12/7/81

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

TESTIMONY OF DAVID P. BLANCHARD
CONCERNING O'NEILL CONTENTION IIG(a)

INTRODUCTION

My name is David P. Blanchard. I have a Bachelor of Science Degree in Nuclear Engineering from the University of Missouri - Rolla, and I am currently employed by Consumers Power Company as a Technical Engineer at the Big Rock Point Plant. During the past five years, I held the position of Reactor Engineer at the Big Rock facility. In this position, I was responsible for implementation of a program for the handling and accountability of nuclear fuel and reactor internals hardware at the Big Rock Point site. These responsibilities included development of procedures for handling nuclear fuel from the time of its arrival at Big Rock, through its receipt inspection and acceptance, insertion into the reactor for power production, transfer to spent fuel storage on depletion of its useful fissile material and

ultimately to its shipment offsite to a fuel reprocessing facility.

Associated with the transfer of fuel and reactor components to, from, and within the plant is the handling of casks designed for the safe transfer and disposal of irradiated material. Being responsible for controls used in the handling of reactor components, I was also to some extent responsible for development of administrative controls and procedures used during operations involving the handling of casks associated with these components.

Based on my work experience at the Big Rock Point Plant, I believe I am qualified to address O'Neill Contention IIG:

> (a) Administrative controls proposed to prevent a cask drop over the pool are inadequate. These are mentioned on pages 4-9 of the application. Administrative controls have proved inadequate in the past in preventing incidents and are frequently violated at the plant.

Contention IIG(a) refers to certain administrative controls set forth on "pages 4-9 of the application." The reference to more than one page of the application is in error. The correct reference is to page 4-9 of the "Spent Fuel Rack Addition Description and Safety Analysis," dated April 1979.

Page 4-9 states in pertinent part:

> Administrative controls will be established for casks other than the fuel transfer cask to ensure that; (a) no cask is moved over stored spent fuel, (b) all cask handling operations are limited to the southwest corner of the spent fuel pool, and (c) no spent fuel is stored in the two existing "A" racks adjacent to the cask handling area during cask handling operations. These controls will preclude the dropping or tipping of a cask onto a fuel rack with stored fuel.

These administrative controls apply to all casks handled in the spent fuel pool at the Big Rock Point plant except for the fuel transfer cask. The administrative controls on page 4-9 are not needed for the fuel transfer cask because it is equipped with safety slings which prevent the cask from dropping, should the cask drop from the reactor building crane.

The purpose of my testimony is to show, in response to O'Neill Contention IIG(a), that the administrative controls on page 4-9 are adequate to minimize the potential for dropping a cask and to prevent damage to spent fuel in the event of a cask drop. I will begin the discussion of Contention IIG(a) by describing two casks, with, of course, the exception of the fuel transfer cask, most frequently

moved in the vicinity of the fuel pool at Big Rock Point. I will then discuss the administrative controls that have been implemented at Big Rock Point to mitigate the consequences of a drop as well as those designed to reduce the potential for such a drop.

Cask Descriptions

The first cask I will describe is shown in Figure 1 and is known as the Treat-II cask. The primary licensee for this cask is the General Electric Company, although other organizations, such as the Exxon Nuclear Company, Inc., can lease and are permitted to ship irradiated materials with this cask. The cask is 9 feet, 8 inches, in length and 2 feet in diameter. It weighs between 13,000 pounds and 15,000 pounds, depending on its contents, and is referred to as the "7-1/2 ton cask" in the Staff's Safety Evaluation Report of May 15, 1981, regarding the Big Rock Point spent fuel pool expansion. General Electric and Exxon have used this cask in the past to transport fueled and unfueled rods from the Big Rock plant after they had been irradiated in the reactor as a part of fuel assemblies. Irradiation of these rods is a result of contracts between Consumers Power Company and the fuel vendors to provide in-reactor experience for various fuel designs and reactor materials.

After one or more years of irradiation in the Big Rock Point reactor, the rods are removed from their fuel assemblies and packaged for shipment in the Treat-II cask to hot cells in laboratories located elsewhere in the country, such as Argonne National Laboratory in Illinois and Battelle laboratories in Ohio and Washington. The cask must be lowered into the fuel pool to load the rods packaged for shipment. Two to three Treat-II shipments a year have occurred in the past from Big Rock Point. A typical shipment may contain one-half dozen rods.

Information gained from irradiation of these fuel rods at Big Rock is used by the vendors to demonstrate the feasibility of improved fuel designs and reactor materials, increase fuel design life and improve fuel performance. Several of these research and development programs have been sponsored by the Department of Energy.

The other cask I wish to describe is a 15-ton cobalt cask licensed by Neutron Products, Inc., of Dickerson, Maryland. (Figure 2). This cask is is just over 3 feet in diameter and approximately 9-1/2 feet long. Its design includes cooling fins to dissipate the heat generated by the decay of Cobalt-60 during shipment.

Consumers Power Company has made available to Neutron Products positions in Big Rock Point fuel assemblies

in which to irradiate cobalt. The Cobalt-60 produced as a result of this irradiation is used by Neutron Products to fabricate cobalt sources for medical and industrial uses. Two to three shipments of cobalt rods a year occur to Neutron Products, generally occurring around the time of refueling outages just after the rods are freshly removed from the reactor. This cask must also be lowered into the fuel pool to load it with the rods to be shipped.

Because the cost of enriching fuel rods has made the irradiation of cobalt uneconomical, recent fuel designs no longer include unfueled locations for the placement of cobalt. As a result, Consumers Power Company expects that the remaining cobalt owned by Neutron Products will be removed from the reactor within the next few years, and use of this cask will be terminated.

These casks are the ones which are handled in the Big Rock fuel pool most frequently, and to which the administrative controls on page 4-9 apply. Other casks have been used in the Big Rock spent fuel pool, and they can be expected to be used in the future. As an example, waste casks used to dispose of radioactive components other than fuel stored in the fuel pool can be expected to be handled in the pool. The controls and handling procedures associated

with these less frequently used casks are expected to be similar to those for the two casks described in my testimony.

Administrative Controls

I will now describe administrative controls associated with cask handling operations, with the exception of the fuel transfer cask, which are currently in existence at Big Rock Point specifically to minimize the consequences of a cask drop. The effects of dropping a cask anywhere at the Big Rock Point site are most important from a personnel safety standpoint. Those personnel closest to the vicinity of the cask drop are most likely to suffer consequences, regardless of the structure or equipment damaged by the drop. Administrative controls have been in place for many years at Big Rock governing training in the use of, preventative maintenance on, and inspection of cask-handling systems to reduce the likelihood of cask drops and thereby, minimize the potential for personnel injury. In addition, load path restrictions are in effect throughout the plant to prevent potential damage to plant safety systems in the event of a cask drop. The specific administrative controls referred to in O'Neill Contention IIG(a) relate only to movement of casks over the spent fuel pool.

The administrative controls delineated on page 4-9 of the application are:

(a) No cask is moved over stored spent fuel;

(b) All cask handling operations are limited to the southwest corner of the spent fuel pool;

(c) No spent fuel is stored in the existing "A" racks adjacent to the cask handling area during cask handling operations.

The purpose of these controls is to prevent damage to fuel stored in the spent fuel pool should a cask be dropped in the pool. The southwest corner of the pool has been designated as the cask handling area in the spent fuel pool as currently there exists no fuel storage in this area, nor will there be after the pool is expanded. Cask handling operations at Big Rock are controlled by procedures which specifically restrict cask handling operation to this area of the pool. In addition, no fuel storage racks are located in the vicinity of the cask handling area at this time, eliminating the potential for the tipping of a cask to damage stored spent fuel. When the pool is expanded, two racks, designated as the "A" racks in the application, will be relocated to the vicinity of the southwest corner of the pool. At that time, the existing cask handling procedures will be modified to prevent casks from being placed in the

pool unless these two racks have been verified to be empty of fuel. This control will provide continued assurance that the dropping or tipping of a cask in the southwest corner of the pool will not result in fuel damage. In summary, the three administrative controls listed on page 4-9 of the application are adequate to preclude fuel damage during cask handling operation in the spent fuel pool.

In addition to those administrative controls, additional controls exist at Big Rock Point which are designed to minimize the potential for dropping a cask in the first place. Inspection, preventive maintenance, and functional testing are performed on a periodic basis to assure all controls, load-bearing and safety devices are in satisfactory working order. More specifically:

Annually: Rope drum, reaving, and rope anchors are checked for wear.
Gears and bearings are checked for wear.
Hook throat opening checked. Rails, joints and stops checked for adjustment and wear.

Quarterly: Sheaves and drums are checked for wear and cracks.
Safety brake trip mechanism, cable, and associated hardware checked for defects.
Wire rope checked for elongation and wear.

Monthly: Brake mechanisms checked for proper functioning and wear.
Limit switches checked for adjustment and wear.
Control panels, controls and electrical components checked for functioning loose connections and deterioration.
Hydraulic systems are checked for leaks and abrasions.
Reaving is checked for proper seating in drum and sheeve grooves.
Hoist rope visually inspected for tightness of end clamps and rope clamps.
Visual inspection of slings for wear and measurement of elongation.

Daily: Limit switches checked for proper functioning.
Hydraulic systems functionally checked.
Operating mechanisms checked for proper operation.

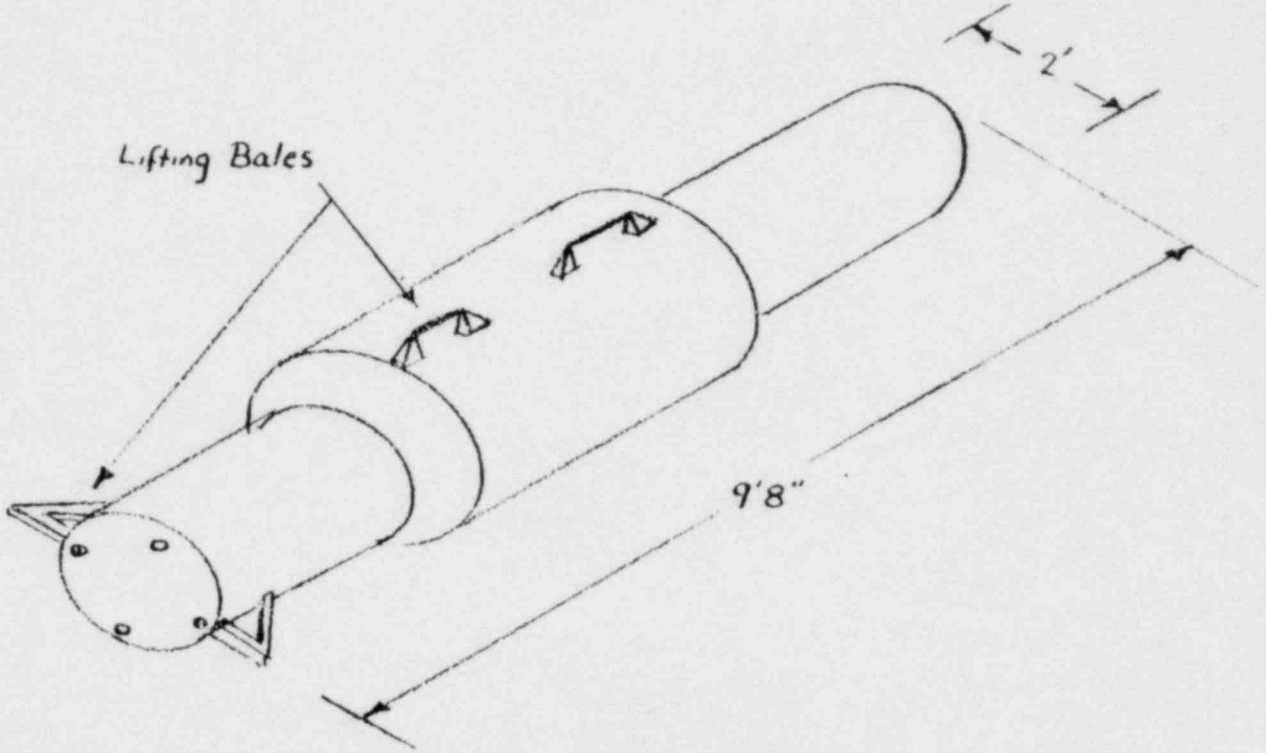
Prior to Each Load: Hooks and latches properly seated.
Slings used for lifting checked for wear.

The above preventative maintenance and inspection procedures have changed periodically to comply with changing requirements as they occur. Preventive maintenance measures such as those described, combined with operator training with respect to the operation of the crane, rigging, and handling of casks, have resulted in 20 years of operation without a cask drop.

CONCLUSIONS

Administrative controls are in place at Big Rock Point which require periodic training of personnel and inspection and maintenance of cask handling equipment. These controls have been sufficient to prevent the accidental dropping of a cask at Big Rock Point for the past 20 years. Additional controls have been implemented at Big Rock Point to minimize the radiological consequences of a cask drop in the pool if it were to occur. These are the controls identified on page 4-9 of Consumers Power Company's April 23, 1979, application. Strict adherence to these controls is required by plant procedures.

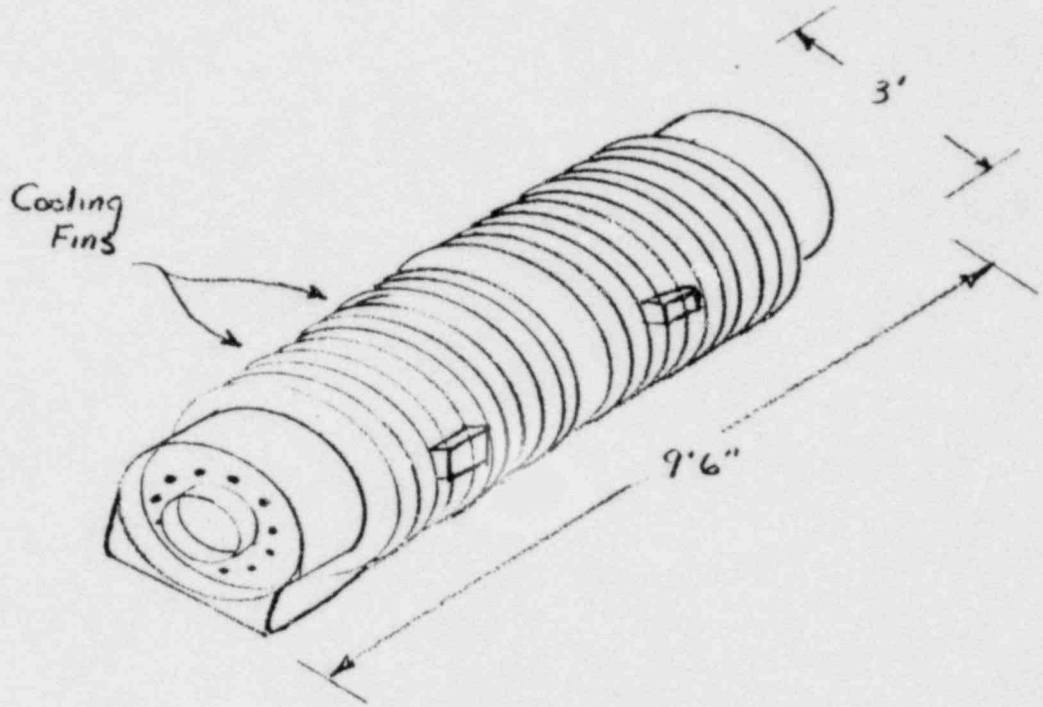
In my opinion, the various administrative controls discussed in my testimony provide the maximum practical defense in depth against the occurrence of a cask drop over the spent fuel pool, and they are sufficient to minimize the consequences of such an event. The testimony of Ed Raciborski and Pat Donnelly explains further reasons for the Company's confidence that these administrative controls can be effectively implemented.



Approx. Wt. = 15,000 lb

Figure 1

Treat-II Cask



Approx Wt = 30,000 lb

Figure 2
Cobalt Cask