UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	Docket Nos. 50-237
COMMONWEALTH EDISON COMPANY	)	50-249
	)	(Spent Fuel Pool Modification)
(Dresden Station, Units 2 and 3)	)	

SUPPLEMENTAL TESTIMONY OF VALENTINE MALAFEEW
ON CONTENTION 1

I am employed as a Nuclear Engineer in the Effluent Treatment Systems Branch, Division of Systems Integration, Office of Nuclear Reactor Regulation, United States Nuclear Regulatory Commission. A statement of my professional qualifications is attached to this testimony.

Contention 1 states:

"The application gives no assurance that the radioactive waste treatment system for the spent fuel pools is adequate for the proposed increase in spent fuel storage capacity."

The spent fuel pool radioactive waste treatment system (or cleanup system) consists of a precoat-type filter and a mixed-bed demineralizer, both in series with the spent fuel pool cooling train. The cleanup system is a full-flow system designed to provide enough filtering capacity to filter the spent fuel pool volume once every 12 hours. The choice of components, namely a filter and demineralizer, is very common for this application. The filter is used to remove suspended impurities (particulates) in the process stream and the demineralizer removes predominantly dissolved impurities.

The proposed spent fuel pool (SFP) expansion is an expansion in terms of spent fuel storage capacity and doesn't increase the volume of water in the pool. Nor is there any reason to believe that the chemical and radionuclide composition of the spent fuel pool water will change as a result of the proposed modification. Therefore, the capability of the SFP cleanup system to perform its function shouldn't be affected by the modification.

While the radionuclide composition is not expected to change, the overall quantity of radionuclides may increase slightly. Introduction of radioactive impurities into the SFP water is a function of: 1) mixing of SFP water with the reactor coolant system water during refueling operations, and 2) stored spent fuel leakage. The first consideration is not a factor since the proposed modification will not affect the frequency of refueling, so this source of impurities remains the same as it is presently.

With regard to stored spent fuel leakage, the Staff, in their June 6, 1980 Environmental Impact Appraisal, stated the following:

> Experience indicates that there is little radionuclide leakage from spent fuel stored in pools after the fuel has cooled for several months. The predominance of radionuclides in the spent fuel pool water appear to be radionuclides that were present in the reactor coolant system prior to refueling (which becomes mixed with water in the spent fuel pool during refueling operations) or crud dislodged from the surface of the spent fuel during transfer from the reactor core to the SFP. During and after refueling, the spent fuel pool purification system reduces the radioactivity concentrations considerably. It is theorized that most failed fuel contains small, pinhole-like perforations in the fuel cladding at the reactor operating condition of approximately 800 F. A few weeks after refueling, the spent fuel cools in the spent fuel pool so that the fuel clad temperature is relatively cool, approximately 180 F. This substantial temperature reduction should reduce the rate of release of fission products from the fuel pellets and decrease the gas pressure in the gap between pellets and clad, thereby tending to retain the fission products within the gap. In addition, most of the gaseous fission products have short half-lives and decay to insignificant levels within a few months. Based on the operational reports submitted by the

> licensees or discussions with the operators, there has not been any significant leakage of fission products from spent light water reactor fuel stored in the Morris Operation (MO) (formerly Midwest Recovery Plant) at Morris, Illinois, or at Nuclear Fuel Services' (NFS) storage pool at West Valley, New York. Spent fuel has been stored in these two pools which, while it was in a reactor, was determined to have significant leakage and was therefore removed from the core. After storage in the onsite spent fuel pool, this fuel was later shipped to either MO or NFS for extended storage. Although the fuel exhibited significant leakage at reactor operating conditions, there was no significant leakage from this fuel in the off site storage facility.

Therefore, it is my conclusion that any increase in radionuclide concentrations due to this SFP expansion will be relatively minor and can be adequately processed by the existing SFP cleanup system. The only potential impact I can forsee is possibly some increased depletion of the demineralizer bed and a resultant increase in demineralizer resin changeout. This may add slightly to solid radwaste generation and has also been addressed by the Staff in the Environmental Impact Appraisal as follows:

> While we believe that there should not be an increase in solid radwaste due to the modification, as a conservative estimate we have assumed that the amount of solid radwaste may be increased by 360 cubic feet of resin a year from the demineralizer (two additional resin beds/year for each unit) from each unit. The annual average amount of solid waste shipped from Dresden Station Units 1, 2 and 3 during 1973 to 1977 is about 140,000 cubic feet per year. Based on this, we estimate the annual average amount of solid waste from Dresden 2/3 is about 93,000 cubic feet per year. If the storage of additional spent fuel does increase the amount of solid waste from the SFP purification systems by about 720 cubic feet per year, the increase in total waste volume shipped from Dresden 2/3 would be less than 0.8% and would not have any significant environmental impact.

VALENTINE MALAFEEW

Professional Qualifications

Division of Systems Integration
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission

My name is Valentine Malafeew. I am currently employed by the U.S. Nuclear Regulatory Commission as a Nuclear Engineer, Effluent Treatment Systems Branch, Division of Systems Integration, Office of Nuclear Reactor Regulation. As such, my duties include participation in safety and environmental reviews associated with licensing actions involving the design and operation of radioactive waste treatment systems of nuclear reactor power plants.

I have attended General Motors Institute and the University of Maryland, and am continuing my education at the George Washington University. In 1966 I enlisted in the U.S. Navy and in the course of the next eight years I spent three years in nuclear engineering and electronics schools, and qualified as a Reactor Operator and Reactor Technician on three naval nuclear power plants. My duties also included lecturing and training operators in the areas of reactor operation and nuclear instrumentation.

In 1974, I joined Bechtel Power Corporation of Gaithersburg, Maryland, as a Nuclear Engineer in their Nuclear Staff Radwaste Group. In this capacity I was involved in the review, design, evaluation and selection of systems and components used for treatment of radioactive wastes. I later transferred to the Mechanical Engineering Department and was promoted to Senior Mechanical Engineer. I was subsequently assigned to a number of in-house nuclear projects where I was directly responsible for the design of the liquid, gaseous, and solid radioactive waste treatment systems for those projects.

I have held my position with the Commission since January 1980.