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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

FEB 1 9 1980

Mr. Jeff Mouras
2694 Alder Vista Drive
Columbus, Ohio 43229

Dear Mr. Mouras:

Your letter to Senator Glenn dated September 24, 1979, was referred to the Nuclear Regulatory Commission (NRC) for consideration. I regret this response has been delayed. The March 1979 accident at the Three Mile Island Plant and its consequences have created a substantial increase in the agency's workload, which has prevented us from responding to you as promptly as we would have liked.

With respect to nuclear plants in Ohio, the Davis-Besse, Unit No. 1 plant, operated by the Toledo Edison Company and located in Ottawa County, is the only one presently in operation. Three additional plants are in various stages of active design and construction. These are:

1) Perry Nuclear Power Plant, Units Nos. 1 and 2 (Cleveland Electric Illuminating Company) located in Lake County. These facilities are under construction and an application for an operating license is expected to be filed in 1981.

2) William H. Zimmer Nuclear Power Station, Unit No. 1 (Cincinnati Gas and Electric Company) located in Clermont County. The Zimmer facility is substantially completed and we estimate that it will be able to load fuel in early 1981.

Applications for construction permits for four additional plants have been filed with the NRC. However, termination of plans to construct these four plants has been announced by the Central Area Power Coordinating Group (see enclosed press release). The four proposed plants were:

1) Erie 1 and 2 (Ohio Edison Company) located in Erie County.

2) Davis-Besse Nuclear Power Station, Units Nos. 2 and 3 (Toledo Edison Company and Cleveland Electric Illuminating Companies) located on the same site as Davis-Besse, Unit No. 1, in Ottawa County. Prior to issuance of the press release, the Toledo Edison Company had undertaken certain preconstruction activities on site, pursuant to two Limited Work Authorizations issued by NRC.

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WASTE

Concerning disposal of radioactive wastes, I am enclosing an excerpt from the NRC's Annual Report 1978, which summarizes the scope of the NRC activities in this regard. Also enclosed is a report entitled "A Classification System for Radioactive Waste Disposal - What Goes Where?" (NUREG-0456) which addresses the subject in detail.

I trust that this letter has been responsive to your concerns.

Sincerely,

Original Signed by
H. R. Denton

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Enclosures:
1. Press Release
2. Excerpts from the NRC's Annual Report 1978
3. NUREG-0456

cc w/out NUREG-0456:

Senator John Glenn

NEWS FROM TOLEDO EDISON

Public Information Department • 300 Madison Avenue • Toledo, Ohio 43652

Contact: Roger Buehrer
(419) 259-5420

For Release: Wednesday, Date: January 23, 19

TOLEDO EDISON TERMINATES PLANS FOR DAVIS-BESSE UNITS

TOLEDO, O., January 23 - Toledo Edison said today that proposed second and third units at Davis-Besse Nuclear Power Station are among four generating units which have been terminated by the Central Area Power Coordinating Group (CAPCO). Stretched out schedules were announced for three units under construction in which Toledo Edison has a 20 per cent ownership.

John P. Williamson, Toledo Edison chairman and chief executive officer, said the two nuclear units were to be built and operated by Toledo Edison. The Company would have owned about 20 per cent of the units as well as the same percentage of two units Ohio Edison Company was to build and operate in Erie County near Berlin Heights which were also terminated.

"We remain convinced that nuclear power is a safe, clean and efficient form of energy," he said. "However, we were committed to a very heavy nuclear program--one of the heaviest in the country. In view of reduced load growth projections, financial constraints and today's climate of over-regulation, we do not believe it is feasible to proceed with future units at this time."

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Toledo Edison remains committed to nuclear power, he said, through its investment in about half of the Davis-Besse Unit One plus about 20 per cent ownership in capacity of the three CAPCO nuclear units under construction, two at North Perry, Ohio and another at Shippingport, Pennsylvania.

"When the committed nuclear capacity is available to us by late 1980's we will have a favorable generation mix of 50 per cent coal, 45 per cent nuclear and 5 per cent in oil," he said.

"For these next few years, as the country's energy situation continues unresolved, customers will be asked to develop more of a conservation ethic than they have evidenced in previous years. Careful and wise use of energy has always been a good idea. Good control of electricity use during peak hours will help us postpone adding new capacity. Perhaps this period will be long enough that the political and regulatory climate can change in ways that will recognize the really extreme difficulties imposed on the only viable fuel rescources available on a large scale through 2,000--coal and nuclear," he said.

The estimated original cost of the Davis-Besse units was about $1 billion each. By 1979, increased regulation and the impact of inflation had increased those estimates to about $3.4 billion combined cost.

"Even with the termination of the four units, Toledo Edison's installed reserve capacity should be adequate through the 1980's to meet the currently forecasted load growth," Mr. Williamson said. "The first additional capacity will come later this year when the third unit at the Bruce Mansfield coal-fired station on the Ohio River is put into operation. Toledo Edison has about a 20 per cent ownership in that facility also."

Plans for the Davis-Besse units were announced in 1973 with the original in-service date set for the early 1980's. Since then there have been four announced delays amounting to about seven years. The last delay was announced in November 1978, when the four units were delayed three years.

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Waste Management

NRC efforts in regulation of nuclear waste management activities during 1978 included the following:

- Work proceeded on a system for classifying wastes according to the type and duration of containment required for their safe disposal. A report setting forth the technical basis for the system was released for public comment.
- Studies were conducted to develop waste disposal performance objectives, including incorporation of societal attitudes.
- Studies were continued concerning the development of performance objectives and criteria for high-level, transuranic and military wastes during long-term storage in deep geological repositories.
- The National Academy of Sciences assisted NRC in evaluating potential criteria for assessing the suitability of sites for geologic waste repositories.
- The NRC staff (continued) preapplication interaction with the Department of Energy in anticipation of the possible submission of a license application for a geologic repository in New Mexico.
- A program to develop regulations on management of low-level waste was announced. A number of studies were conducted to develop the information base needed to establish these regulations.
- In late 1978, NRC published results of a screening of alternatives to shallow land burial for disposal of low-level waste.

Interagency Review Group

During 1978, the NRC staff participated in an Interagency Review Group (IRG) on Nuclear Waste Management. (Because of its status as an independent regulatory agency, NRC participated as a non-voting member. See also Chapter 1.) The IRG was instituted in March 1978 at the direction of the President to develop a strategy for dealing with the radioactive waste management problem. The primary objec-

tive of the plan is to provide assurance that existing and future nuclear waste from military and civilian activities can be isolated from the biosphere to protect public health and safety. The strategy developed by the IRG contains tentative policy and implementation recommendations, requirements for new legislation and work plans indicating key milestones for the involved Federal agencies. These plans and recommendations were published for public comment in a Draft Report to the President in October 1978. A Final Report, incorporating public comments received and additional agency reviews, was scheduled to be published in late 1978. (See Chapter 1.)

WASTE CLASSIFICATION

To provide a broad analytic basis for regulations governing the management and disposal of radioactive waste, the NRC is developing a system for categorizing wastes according to the type and duration of containment required for their safe disposal.

Three categories are currently proposed:

(1) *Class A*: Waste which, due to nigh or persistent radiotoxicity, requires isolation in a Federal repository or other disposal facility providing a high degree of isolation.

(2) *Class B*: Waste which is acceptable for disposal in near-surface facilities such as by shallow land burial.

(3) *Class C*: Waste which is nonradioactive or has such low levels of radioactivity that it can be disposed of routinely, as in sanitary landfills.

The classification system will present a systematic method for defining and quantifying the radioactivity concentration interfaces between the three categories.

In June 1978 the NRC published a report giving the technical basis for the classification system, "A Classification System for Radioactive Waste Disposal - What Waste Goes Where?" (NUREG-0456). In August, a Federal Register notice announced the availability of this report and requested public comments. An advisory panel with representatives of Federal and State governments, industry, universities, and a public interest group was convened in March and in December to review the progress of the study. A waste classification regulation, a supporting environmental impact statement, and a regulatory guide on complying with the regulation are scheduled for development in 1979.

PERFORMANCE OBJECTIVES

During fiscal year 1978 the NRC conducted two studies to develop performance objectives for radioactive waste disposal. The first of these, conducted jointly by NRC and by Lawrence Livermore Laboratory (LLL) under contract to NRC, surveyed current regulations and recommendations by scientific bodies regarding allowable levels of radiation exposure. From this information a set of objectives was developed which would limit the predicted radiological impacts from radioactive waste disposal to values likely to be considered acceptable by society.

The second study, conducted by LLL under contract to NRC, utilized a technique known as "multi-attribute decision analysis" to make a mathematical model of societal attitudes toward the risks associated with radioactive waste disposal. The major thrust of this study was to determine trade-offs between different types of risks (e.g., risks to the present generation versus risks to future generations) so that different repositories—or even totally different waste disposal concepts—can be compared.

The results of these studies (NUREG/CR-0540) are being evaluated by the NRC staff and will be used to further develop and refine NRC's waste disposal performance objectives. These objectives will, in turn, guide NRC's development of criteria for site suitability, repository design, and waste form performance, and will be used to evaluate the safety of proposed waste disposal projects.

Projecting Disposal Needs

During 1978, NRC-sponsored work was begun by Teknekron, Inc., on a computer model for

projecting waste disposal needs. The model will consider the quantities of various classes of radioactive waste generated as a function of time and in a number of geographic regions of the country. This model will be used as a tool in making decisions about the need for licensing new sites. The project is scheduled to be completed in mid-1979.

HIGH-LEVEL AND TRANSURANIC WASTE

During fiscal year 1978 several studies were conducted by or for the NRC to provide a data base for regulations governing permanent repositories for high-level and transuranic waste. Proposed regulations are now scheduled to be published for public comment in the summer of 1979.

Waste Form Performance Criteria

Studies were continued by LLL under contract to NRC to investigate the performance of various forms of high-level and transuranic waste during long-term storage in deep geologic repositories. Investigations during fiscal year 1978 focused on storage in deep salt formations. Other media will be considered in the future. The high-level waste portion of the program was a continuation of fiscal year 1977 work. The commercial high-level waste study was terminated in February 1978 because of President Carter's decision deferring reprocessing. A report is being prepared by LLL which will summarize all the work performed on commercial high level waste through termination of the effort in February 1978. The report is expected to be completed in draft form in early 1979, at which time the report will undergo extensive review by the NRC staff and then be released for public comment.

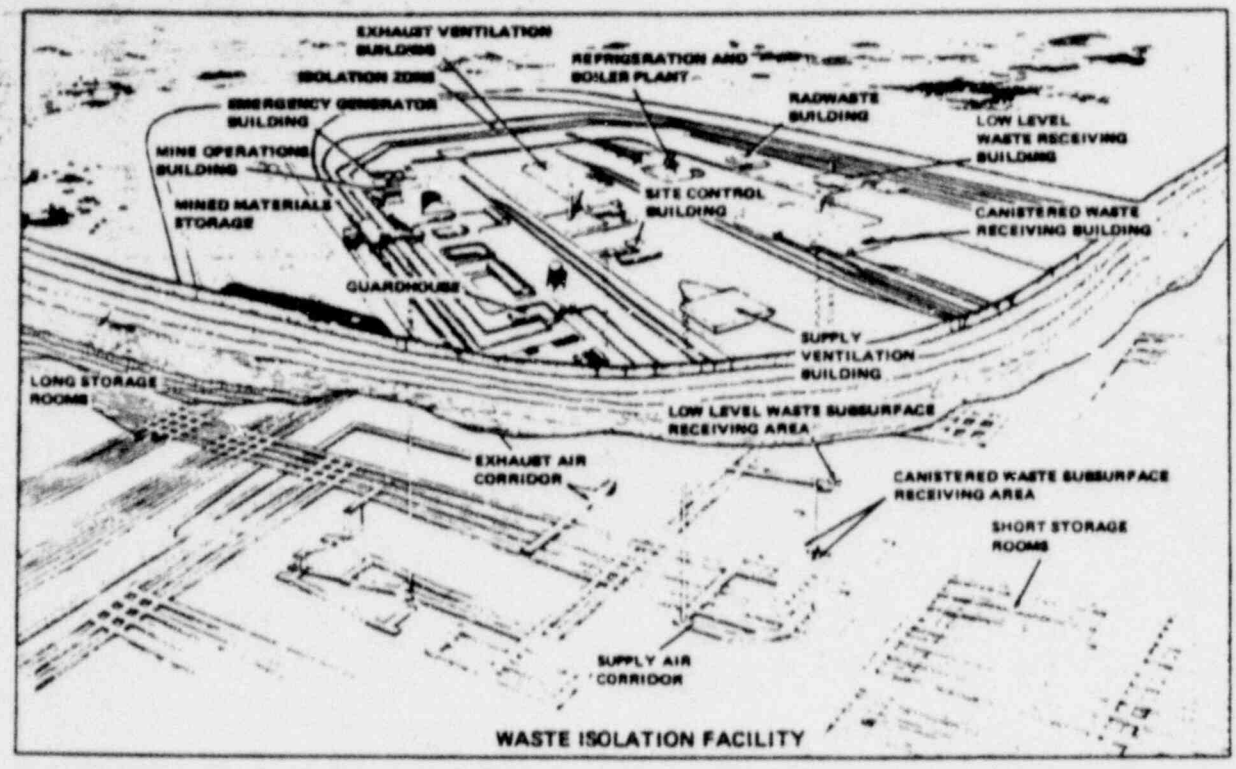
As the work on reprocessing high-level waste was phased out, work on spent fuel was initiated. Some of the models and mathematical codes utilized in the initial high-level waste studies were modified to apply to spent fuel. Investigations now are in the preliminary stage. They involve model development and modification, reference system definitions, and simplified analyses. The bulk of the study, also being conducted by LLL, is expected to be carried out in fiscal year 1979.

The long-term storage of transuranic waste is also being considered. (While transuranic waste is not considered high-level waste, it is thought to be necessary to dispose of it in the same manner as high-level waste because it maintains a hazardous level of radioactivity for long periods of time. The waste classification system will define those concentrations of transuranic waste which must be disposed of in this manner.) Earlier efforts in this area consisted of developing a working definition of transuranic waste and determining its inventory accordingly. As a result, LLL issued a draft report, "Inventory and Sources of Transuranic Solid Waste," in June 1978. The final version of this report is expected to be received by the NRC in the spring of 1979. Development of models for transuranic release mechanisms and rates has begun. Work planned for the next fiscal year includes identifying possible synergistic effects from placing transuranic waste in the same repository as high-level wastes or spent fuel. A report covering fiscal year 1978 work through July will be released in draft form in early 1979.

LLL also conducted an investigation of military waste mainly concerned with establishing the form and inventory of high-level defense-generated waste. This portion of the program was initiated and completed in fiscal year 1978. A draft report is to be issued in early 1979.

Repository Site Criteria

Under contract to the NRC, LLL has been conducting studies on the suitability of sites for geological repositories. The objectives of these studies are to identify those natural features which are most important to a geological repository's ability to isolate radioactive waste. In October 1977, LLL submitted an interim progress report to the NRC. In June 1977, the staff had drafted site suitability criteria based upon the study results at that time and on papers published by groups such as the International Atomic Energy Agency (IAEA). These criteria, and the interim study report, were



This is the Department of Energy's conceptual design of the probable layout of a bedded-salt repository for high-level and transuranic wastes. NRC will be responsible for the safety review and licensing of these facilities. As designed, the facility could handle both spent reactor fuel and high level waste from fuel reprocessing.

presented to a peer review panel on October 28 and 29, 1977. The panel's comments and suggestions, submitted to NRC in March 1978, were incorporated into a revision of the draft site suitability criteria and will be reflected in the regulations to be published for public comment in 1979.

In November 1977, the National Academy of Sciences convened a Panel on Geologic Site Criteria to assist the NRC by: (1) identifying the criteria needed in determining the suitability of a waste disposal site, (2) reviewing NRC's revised site suitability criteria, and (3) reviewing the LLL interim report. The panel's report was submitted to NRC in August 1978, and results will be incorporated in NRC staff position papers. The panel's comments on the LLL report were forwarded to the Laboratory for consideration in its continuing study.

Since submitting its interim report in October 1977, LLL has continued to refine the study. This has involved expansion and revision of the analytical model developed for waste transport in sedimentary basins, revision of the earth-sciences information used with that model, identification of areas where more research is needed, and determination of the effort required to study other geologic formations such as domed salt, basalt and granite.

The study for sedimentary basins is scheduled for completion by December 1979. The NRC staff will use its results as a basis for position papers on site suitability.

Repository Construction and Operation Requirements

The NRC staff is obtaining background information and developing regulations to govern performance of the engineered aspects of a geologic repository. All activities which might degrade the ability of an inherently suitable repository site to contain radioactive waste (e.g., mining, waste emplacement, mine closure) are being considered. Ongoing programs include:

- Identifying performance requirements for shaft and borehole seals.
- Defining performance requirements for equipment that will be operating in a repository.
- Identifying those interactions between wastes and the disposal media which would affect a repository's radionuclide containment capabilities, or adversely impact the ability to retrieve wastes.
- Analyzing the thermomechanical response of mine structure features.
- Identifying the decommissioning performance requirements.
- Analyzing the impacts of excavation on a repository's ability to contain radionuclides.

The NRC staff will use radionuclide transport and systems analysis models to determine which aspects of the design of a repository have the greatest impact on its performance.

Licensing Procedures for Repositories

The NRC staff is making preparations for the licensing review of geological repository applications to be submitted by the Department of Energy.

A statement of policy regarding administrative procedures to be followed by NRC and the applicant was expected to be issued for public comment in late 1978.

Technical papers are being prepared on the standard format and content of both environmental reports and license applications. Working drafts of these papers are undergoing internal review. They will provide early guidance to the Department of Energy (DOE) in its licensing activities.

Development of computer modeling techniques to assist in the evaluation of repository license applications continued at Sandia Laboratories, New Mexico, under contract with NRC's Office of Nuclear Regulatory Research. Preparation for the use of those techniques was initiated at NRC during the reporting period. This project is discussed under "Fuel Cycle Risk Assessment Research," Chapter 11.

NRC staff members have inspected potential repository sites under investigation by DOE in southeast New Mexico, at the Nevada weapons test site, and at the Hanford reservation in Washington. NRC inspection and enforcement procedures and quality assurance requirements were explained to DOE staff members at meetings held in April and June 1978, respectively. Docket files for the Waste Isolation Pilot Project (WIPP) have been established at the public document rooms in NRC Headquarters and in Albuquerque and Santa Fe, New Mexico, anticipating a possible license application by DOE for a waste repository in deep salt formations, near Carlsbad, New Mexico. An updated list of all docket material is maintained at three additional locations in New Mexico.

LOW-LEVEL WASTE DISPOSAL

Development of Regulations

In December 1977 the NRC announced in the *Federal Register* a program to develop regulations governing the management of low-level radioactive waste. The program was described in a document entitled "The Nuclear Regulatory Commission Low-Level Radioactive Waste Management Program" (NUREG-0240).

During fiscal year 1978, progress was made in developing the information base needed to establish these regulations. Approximately 40 percent of the radioactive waste shipped to the commercial shallow land burial sites is from sources not involved in the nuclear fuel cycle for commercial power reactors, such as hospitals, universities, radiopharmaceutical suppliers, and industrial users. Results of a study characterizing the sources, volumes, isotopic content and physical form of wastes from such non-fuel cycle waste generators were published in March 1978 as NUREG/CR-0028, "Institutional Radioactive Wastes." Other studies proceeding in 1978 related to the physical properties of solidified low-level wastes using commercially available solidification agents, the parameters important to obtaining an acceptable solid product, and the chemical toxicity of low-level wastes.

Field studies were initiated during fiscal year 1978 at licensed burial sites in West Valley, New York and Maxey Flats, Kentucky to identify

potential pathways for radionuclide migration. Also, measurements of the radio-chemical compositions of trench leachate continued at licensed burial sites in cooperation with the U. S. Geological Survey. The results of these studies will be used to develop models to evaluate radionuclide migration and to establish criteria on the suitability of burial sites. Completion of the models and proposed regulations governing siting criteria for shallow land burial is planned for 1980. In October of 1978, the NRC staff published an advance notice of rulemaking in the *Federal Register* asking for public comment on the proposed rgulations and on the supporting environmental impact statement.

Limits On Disposal Capacity

Recent developments at the commercial low-level waste burial grounds have raised the question of whether adequate regionally distributed disposal capacity for the nation's low-level radioactive wastes will be available at currently operating facilities. Two of the six licensed commercial burial grounds (West Valley, New York and Maxey Flats, Kentucky) are closed. A third site, at Sheffield, Illinois, has reached its licensed capacity. A limit has been placed by the State of South Carolina on the volume which may be accepted at the Barnwell, S.C., site. Thus, a large fraction of the waste from reactors and other waste generators located in the Eastern and Midwestern United States must soon be transported to the burial sites at Beatty, Nevada and Hanford, Washington.

It can thus be seen that the options available for disposal of low-level waste are now limited, especially if operational problems should develop at any of the functioning sites. The NRC believes that the situation can be addressed in the short term by having the industry work out cooperative arrangements for use of shielded casks, transport vehicles, interim storage and optimal utilization of the capacity of the operating sites. However, NRC also believes that additional standby capacity should be made available and has requested DOE to develop a contingency plan which would allow its burial sites to accept commercially generated wastes, should the need arise. The NRC has also requested DOE to consider disposing of radioactive wastes from its prime contractors at DOE sites rather than at commercial burial sites.

Battelle Pacific Northwest Laboratory personnel obtaining sediment samples from Cattaraugus Creek during winter sampling period at West Valley, New York, Nuclear Center as part of NRC sponsored program to model radionuclide migration by sediment transport.

Alternatives to Shallow Land Burial

In 1978, the NRC continued a study of alternative methods to shallow land burial for disposal of low-level radioactive wastes. This study was initiated at the recommendation of an NRC Task Force set up to review the Federal/State program for regulation of commercial low-level radioactive waste burial grounds. The study was recommended because it was believed an alternative method could have advantages over shallow land burial and also because having more than one method would provide additional disposal capacity.

After a preliminary screening, NRC evaluated the following alternatives in some detail: (1)

emplacement of wastes in engineered structures, (2) disposal of wastes in ocean waters, (3) emplacement of wastes in mined cavities (existing mines or mines dug specifically for waste disposal), and (4) burial of wastes at an intermediate level (e.g., 30 feet of cover as compared to 4–6 feet of cover for shallow land burial). Preliminary results of the study were published in September 1978 (NUREG–CR–0308). The advance notice of proposed rulemaking, which was issued in October 1978 to solicit comments on development of the low-level waste disposal regulation and its supporting EIS, also requested comments on the development of a regulatory program for alternative disposal methods to the present practice of shallow land burial. (See Chapter 10 for discussion of the decommissioning of licensed facilities.)

(Developments on waste management occurring after the end of the fiscal year are discussed briefly in Chapter 1. Mill tailings management is discussed in Chapters 1 and 3.)

September 24, 1979

Senator John Glenn
Room 204 Russell Senate Office Building
Washington, D.C. 20510

Dear Senator Glenn:

I am interested in nuclear energy and I understand that Ohio has one nuclear energy plant. I'd like to know if there are any plans for more plants. How are nuclear wastes being disposed of at this time, and are there any great risks being taken concerning people's health and safety? I would appreciate any information you can offer me about nuclear power in Ohio.

Sincerely,

Jeff Mouras

Jeff Mouras
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