UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
THE CLEVELAND ELECTRIC ILLUMINATING COMPANY	)	Docket Nos. 50-440 50-441
	)	
(Perry Nuclear Power Plant, Units 1 and 2)	)	

AFFIDAVIT OF
RICHARD R. BOWERS
ON CONTENTION B

County of Lake)
) ss:
State of Ohio)

Richard R. Bowers, having duly sworn, deposes and says:

1. I am presently Corporate Health Physicist, The Cleveland Electric Illuminating Company (CEI). My business address is 10 Center Road, Perry, Ohio 44081. In my position, I have technical overview responsibilities for both the operational health physics program and the engineering health physics program. In this position I provide consulting assistance to these two groups as well as perform reviews of their programs. A current statement of my professional and technical qualifications is attached hereto. I have personal knowledge of the matters stated herein and believe them to be true and correct. I make this affidavit in support of Applicants' Motion for Summary Disposition of Contention B.

2. Contention B states in part that a low power or no power operation at Perry during extreme conditions of inclement

weather has not been included in the emergency plans. The logic implicit in this part of the contention appears to be that (1) evacuation is the only appropriate protective action in the event of an accident at the Perry plant with significant off-site consequences; (2) evacuation would be impossible during an "immobilizing period of inclement weather" (Sunflower Alliance's August 20, 1984 Particularized Objections, p. 3); therefore (3) such an accident must be avoided by requiring low power or no power during such weather conditions. My affidavit addresses the first of these arguments. The Affidavit of Gary Winters on Contention B addresses the second issue and the Affidavit of Kevin Holtzclaw on Contention B the third.

3. Initially, it should be pointed out that the kind of blizzard conditions postulated by the contention are typically associated with high winds. Such high winds would certainly be characterized as Pasquill-type A or B meteorological conditions, the most favorable conditions for rapid dispersion of a radioactive plume. Rapid dispersion would greatly reduce any doses to the public. The dose reduction would range anywhere from factors of 45 to several hundred, as compared to doses calculated using standard NRC design basis licensing methodology.

4. As for the argument implicit in the contention on evacuation as the only protective action, this position is inconsistent with NRC regulations, NRC/FEMA regulatory guidance, and with studies that have been done on protective

action measures. NRC regulations talk about a "range of protective actions," not only of evacuation. 10 C.F.R. § 50.47(b)(10). NRC/FEMA guidance also recognizes a range of protective actions, NUREG-0654, p. 59, and specifically identifies sheltering as an appropriate off-site protective action, NUREG-0654, p. 9, 20, 1-12, 1-16.

5. Sheltering is an effective protection method. EPA studies conclude that sheltering is recommended in at least two types of situations:

> 1. If the projected dose exceeds the [Protective Action Guide] by more than a few-fold, and ... timely evacuation is not feasible (i.e., the time available before cloud arrival is short compared with the required mobilization, warning, and transit time for evacuation), then sheltering is recommended.
>
> 2. If the projected dose does not exceed the PAG by more than a few-fold, then sheltering will probably be adequate and economical.

EPA 520/1-78-001, Protective Action Evaluation -- Evacuation and Sheltering as Protective Actions Against Nuclear Accidents Involving Gaseous Releases, Pt. II, 53.

6. Studies[1/] show that the average home will reduce whole body dose by a factor of 2.5 to 3. The degree of whole body dose protection afforded by homes as a function of cloud exposure time tends to remain relatively constant for cloud

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1/ PSR Report 515, Pacific-Sierra Research Corp., The Effectiveness of Sheltering as a Protective Measure Against Nuclear Accidents Involving Gaseous Releases, p. 85 ff.

exposure periods up to several hours because the main source of whole body dose will be gamma radiation from the cloud through the structure. The protection that homes offer from exposure to particulates and iodines will tend to decrease with time (if the cloud is still present), as the cloud concentrations infiltrate into the home.

7. For radioiodines and particulates, the typical home will provide a protection factor from 4 to 10 for representative air change rates and a factor of from 20 to 70 for low air change rates for at least three hours. In the winter time when people have their houses reasonably tightly closed, both the protection factor for particulates and iodines and the length of time sheltering will be effective will be higher because infiltration will be reduced. When houses are tight, as is common in the northern part of the United States, such as the area around Perry, particulates and iodines are partially filtered as they pass through the relatively small cracks which allow outside air to enter the home.

8. Respiratory protection is another protective action which could further reduce doses for sheltered individuals from inhaled particulates during extremely adverse weather that made evacuation unadvisable. This would involve covering the nose and mouth with such common items as towels, handkerchiefs or toilet paper. Such simple measures can reduce doses from such a release by a factor of about 10. EPA 520/1-78-001, Pt. II at 55.

9. For these reasons, sheltering and respiratory protection are protective actions which can provide substantial dose savings in the event of a radiological release.

Richard R Bowers
Richard R. Bowers

Subscribed and sworn before me this 4 day of February, 1985.

Bethany M. Reese
Notary Public

My Commission Expires:

BETHANY J. REESE
Notary Public - STATE OF OHIO
My Commission expires 3/11/88
(Recorded in Lake County)
Now known as
Bethany M. Reese

Name: Richard R. Bowers, Corporate Health Physicist

Formal Education:

Bachelor of Science in chemistry, The Pennsylvania State University, 1955

Experience:

1984-Present: Cleveland Electric Illuminating Company

As Corporate Health Physicist, responsible for overview of operational, engineering, and environmental radiological control programs. Responsible to provide policy, criteria, standards, measurement methodologies, and evaluations for radiological and radiological environmental protection programs and practices.

1970-1984: NUS Corporation

As Manager of the Health Physics Services Department, responsible for management and technical direction/review of radiation protection consulting projects for utility clients. Projects included development of operational radiation protection programs, health physics procedures, radiological emergency plans, health physics training, and decommissioning programs as well as plant/system ALARA reviews, radiation protection equipment evaluations, and reviews of health physics programs.

1963-1970: Niagara Mohawk Power Corporation

As Health Physics and Chemistry Supervisor, responsible for setup and management of the radiation protection program at Nine Mile Point 1. Trained and supervised technicians, administered environmental monitoring program, developed radiological emergency plan, wrote health physics and chemistry procedures, and purchased and set up health physics/chemistry equipment.

As Radiological Engineer, assisted in the design of Nine Mile Point 1. Assisted with general plant layout and designed plant shielding. Designed health physics and chemistry facilities. Designed installation details of process and effluent monitors.

1955-1963: E. I. duPont de Nemours and Co.

As Health Physics Engineer at the Savannah River Plant, supervised technicians in separations plants, fuel fabrication facilities, and production reactors.

Professional Memberships:

Health Physics Society

Certification:

Comprehensive Health Physics-American Board of Health Physics-1963
Power Reactor Health Physics-American Board of Health Physics-1980