UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
DUKE POWER COMPANY	)	
	)	Docket No. 70-2623
(Amendment to Material License SNM-1773 for Oconee Nuclear Station Spent Fuel Transportation and Storage at McGuire Nuclear Station)	)	

TESTIMONY OF LIONEL LEWIS

My name is Lionel Lewis. I am the System Health Physicist for Duke Power Company. My job in the General Office in Charlotte, North Carolina is to establish and direct the Radiation Safety program for all of Duke's nuclear power stations.

I received a BA degree from the University of Vermont and an MS degree in Biophysics from the University of Rochester, after completing an Atomic Energy Commission Fellowship in Radiological Physics.

I have over 25 years experience as a Health Physicist in the nuclear industry, including Brookhaven National Laboratory, the Martin Company, and Combustion Engineering where I also served at the U. S. Navy S1C Submarine Prototype Reactor. Before joining Duke Power Company, I was Health Physics and Safety Coordinator at the Carolinas-Virginia Tube Reactor (CVTR)

in Parr, South Carolina which was the first nuclear power plant in the Southeast. I also served as Plant Superintendent at the CVTR for the first year of power operation.

I have served on Scientific Committee 46 of the National Council on Radiation Protection (NCRP), and am presently a member of the American Nuclear Society, the Health Physics Society, the American Industrial Hygiene Association, the American Public Health Association, and the EEI-Health Physics Task Force.

I am the author of numerous technical papers over the years; one of which was included in the First Geneva Conference on the Peaceful Uses of Atomic Energy and have more recently served on a technical committee that prepared a safety guide on radiological protection at nuclear power plants for the International Atomic Energy Agency in Vienna, Austria.

I am Certified in Health Physics by the American Board of Health Physics.

This testimony addresses the various contentions concerning the radiation dose aspects of shipping spent fuel and the alternatives to shipping. It includes a comparison of dose to occupational workers and the public for the proposed actions and for the alternatives. This testimony also addresses emergency response plans.

I have reviewed and estimated the dose aspects involved in the proposed action and the alternatives. The following table, based on the shipment of 400 spent fuel assemblies, summarizes my conclusions in this regard.

Viable Alternatives	Total Dose (person-rem)	Dose Differences (person-rem)
1. Modification of Existing ONS Spent Fuel Pool, Unit 1 - 2	84	36
2. Installation of Poison Racks, Units 1, 2 and 3	107	59
3. Construction of Separate Fuel Storage Facility at Oconee	48	0
4. Construction of Separate Fuel Storage Facility away from Oconee but not at McGuire	72	24
5. Shipping/Storage at McGuire	56	8

The economic value of a person-rem for exposure of the public can be as much as $1,000 and we at Duke Power Company have generally been using a value of $1,500 per person-rem for occupational exposure considerations. Reviewing the dose table and considering the economic cost of the various alternatives shown (such as approximately 4 million dollars for alternative 1; and approximately 7 million dollars for alternative 2; and about 44 million dollars (1976 dollars) for alternatives 3 and 4; versus about $984,000 for alternative 5) it can be seen that even assigning a value of as much as a million dollars per person-rem for the differences in radiation exposure received will still make

shipping the spent fuel to McGuire and storing it there, the best alternative, despite the approximately 8 person-rem higher dose over the lower dose alternative, that of a Separate Fuel Storage Facility at Oconee.

The specific transportation doses to the public which are included in the total dose in the above table are as follows:

For alternative 4 - 1.13 person-rem; avg. dose 0.003 mrem

For alternative 5 - 0.14 person-rem; avg. dose 0.003 mrem

The doses to the public can be put into perspective by comparing them to the annual average dose that a person (or the people along the route) receives from natural background radiation in North and South Carolina, which is approximately 140 mrem per year. Therefore, the average dose that members of the public living along the route might receive from 400 shipments of spent fuel to McGuire is only about 1/42,000th of the dose they receive annually from natural background radiation. Correspondingly, the highest individual dose for 400 shipments is 0.01 mrem which is only about 1/10,000th of the natural background dose to that individual. The transportation dose is, in my opinion, as low as reasonably achievable, ALARA.

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The highest total dose that any given person might receive such as in a car or a school bus closely following a spent fuel shipment along the highway for 10 hours is 0.4 mrem. The corresponding dose to a person in a car or bus remaining immediately alongside the spent fuel shipment at a traffic jam or accident scene for as much as 10 hours would be at most only 30 mrem.

If the truck carrying a loaded spent fuel cask was involved in a traffic accident such that the truck overturned, persons involved in the tasks of removing the cask and transferring it to another truck, if that were necessary, might receive doses as high as 400 mrem (assuming 40 mrem per hour maximum dose rate on surface of cask for as much as 10 hours). Doses received for this job would correspond to occupational exposure where the dose limits routinely permissible are 5,000 mrem per year and 1,250 mrem per quarter. 10 C.F.R. 20.101(a). Occupational doses up to 12,000 mrem per year and 3,000 mrem per quarter are also permitted by present NRC regulations under certain conditions. 10 C.F.R. 20.101(b).

The States of North and South Carolina have emergency response capabilities for radiological accident situations as do local civil preparedness agencies. The State of North Carolina has an emergency radiological response plan

which involves the Radiation Protection Section of the Department of Human Resources. Duke Power Company, System Health Physics personnel are local members of the North Carolina Emergency Response Team. In the past, Duke personnel have responded to two incidents involving radioactive materials on behalf of the State of North Carolina.

The Charlotte/Mecklenburg Office of Civil Preparedness has also developed a response plan for accidents involving radioactive materials which utilizes many city and county agencies.

As part of the State plans, Highway Patrol personnel in both states are trained in the proper procedures to follow in a highway accident involving radioactive materials. They are usually among the first to arrive at an accident scene and have demonstrated their ability to protect the public in actual accident situations where radioactive materials were involved. Duke Power Company will also make Health Physics personnel from Oconee and McGuire Nuclear Stations and from the General Office staff available to help local authorities in any such accident situation involving the spent fuel shipments.

There have been eighty-one incidents involving the transport of radioactive materials in North Carolina. Eleven of these incidents have occurred since 1976. The only incident involving transportation in the Charlotte area occurred April 24, 1975

in Huntersville, North Carolina. None of these incidents involved spent fuel or posed a threat to the public health or safety since source integrity was maintained. The State response time for these emergencies depends on their evaluation of the information available from the Highway Patrol. Generally, a two person survey team is mobilized within 30 minutes during working hours and within one hour at other times. The team determines if a hazard to the public health or safety exists and takes action to correct any existing hazards. The duration of this corrective action may be a few minutes to several days as occurred with a train derailment near Rockingham, North Carolina in 1977.

Dated: June 4, 1979

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