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17TH DISTRICT, ILLINOIS

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April 4, 1979

50-237, 249, 254, 265

The Honorable Joseph Hendrie
Chairman, NRC
Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Hendrie:

Mrs. Leo A. Drey, of St. Louis, Missouri, has written to me in support of her request that an environmental impact statement be required before use of a Dow Chemical solvent to flush out piping in the vicinity of Commonwealth Edison's Dresden nuclear plant in Ilinois.

I am enclosing for your convenience a copy of her March 19 letter to you and other federal and state officials and members of Congress.

The Kankakee River flows through a large part of my Congressional district. On behalf of the thousands of my constituents who live in that area, I would appreciate it if you would carefully review Mrs. Drey's letter and advise me as to the validity of her concerns.

Sincerely,

George M. O'Brien
Member of Congress

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19 March 1979

To: President Jimmy Carter, and to Messrs. Douglas Costle(Administrator, Environmental Protection Agency), Jacob Dumelle(Chairman, Illinois Pollution Control Board), Joseph Hendrie(Chairman, Nuclear Regulatory Commission), Charles Percy(U.S. Senator from Illinois), James Schlesinger (Secretary, Department of Energy), William Scott(Attorney General of Illinois), Adlai Stevenson(U.S. Senator from Illinois), James Thompson (Governor of Illinois), and Charles Warren(Chairman, President's Council on Environmental Quality)

From: Kay Drey, 515 West Point Avenue, University City, Missouri 63130

A PLEA FOR AN ENVIRONMENTAL IMPACT STATEMENT ON A MAJOR FEDERAL ACTION PROPOSED FOR THIS SPRING, 1979, IN ILLINOIS:

The U.S. Department of Energy is presently contributing $8.2 million toward the first of a series of decontamination experiments designed to dissolve and flush out radioactive corrosion products from nuclear reactors. In April or June(?), 85,000 gallons of a proprietary Dow Chemical solvent are to be flushed through an estimated five miles of piping for 100 hours within our nation's oldest active commercial reactor(Commonwealth Edison's 200-megawatt Dresden plant, Unit One, near Morris and Joliet, Illinois, on the Kankakee River).

This solvent may be chemically similar to, even identical with, the very compounds which have been found to be causing the unexpectedly rapid migration of radionuclides out of the Oak Ridge burial trenches and possibly into the human food chain.

The claim contained in a letter I received last month from the Department of Energy that there is "reasonable evidence that it(the solvent) will not contribute to the escape of the radioactive material, nor will it cause migration of radioactive substances through the environment" is not convincing. Once the Dow Chemical solvent has bound the radioactive materials, we may lose all hope of keeping those substances isolated from the biosphere.

I have obtained information and suggestions from professors of geochemistry, physics, biophysics, biology, biochemistry and radiation oncology. Every one of them is as concerned about this experiment as I am. They have helped formulate(and explain) the questions that follow, and all believe that an environmental impact assessment is imperative. To quote one of the men from a letter dated March 9, 1979:

"I think it is unacceptable that the DOE assure you that their chelating preparation is environmentally safe and, at the same time, refuse to divulge the nature of the material. We still know relatively little about the movement of radio nuclides in the environment, but there is increasing evidence that natural ligands may contribute to the process. I should think that one would need to take care that the artificial ligands provided by Dow would not enhance the mobility of nuclides in the biosphere and result in their concentration in the food chain."

Before this action is undertaken the public is entitled to the assurance that physical and biological scientists who are not financially and/or emotionally committed to this project will have studied questions similar to those which follow, and will have conclusive evidence that the proposed Dresden experiment can be performed without jeopardizing the human environment. If not, the project should not proceed.

1. First, is it possible that an environmental impact assessment and a negative declaration have already been written regarding the proposal to decontaminate Dresden Unit One? I have asked this question several times of the DOE, but have not received an answer. If an assessment was made, which individuals of the Department of Energy made the decision that this project will not affect the quality of the human environment, and therefore did not require an environmental impact statement under 40 CFR 1500? That is, was a negative declaration made by the DOE, and if so, by whom and when? Is a copy available? Did it address the following questions?:

2. What do field or laboratory tests demonstrate to be the migration potential of radioactive wastes entrapped in the Dow Chemical solvent, assuming some were to escape from buried containers into the environment?

   According to an article published in Science, Vol. 200, 30 June 1978, by Jeffrey Means, David Crerar and James Duguid, chelating agents were found to be the very substances responsible for the mobilization of radionuclides

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from disposal pits and trenches in the Oak Ridge National Laboratory. In a personal communication from Dr. Crerar, the environmental implications are described as follows:

> "While chelates are used because of their powerful metal-binding properties, it is this same characteristic which may have undesirable environmental consequences. For example, EDTA, which is used in nuclear decontamination operations, is causing the migration of some ^{60}Co from intermediate-level liquid waste disposal pits and trenches in the Oak Ridge National Laboratory burial grounds. Because it forms extremely strong complexes with rare earths and actinides, EDTA and similar chelates may also be contributing to mobilization of these radionuclides from various terrestial radioactive waste disposal sites around the country. EDTA is relatively resistant to decomposition by radiation, thermally stable up to about 200-250° C, and rather slowly biodegradable. Consequently, it is persistent in the environment. Indeed, the presence of significant concentrations of EDTA in 12 to 15 year old radioactive waste at ORNL attests to its persistence. Therefore, wherever EDTA and similar compounds have been introduced into the natural environment, the aqueous transport of transition metals, rare earths, and transuranics, which characteristically form the most stable complexes with chelates, will be expected to occur. ...
>
> Degradation rates of all three chelates(NTA, EDTA, and DTPA) were not rapid enough, even under ideal laboratory conditions, to preclude concern about their release to the environment. Heavy metal mobilization can occur at extremely low chelate concentrations, as witnessed at ORNL. Biodegradation, if slow or incomplete, may be an inadequate barrier to their various undesirable environmental consequences. Destruction of chelates by thermal or chemical means (such as ozonation) prior to environmental discharge appears to be much more efficient than biodegradation after discharge."

3. For how many years have radioactive corrosion products, bonded with the proposed Dow Chemical solvents, remained free of water after being solidified by the Dow Chemical polymer process?

According to Dow Chemical's publication entitled "Solidification Process for Low-Level Radioactive Wastes", (Form No. 173-1026-78), only a few descriptions of the solidification process, which I understand is to be used for the Dresden wastes, are included:

> "The Dow Solidification Process consists of the combination of a binder -- a modified vinyl ester resin -- with small amounts of a catalyst and a promoter. The process encapsulates the low-level radioactive wastes into a stable, solid and homogeneous matrix. ...
>
> The Process, using polymer chemistry, dictates that it must solidify aqueous and slurry wastes, including ion exchange resins, evaporator bottoms, spent decontamination solutions, and filter sludges.
>
> The Dow Process solidifies radioactive waste with no free liquid. ... The Dow definition of 'free liquid' is liquid in or on the specimen or in the container upon completion of solidification or after 3-7 days of aging."

a. Has the Dow solidification process been tested on reactor corrosion products comparable to those which will result from the Dresden experiment? What assurance is there that the encapsulated waste is going to be low-level?

b. When did Dow Chemical first develop its solidification process for low-level radioactive wastes? What is the longest duration period for one of its "monoliths" or matrixes -- that is, how long has such a solidified Dow substance remained free of liquid? What would be the long-term stability of the solid polymer over a period of thousands of years?

c. What is the leach rate of the polymer under burial conditions, or the potential for diffusion and release of encapsulated radionuclides, solvents, etc.?

d. During the evaporation step, is the solvent volatile, and if so, will an ion exchange resin completely scrub chelated radionuclides from the evaporate? (I am told by one person that his experience indicates it will not).

4. For how many years have the barrels designed for burying the solidified wastes been found to remain resistant to corrosion from both the proposed contents and from surrounding environmental impacts?

   a. According to a letter I received from Mr. Paul Pettit(Light Water Reactor Section, Division of Nuclear Power Development, DOE) dated February 6, 1979, the solidified wastes from the Dresden experiment are to be shipped in drums to a commercial low-level waste disposal site. Since additional wastes are no longer being accepted at the nearby Sheffield, Illinois burial site(in fact, the licensee has just walked away, with the NRC in hot pursuit), will the wastes be shipped to Nevada, South Carolina, or Washington? Were the drums designed to comply with the Department of Transportation's packaging and shipping regulations for low-level or high-level wastes(49 CFR Parts 170-178), or to comply with the NRC transit regulations for fissile materials(10 CFR 71 and 73)? And/or were the drums designed for indefinite burial?

   b. What is the estimated lifespan of the barrels? What precautions are going to be taken at the life-end of the barrels to ensure continued containment of the residual radioactivity? Have any metals been found that will resist the corrosive action of the proposed contents for even a decade? Is there apt to be any chemical reaction between the compounds going into the barrels and the materials of which the barrels are composed?

   c. In the June 30, 1978 Science article, Dr. Crerar and colleagues describe the accelerated dispersal through the groundwater and the increased uptake by vegetation of the radionuclides when bonded to nonbiodegradable chelates. If the buried drums with the solidified Dresden effluent were to corrode and the matrix were to come into contact with water, would the radionuclide-chelate complex not become soluble again? Could this solution then migrate through the environment in the same manner found at the Oak Ridge burial site?

   d. If chelates are to be used, can they be deactivated thermally, chemically, or biologically before evaporation and solidification?

5. Is it possible that any of the solvent with or without dissolved radionuclides may remain after the principal effluent and first rinse water have been removed for evaporation and solidification -- and then be flushed into the Illinois River? If so, might the radionuclides absorbed by the river's sediment near the plant's cooling water outfall in years past become resuspended and migrate into the food chain?

   a. How much radioactivity and residual chelating agent are expected in the first rinse? How many additional rinses will there be? Scientists have told me that they did not think that chelated, radioactive metal ions would be removed by a demineralizer; although demineralizers have a high affinity for naked metal ions, I have been informed that they generally do not remove chelated forms. Or will the chelating agent perhaps be charged, and thereby be removable by the demineralizing step? People with whom I have spoken seem surprised to learn that the purification of the first rinse -- the removal of the residual chelating agents and chelated metal ions -- was to be done with a demineralizer. What is the explanation for this apparent departure from traditional practice?

   b. According to Mr. Pettit's letter of February 6, 1979, "the formulation of the Dow Chemical solvent is known to DOE staff, but is protected from release to the public by a proprietary agreement." Solvents used for decontamination purposes at nuclear facilities have been described elsewhere, however, by

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a. According to a letter dated March 13, 1979, from Mr. A. David Rossin(System Nuclear Research Engineer, Commonwealth Edison), thirty workers will be needed during the presently proposed 100-hour project. And although I was told by Mr. Paul Pettit of the DOE that his agency is not concerned about the toxicity of the Dow solvent itself during the decontamination operation, what hazards may it pose to workers when it is in combination with radioactive materials?

b. What procedures are to be taken to make certain that the radionuclide-chelating agent is totally contained and will not in fact come in contact with the workers? What is the radiation dose expected per hour at one meter from the reactor containment vessel, the effluent piping, the evaporation and solidification equipment, and the drums preparatory to and during shipping? What shielding will be erected to protect the workers?

These are questions of profound import. To proceed with the Dresden experiment while they remain unanswered would be egregious folly. For the safety of the public and the workers, and for the protection of our country, can we count on you to demand that a full environmental impact statement be prepared immediately?