

The Need for a Critical Review of the Airborne Particle Monitoring Systems at U.S. Nuclear Power Plants

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ABSTRACT

In view of the rapid advances that have been made in all fields of science, it is surprising that most nuclear power plants are still using antiquated systems for stack and ambient monitoring that have not been performance tested.

The basic problem is that the corporate executives who are responsible for radiation safety think that the existing air monitoring systems are adequate, but do not have the specialized knowledge of aerosol behavior and performance testing to know whether these systems will work as that are supposed to in the event of a radioactive discharge. This is also true of the manufacturers of these systems who, for the most part, are not professional engineers and scientists, and have never had to meet any Nuclear Regulatory Commission performance standards.

One answer to this problem is for American Nuclear Insurers (ANI), which provides nuclear liability insurance coverage to all U.S. operating commercial nuclear power plants, to provide financial incentive through reduced insurance rates to those plants that have had their airborne particulate monitoring systems tested and certified by qualified professionals. Another answer is for the Nuclear Regulatory Commission to realize that a critical review of these systems is long overdue and to order that it be done.

There are three steps in making a critical review:

- (1) An on-site survey of the existing systems, including the facilities needed for testing them;
- (2) Performance testing with particles that simulate releases of airborne radioactivity; and
- (3) Recommendations for upgrading deficient systems and components. With the help of station personnel step (1) should require no more than one man-week of consultant time, and will provide essential information for estimating the costs of steps (2) and (3).

Consultants who are hired for this work should have the following qualifications:

- (1) Training in aerosol behavior, turbulent flow, boundary layer theory, flow measurement, flow control, health physics, and nuclear power plant layout;
- (2) The ability to work with nuclear power plant personnel; and
- (3) Some previous experience in designing and testing aerosol monitoring systems.