UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

APPLICANTS' DIRECT TESTIMONY OF
RICHARD R. BOWERS
ON ISSUE NO. 1 - CONTENTION M

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.

2. Contention M states that Independent Radiation Data Monitoring Systems should be installed within the 10-mile Emergency Planning Zone (EPZ). Sunflower's argument is that each of the three counties within the plume exposure pathway EPZ should have fixed radiation monitors, meteorological equipment and telemetering equipment. Sunflower Alliance's Particularized Objections to Proposed Emergency Plans in Support of Issue No. 1, dated August 20, 1984, p. 17-18.

3. There is no regulatory requirement or guidance that each jurisdiction within the plume exposure pathway EPZ have independent radiation monitoring systems. NUREG-0654, Criterion H.7 (p. 54) says that

> [e]ach organization, where appropriate, shall provide for off-site radiological monitoring equipment in the vicinity of the nuclear facility.

(Emphasis added.) NUREG-0654, Criterion I.7 (p. 57) states that

> [e]ach organization shall describe the capability and resources for field monitoring within the plume exposure pathway Emergency Planning Zone which are an intrinsic part of the concept of operation of the facility.

(Emphasis added.) This criterion does not require that each organization have its own capability, but rather that each organization describe the monitoring capability on which it will rely. Similarly, NUREG-0654 Criteria I.9 and 11, which recommend capability for airborne iodine measurements and airborne plume tracking, are only responsibilities of the State (I.9 and 11), and the licensee (I.9). These are not identified as responsibilities of the local jurisdictions.

4. There also is no regulatory requirement or guidance which states that any independent off-site monitoring which may be provided must be a fixed system. Indeed, guidance from the Federal Emergency Management Agency indicates that fixed monitoring systems are not recommended. As stated in FEMA-REP-2, Guidance on Off-Site Emergency Radiation Measurement Systems (September 1980), p. 4-15:

> The Task Force considered the concept of making field measurements of the distribution of radionuclide concentrations in the plume with a system of fixed monitoring locations as a method of estimating the dispersal of the plume and for projecting exposure patterns. This concept was rejected because of the large number of sophisticated detectors and the telemetry necessary for such a system. At least 150 detector locations would be required out to a distance of approximately 8 miles from the site for good spatial distribution. Both radioiodine and direct gamma measurements would have to be made and telemetered to the EOC in order to get the necessary information for making a dose projection. The maintenance, repair and calibration of such systems would be very costly and hard to justify in view of the accident probability.

For Perry, approximately 103 fixed monitoring locations would be needed to be sure that the plume would be tracked. The cost for installation and operation of such a system would be substantial.

5. A more effective method for evaluating accidental releases is to use mobile survey teams. These teams can move to the area where meteorological conditions (both wind speed and direction) indicate the plume is located, and make measurements to define the precise plume location and the radiation levels associated with it. The mobile survey teams can use instruments to measure the whole body dose directly, and can take special air samples to evaluate radioiodine concentrations. As the plume moves, the survey teams can follow it. Data from these actual field measurements are fed back into the dose projection models to make the projections more accurate.

6. NUREG-0654, Criterion I.8 (p. 58), which discusses assessment of radiological hazards, includes the statement that

> [t]his shall include activation, notification means, field team composition, transportation, communication, monitoring equipment and estimated deployment times,

thus indicating the use of mobile monitoring teams to perform the assessment. FEMA-REP-2, p. 4-17, also states:

> Portable instrumentation is expected to be the most cost-effective category of instrumentation for measuring exposure rate patterns from an airborne release from a nuclear incident. The plume from such a release may cover a large area and its shape may be continuously changing with the prevailing meteorology. Therefore, a flexible system using a limited number of measuring devices is much more cost effective than the large number of fixed detectors with their associated telemetry required to obtain the same information.

Thus, the use of mobile monitoring teams provides the most effective, as well as efficient, method to track and measure offsite doses during an accidental release.

7. The PNPP Emergency Plan calls for two radiation monitoring teams to be dispatched at an Alert, and a third team to be dispatched at a Site Area Emergency, to monitor the actual conditions downwind of the plant. Additional teams may be organized as the situation warrants. PNPP Plan (Rev. 4), § 5.2.2.4. All these teams are staffed by Plant personnnel.

8. In addition to the mobile survey teams used by CEI, the State of Ohio also will field mobile survey teams in the event of a radiological emergency at Perry. These State teams provide independent monitoring assessments. The State's

monitoring teams are described in Applicants' Direct Testimony of Kenneth B. Cole on Issue No. 1 - Contention M.

9. In addition to the CEI and State monitoring teams, Lake County will maintain two fully trained and equipped radiological monitoring teams for response to a radiation emergency at Perry. Each team will consist of two Lake County Health District employees who will be trained to perform both radiation and airborne activity surveys. For each team, two additional trained personnel will be available as backups.

10. The Lake County monitoring teams will be activated at the Alert emergency stage. Team members will report to the County Health District offices in Painesville, where they will pick up the survey kits and vehicles designated for their teams. Each kit will include air sampling equipment, radiation survey equipment, direct reading dosimeters, thermoluminescent dosimeters (TLDs), county maps, survey procedures, note paper and pens, and a portable radio which operates on the County DSA frequency. It is estimated that the teams can be dispatched and in place within 1.0 to 1.5 hours during normal working hours, and within 1.5 to 2.0 hours during off-work hours, after declaration of an Alert. The teams will communicate with the County EOC, and will perform surveys as directed by the County Radiological Officer in the EOC.

11. The CEI teams will provide field monitoring capabilities prior to the deployment of the State and County teams. Depending on the time of day and site staffing, teams

can be dispatched and in place within 30 to 45 minutes after declaration of an Alert.

12. In addition to the State of Ohio and Lake County mobile teams, there currently are two fixed independent radiation monitoring systems in place around Perry. The State of Ohio and the NRC have 27 and 25 TLD monitors, respectively, arranged in rings within the plume exposure pathway EPZ. The TLD monitors measure the doses from accidents, as well as any doses from normal plant operation, if any measurable doses are produced. These fixed systems are in addition to the 25 TLD monitors placed and maintained by CEI throughout the EPZ. Although these devices cannot give instantaneous indications, they would be valuable to measure the doses during an accident. They could be (and typically are) changed during an accident to evaluate doses during various stages of an accident.

13. In summary, there is no regulatory requirement or guidance for fixed, off-site independent radiation monitoring systems. Fixed systems would be much less desirable than the flexible, mobile systems available at Perry.