The M.P.R. Analysis shows, Johnson concluded, that the load carrying components can withstand the stresses of a drop of the 24-ton cask and catch the cask. (Johnson, p. 11).

Mr. Charles R. Norman is an employee of the Whiting Corporation whose responsibilities include the supervision of all computer based engineering analyses for cranes and similar products. Mr. Norman testified that highly conservative analyses verify the safety of the gantry crane used at Big Rock Point, and show that both the crane and the cask catch mechanism are able to withstand the maximum anticipated dynamic load that would be imposed on the crane and its components by a free drop of the fuel transfer cask. (Testimony of Charles Norman, ff. Tr. 2419, p. 5, 6).

Mr. Norman concluded that, with the exception of the cask catch pins and the bolts used to connect the load girth with the trolley trucks, the imposition of a dynamic load of 150 tons will not deform, due to over-stress, either the Big Rock cask catch mechanism or the gantry crane. (Norman, p. 13). In regard to the cask catch pins, Mr. Norman stated that the adoption of his recommendations to replace the cask catch pins and substitute A235 high strength bolts for the currently used turned bolts

on the crane trolley will preclude deformation of either the cask catch mechanism or the gantry crane due to the postulated cask drop. (Norman, p. 14).

Mr. John J. Popa is a registered engineer whose responsibilities include reviewing the procedures used by the maintenance department associated with the rigging and inspection of the Fuel Transfer Cask. He testified on how the Big Rock Maintenance Department ensures that the safety sling is properly rigged prior to the use of the fuel transfer cask over the spent fuel pool. His conclusion stated that the training procedures and inspections are adequate to insure that the fuel transfer cask is rigged and set up for safe and proper operation. (Testimony of John Popa, ff. Tr. 2419, pp. 1-8). Mr.Popa concluded that there is a reasonable assurance that the cask slings are rigged properly and that the fuel transfer cask will not be dropped (Popa, p. 8).

Mr. Davis Mullholand, Jr., the Project Engineer for the licensing aspects of the Big Rock Point Spent Fuel Pool Modification testified to Consumers Power Company's commitment to make certain modifications to the 24-ton fuel transfer cask safety sling mechanism and to the crane itself. (Testimony of Davis Mullholand, Jr., ff. Tr. 2419, pp. 1-4). He stated that Consumers Power Company has undertaken several actions to correct the potentially overstressed condition of the bolts which connect the load girt to the trolley trucks and the pins which connect the 24-ton cask lugs to the cask catch mechanism. (Mullholand, p. 3). Big Rock Point personnel have issued maintenance orders to replace the op and bottom 1-inch turned bolts on the load girt to trolley truck connection with higher strength steel bolts and to replace the 1-11/16

inch pins which connect the cask lugs to the wedge housing with 2-inch pins. (Mullholand, pp. 3, 4).

The NRC staff presented witnesses Fred Clemenson, Richard Emch, Ian Sargent, and D. J. Vito to testify on the adequacy of the crane. They also evaluated each response of the Licensee to the guidelines set forth in NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants", and concluded that for the fuel transfer cask operations, the design and procedures of the Big Rock Point semi-gantry crane comply with the guidelines of NUREG-0612. (Testimony of Clemenson, Emch, Sargent and Vito, Tr. ff. 2434, P. 5). They also concluded that, aside from the seismic qualifications concern on the crane which is currently under review, the semi-gantry crane was acceptable for handling the 24-ton spent fuel transfer cask. (Testimony ff. 2434, p. 20, 25).

Mr. Clemenson also testified that, in addition to the lifting sling, Big Rock Point has provided a safety sling which precludes the fuel transfer cask from dropping. (Tr. 2437). Mr. Emch stated that the Licensee is restricted from using the shipping cask. (Tr. 458). Mr. Emch also stated that there is not currently a restriction against lifting the reactor vessel head. Clemenson, et al. indicated 1) that the overall generic issue of control of heavy loads is still under review by the Staff for Big Rock Point and 2) that additional information in several areas would be required before loads heavier than the fuel transfer cask could be assessed as part of the Staff review of control of heavy loads for Big Rock Point. (Testimony ff. 2434, pp. 1-25; Tr. 2440-2442; Tr. 2453). The reactor head is not carried over the pool and is not, therefore, a threat to the stored spent fuel. (Tr. 2459-2460).

The Licensee presented "rebuttal" witnesses A. Davis Mullholand, Jr. and Charles R. Norman. (Tr. ff. 2470). Mr. Norman testified that the quality of welding done on the crane in 1960-61 was at least as good as the welding quality done today. (Norman, p. 2). He also concluded that gantry legs meet present design standards as specified in CMAA-(70) for the 75-ton rated load. (Norman, p. 2). Additionally, he stated the hoist gearing was adequate for the rated load of 75 tons on the hook. (Norman, p. 4).

Mr. Mullholand testified that the crane tested at one-hundred and thirty percent of its load. The crane lifted the primary steam drum weighing roughly 100 tons. The lift met the initial requirement of ANSI B30.2-1976, Article 2-2.2.2. (Tr. 2472). In conclusion, witness Norman affirmed that he calculated the strength and durability horsepower of the gears as configured using AGMA Standards and found that they were adequate for service. (Tr. 2475-76).

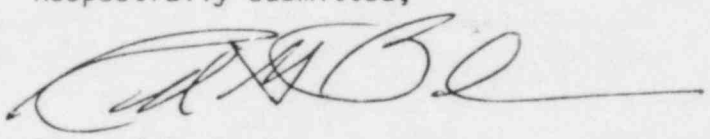
No direct testimony by the Intervenor was presented to controvert either the testimony or conclusions of the Staff's witnesses.

The Intervenors on cross-examination inquired as to whether human error could also cause a failure in the operation of the cask and supporting slings in this plant. (Tr. 2443). Staff witness Sargent affirmed that human error could cause the lifting sling to separate from the cask. However, he did not believe that human error could cause the cask to fall into the pool since the safety cables are not affected by human error. (Tr. 2443). Intervenors did not controvert either the testimony of the witnesses or their conclusions.

V. CONCLUSIONS OF LAW

Based on the foregoing reasons and the uncontroverted evidence of the Licensee and Staff, the Board finds as a matter of law that the overhead semi-gantry crane used to transfer the 24-ton fuel transfer cask complies with the guidelines set forth in NUREG-0612 and is adequately constructed to prevent the occurrence of a rupture caused by the drop of a spent fuel transfer cask. The Board finds, therefore that there is reasonable assurance that t fuel transfer activities authorized by the proposed amendment can be conducted without endangering the health and safety of the public, in accordance with 10 C.F.R. Section 50.57(a)(3)(i).

Respectfully submitted,



Richard G. Bachmann
Counsel for NRC Staff

Dated at Bethesda, Maryland
this 27th day of September, 1982.