

Statement of Kenneth Davis
Deputy Secretary of Energy
Before The
Subcommittee on Energy and the Environment
Committee on Interior and Insular Affairs
U.S. House of Representatives

July 9, 1981

Nuclear Waste Management Legislation



Mr. Chairman and Members of the Subcommittee, I am pleased to appear before you today to present the Department of Energy's comments on Title I of your bill, H.R. 3809, and four other nuclear waste management bills introduced during this Congress, namely: H.R. 1993 (Lundine); H.R. 2800 (Oakar); H.R. 2840 (Huckaby); and H.R. 2881 (Derrick). I am accompanied by Dr. Shelby Brewer, the Assistant Secretary for Nuclear Energy and Dr. Colin Heath, the Director of the Office of Waste Isolation.

I would like first to express our appreciation for the interest and support of this and other committees in the Congress in achieving a more effective approach toward radioactive waste management. The concern with which this issue is viewed is reflected in the numerous pieces of legislation which have been submitted this session. With your permission, Mr. Chairman, I would like to provide a frame of reference for our comments on the cited legislation by briefly outlining the Administration's evolving nuclear waste management policies and describing the key features of the Department's proposed program strategy for isolating high-level radioactive waste.

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The Integrated Fuel Cycle

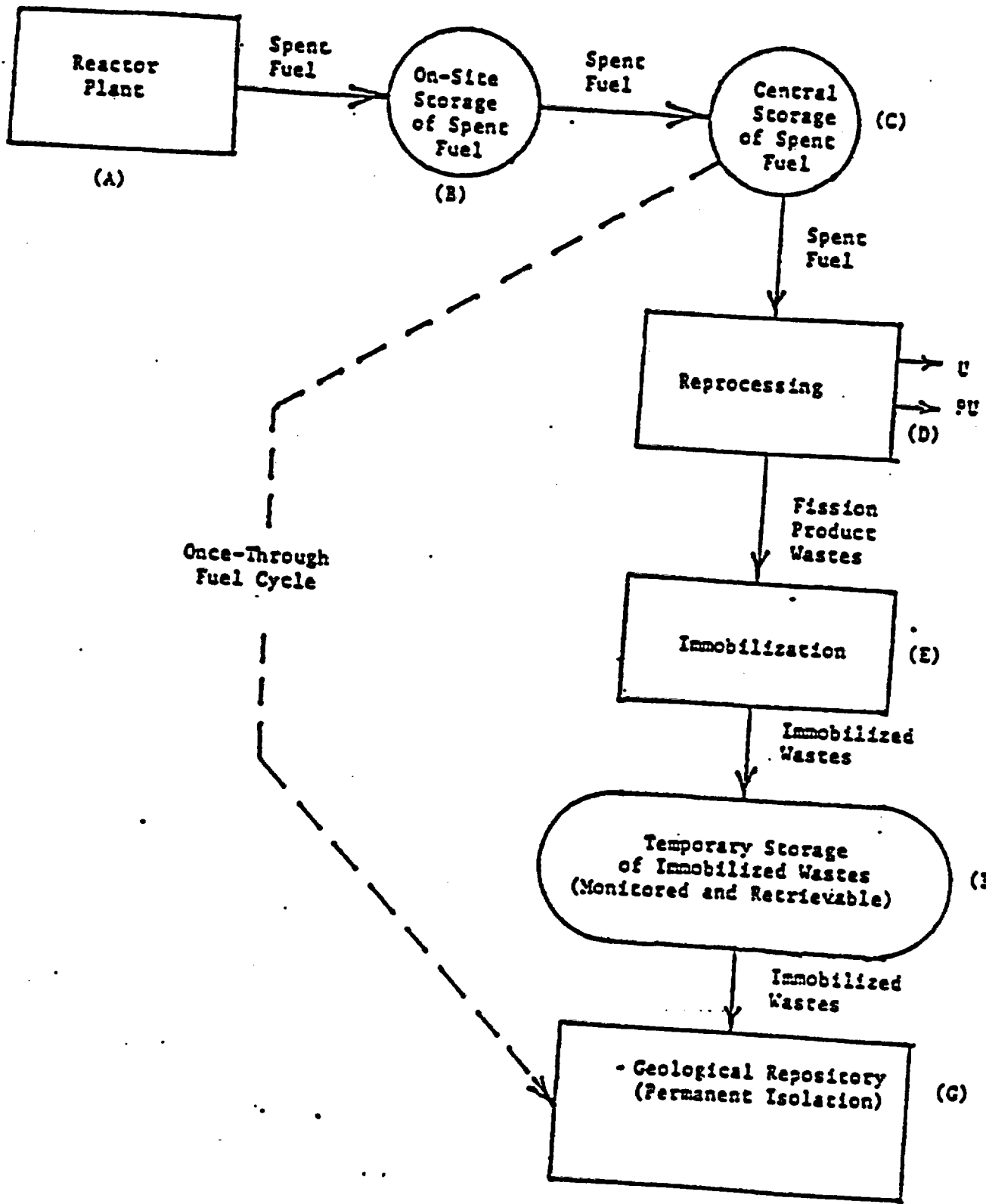
Before discussing the specifics of the evolving waste management policy, it is useful to walk through the current and prospective backend of the nuclear fuel cycle and to place the waste management program in this broader context. Again, I hasten to point out that the Administration has not as yet settled on the specific details of the closure of the fuel cycle. To complete the formulation of our technical and institutional policies will require careful consideration of several factors.

The backend of the nuclear fuel cycle should be regarded as an integrated system, as shown in Figure 1. Waste management is one element of this system.

Spent fuel discharged from a reactor core (A) is stored for some period of time at the reactor site (B). To date, the U.S. has not gone beyond this step, and some on-site storage pools will be full by the mid-1980s. This spent fuel storage congestion represents a very real, near-term concern of many utility companies. The possible steps beyond on-site storage are prospective -- that is, facilities to accomplish those steps do not presently exist.

Beyond on-site storage of spent fuel, a temporary measure at best is the possibility, if logistics require, of centrally located spent fuel storage facilities to accommodate more than one reactor.

FIGURE 1



Reprocessing is the next prospective step (D). Reprocessing mechanically and chemically separates the incoming spent fuel into three output streams: uranium, with a residual energy value; plutonium, with a residual energy value; and a stream concentrated in fission product "wastes". The term "wastes" may, indeed, be a misnomer; there is a significant body of opinion in the scientific community that several of the fission product species may have economic applications. For the moment, for simplicity in our discussion, let us retain the word "wastes".

Step (E) is the immobilization (or solidification) of the waste stream. There are several candidate forms for the solidified wastes: for example, borosilicate glass, SYNROC (synthetic mineral), tailored ceramics, and high silica glass. Several of these processes have been demonstrated on a laboratory scale, and some have been scaled to operational practice abroad. Immobilization, we believe, will certainly be an element of the reprocessing complex. Transportation of high-level wastes in liquid form is not allowed by the Nuclear Regulatory Commission.

Prospective step (F) is an engineered facility to store, retrievably, immobilized wastes until an ultimate disposition system in a natural geological formation is available. This step would provide a logistical "surge" capability against the possibility of a delay in finding a politically acceptable method of permanent isolation of high-level wastes from the biosphere. We are impressed with the

rench approach: reprocessed wastes are immobilized and these immobilized wastes are stored in a retrievable facility until such time as geologic disposal is available.

Finally, the last step is ultimate separation of immobilized high-level waste from the biosphere. Major candidate media are geological formations known to be seismically stable for millions of years.

What I have just described is a chain of steps designed to maximize flexibility of choices in the future, allow for logistical contingencies, and conserve our nuclear reserve base. It is a strategy envisioned by the pioneers in the nuclear community decades ago and sustained in principle, if not in detail, by both Democratic and Republican Administrations.

Another possibility is the policy of the previous Administration which established as a reference strategy the once-through fuel cycle. This is shown in dotted lines in Figure 1. In this plan, residual energy values were not to be recovered but irretrievably disposed of. Reprocessing was banned. Civilian immobilization technology development was banned.

The waste management program that we are proposing differs markedly with the previous Administration's program. Although this Administration's waste management policy has not been finalized, the approach proposed by the

Department is a logical extension of the 30 years of research and development that was carried out by the Atomic Energy Commission and its successor agencies and is in continuity with the waste management programs of the rest of the world.

We believe that the cornerstone of the waste management program should be that the reference waste form, as it was prior to the Carter Administration and as is in concert with the rest of the world, is reprocessed high-level waste. While the previous Administration's approach of using spent fuel as the reference waste form may have been technically achievable, we believe that reprocessed waste results in a more desirable waste form from the standpoint of long term stability. In addition, it will permit the recovery of the substantial unused energy values in the fuel. The waste will be similar in nature to the considerably larger volume of defense waste and can benefit from that parallel developmental program. Further, it is our intent to demonstrate the permanent storage of high level radioactive wastes as soon as possible.

National reprocessing capability is key to the formulation of our high-level waste program and the President has gone on record as favoring reprocessing by the nuclear industry. We believe it can enhance our ability to successfully demonstrate that we can effectively deal with the waste management problem. By separating

the principal long term concern—plutonium, converting the waste to a solid form and then placing it in a very stable, immobilized form, such as glass, we can go far toward demonstrating that we can effectively handle radioactive waste and prepare it for permanent storage. The temporary storage of such solidified wastes at or below the earth's surface will lend further credence to availability of an effective solution. It could also serve as a valuable contingency plan should difficulties occur in development of an acceptable permanent repository. As our policy crystallizes, we will be providing you with additional information on our decisions and plans.

There are several other areas in which significant policy redirection has taken place. The Terminal Isolation Program which focuses on step G of Figure 1, has been reoriented to provide an earlier focus on actual alternative site locations.

Since waste isolation is a major interest in the bills under consideration, I would like to outline the strategy that DOE currently proposes to implement. I believe you will agree that many of the initiatives and objectives in the DOE plan are similar to those provided for in the proposed legislation.

1. Focus on specific sites -

DOE proposes to identify three specific sites at which construction of exploratory shafts to depth would begin by 1983. As a result of the technical status of the program, these three locations will likely be: