A-90
12/8/83



UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

| | | |
|---|---|---|
| In the Matter of | ) | |
| | ) | |
| DUKE POWER COMPANY, et al. | ) | Docket Nos. 50-413 |
| | ) | 50-414 |
| (Catawba Nuclear Station, Units 1 and 2) | ) | |

TESTIMONY OF MICHAEL S. TUCKMAN

Q. WHAT IS YOUR NAME?

A. Michael S. Tuckman.

Q. BY WHOM ARE YOU EMPLOYED?

A. Duke Power Company.

Q. IN WHAT CAPACITY ARE YOU EMPLOYED BY DUKE POWER COMPANY?

A. I am employed by Duke Power Company as the Superintendent of Technical Services at the Catawba Nuclear Station.

Q. HOW LONG HAVE YOU BEEN EMPLOYED IN THIS POSITION?

A. I have been employed in this position since January, 1978.

Q. WHAT IS YOUR EDUCATIONAL AND PROFESSIONAL BACKGROUND?

A. I obtained a Bachelor Degree in Electrical Engineering from Georgia Institute of Technology in 1965. I participated in the U.S. Navy Nuclear Propulsion Training Program as an officer from 1965-1969 and 1972-1974. I also attended graduate school at University of Tennessee in Electrical Engineering. I am an NRC Certified Senior Reactor Operator and a Registered Professional Engineer in North Carolina. My work experience includes 6 years Navy nuclear experience; 3 years Electrical Development Engineer at Union Carbide Corporation, Oak Ridge, Tennessee; 3½ years with Duke

Power company as Oconee Licensing Engineer; and 5½ years with Duke Power Company as Superintendent of Technical Services, Catawba Nuclear Station. Effective October 1, 1983, I will be transferred to Oconee Nuclear Station as Assistant Station Manager. My resume is included as Attachment 1.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to address that part of Contention 16 which deals with the storage of Oconee and McGuire spent fuel at Catawba. In particular, I will address that part of the contention which deals with the handling of the cask to unload spent fuel assemblies and move them into position in the spent fuel pool.

Q. WILL CASK HANDLING BE NECESSARY TO UNLOAD ANY SPENT FUEL ASSEMBLIES WHICH MAY ARRIVE FROM OCONEE AND MCGUIRE FOR STORAGE IN THE CATAWBA SPENT FUEL POOL?

A. Yes.

Q. AS SUPERINTENDENT OF TECHNICAL SERVICES AT THE CATAWBA NUCLEAR STATION WHAT ARE YOUR AREAS OF RESPONSIBILITY?

A. I am responsible for radiation protection, chemistry, performance engineering, licensing, project engineering and emergency preparedness at the Catawba Station.

Q. PLEASE DESCRIBE YOUR FAMILIARITY WITH HANDLING SPENT FUEL.

A. My familiarity with spent fuel unloading and storage procedures is based upon several years' supervision of the reactor engineering and health physics sections, which are responsible for review of spent fuel handling procedures, radiation protection measures to be

employed during spent fuel unloading, and accountability for special nuclear material.

Q. HAS CATAWBA DEVELOPED PROCEDURES FOR THE HANDLING AND STORING OF SPENT FUEL FROM DUKE POWER COMPANY'S OCONEE AND MCGUIRE STATIONS AT CATAWBA?

A. No. However, Applicants have draft procedures for handling and storage of Oconee and McGuire spent fuel at Catawba. Because there is no immediate need to transfer Oconee and McGuire spent fuel to Catawba, we have not yet finalized written procedures for this process. Catawba personnel are already generally familiar with the procedures which will be used.

Q. WHAT IS THE BASIS FOR YOUR STATEMENT?

A. Applicants have had considerable experience in unloading and storing Oconee spent fuel at the McGuire plant, and in transferring Oconee spent fuel from one Oconee spent fuel pool to another during re-racking activities. The procedures which will be used for unloading and storing Oconee and McGuire spent fuel at Catawba are essentially the same as those approved for use at both Oconee and McGuire. Catawba personnel have familiarized themselves with these procedures, have observed fuel handling operations, and in some instances have participated in fuel handling operations at Oconee and McGuire.

Q. WOULD YOU PLEASE DESCRIBE THE PROCEDURES THAT YOU CONTEMPLATE WILL BE UTILIZED IN THE HANDLING AND STORING OF OCONEE AND MCGUIRE SPENT FUEL AT CATAWBA?

Q. Based upon experience at Oconee and McGuire, I contemplate the following procedures will be utilized. First, before Oconee or

McGuire spent fuel is received and unloaded at the Catawba Station, certain measures will be taken. These include the following:

(a) The reactor engineer or the operation's fuel handling supervisor will receive notification of the spent fuel shipment and will authorize receipt and storage.

(b) The Catawba health physicist or his representative will receive notification of the shipment.

(c) Periodic tests of the 125-ton overhead fuel handling bridge crane and the auxiliary hoist will have been performed pursuant to applicable regulatory requirements. This includes an inspection prior to use and completion of a checklist.

(d) Lifting equipment (short and long lift adapter, lifting yoke) will have been periodically inspected as necessary.

(e) Water and air supplies will be available.

(f) Spent fuel building radiation monitors will have been checked from the control room prior to transferring the spent fuel, in order to assure that the monitors are operable.

(g) A radiation work permit for receipt of the cask will be issued by the Catawba health physics section.

(h) The necessary tools and equipment will have been inventoried and readied.

(i) Sufficient underwater lighting equipment will be available.

(j) The ventilation system of the spent fuel pool will have been checked to verify that it is operating in the filtered mode.

Q. AFTER THESE PRELIMINARY MEASURES HAVE BEEN TAKEN, WHAT ACTIVITY ENSUES?

A. Once the flatbed carrying the cask has been positioned in the designated part of the receiving area in the spent fuel pool building, health physics personnel then survey the transport trailer and personnel barrier for external radiation contamination levels. The flatbed and personnel barrier are inspected by the operations staff for any physical damage. If the tamper seal has been broken or damaged, or indicates an attempt to render it inoperable, the

shift supervisor will be contacted and work will cease. A designated Duke employee in the general office will then be notified, and will decide whether to call the NRC. If any damage to the barrier or the flatbed is evident, the cask vendor representative and the Duke representative must concur on the advisability of continued use of equipment.

Q. WHAT IS THE NEXT STEP?

A. Bolts are removed from the personnel barrier on the flatbed. Upon approval of health physics personnel, the personnel barrier is removed and placed on a nearby concrete pad, or other suitable location. Health physics personnel survey the cask for external radiation contamination levels. All work then stops on the cask until health physics gives approval to continue.

Q. WHAT HAPPENS AFTER APPROVAL IS GIVEN?

A. Once such approval is given, the impact-limiting structures on the top and bottom of the cask are removed with the use of the auxiliary hoist and sling and placed on the flatbed. The cask tie-down bolts are then removed and placed on the flatbed.

Q. ONCE THE IMPACT-LIMITING STRUCTURES AND THE CASK TIE-DOWN BOLTS ARE REMOVED, WHAT HAPPENS?

A. A lifting device (consisting of the 125 ton overhead bridge crane, the short lift adapter, and the yoke) is moved into position above the cask. The cask is raised to a vertical position, with the crane moving as required to keep the hoist cable vertical. When the cask is fully vertical, it is raised, moved approximately 15 feet so that it is positioned over the decontamination pit and lowered into the pit. The decontamination pit is shown in FSAR Figures 9.1.1-1, 9.1.1-2 and 9.1.2-2.

Q. WHAT OCCURS ONCE THE CASK HAS BEEN LOWERED INTO THE DECONTAMINATION PIT?

A. Once the cask is in the decontamination pit, the operating staff then begins preparing the cask for the removal of the fuel assembly. The outer cavity drain valve covers are removed. Next, the outer closure head bolts are removed and, using a sling on the auxiliary hoist, the outer closure head of the cask is removed and placed on the work platform in the decontamination pit. It is inspected for damage. Health physics personnel then survey the top portions of the inner closure head and adjacent cask surfaces, and work halts until they give approval to continue.

Q. WHAT HAPPENS AFTER APPROVAL IS GIVEN?

A. Once approval is given the inner head valve covers are removed, in preparation for flushing the cask. A water supply hose and a vent hose are then attached to the cask's inner head valves and the cask is filled with water. The displaced helium is routed by a hose/filter system to the spent fuel ventilation system. The inner head bolts are then loosened, but not removed. The short inner head guide pins are replaced with long inner head guide pins (for later removal and replacement of the inner head.)

Q. WHAT IS THE NEXT STEP?

A. The lifting device (consisting of the 125 ton overhead bridge crane, the short lift adapter, and the yoke) is then prepared and moved into position for movement of the cask into the cask handling area of the spent fuel pool. After the yoke has been attached to the cask, the cask is lifted out of the decontamination pit, moved about 15 feet into position and lowered into the shallow portion (i.e., the upper platform) of the cask handling area of the spent fuel pool.

While the cask is being lowered onto the upper platform, it is sprayed with demineralized water in order to minimize cask contamination.

Q. IS THE CASK TOTALLY UNDER WATER ONCE IT IS POSITIONED ON THE UPPER PLATFORM?

A. No. Approximately 1½ feet of the cask remains above the water at this point.

Q. WHAT TAKES PLACE ONCE THE CASK IS POSITIONED ON THE UPPER PLATFORM?

A. When the cask rests in a vertical position on the upper platform, the yoke is disengaged. The short lift adapter is then disconnected from the yoke and the 125 ton overhead bridge crane hook, and is replaced with the long lift adapter. This adapter is then connected to the overhead bridge crane hook and the yoke. The inner closure head slings are then attached to the yoke. The yoke is then engaged and the cask is lifted. The inner closure head is then attached to the yoke by means of the inner closure head slings. The cask is moved approximately 8 feet into position and lowered until it rests on the deep end of the cask handling area (i.e., the lower platform).

Q. IS THE CASK TOTALLY UNDER WATER ONCE IT IS POSITIONED ON THE LOWER PLATFORM?

A. Yes.

Q. HOW MUCH WATER IS ABOVE THE TOP OF THE CASK?

A. Approximately 25 feet.

Q. WHAT TAKES PLACE ONCE THE CASK IS POSITIONED ON THE LOWER PLATFORM?

A. With the cask resting on the lower platform, the yoke is disengaged. At this point, the top of the cask is covered with approximately 25 feet of water. Thereafter, the lifting device is raised. As it is raised, the inner closure head slings become taut and the inner head of the cask is lifted. While remaining underwater, the inner head is raised until it clears the upper platform of the cask handling area and is moved away from the cask.

Q. WHAT PROCEDURES ARE UTILIZED TO REMOVE THE ASSEMBLY FROM THE CASK?

A. The appropriate spent fuel handling tool (the exact tool used will depend upon the fuel assembly design) is then lifted by the east manipulator crane auxiliary hoist, is positioned over the fuel assembly, and is attached to the assembly. The assembly is then lifted clear of the cask, and transported through the open weir to the location in the spent pool designated by the reactor engineer. At the point at which the assembly is lifted clear of the cask, it is covered by approximately 10 feet of water above the top of the assembly. Thereafter, the assembly is lowered into position, and the fuel handling tool is disengaged. The cask is then prepared for re-use. This activity completes the transfer of the assembly.

Q. WHAT MEASURES ARE TAKEN DURING FUEL HANDLING ACTIVITIES TO ASSURE THAT RADIATION EXPOSURES ARE MAINTAINED AS LOW AS REASONABLY ACHIEVABLE (ALARA)?

A. Various measures taken are designed to keep employee radiation exposure ALARA. First, the design of the spent fuel cask provides shielding to workers. In addition, health physics personnel perform surveys of the cask for radiation levels and

contamination before unloading begins. Additional health physics coverage is provided throughout the unloading and handling process to assure that proper radiation protection practices are followed and to detect any abnormalities. The venting of the cask through a particulate filter directly to the spent fuel pool ventilation system also minimizes internal radiation hazards. Finally, the inner closure head of the cask is removed under water to keep worker exposure as low as reasonably achievable.

I hereby certify that I have read and understand this document, and believe it to be my true, accurate and complete testimony.

Michael S. Tuckman

Michael S. Tuckman

Sworn to and subscribed before me
this 29th day of September, 1983.

Marguerite J. Jennings (Watson)
Notary Public

Commission Expires August 1, 1984

# RESUME OF MICHAEL STEVEN TUCKMAN

Holds a Bachelor Degree in Electrical Engineering from Georgia Institute of Technology - 1965

Attended Navy Nuclear Propulsion Training Program (Officer)

Graduate School at University of Tennessee in Electrical Engineering

NRC Certified Senior Reactor Operator

Registered Professional Engineer in North Carolina and South Carolina

## Work Experience

6 years Navy nuclear experience

3 years Electrical Development Engineer at Union Carbide Corporation, Oak Ridge, Tennessee

3½ years Duke Power Company, Oconee Licensing Engineer

5½ years Duke Power Company, Superintendent of Technical Services, Catawba Nuclear Station

NUCLEAR REGULATORY COMMISSION

Docket No. 50-413 OL
In the matter of Catawba
Staff
Applicant ✓ IDENTIFIED ✓
Intervenor RECEIVED ✓
Cont'g Org.
Contractor REJECTED
Other
DATE 12/8/83
Witness
Reporter Mary Simons