UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

| | | |
|---|---|---|
| In the Matter of | ) | |
| | ) | |
| DETROIT EDISON COMPANY | ) | Docket No. 50-341 |
| | ) | |
| (Enrico Fermi Atomic Power Plant, Unit 2) | ) | |

AFFIDAVIT OF W. WAYNE MEINKE
REGARDING CONTENTION 5

I, W. Wayne Meinke, being duly sworn do depose and state as follows:

1. I am employed by the U. S. Nuclear Regulatory Commission in the Office of Nuclear Reactor Regulation, Division of Systems Integration, Radiological Assessment Branch (RAB). My professional qualifications are attached to this affidavit.

2. I am a technical reviewer for the Enrico Fermi Atomic Power Plant, Unit 2 (Fermi-2) and am responsible for the radiological assessment of monitoring activities outside of the site boundaries of the Fermi-2 facility. I wrote Sections 4.5, 5.2.5, 5.3.4 and Appendices B & C of the Final Environmental Statement for Fermi-2 which I hereby adopt as my testimony.

3. The purpose of my affidavit is to address the issues raised by the Intervenor in Contention 5, which I have read in its entirety.

4. Contention 5 reads as follows:

The design of the radiation monitoring system is insufficient and incomplete as specified below to adequately monitor radiation releases (a) to demonstrate, during normal operation, conformance with Part 20 and Appendix I to 10 CFR Part 50 and (b) to implement the offsite protective actions following accidents set forth in the Applicant's emergency plan. The deficiencies of the radiation monitoring system are:

(a) There is no continuous monitoring system on the lake (for air and water) that can be read remotely; and (b) There is no continuous monitoring system at the site boundary that can be read remotely.

5. Title 10 of the Code of Federal Regulations, Parts 20 and 50 including Appendix I requires that radiological environmental monitoring programs be established to provide data on measurable levels of radiation and radioactive materials in the site environs. The results of the radiological environmental monitoring are intended to supplement the results of the radiological effluent monitoring by verifying that the measurable concentrations of radioactive materials and levels of radiation are not higher than expected on the basis of the effluent measurements and modeling of the environmental exposure pathways.

6. The primary monitoring of gaseous and liquid radioactive effluents from the vents and discharge points of the plant during normal operations is performed by the effluent monitors installed in the plant to measure directly the radioactive content of the effluent streams.

7. To provide a back up during normal operations to the effluent monitors inside the plant, the Branch Technical Position (BTP) of the NRC Radiological Assessment Branch sets forth guidance for an acceptable program for monitoring radioactive airborne and waterborne emissions outside of the plant boundaries. The program provides for continous monitoring of three types of samples: airborne noble gases, airborne radioiodine and particulates, and waterborne contaminants.

8. In the program defined in the BTP, direct radiation from radioactive noble gases is monitored continuously at a number of stations either by integrating thermoluminescent dosimeters (TLDs) or by continuously recording dose rate meters. Contamination from radioiodine and particulates is sampled continuously by sample collection and measurement made weekly. Samplers for surface water and drinking water run continuously, taking samples daily and combining them into a composite sample that is measured monthly.

9. The TLDs accumulate (or integrate) the gamma dose at a monitoring station. This cumulative dose is then "read" or measured quarterly. Similarly, the sample cannisters containing radioiodine and particulates are analyzed weekly. The composite water samples are analyzed radiochemically for contaminants on a monthly or quarterly basis.

10. Section 5 of the Fermi-2 Final Environmental Statement (FES) describes the offsite radiological monitoring system for the plant. Tables 5.1 and 5.1a of the FES show that the Fermi-2 program follows the guidance of the BTP, and that monitoring will be performed at both the site boundary and Lake Erie. The system of 37 TLD monitoring stations currently operated by Detroit Edison Company (DECo) for the preoperational monitoring program for Fermi-2 satisfies the provisions of the NRC guidance for compliance with the Commission's requirements set forth in the BTP for continuous airborne monitoring of noble gases. The continuous airborne particulate sampling stations currently operated by DECo for their preoperational monitoring program satisfy the guidance of the BTP for radioiodine and particulate monitoring. Similarly, the surface water and drinking water sampling stations and procedures currently operated by DECo for their preoperational monitoring program satisfy the guidance of the BTP for continuous waterborne sample monitoring.

11. This peroperational monitoring system along with several modifications to be initiated prior to fuel loading is sufficient to satisfy the BTP provisions for offsite monitoring during normal operations in the environs of a nuclear power plant. No significant additional benefit would be achieved by a system of continuous air or water monitors that could be read remotely to monitor airborne or waterborne radioactive emissions. The small amounts of airborne and waterborne effluents that are released through vents and discharge points during normal operation are greatly dispersed

and diluted by the time they reach unrestricted areas. The levels of such airborne and waterborne emissions in the environs are so low that they would be indistinguishable from the normal background radiation recorded by such a continuous monitoring system.

12. Currently the 37 TLDs provided by DECo and an equal number of TLDs provided by the State and NRC serve as integrating dose monitors that can be used to determine radiation doses in the event of an accidental radionuclide release. Although a proposal to require real-time monitors that can be read remotely is being considered by the NRC staff, the capability of such a system to provide useful, timely information to implement the offsite protective actions following accidents has not been established. Such raw monitor readings must be corrected for background and non-plant initiated radiations and processed through complex computer models using concurrent meteorological conditions in order to provide accurate and intelligible information to the control room. This processed information is then used for protective action decisions. The NRC Staff is presently managing a consultant contract that is studying such a system. After receipt of the results of the contract effort, the Staff will determine whether or not such a system will serve a useful purpose in emergency situations and will then determine whether or not to require such a system for every operating reactor site.

13. The NRC Staff has reviewed in detail the final operational monitoring program proposed by DECo and finds that this program follows the

guidance provided for "An Acceptable Radiological Enivronmental Monitoring Program" in the BTP of the NRC Radiological Assessment Branch. The specifics of the Fermi-2 monitoring program will be incorporated into the Fermi-2 operating license Radiological Technical Specifications.

14. In summary, it is my opinion that the continuous monitoring system at Fermi-2 is sufficient and complete to adequately monitor radiation releases during normal conditions and to provide some information concerning accident conditions. This system complies with NRC requirements in 10 C.F.R. Parts 20 and 50 and the guidance provided by the Staff Branch Technical Position. It is also my opinion that installation of monitors which can be read remotely would be unjustified until such time as a significant benefit from such monitors is established.

W. Wayne Meinke

W. Wayne Meinke

Subscribed and sworn to before me
this 8th day of September, 1981.

Linda M. Ayler
Notary Public

My Commission expires: July 1, 1982

PROFESSIONAL QUALIFICATIONS
W. WAYNE MEINKE
RADIOLOGICAL ASSESSMENT BRANCH
DIVISION OF SYSTEMS INTEGRATION
OFFICE OF NUCLEAR REACTOR REGULATION
U.S. NUCLEAR REGULATORY COMMISSION

I joined the U.S. Nuclear Regulatory Commission in December 1980 after a career of 30 years both as scientist and manager in the broad fields of nuclear energy, analytical chemistry, trace contaminants, and the environment. I am presently responsible for the assessment of the radiological effects of nuclear plant effluents beyond the boundaries of the plant site. This entails the review and evaluation of environmental reports and preparation of environmental statements, the calculation of radiation doses to members of the public resulting from the various exposure pathways of radioactive effluents, and the evaluation of environmental monitoring programs of nuclear power reactors.

My background includes an A.B. in chemistry from Oberlin College in Ohio in 1947 after three years in the U.S. Navy, and a Ph.D. in Nuclear Chemistry with Professor Glenn T. Seaborg from the University of California at Berkeley in 1950. From 1950 to 1963 I taught Analytical Chemistry and Radiochemical Techniques at the University of Michigan in Ann Arbor, progressing from Instructor to full Professor. I established the Radiation Safety Program at the University of Michigan and chaired the University's Radiation Policy Committee for 10 years. I helped design radioisotope facilities for the University of Michigan Memorial Phoenix Project and Research Reactor. My students and I used these facilities and the reactor for research in radiochemical trace analysis. Within the U.S. I served as consultant in radioisotope techniques and laboratory design to 15 industrial companies and five (5) government laboratories. Outsite the U.S. I was a consultant for the International Atomic Energy Agency and the U.S. A.I.D. program and made study trips on research reactor utilization to 11 foreign countries. I chaired the Subcommittee on Radiochemistry of the Natural Research Council and edited its series of 66 monographs on the Radiochemistry of the Elements.

In 1963 I joined the National Bureau of Standards in Washington, D.C. as Chief of the Analytical Chemistry Division where I directed the activities of 120 technical personnel in research and application in 57 different areas of chemical and physical measurements, with emphasis on measurement in trace contaminant analysis. I worked with the Division's nine semi-autonomous section leaders to reorganize Division programs to place special emphasis on accuracy of measurement in areas of national need as diverse as air and water pollution, low level radiation and nuclear accountability, clinical chemistry, oceanography and solid state physics. Concurrent with the position of Chief, Analytical Chemistry Division, as Chief of NBS Office of Standard Reference Materials, I reorganized and managed within NBS the non-profit business in Standard Reference Materials (SRMs) with a catalog listing more than 600 different

kinds of certified materials and sales of 40,000 units per year. NBS SRMs are used as a primary calibration of measurement systems (e.g. effluent and environmental monitors of nuclear power plants, and mass spectrometers for nuclear accountability analyses). I redirected the SRM program from primary emphasis on steels and minerals to new areas of national need such as clinical chemistry, environmental analyses and nuclear accountability.

In 1973 I left government service to join KMS Fusion, Inc. in Ann Arbor, Michigan to help accelerate application of fusion energy to the national energy needs through my special experience in applying nuclear radiation. I worked with chemists and engineers to develop processes to convert laser fusion energy into chemical energy of portable fuels to replace natural gas, oil and gasoline. Later I provided in-depth staff backup in science, technology, and administration to the Chairman of KMS Fusion and developed for the company an overview of problems and business potential of the entire energy field with emphasis on thermonuclear fusion.

I have published more than 150 scientific papers, edited 66 scientific monographs and 2 books, and presented more than 250 scientific lectures. I have received six (6) national and international awards, including the American Nuclear Society Special Award for Industrial Applications of Radiation Techniques and the First George Hevesy Medal for Radioanalytical Chemistry.

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CERTIFICATE OF SERVICE

I hereby certify that copies of "NRC STAFF MOTION FOR SUMMARY DISPOSITION OF CONTENTION 5" in the above-captioned proceeding have been served on the following by deposit in the United States mail, first class, or, as indicated by an asterisk, through deposit in the Nuclear Regulatory Commission's internal mail system, this 16th day of November, 1981:

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