

Natural Resources Defense Council, Inc.

917 15TH STREET, N.W.
WASHINGTON, D.C. 20005
202 737-5000

Western Office
2345 YALE STREET
PALO ALTO, CALIF. 94306
415 327-1080

New York Office
122 EAST 42ND STREET
NEW YORK, N.Y. 10017
212 949-0049

Statement

of

Thomas B. Cochran

on behalf of

Natural Resources Defense Council

before the

Governmental Affairs Committee

U. S. Senate

Chicago, Illinois

July 5, 1979

My name is Thomas B. Cochran. I have a Ph.D. in physics and am presently a Senior Staff Scientist at Natural Resources Defense Council (NRDC) on whose behalf I am testifying. NRDC is a national non-profit environmental organization with a membership of approximately 45,000. We have been concerned with the nuclear waste issue for a number of years and welcome this opportunity to appear before this Committee.

My testimony will focus on the three areas of interest identified in the Chairman's June 26, 1979 letter to my colleague, Mr. Roisman, namely: 1) identify and discuss the key issues in nuclear waste storage and disposal policy, and is there a need for Federal acquisition or construction of AFR storage capacity of spent nuclear fuel; 2) assess the adequacy of current, planned and past efforts of the Federal Government to provide storage and disposal of high level nuclear waste and spent fuel; and 3) discuss the objectives and provisions of S.742 and suggest possible changes and additional issues which should be addressed.

Before addressing these specific issues and to place the waste issue in perspective, let me state briefly a few general perceptions related to the risks associated with nuclear waste management.

a) In the hierarchy of concerns, nuclear waste management does not rank at the top of my list. Relative to other risks associated with the commercial nuclear power industry, I would rank waste management after nuclear weapons proliferation and reactor safety. Nonetheless, the nuclear waste problem is an extremely serious problem which is getting increasingly worse

due to mismanagement and the unrestrained and increasing rate of production of nuclear wastes.

b) Safe permanent disposal of nuclear wastes in mined geological repositories is technically feasible, at least in theory.

c) It is likely that permanent disposal will be managed in an unsafe or risky manner, the reasons having more to do with institutional, as opposed to technical, uncertainties. As noted in the IRG Report, ". . . the resolution of institutional issues, required to permit the orderly development and effective implementation of a nuclear waste management program, is equally important as the resolution of outstanding technical issues and problems and . . . may well be more difficult than finding solutions to remaining technical problems." (IRG Report, p. 87) Also, "Institutions that can cope on a small scale may fail as the demands placed on them multiply. The IRG believes that a more detailed analysis of logistical and other institutional problems which would arise out of attempting to manage wastes on the scale required should be undertaken." (IRG Report, p. 88)

d) Because of the extremely long time period during which the nuclear wastes remain hazardous, nuclear waste management involves important ethical considerations. However, nuclear waste management is far from unique in this regard. The coal technology with its CO₂ and solid waste problems and the fact that it's a non-renewable resource presents the same ethical problems. Unlike nuclear waste management, some of these problems with coal appear intractable.

Key Issues in Nuclear Waste Storage and Disposal Policy

Today the central overriding unresolved waste management question is what should be our strategy for ensuring safe permanent disposal of radioactive waste? The Administration's efforts to come to grips with this question are embodied in the Report to the President of the Interagency Review Group on Nuclear Waste Management (IRG Report). We have commented on the IRG Report before the Senate Committee on Government Affairs, and I am enclosing a copy of these remarks for your convenience (Enclosure 1). Here, let me simply highlight a few of the points made in this testimony.

° The present Government waste management program is proceeding backwards through the stages of a rational approach to waste management (Enclosure 1, pp. 1-3).

° The important unresolved issues are of two kinds: technical and institutional . As quoted above from the IRG Report, "The resolution of institutional issues . . . is equally important as the resolution of outstanding technical issues and problems."

° The quality of the IRG review, particularly as it related to the resolution of the underlying institutional problems, was severely restricted (Enclosure 1, pp. 3-4).

With respect to the unresolved technical issues, the most immediate requirement is the development of criteria and standards for nuclear waste management. In this regard, NRDC has recently completed a radioactive waste management study under a small DoE contract which I will make available to the Committee. It is essential that the development of the U.S. waste

management criteria and standards be subjected to extensive Congressional oversight and we are very troubled by the lack of attention given this area by the Congress. If we do not have strong Congressional oversight in this area, the bureaucracy is going to hand us a pig in a poke - - criteria under which bad disposal plans can, and very likely will, be licensed. The approach taken by this and previous Administrations - - developing the disposal plan first and the criteria last - - look an awful lot like throwing the dart and then going up and drawing the bullseye around it.

With respect to the unresolved institutional issues we are pleased that Senators Percy and Glenn have taken the lead in resolving some of the stickiest problems. I will have a few comments on the Percy-Glenn bill (S-742) subsequently.

The resolutions of the technical and institutional issues surrounding permanent disposal still leaves open the question of what to do with the spent fuel in the interim. In this regard, I now turn to the Administration's proposed Spent Fuel Policy and the question of whether there should be a Federal Away From Reactor Spent Fuel Storage Facility (a Government AFR).

The AFR Issue

In October 1977, without the benefit of an environmental impact statement, and without compliance with any procedure for soliciting and considering public opinion, the Department of Energy announced two spent fuel storage policies. One policy was a scheme for the interim storage of spent fuel from domestic reactors, and the other policy provided for the selective return and interim storage of spent fuel from foreign reactors. These

two policies, addressed separately below, have been linked by DoE although there is no rational justification for such linkage and serious disadvantages to it.

With regard to DoE's policy as it relates to domestic reactors, there are several issues that should be addressed: first is the question of whether there is a genuine need for a Government AFR; second, given that the answer to the first question is "No", what is the real underlying basis for the Administration's AFR proposal; third, what are the downside risks of the Administration's proposal; and finally, what is the preferred alternative?

Is a Federal AFR Needed?

We think now, at least for domestic use. In late February and early March, NRDC conducted a survey of utilities to check the factual basis of a list of reactors which DoE was circulating as evidence that an AFR is needed. The findings of this survey are presented in a March 26, 1979 report, "NRDC Findings on the Alleged Need For Acquisition or Construction Of An Away From Reactor Spent Fuel Storage Facility" (Enclosure 2). We concluded that the DoE survey was inaccurate and that contrary to DoE claims, an AFR was not needed. In a March 30, 1979 report accompanying a letter to Congressman John Dingell, DoE challenged our analysis. Subsequently, NRDC prepared "No Need for AFR's", a critique of the new DoE analysis (Enclosure 3). As the title indicates, this May 1, 1979 NRDC report reaffirmed our earlier analysis and its conclusion that no Government AFR is needed. I particularly wish to call your attention to the Summary of this report (Enclosure 3, pp. 24-25).

More recently, the General Accounting Office has arrived at essentially the same conclusion, ". . . the Department [of Energy] should not develop an interim spent fuel storage program."^{*/} I might also note that last year the Tennessee Valley Authority approached DoE with an offer to build a national AFR facility. On the basis of a more recent staff report, TVA is now planning on expanding existing onsite spent fuel storage rather than building new AFR pools.

The Administration's Motive for an AFR

If there is no real need for a Government AFR, then what is DoE's motive? The answer to this is quite simple. The DoE is marching to a different drummer. Its highest priority is to insure the survivability of the nuclear option, rather than insuring the health and safety of future generations. This has infected virtually every important waste management policy decision of this Administration.

From the perspective of the nuclear industry there are four clearly identifiable nuclear waste problems. First, there is the problem arising from the California nuclear laws and recent actions in other states which require some sort of demonstration that the waste problem is solvable. Second, public service and utility commissions (PSCs and PUCs) are demanding that nuclear fuel cycle uncertainties be reduced and that the cost of nuclear

^{*/} General Accounting Office, "Federal Facilities for Storing Spent Nuclear Fuel -- Are They Needed?", EMD-79-82, June 27, 1979.

waste management be determined. Third, the utilities are becoming constipated with waste -- the spent fuel storage problem. And finally, the Congress and the public are clamoring that the Administration doesn't know what it's doing -- there doesn't exist a workable process for solving the waste problem.

What is DoE's response to this? First, in response to the California problem, DoE is pushing for a demonstration effort at the WIPP facility. Although the geologic community, at least here in the U.S., has seriously questioned the wisdom of salt disposal and the Carlsbad site, DoE proposes that the determination of whether salt is an appropriate medium and Carlsbad an appropriate site be adjudicated via the NRC licensing process. It should be noted that the President may override DoE on this matter, in part because the House Armed Services Committee will not go along with licensing the WIPP facility. Second, in response to the PSCs and PUCs, the DoE wants to take title to the waste for a fixed fee, and in response to the spent fuel storage problem, DoE is pushing the AFR proposal. AFR storage, of course, goes hand in hand with the government taking title to the fuel for a fixed fee. And lastly, the IRG Report on waste management was a response to the criticism that the Administration was not on top of the waste issue. All of these Administration responses are not bad. All but the last, however, conflict with the approach one would take if the overall objective is to protect future generations instead of the domestic nuclear power industry.

Well after the Administration announced its spent fuel policy in October 1977, DoE officials became convinced that it was not in the Government's interest to get stuck with numerous Government AFRs. In July 1978, DoE stated, "There is considerable interest in minimizing AFR storage requirements and shipments by encouraging the use of at-reactor storage by further densification and/or expansion. It is assumed that there would be economic and other advantages to the utilities of keeping their spent fuel at their own reactor sites rather than shipping it to interim AFR storage basins." ^{*/}

Since the President had already committed the Administration to the Government AFR, DoE opted to encourage at reactor storage by fixing a high fee for its use and by abandoning the one time charge in favor of a one time charge with an adjustment at the time the spent fuel is ultimately delivered to the final repository - in effect, a "two time charge." DoE reduced its estimate of the demand for Government AFR use by domestic utilities from about 15,000 tons, estimated in 1977, to about 500 tons. This new estimate does not readily appear in DoE public statements, for DoE officials are now caught between a rock and a hard place. They cannot publicly admit that the demand for AFR storage is less than what is needed to justify one AFR without undercutting the President's previously announ-

^{*/} Preliminary Estimates of the Charge for Spent-Fuel Storage and Disposal Services, DOE/ET-0055, July 1978, p. 3.

ced policy.

The Downside Risks

What are the downside risks of going ahead with a Government AFR? First, it should be noted that the DoE spent fuel policy as it relates to domestic reactors if implemented would involve a potentially massive new subsidy by the Federal government for nuclear power, by shifting to the government the economic risk that waste handling and disposal will be substantially more expensive and shifting from the utility the need to consider the nuclear waste problem in deciding whether to build and operate nuclear reactors.

Recent hearings held by the NRC with respect to the proposal of Duke Power Company to shuffle spent fuel from its operating Oconee reactors to its yet to be operated McGuire reactors in order to avoid expanding spent fuel storage space at the Oconee site illustrate our point. Duke plans to move spent fuel from its older reactors to its newest reactors in a scheme called the "cascade plan" but could be more accurately described as a nuclear waste chain letter. Duke concedes that this is a holding action while waiting for the Government to find an AFR. Duke would prefer to have the government AFR because it reduces political problems for Duke - i.e., reduces citizen and local government opposition to nuclear wastes and because it is cheaper - i.e., it relieves Duke from the responsibility of raising its own capital to finance expansion of spent fuel storage at the site of its reactors, a step Duke admits it can take.

More importantly, we believe a Government AFR policy could lock us into permanent "interim solutions" namely Government AFRs. Table 1 is taken from the IRG Report. The two columns, Cases 1 and 2, represent nuclear growth rates leading to 148 Gwe and 380 Gwe in the year 2000 respectively. The 148 Gwe figure is compatible with a moratorium on new reactor starts, building only those reactors which are more than about 2 percent completed as of today. As can be seen from the first sets of entries, we will need, by DoE estimates, from 3 to 6 geologic repositories to handle the defense and commercial high level wastes. This estimate is based on an assumption that a repository will hold 100,000 tons of commercial high level waste. If, as has been assumed by the California Energy Commission, we use a more conservative figure of 35,000 tone, then we will need 9 to 18 repositories. And yet after 35 years of nuclear power plant operation, we still don't know where the first one will be! Short of a nuclear moratorium, we are likely to find that we cannot site, build and license repositories fast enough. The nuclear industry ran into this same problem with nuclear fuel reprocessing plants prior to 1977 when the President indefinitely deferred reprocessing in the U.S. As noted previously, the IRG concedes our institutions may not be able to cope with the potential logistical problems that loom ahead, and that a more detailed analysis of these logistical and institutional problems is required.

Looking at the second set of entries in Table 1, if the first repository doesn't open until 2000 (as now seems likely),

Table 1 ^{*/}

Nominal "Lifetime" Requirements for Nuclear Waste Management and Disposal

	<u>Case 1</u> ^{1/}	<u>Case 2</u> ^{1/}
Geologic Repositories:		
for defense high level wastes	1	1
for defense TRU wastes	1	2
for commercial high level waste ^{2/}	2	5
Potential Away-from-Reactor Spent Fuel Storage Facilities:		
if repository opens in 1988	3	3
if repository opens in 1992	6	6
if repository opens in 1996	8	9
if repository opens in 2000	12	14
Low Level Waste Disposal Sites:		
commercial LLW (acres required)	300	950
defense LLW (acres required)	140	700
Uranium Mine and Mill Tailings:		
billions of tons	1.9	5.2
number of sites	40	40
Decontamination and Decommissioning Activities:		
number of facilities decontaminated and decommissioned (commercial facilities only)	148	380
Transportation Requirements		
a. Low level waste volume ^{4/}	120	450
b. Number of trips with high level wastes ^{3/}	1400	3200
c. TRU waste volume ^{4/}	6.8	116

^{1/} Defined in Appendix D.

^{2/} The requirement for repository space is not sensitive to the decision to dispose of spent fuel or to reprocess the spent fuel and recycle the uranium and plutonium.

^{3/} The number of trips does not include interim storage of spent fuel in an AFR storage facility. Depending on the date of a repository opening these numbers could be somewhat (50%) higher.

^{4/} Millions of cubic feet, cumulative through the year 2000.

^{*/} Report to the President by the Interagency Review Group on Waste Management, TID-29442, March 1979, Washington, D.C. p. 12.

and we have a Government AFR program, we may end up with not one, but 12 to 14 Government AFRs. A commitment now to one Government AFR is more realistically a commitment to 12 or more in the coming decades.

The Government's AFR program is admittedly an attempt to decouple nuclear reactor licensing and operation from nuclear waste considerations to make it easier to obtain approval to build and operate nuclear plants. Even without Congressional action formally linking the further use of nuclear power to progress on solving the nuclear waste problem, there is in fact now such a linkage. Four states, California, Wisconsin, Iowa and Maine, have taken legal steps to limit or prevent further nuclear plant licensing without a solution to the nuclear waste problem. Both the President's Council on Environmental Quality and the General Accounting Office have called for a limitation on the use of nuclear power unless progress is made toward solving the nuclear waste problem. The public awareness of this problem is very much influenced by the build-up of nuclear wastes at reactor sites. Once those wastes leave the reactor sites, the public most concerned with the reactors may be less concerned with the wastes -- afar from site, afar from mind. On the other hand, efforts to expand spent fuel capacity at an existing reactor site or for new reactors forces those who benefit from the nuclear power to face up to the risk that further use of nuclear power at their reactor without any solution to the nuclear waste problem could make their reactor

site a large de facto permanent waste disposal site. That places the choice and the considerations relevant to it precisely where they belong.

With a Government AFR program, the natural control on further generation of nuclear wastes will be gone and AFR capacity will expand to the point where any solution to the nuclear waste problem will be virtually impossible. As noted above, we are already over-committed to repositories. This is to say nothing of the massive numbers of truck and rail shipments of nuclear wastes that will be required each year - a number that will almost double under a Government AFR program. After so many disastrous waste management programs, it would be the height of folly to buy yet another interim solution to a real and permanent problem.

The Preferred Alternative to AFRs

Clearly, the preferred alternative is for the Government to devote its full attention to finding a permanent solution to the nuclear waste problem. The Government should neither build nor allow to be built any AFRs except possibly under very strict guidelines that ensure that AFRs are not used as a crutch by utilities to bail out of the waste problem. As the GAO has noted, interim spent fuel storage can and should be handled by the private sector.

The preferred alternative is for utilities to expand at-reactor storage to meet their reactor lifetime spent fuel storage requirements. NRDC has shown that there is ample storage space at all existing reactor sites to build new storage

capacity (Enclosure 4). Local and state governmental activities with the authority to approve or disapprove spent fuel storage expansion would do so with the knowledge that their denial will force shutdown of the reactor and with the assurance that if they make that decision the availability of an AFR will not be used as a device to evade the consequences of that decision. In this way the interim spent fuel storage remains neutral to the question of the desirability of continued use of nuclear power.

Return of Foreign Spent Fuel

NRDC supports the return and storage of limited amounts of foreign spent fuel of U.S. origin, where we believe it serves our non-proliferation interests. This would include removal from sensitive areas, and removal where such action would be effective to forestall commitments to reprocessing, or otherwise provide a clear non-proliferation benefit. (For further discussion, see Enclosure 5.) However, we do not believe that a government AFR is needed for this purpose.

Before one can address intelligently how best to provide on an expedited basis limited capacity for the return of foreign spent fuel of U.S. origin, one needs answers to the following questions:

- 1) What is the spent fuel storage capacity at the Federal installations that can be made available immediately, or on short notice?

- 2) What capability exists to transport spent fuel from sensitive areas? How much can be moved, and how soon?

We have been told by DoE and the Department of State that no significant storage capacity is presently available at the National laboratories, and that the U.S. will not have the capability to move foreign spent fuel for several years. It would be helpful if the Congress could obtain firm data on these issues, if they have not already done so.

Before offering our own proposals for obtaining foreign spent fuel storage capacity, it is useful to review DoE's thinking as we understand it.

DoE argues that there must be a Government AFR facility because the President has so decreed, and that the return of foreign spent fuel must be linked to the domestic AFR, because Congress would take a dim view of the Administration providing a service for foreign utilities that it will not provide for domestic utilities. The domestic AFR must be licensed under existing law. DoE argues that the Armed Services Committee will not allow licensing of an AFR at the Hanford, Savannah, or Idaho reservations for fear that regulatory restraints might also be placed on weapons or military related activities. Hence, the Government AFR facility must be located elsewhere. In order to obtain immediate AFR capacity under the above constraints, DoE feels that it must buy one of the existing facilities, Barnwell, Morris, or West Valley. DoE prefers the Barnwell plant in South Carolina, even though storage of foreign spent fuel next to a reprocessing plant would generate counter-productive suspicions by countries that already question the U.S. commitment against reprocessing.

The Governor of South Carolina has in effect told DoE that he will not allow Barnwell to become the waste dump of the country; that DoE must get another state to take some of the waste. Thus, we now hear references to regional AFRs. In order to meet the demands of the Governor of South Carolina, DoE tried to strike a deal with the State of New York on West Valley. Even though West Valley is a bad site from a waste management standpoint, and there is very little excess spent fuel storage capacity, DoE is willing to purchase West Valley to get Barnwell. In summary, by tenaciously refusing to decouple the return of foreign spent fuel from the domestic AFR issue, DoE is being forced into a new series of waste management blunders.

There may be a better answer. Assuming that there is no storage space presently available at Federal facilities, we offer the following proposals for your consideration:

a) The Congress should require the Secretary of Energy to consult with nuclear utilities to determine the price at which they would be willing to rent varying amounts of space at existing reactor spent fuel storage pools to the Federal Government for a limited period of time, that is, until the Federal Government builds an AFR at a Federal installation dedicated for foreign spent fuel. Parenthetically, those price quotations may provide an interesting index of the appropriate one-time transfer fee which the Administration proposes to assess utilities for taking custody of fuel rods in a domestic AFR.

The Secretary should also study the feasibility of expanding storage capacity which is to be constructed at National Engineering Laboratory for submarine fuel to take foreign fuel as well. Or, the Clinch River Breeder Reactor (CRBR) site might be considered. The necessary environmental survey for that site has already been completed.

b) The Secretary should report the results of these inquiries to Congress. If feasible as an alternative to building a new Government AFR storage facility, the Congress could authorize or require the Secretary to purchase available space at spent fuel storage pools at operating commercial reactors or government installations.

These proposals have several clear advantages over the Administration's AFR proposal:

i) Limited space could be provided immediately, by Act of Congress if necessary. Existing U.S. commercial reactors can handle both PWR and BWR fuel assemblies. While DoE argues that any of 22 reactors - and we dispute this - may need AFR storage relief prior to 1985, the remaining 50 reactors have an adequate spent fuel storage capacity. The TVA reactors already have adequate storage capacity to meet their needs beyond 1990. The storage pools for Unit 2 at Three Mile Island also comes to mind.

ii) The cost should be modest by comparison with DoE's current approach which could involve the acquisition of several sites and the construction of new facilities.

iii) Storing limited quantities of spent fuel of U.S. origin in domestic reactor pools makes more efficient use of investments in current nuclear power infrastructure rather than neces-

sitating further investments in a technology which imposes such large social costs, most notably, the proliferation of nuclear weapons.

Care should be given to insure that the Secretary's authority does not extend to all existing spent fuel pools, as this would include the existing pool at the AGNS reprocessing facility at Barnwell. As noted previously, storage of spent fuel at this facility would clearly send the wrong signal to countries that already question the U.S. commitment on non-proliferation objectives.

The Percy-Glenn Bill - S.742

Turning now to the Percy-Glenn bill, we believe this represents a good step toward resolution of some of the institutional issues inhibiting responsible nuclear waste management. We have the following specific comments:

1) With respect to makeup of the Repository Review Panel, it should be noted that the potential migration of radioactivity knows no state boundaries. If the repository is located at or near a state boundary the state or states most affected may be the adjacent states, or even some non-adjacent ones. The makeup of the Repository Review Panel should be more regional in nature and not the sole discretion of the Governor of the State in which the site is selected.

2) The actions of the Nuclear Waste Coordinating Committee should not be triggered by application for a license to construct the main shaft of a repository. A more appropriate trigger would be tendering an application for a construction permit or limited work authorization without reference to shaft work.

3) The Nuclear Waste Management Planning Council is too heavily weighted with state or local officials. Furthermore, the Planning Council might be more useful if it has more of a review role, structured along the lines of the Advisory Committee on Reactor Safeguards.

4) The Bill should include provisions to ensure that the Freedom of Information Act and the Sunshine Act apply to the various committees and councils set up by the Bill.

5) The Bill is good as far as it goes, but it does not appear to provide sufficient oversight with regard to the site selection process.

6) Assuming that the Congress is serious about adequate citizen and state participation, the Bill should insure that this participation is fully funded. Citizens cannot now marshal the resources to effectively participate in hearings before the Nuclear Regulatory Commission or DoE on matters related to nuclear waste management.

I hope these comments are of some use to the Committee. This concludes my statement.