

November 20, 1980

MEMORANDUM FOR:

S. Lawroski Chairman
Subcommittee on Radioactive
Waste Management

FROM:

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SUBJECT:

Confidence in the disposal of High
Level Nuclear Waste in Geologic
Repositories

Reasonable assurance that high level nuclear waste, including spent fuel, can safely be disposed of in geologic repositories is technically sound. This can be supported by the following:

- 1 Review and analysis of the information obtained from millions of dollars worth of studies and tests made by the U.S. Government and its Contractors
- 2 Applicable experience in the Mining, Construction, Tunneling, Petroleum Production and other Industries
- 3 Detailed studies on nuclear waste management reported in Position Statements and elsewhere by responsible scientific and technical organizations including:

National Academy of Science
American Institute of Chemical Engineers
American Nuclear Society
Association of Engineering Geologists

- 4 Position Statements filed by organizations supported by the nuclear industry

Atomic Industrial Forum
Edison Electric Institute
Utility Waste Management Group

5 Position Statements filed by utilities that own and operate nuclear power reactors including:

Tennessee Valley Authority
Consumers Power Company
Niagara Mohawk
Omaha Public Power

Institutional issues may present more formidable problems for geologic disposal than the technical ones. Citizens are concerned about the safe disposal of all types of waste and are skeptical that a safe method for nuclear waste disposal can be developed, because after over thirty years of effort and the expenditure of millions of dollars, no permanent high level disposal system is yet in operation. The gravity of the situation is expressed in many carefully prepared Position Statements including ones received from the States of California, Illinois, Minnesota, New York and Wisconsin, which state that based on existing knowledge there is no reason for confidence that high level nuclear waste can be disposed of safely. Technical arguments in rebuttal of these no confidence issues are presented in the DOE Cross Statement dated 9/5/80.

DOE is well aware of the impact on the program these issues may have, such as state moratoriums on the construction of new nuclear plants, prohibition of geological surveys for repository locations and prohibition of the disposal of high level waste within the State. Through their Office of Nuclear Waste Isolation, DOE is developing methods for handling the problem.

It is imperative that a geologic repository be built to demonstrate that nuclear waste can be safely disposed of. The principal waste form would be spent fuel. The repository design would permit waste stored in it to be retrieved.

No spent fuel is presently being reprocessed in the U.S. It is probably not economical at this time to reprocess fuel for use with a once through cycle in Light Water Reactors. Liquid Metal Fast Breeder Reactors, however, are expected to produce thirty times as much energy from fuel and will need reprocessing to provide the uranium and plutonium they use for fuel.

When the Breeder has been demonstrated, the decision can be made to retrieve the spent fuel from the repository for reprocessing and replace it in the repository with the high level waste produced. This will not only permit the recovery of the uranium and plutonium but other commercial and strategic materials contained in the spent fuel. The energy obtained from this spent fuel should minimize the use of fossil fuels that will be needed in the future as feed material for the Chemical Industry.

Prior to the time the demonstration repository becomes operational, under water surface storage can continue to be used. This type of interim storage has been used for many years and its reliability and safety has been adequately demonstrated. The option to continue the use of this method for spent fuel storage in excess of that needed for the repository demonstration can be decided at a later date.

Comments on the NRC Research Budget

F. Arsenault is to be complimented on his excellent presentation of the Research Budget. The considerations used in planning

NRC Objectives
Technical Capabilities Required
Status of Technical Capabilities
Research Objectives
Research Program

provide a simple yet meaningful basis by which to analyze the needs for research, the structure of the organization, and the utilization of resources.

The degree of coordination with other Divisions of DOE reported is very desirable as it minimizes the duplication of effort needed to develop the basic information needed by both NRC and DOE for planning and executing the work for which each is responsible.

I am somewhat concerned about the information presented on risk analysis, dealing with water flow from a repository, not so much with the methods used but the ability of obtain good field data on the characteristics of the flow path. As discussed in our meeting, the presence of water in the repository should be considered only if it can be demonstrated that it is impossible to locate a suitable dry site.