ILLINOIS POLLUTION CONTROL BOARD
May 3, 1972

APPLICATION OF	)	
COMMONWEALTH EDISON CO. (Dresden, Quad-Cities, Zion, and LaSalle)	)	#70-21, 71-20, 71-328, 71-354
APPLICATION OF	)	
GENERAL ELECTRIC CO. (Midwest Fuel Recovery Plant	)	#71-238

Supplemental Statement by Jacob D. Dumelle

By this unanimous action the Board has taken itself out of the regulation of nuclear power plants and nuclear fuel reprocessing plants and in effect declared Title IV-A to be of no force and effect because of Northern States v. Minnesota.

In Mr. Currie's opinion the efforts of this Board to regulate in radiation-related fields is termed an "experiment". I think it was more than that. It was an exercise valid at the time of inherent State powers to protect the health and safety of its citizens. The Supreme Court of the United States has now said that this area has been pre-empted by the national government and we must accept this. But it does not mean that the problems this Board faced in regulating radiation will go away with the stroke of the pre-emption pen.

What are these persistent problems? They are:

1. The well-founded fears as to the safety of nuclear plants.

2. The poor record of nuclear plant operation and design to date.

3. The worry as to synergism of radiation with other pollutants.

Let us briefly explore each of these categories and lay out the spectrum of knowledge as it stands at this writing:

1. Nuclear Plant Safety

My dissenting opinion in the Quad-Cities thermal variance (PCB 71-20, April 25, 1972) details the consequences of a nuclear plant core meltdown. It is grim reading. If a meltdown occurs, it could dwarf in fatalities the combined death toll of the Johnstown Flood, the sinking of the Titanic, the Chicago Fire, the capsizing of the Eastland, the Iroquois Theater fire, the Texas City explosion, the Coconut Grove fire and the Queen of Angels School fire.

The Union of Concerned Scientists, an organization of scientists and engineers in the Boston area, sums up the consequences of a nuclear plant accident in their March 23, 1972 study of 352 pages titled An Evaluation of Nuclear Reactor Safety as follows:

> Our analysis of the scale of the disaster that can occur should only a fraction of the fission product inventory of a modern power reactor be loosed upon an unsuspecting population shows that tens or hundreds of thousands of deaths is not a remote possibility. The scale is immeasurably greater than that for any other peace-time accident (Chap. 9, p. 1)

And if by some quirk of fate or wind, no person were hurt or killed by a core meltdown the possibility is great that Lake Michiga itself could be so polluted by strontium-90 (from a lakeside plant) that the radioactivity levels would be above acceptable standards.

The Businessmen For the Public Interest has recently issued "A Preliminary Hazards Analysis Report on Bailly Generating Station Nuclear I." On p. 2 appears the following:

> The strontium-90 alone released by a major accident would contaminante the 1,170 cubic miles of Lake Michigan water to levels far in excess of U.S. Public Health Service drinking standards, even if no one died directly from the accident. Strontium-90 has a half-life of 28 years. Lake Michigan has a mean flushing time of over 100 years. All of the cities using Lake Michigan as a source of drinking water (Milwaukee, Chicago, etc.) would have to find some other source of supply.

If either fatalities, injuries or water contamination occurred or all three the next inevitable result would be a national closing of all nuclear plants until the hazards were corrected.

Having established the consequences of a nuclear plant meltdowr we next turn to the question of safety systems. The safety system

to cool a core is the Emergency Core Cooling System (ECCS). The respected publication Science, in a four page article by Robert Gillette titled "Nuclear Reactor Safety: At the AEC the Way of Dissenter is Hard" (May 5, 1972) puts it this way;

> The argument over ECCS is neither academic nor trivial. Should a reactor's searingly hot core run dry, the ECCS is supposed, to reflood it with water within seconds after the leak occurs. Should the ECCS fail - or even hesitate for long - the core could melt and ensuing steam explosions could scatter its radioactive contents over a wide area. The indications are that existing designs of back-up cooling systems might not adequately reflood a reactor after a major leak.

If one reads the highly technical critiques of ECCS in the AEC testimony it is easy to get lost in the details of computer codes and heat transfer assumptions. Those men who have spent large portions of their professional lives in the nuclear field are worth listening to. The Science article quotes a February 9, 1972 letter from Dr. Alvin M. Weinberg, director of the Oak Ridge National Laboratory, to AEC Chairman Dr. James Schlesinger expressing a "basic distrust" of computer calculations for evaluating ECCS performance. And one of Dr. Weinberg's staff, Philip Rittenhouse on March 9, 1972 read into the record the name of 28 scientists and engineers of the national laboratories and the AEC's research arm, the Aerojet Nuclear Corporation,who share his doubts as to the reliability of ECCS as presently designed and installed.

One could go on and on. Aerojet Nuclear's own April 9, 1971 review of the status of ECCS is laced with terms describing the "state-of-the-art" knowledge as being "Inaccurate" or "Unverified" or "Uncertain" or "Imprecise" or "Inadequate" or "Incomplete." If the AEC's own safety research group feels this way then should not we too be concerned?

No ECCS research has been done on a real nuclear core. The core tests to destruction are not scheduled until 1975 although Dr. Weinberg has asked that they be speeded up and be done in a year.

My own feeling, expressed in the Quad-Cities April 25, 1972 dissent, is that existing nuclear plants ought to be derated to 70% of full power and that the testing research be accelerated.

We have now ample warnings from competent qualified people. Will we (and the AEC acting for us) heed the warnings or court disaster?

2. Record of Nuclear Plant Operation

Illinois which currently has five nuclear power reactors in operation may well have 15 reactors by the 1980's. The operation and design of existing Illinois nuclear plants has not been of a high order. On June 5, 1970 the Dresden 2 reactor malfunctioned resulting in extensive signal cable damage. At least eight errors were identified in design, procedures, operation or settings. The Union of Concerned Scientists in their report cited above stated:

> No member of the general public was exposed to radioactivity. Although the existence of fuel damage from the accident was denied by the reactor owners, the plant was refueled after the accident. It had been refueled two months prior to the accident.
>
> This accident displayed an incredible level of irresponsibility and incompetence. One should recognize that such an unexpected combination of poor design, inadequate maintenance, and defective operating procedures can, in unfortunate circumstances, inject radioactivity into the atmosphere in amounts that can be lethal at dozens, if not close to 100 miles. Extraordinary efforts have to be made to prevent such an event from occurring and it is abundantly clear that they have not been made (p. A21)

On December 8, 1971 a malfunction occurred in the Dresden 3 reactor and again signal cable damage occurred. This same type of damage showed that the cables which had proven defective in the twin reactor (Dresden 2) incident 18 months earlier had not been replaced with higher rated cables. The Union of Concerned Scientists comment was:

> It had been recognized after Dresden II that feedwater control, especially for high water levels had previously been inadequate. It is apparent that the lesson was not learned. We wonder what is required in order for these potentially hazardous reactor installations to be designed, constructed, maintained, and operated in safe and reassuring ways.

On May 4, 1972 the Dresden 3 reactor shut itself down for a reason not yet known. No damage is said to have occurred. Perhaps the expression "Plus ça change, plus ça même" will apply.

3. Radiation Synergism

In the General Electric permit proceeding on its nuclear fuel reprocessing plant, the United Auto Workers Community Action Program asked to intervene to present testimony from Dr. Edward Radford of Johns Hopkins University. In an affadavit Dr. Radford

spoke of the "combined effects of ionizing and ultraviolet radiation." He was never heard and we do not know now how serious these effects are that he wished to discuss. And now because of Northern States v. Minnesota we must leave the exploration of this voiced hazard to the Atomic Energy Commission.

The April 1972 issue of Environment (p. 53) contains a letter by Dr. Clark Most, Jr. titled "Radiation Plus." He states:

> It is not particularly surprising that the cancer-inducing capabilities of radiation and chemicals should act in an additive manner, and indeed such capabilities have been amply demonstrated, particularly in the field of radiology...What is perhaps more interesting is that certain carcinogens have been found to interact with radiation in a more than additive fashion, and that even some noncarcinogens have been shown to be radiation sensitizers and to augment radioactive effects... . ...The possibilities inherent in a synergism between chemicals and radiation cry out for creating a more adequate level of research and suggest a potential hazard in siting nuclear facilities near urban areas, where a more carcinogenic environment may already exist.

SUMMARY

Three persistent problems dealing with radiation have been outlined above. The first, nuclear plant safety, is the subject of ongoing AEC hearings already quoted. These hearings may run until December 1972. In addition, on January 22, 1972 the Illinois Society of Professional Engineers adopted a resolution setting up an interdisciplinary committee to study ECCS adequacy. A report is expected in July 1972.

The second problem, that of nuclear plant design and operation has been recognized at the highest level of State government. In February 1972 Governor Richard B. Ogilvie asked the Illinois Commerce Commission to investigate the first two Dresden reactor malfunctions cited. The Commission has engaged two noted nuclear consultants, Dr. Ralph E. Lapp, and Dr. Ernest Tsivoglou. Their report is expected late this summer.

The third problem, that of possible synergism of radiation with other pollutants, must depend solely upon individual researchers such as Dr. Radford and Dr. Most to quantify unless the AEC can step up its research effort.

Dr. Arthur R. Tamplin has testified before this Board in the Dresden 3 permit proceeding. He and his associate, Dr. John W. Gofman, in their book "Poisoned Power" have a chapter titled "Is Any Radiation Safe?" The two scientists (Dr. Gofman is also a

physician) state:

> All the evidence, both from experimental animals and from humans, leads us to expect that even the smallest quantities of ionizing radiation produce harm, both to this generation of humans and future generations. Furthermore, it appears that progressively greater harm accrues in direct proportion to the amount of radiation received by the various body tissues and organs. (pp. 92-93)

Since ionizing radiation is thus a "no-threshold" pollutant should we not make absolutely certain that ECCS systems really will work, that nuclear plants are being well operated and designed, and that we know the full extent of synergistic effects? Gofman and Tamplin, in discussing radiation standards, give us a relevant public health principle

> Where unknowns exist, always err on the side of protecting the public health. (p. 257)

Unknowns do exist as detailed before in this statement. And because we have not "erred on the side of protecting the public health" we are now all exposed to nuclear power hazards. The Atomic Energy Commission and the United States Government have now sole jurisdiction in these matters. We pray that they discharge their responsibilities to a greater degree in the future than they have done in the past.

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I, Christan L. Moffett, Clerk of the Illinois Pollution Control Board, hereby certify the above Supplemental Statement was submitted on the 18th of May, 1972.

Christan L. Moffett, Clerk
Illinois Pollution Control Board