

# UNITED STATES OF AMERICA NUCLEAR REGULATORY COMMISSION

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

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BRIEFING BY DOE ON HIGH-LEVEL  
WASTE PROGRAM

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PUBLIC MEETING

Nuclear Regulatory Commission  
One White Flint North  
Rockville, Maryland

Monday, December 20, 1995

The Commission met in open session,  
pursuant to notice, at 2:30 p.m., Ivan Selin,  
Chairman, presiding.

COMMISSIONERS PRESENT:

IVAN SELIN, Chairman of the Commission  
KENNETH C. ROGERS, Commissioner  
FORREST J. REMICK, Commissioner  
E. GAIL de PLANQUE, Commissioner

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## STAFF AND PRESENTERS SEATED AT THE COMMISSION TABLE:

SAMUEL J. CHILK, Secretary

WILLIAM C. PARLER, General Counsel

DANIEL DREYFUS, Director, Office of Civilian  
Radioactive Waste Management, DOE

LAKE BARRETT, Acting Deputy Director, OCRWM, DOE

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P-R-O-C-E-E-D-I-N-G-S

2:30 p.m.

CHAIRMAN SELIN: Good afternoon, ladies and gentlemen.

The Commission is meeting now to receive a briefing from the Department of Energy on its Civilian High-Level Waste Program.

With us today are Doctor Daniel Dreyfus, Director of DOE's Office of Civilian Radioactive Waste Management, and Mr. Lake Barrett, the Acting Deputy Director, and several other staff.

We were last briefed by DOE on this program just about a year ago, in December 1992. We've heard some significant decisions and some significant questions that the Department and the Secretary have raised and we're very anxious to hear more about the Office of Civilian High-Level Waste Program's progress to date and the initiatives under consideration by the Department.

Commissioners?

COMMISSIONER ROGERS: Nothing.

CHAIRMAN SELIN: We welcome you, gentlemen, and we look forward to your presentation. Thank you.

DOCTOR DREYFUS: Well, thank you, Mr.

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1 Chairman and Commissioners. I appreciate this first  
2 opportunity to brief the Commission. As the Director  
3 of the Office of Civilian Radioactive Waste  
4 Management, I'm pleased to represent the Clinton  
5 Administration and Secretary O'Leary on behalf of the  
6 program.

7 Secretary O'Leary, since taking office,  
8 has made a number of important decisions that impact  
9 the program. The Secretary has affirmed that the key  
10 to determining the suitability of the Yucca Mountain  
11 site lies in investigation of the site's geology  
12 through tunnel exploration. Therefore, she has  
13 ordered the excavation and tunneling activities for  
14 the Exploratory Studies Facility, or ESF, to continue  
15 as planned. She has directed the program to continue  
16 the development of a design for standardized  
17 containers to support spent fuel transportation,  
18 storage and disposal.

19 The Secretary has recommended that the  
20 Administration propose revolving fund legislation  
21 which will provide greater access to the Nuclear Waste  
22 Fund collections to carry out the program. She has  
23 also directed the program to explore a full range of  
24 options for the near-term storage of spent fuel  
25 pending ultimate disposal and to consider alternative

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1       licensing strategies for the repository. Options to  
2       address both of these issues will be reviewed with  
3       substantial external consultation.

4               As has been customary in this annual  
5       meeting, my prepared statement, which you have,  
6       provides you with a full report on the broad progress  
7       that the program has made in the past year. The  
8       statement reviews mine geologic disposal system  
9       development, storage and transportation system  
10      development with an emphasis this year on the multi-  
11      purpose canister or MPC activities, and the associated  
12      technical integration program.

13             We have continued to work with your staff  
14      on the repository annotated outline and on issue  
15      resolution initiatives, closure of site  
16      characterization analysis open items and the licensing  
17      support system. These are all matters in which the  
18      Commission expressed particular interest last year.

19             My statement also covers the ESF design  
20      control issues, the affect of budget uncertainties on  
21      this program and our plans for interacting with the  
22      Commission in 1994. These matters are all vital to  
23      the progress we intend to make in the years to come.

24             To begin the briefing, I will note my own  
25      observations thus far in my relatively short tenure as

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1 director. The Department's program has been in  
2 progress now since 1982 and we have gained a great  
3 deal of experience. We have collected data and we  
4 have increased our comprehension of the technologies  
5 of the repository site characterization, waste package  
6 development and transportation of spent nuclear fuel  
7 and high-level radioactive waste. This decade of  
8 experience, however, also encompasses development,  
9 along with the Congress, the Commission and the other  
10 participants, of a legal and regulatory framework for  
11 dealing with a first-of-a-kind facility, a facility  
12 which has to serve for a very long period of time.

13 We have gained experience as well with a  
14 related issue, that of achieving social acceptability  
15 for the management and disposal approach we take to  
16 such materials. This decade of experience in both its  
17 successes and in its failures, and possibly  
18 particularly in its failures, constitutes a major  
19 asset upon which I think we should build for the  
20 future.

21 Major redirections of the program have  
22 been made along the way by the Congress, by the  
23 administrators and by the Commission. In my view, it  
24 is a continuing responsibility of the program to  
25 review past progress and to look at the new outlook

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1 for the future and to initiate or at least propose new  
2 directions whenever experience warrants such  
3 initiatives.

4 In our report to you last year, we stated  
5 that 1993 would be a very busy year and the following  
6 highlights of our progress validate that prediction.

7 At Yucca Mountain we accelerated our  
8 efforts to design and construct the ESF. We selected  
9 the design for the ESF launch chamber, ordered the  
10 first tunnel boring machine, continued very  
11 comprehensive Title II design activities, completed a  
12 200 foot long starter tunnel for the tunnel boring  
13 machine eleven days ahead of schedule, and just  
14 recently we completed the initial phase of excavation  
15 and testing in Test Alcove Number 1.

16 During 1993, the surface-based testing  
17 activities were also expanded. We completed the 24  
18 hole drilling program for the neutron source  
19 investigation of water infiltration. We conducted  
20 geophysical logging activities in three bore holes,  
21 continued gas phase testing activities and established  
22 a geophysical integration task force.

23 Progress was made in the repository and  
24 waste package advanced conceptual design efforts. As  
25 a result of this work, the Department proposed

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1 improvements to the design of the facility, which  
2 provide for characterization of the Ghost Dance fault  
3 at a number of points along the main drift. If the  
4 site is suitable, these proposed design improvements  
5 offer more repository layout flexibility than the  
6 current arrangement. They eliminate the need for the  
7 repository emplacement drifts to cross the Ghost Dance  
8 fault, the major fault in the mountain, and will allow  
9 repository drifts to be placed further above the water  
10 table. Flatter grades at the entries in the ESF will  
11 also allow the use of conventional rail haulage for  
12 excavation and if the site is suitable for emplacement  
13 of waste.

14 The scope of performance assessment  
15 activities has been expanded. We conducted test  
16 interference and waste isolation evaluations to  
17 preclude test-to-test interference and to ensure that  
18 the construction of the ESF and the testing activities  
19 would not affect waste isolation in the final  
20 repository. We have completed initial calculations  
21 for Total System Performance Assessment II, which is  
22 focused on parameter sensitivity, uncertainty  
23 analysis, and the comparison of simplified and more  
24 complex flow models. The report is expected to be  
25 completed in the spring of '94.

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1           Our efforts to develop the MRS and  
2           transportation elements of the system have seen  
3           progress as well as frustration in the past year. We  
4           completed the conceptual design of the MRS and the  
5           related evaluation of off-the-shelf technologies to be  
6           used and the monitored retrievable storage. The  
7           program is ready to begin license application design  
8           should a site be designed. The program has supported  
9           efforts of the Nuclear Waste Negotiator to identify a  
10          host for an MRS by conducting on-site assessments of  
11          potential sites that were identified on Mescalero and  
12          Skull Valley Goshute tribal lands. No significant  
13          problems were identified at either location. Recent  
14          congressional action, however, calls into question the  
15          prospect of future progress at these volunteer sites.  
16          We are continuing to work with two other interested  
17          jurisdictions.

18                 We are continuing our efforts to develop  
19          truck casks and have completed the final design of an  
20          advanced technology legal weight truck cask.

21                 The Annotated Outline initiative is an  
22          excellent example of a Department/NRC effort that is  
23          taking advantage of experience to enable us to ensure  
24          future success.

25                 To date, the Department has submitted four

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1 iterations of the repository annotated outline to your  
2 staff. The most recent revisions, 2 and 3, were  
3 provided in May and at the end of November of '93.  
4 The program appreciates the guidance and comments  
5 received on Revisions 0, 1 and 2. We plan to submit  
6 Revision 4 of the Repository Annotated Outline in  
7 1994.

8 Our experience with the MRS Annotated  
9 Outline has been comparable. To date, the Department  
10 has submitted three iterations, the last in June of  
11 '92, and has received staff guidance and comments on  
12 Revisions 0 and 1. We do not, however, plan to update  
13 the monitored retrievable storage annotated outline  
14 document until such time as an MRS site is identified.

15 In the past year, consistent with the  
16 emphasis we have placed on the development of the  
17 multi-purpose cask system, we expanded the scope of  
18 our issue resolution activities. They now actively  
19 address repository, storage and transportation issues.  
20 The program has conducted technical exchanges with  
21 your staff on issues such as substantially complete  
22 containment as it relates to the engineered barrier  
23 system, volcanism, seismic hazard assessment  
24 methodology, the conceptual design of the multi-  
25 purpose cask, and the related issues of burn-up

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1 credit, criticality control and thermal loading.

2 There are two important activities I would  
3 like to address in particular. These are the multi-  
4 purpose cask effort and the ESF design and design  
5 control process.

6 The role of the multi-purpose cask in our  
7 program has grown in importance and we have devoted a  
8 great deal of attention to its development. The  
9 program completed a feasibility study announced to you  
10 last year and just recently completed a conceptual  
11 design study. Because the MPC would be employed at  
12 reactor storage and transportation and potentially in  
13 disposal activities, we will have to satisfy  
14 applicable requirements under two NRC regulations and  
15 be compatible at least with the disposal regulation.  
16 The issues of burn-up credit, criticality and thermal  
17 loading are very significant to Commission approval of  
18 our design. We have briefed your staff on the MPC  
19 conceptual design and discussed the issue of burn-up  
20 credit. We will continue to keep the staff fully  
21 informed.

22 We have not, as yet, decided to implement  
23 the MPC. If we decide to proceed, this approach could  
24 permit availability of canisters for utility use near  
25 the 1998 goal, subject of course to timely Commission

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1 approval. Implementing the MPC will require a  
2 consistent DOE approach to compliance and coordinated  
3 implementation by the Commission of its regulations,  
4 Parts 60, 71 and 72, for storage, transportation and  
5 disposal. This is an effort that will challenge the  
6 Department and the Commission staff. The program will  
7 seek certificates of compliance for storage and  
8 transportation before we can be specific with regard  
9 to all of the disposal-related considerations. We  
10 will work closely with the NRC staff so that we can  
11 proceed to certification without compromising our  
12 ability to comply with the disposal requirements of 10  
13 CFR Part 60 relative to criticality control. We have  
14 begun interactions with your staff and appreciate the  
15 time they have already given us.

16 The other matter of particular  
17 significance is the NRC letter to the Department dated  
18 August 20th, 1993 which reiterated previously  
19 expressed questions about the Department's ESF design  
20 and design control process. I want to assure you we  
21 take the staff's letter seriously.

22 Based on numerous meetings and technical  
23 exchanges, the program is now satisfied that the  
24 rationale for proceeding with the ESF design and  
25 construction activities is sound. We think so for the

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1 following reasons.

2 Each deficiency identified in either  
3 design or construction activities which was considered  
4 adverse to quality was documented in corrective action  
5 reports. Each deficiency was evaluated in accordance  
6 with applicable criteria and procedures to determine  
7 if the deficiency or condition was a significant  
8 condition adverse to quality.

9 Each of the significant deficiencies was  
10 evaluated in accordance with applicable work  
11 classification criteria and procedures to determine  
12 whether work should be stopped.

13 As a result of these evaluations, the  
14 program concluded that the deficiencies identified did  
15 not warrant institution of a stop work order.

16 The Program Office of Quality Assurance  
17 conducted a surveillance of the contractor in  
18 September of 1993 to evaluate the effectiveness of the  
19 quality assurance program for the development,  
20 preparation, review and issuance of relevant  
21 requirements documents. The surveillance determined  
22 that, overall, the process for preparing and issuing  
23 these documents was effective, that documents were  
24 adequate for their intended purpose.

25 The contractor has acted aggressively and

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1 comprehensively to improve compliance. As a part of  
2 these efforts, the contractor has developed and is  
3 implementing a management operating contractor mined  
4 geologic disposal system design control improvement  
5 plan.

6 Recognizing that we have responded to the  
7 staff's questions, provided the information requested,  
8 and are taking corrective action, it's also  
9 appropriate that I share with you my views on this  
10 very important problem and the corrective action we  
11 are taking to preclude its recurrence.

12 The problem had management and technical  
13 dimensions that encompassed a transition of work from  
14 one contractor to another. The intent of the design  
15 control improvement plan referred to above is to  
16 address these aspects of the problem.

17 We will keep the NRC staff better informed  
18 of ESF and geologic repository operational changes.  
19 We will ensure that progress and changes to the ESF  
20 that impact the geologic repository area are included  
21 in each edition of our semiannual progress report. We  
22 will promptly provide revisions of site  
23 characterization program baseline to the staff. We  
24 will encourage weekly teleconferences between the ESF  
25 branch chief and the NRC geotechnical section leader

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1 during which items of interest will be discussed. We  
2 will continue bimonthly ESF update meetings. We will  
3 improve the process by which the NRC staff can  
4 participate in the 50 percent and 90 percent design  
5 reviews conducted by the project office.

6 We intend to do more than keep you  
7 informed. The program must also perform better if we  
8 are to conduct the program to our satisfaction and to  
9 yours, and to the satisfaction of the public at large.

10 Now, at this point, I would like to show  
11 a few photographs that we have back in the booth in  
12 order to sort of attach this rather dry report to  
13 reality.

14 (Slide) The first photo is simply an  
15 aerial view of Yucca Mountain, Nevada. I have been  
16 out there recently and I believe it gives new meaning  
17 to the word "remote."

18 (Slide) The second view, if I can have --  
19 the second view seems to be me, but I think we have a  
20 better picture in the back. The second review is an  
21 aerial view of the exploratory studies facility north  
22 portal as it now appears. There has been substantial  
23 earth moving activity during the past year and it's  
24 pretty evident from that picture.

25 (Slide) The third one is the exploratory

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1 studies facility starter tunnel. The test alcove  
2 appears, it says in my book, to the left, but it  
3 appears in that picture to the right.

4 COMMISSIONER de PLANQUE: There's been a  
5 mirror image.

6 DOCTOR DREYFUS: Actually, I think the  
7 picture is reversed because my recollection is that as  
8 you come in it's to your right. In any event, the  
9 light you see at the end of the tunnel is where we  
10 came in. Really. That's the way it really looks.  
11 Rock bolts and wire mesh are visible in the alcove.  
12 The starter tunnel has been sprayed with shotcrete and  
13 that is the beginning of the take-off point for the  
14 tunneling machine.

15 (Slide) The next view is the LM-300 drill  
16 rig at Bore Hole 14 in the unsaturated zone. This is  
17 a rig that uses a dry drilling technology which is  
18 very difficult and costly to avoid contaminating the  
19 rock with drilling fluids. It's a fairly  
20 unconventional approach to drilling and part of the  
21 reason that this is an expensive project.

22 (Slide) The next item is a view that we  
23 put in in order to remind you that this is not all  
24 safety shoe/hard hat operation. This is a computer-  
25 aided design work station being used for modeling and

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1 simulation.

2 (Slide) The one after it is a view of a  
3 three dimensional computer model of radionuclide or in  
4 this case cesium-135 migration at the proposed  
5 repository site at Yucca mountain. The red area  
6 signifies the highest concentrations of cesium and the  
7 model displays the motion and the movement of the  
8 radionuclide through the strata at the mountain.

9 (Slide) Finally, I have a repeat. This  
10 is a picture of the desert tortoise that I believe you  
11 saw last year. This particular tortoise is not a  
12 radio-controlled tortoise but is equipped with a radio  
13 transmitter for environmental monitoring purposes. I  
14 think I'd like to put a different spin on this picture  
15 though. This tortoise is frequently used in public  
16 meetings as an example of an exorbitant expenditure of  
17 funds to carry out an environmental purpose. The  
18 tortoise, on the other hand, is on the endangered  
19 species list and apparently enjoys the Yucca Mountain  
20 environment. I think it's symbolic of a different  
21 aspect of the program because I take considerable  
22 pride in the fact that we are working effectively in  
23 carrying out what is now a major construction project  
24 in the habitat of an endangered species and we're  
25 doing it in full compliance with all of the

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1 responsibilities that are involved at both the state  
2 and federal level. I don't think I need to call the  
3 attention of anyone who reads the newspapers to the  
4 fact that many other people have had far less success  
5 in dealing with endangered species.

6 I present the tortoise as symbolic of the  
7 approach to health and safety and environment that we  
8 intend to maintain at the project. We will, in fact,  
9 deal with the rules that are imposed upon us and I  
10 hope we will do it in a way that is successful.

11 To return to my written report, our  
12 program is moving into a phase of both underground and  
13 above ground site characterization. We need to  
14 increase the funding of the program if we are to  
15 maintain program progress and achieve greater  
16 management efficiency. The program has been planned  
17 in the expectation of a much higher funding level than  
18 we have achieved in fiscal year 1994. To make the  
19 collections for the Nuclear Waste Fund more readily  
20 available as needed, the Secretary has proposed to the  
21 Office of Management and Budget the new funding  
22 mechanism that would provide increased funding levels  
23 in 1995 and in later years. At the moment, I am both  
24 hopeful and expectant that the Administration will  
25 support that funding level.

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1                   Funding constraints do affect our ability  
2                   to conduct the program consistent with the legislative  
3                   goals. If the Administration and Congress should  
4                   conclude that other resource requirements must  
5                   continue to restrict the funding profile for the  
6                   program in 1995, then we will have to restructure our  
7                   program plans. We are developing alternative concepts  
8                   that would permit us to continue to make meaningful  
9                   and efficient progress at the lower funding level, but  
10                  we would have to recognize the realities of that  
11                  funding expectation. As the funding outlook  
12                  clarifies, we'll consult with you and with the other  
13                  interested participants of the program concerning any  
14                  alternatives that we intend to consider.

15                  We are going to be very busy in early  
16                  1994. We'll be evaluating alternative approaches  
17                  consistent with the funding outlook whichever way it  
18                  goes. The Program Change Control Board is expected to  
19                  approve a proposal to modify the design of the ESF.  
20                  If it does, we will act to change the baseline  
21                  configuration accordingly and formally.

22                  We also expect to make a decision on  
23                  moving forward with the multi-purpose cask. If that  
24                  decision is positive, we'll go forward to industry in  
25                  the spring with a request for proposals for design of

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1 the MPC. The tunnel boring machine is scheduled for  
2 delivery in April and we plan to start boring the main  
3 drift in the summer. We will continue ESF Title II  
4 design, repository and waste package advanced  
5 conceptual design, surface-based testing activities  
6 and site characterization testing activities.

7 We will be working with your staff and the  
8 Advisory Committee on Nuclear Waste extensively in the  
9 first half of 1994. Our interactions will include  
10 technical exchanges and meetings on a whole host of  
11 MPC and repository-related subjects. Efforts on our  
12 part will be made to close out open site  
13 characterization analysis comments and questions in  
14 the areas of substantially complete containment and  
15 seismic hazards.

16 Over the course of the year, we will  
17 submit documents for review, guidance and comments.  
18 They'll include safety analyses reports for the GA-9  
19 and GA-4 casks late in the year, our report on Total  
20 System Performance Assessment II in the spring, our  
21 topical report on the methodology for assessing  
22 seismic hazards in the first half of '94, our topical  
23 report on burn-up credit in September, and Revision 4  
24 of the Repository Annotated Outline in November. All  
25 of these will be in addition to efforts to keep you

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1 informed about the status of ESF design and  
2 construction activities.

3 The program looks forward to interacting  
4 with the staff during their development of the license  
5 application review plan and our mutual effort to  
6 support the National Academy on the technical basis  
7 for Yucca Mountain standards.

8 In conclusion, I'd like to express my  
9 belief that we, the Department and the Commission,  
10 must expect and plan for midcourse corrections in the  
11 progress of the national nuclear waste disposal  
12 program. This may possibly include major changes in  
13 policy over the next few years. These changes will be  
14 based on our experience since 1982.

15 As I have indicated, the Department will  
16 be developing alternatives and we'll welcome the  
17 Commission's participation in the process. As  
18 Secretary O'Leary has stated, we are aspiring to  
19 address a national environmental priority and to grasp  
20 what could be an opportunity for the United States to  
21 set the standard for international nuclear waste  
22 management. Our success in realizing these  
23 aspirations can be immensely consequential to the  
24 country.

25 Mr. Chairman, that completes my summary

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1 and I will be pleased to respond to questions.

2 CHAIRMAN SELIN: Thank you very much,  
3 Doctor Dreyfus.

4 I wondered if -- I just might ask you to  
5 speculate a little bit about the next year a bit more  
6 in each of the four topics that you've brought up.  
7 I'll go over this lightly and then my colleagues will  
8 undoubtedly fill in in some detail.

9 In the ESF itself, or more precisely in  
10 the facility towards which you're looking, has there  
11 been thought about trying to take some credit for the  
12 engineered facility? Would you care to speculate a  
13 little bit about that? What about the schedule, the  
14 overall schedule? Is it premature to talk about where  
15 you see these topics going?

16 DOCTOR DREYFUS: With regard to an  
17 engineered facility, the Secretary has made remarks  
18 and I agree that the engineered aspect of the project  
19 deserves more emphasis and consideration. In my view,  
20 the ultimate suitability of the site for the long-term  
21 must rest on geologic competence at the site. There  
22 is no question about that and I don't think there is  
23 any consideration or otherwise. On the other hand,  
24 the Commission has already, of course, concluded that  
25 in the near-term the engineered facilities in the

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1 waste package must have rather long-term or very long-  
2 term integrity. We need to be looking at that. The  
3 question as to how these two can be merged is one that  
4 we are looking at at the moment, but have no immediate  
5 policy level recommendations to make.

6 The overall schedule is certainly in  
7 question because this program has been planned on the  
8 site, on the ground to be receiving somewhere in the  
9 neighborhood of \$700 million in fiscal year '94 and it  
10 is, in fact, receiving \$380. It would be remarkable  
11 if that did not have an impact on accomplishment. I  
12 think the problem began probably in the '93 cycle when  
13 we were, in fact, moving into active underground and  
14 surface activity at the site. But in '94 it becomes  
15 quite apparent because we have heavy equipment at the  
16 site which efficiently and effectively ought to be  
17 operating three shifts at the same time we have to  
18 keep up with the ancillary activities, the science  
19 that is not related to operating the heavy equipment  
20 and all of the quality control, quality assurance  
21 aspects.

22 So, we simply do not have enough money to  
23 run the program efficiently in '94. If that continues  
24 into '95, we will be restructuring accordingly. We'll  
25 have to decide how to do this.

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1 I am not prepared to give up on the  
2 schedule in '94. When I know what we can expect as a  
3 budget profile in later years, we'll sort of rebench  
4 and decide whether the schedule is still capable of  
5 accomplishment. Our hope would be that given  
6 increased funding beginning in '95 and expectation of  
7 increased funding in later years, and given some  
8 restructuring of the approach, possibly simplification  
9 of the program, we can come pretty close to the dates  
10 everyone is used to for filing an application.

11 CHAIRMAN SELIN: Before I ask you  
12 questions about the multi-purpose canister or the  
13 interim storage, I think I'll turn to my colleagues  
14 now on the facility itself and the basic studies and  
15 then we'll come back to some of these others.

16 Commissioner Rogers?

17 COMMISSIONER ROGERS: Well, just on the --  
18 in your report you mentioned that you've made progress  
19 on the advanced conceptual design efforts reviews and  
20 that there are some proposed design improvements that  
21 allow greater repository flexibility than the current  
22 arrangement and allow for the use of a larger MPC.  
23 Could you just say a little bit about that, what the  
24 nature of those changes is and how much larger? Is it  
25 appreciable? What would be the significance of a

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1 larger MPC? How much larger would it be?

2 DOCTOR DREYFUS: Well, essentially, the  
3 changes that are there are the revision of the ramp  
4 configuration with a more gradual slope and a revision  
5 of the underground main drift for the exploration,  
6 which provides us with an opportunity both to explore  
7 the major Ghost Dance fault a little more effectively  
8 and also to realign the repository underground. The  
9 repository design changes the configuration below  
10 ground, gives us several options for the emplacement  
11 drifts. The more gradual slope in the entry tunnel  
12 provides for conventional rail transportation which  
13 obviously then will make it easier to deal with a  
14 heavy canister, a multi-purpose canister or a canister  
15 at an over pack. We can deal with a heavier load now  
16 in emplacement should we use those entry ways. We can  
17 also benefit from the slope in terms of excavation.

18 So, that redesign is now subject to formal  
19 approval and provides for several layouts below ground  
20 that we were unable to do with the previous design.

21 COMMISSIONER ROGERS: I see, yes. Okay.

22 DOCTOR DREYFUS: Did you want to discuss  
23 the weight of the canister --

24 COMMISSIONER ROGERS: Well, unless you  
25 have really gone that far.

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1 MR. BARRETT: The conceptual design work  
2 on the MPC, the larger size, there's two sizes, is a  
3 nominal 100 ton gross weight. It holds approximately  
4 ten tons of spent fuel. That would be for large  
5 weights like that. The original design was -- the  
6 nominal waste package was around 20 tons total with  
7 its over pack or the shield, I should say, and that  
8 would be rubber tired haul of the original slope  
9 design.

10 COMMISSIONER ROGERS: I see. That's a  
11 significant change, isn't it?

12 MR. BARRETT: Correct.

13 COMMISSIONER ROGERS: Yes.

14 MR. BARRETT: It's about a factor of five.

15 COMMISSIONER ROGERS: Yes, that's very  
16 big.

17 You're talking a little bit about the MPC  
18 in your report and improving the interactions of your  
19 activities with utility and industry representatives  
20 in various ways to ensure the MPC development will be  
21 responsive to utility needs. Are you involving in  
22 that or do you propose to involve in those discussions  
23 any other groups beyond the utilities?

24 DOCTOR DREYFUS: Yes, there are other  
25 groups involved. We have had along the way

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1 stakeholder meetings. Now, to be sure, the vendors  
2 and the utilities are the most interested parties, but  
3 the meetings are open. There has been involvement by  
4 state regulatory commissions and other groups.  
5 They're open meetings and as this becomes more of a  
6 topic of current interest, we expect to see a lot more  
7 interest on the part of people who otherwise have not  
8 participated, but they are open.

9 COMMISSIONER ROGERS: I guess it also --  
10 towards the end of your report you talk about  
11 interacting with NRC staff and various ways in which  
12 that's been taking place successfully and improvements  
13 that you expect to make. To what extent are you using  
14 electronic communications? You did mention, I think,  
15 in the end that you have a bulletin board system or  
16 something of this sort, I think, that you're using.  
17 What other ways have you in mind to communicate with  
18 NRC staff? I'm not just thinking of the electronic  
19 technology, but what the kinds of schemes that one  
20 might put in place with respect to hierarchial  
21 processes involving limited access and broader access  
22 to other people in the public and so on and so forth.  
23 Have you thought about some kind of a program there  
24 that provides for a broader means of communication  
25 with NRC staff and maybe eventually later on with

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1 other people?

2 DOCTOR DREYFUS: Well, I assume you're  
3 drawing a distinction between daily ongoing material  
4 and the actual structure of an electronic system for  
5 the licensing control.

6 COMMISSIONER ROGERS: Yes. No, I'm not  
7 talking about the licensing, although I suppose  
8 anything you do now ultimately will go into that.

9 DOCTOR DREYFUS: Well, as a matter of  
10 fact, I do not know whether we are using any  
11 electron -- I'm sure we're using the conventional easy  
12 stuff, but I would need advice from elsewhere in the  
13 room as to what extent we have established links  
14 between our electronic program support.

15 MR. BARRETT: The info streams approach  
16 that we're putting together will have access basically  
17 to anyone. You'll have a dial-up capability. We have  
18 that today through the electronic mail and you can get  
19 in and look at the documents that are on that. Any  
20 member of the public can tie into that. Your staff  
21 can tie into that. Extensive use of video  
22 conferencing east of the Mississippi and the State of  
23 Nevada, we're doing a lot of that type of thing.

24 So, we're trying to build on basically  
25 20th century electronics here today to expedite the

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1 communications between our folks. Our staff meetings  
2 are basically open out there with your state  
3 representatives, which is very helpful for us to have  
4 folks on the ground there. They can effectively  
5 interface in the meetings and in the hall and  
6 certainly out at the site itself. We have a county  
7 rep. out at the site, establishing an office in Area  
8 25 and your folks are out there a lot too. So, I  
9 think those kinds of things expedite the communication  
10 amongst your staff and our staff.

11 COMMISSIONER ROGERS: Well, I just wanted  
12 to make sure that we have adequate means to  
13 communicate in the most efficient and effective way  
14 electronically with your people. That should be a  
15 good match between the facilities that you have  
16 available for these purposes and ours and really  
17 whether there are any unmet needs in that direction.

18 DOCTOR DREYFUS: We can run the trap line  
19 on that and let you know whether there are any  
20 specific compatibility issues at the electronic  
21 interface.

22 COMMISSIONER ROGERS: Yes.

23 DOCTOR DREYFUS: We'll find out from the  
24 people who use it regularly.

25 COMMISSIONER ROGERS: We'll be interested.

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1 We're trying to see that we stay in a reasonably  
2 advanced state with respect to such things.

3 Also in your summary you mentioned that  
4 even with the best of intentions we have difficulty in  
5 reaching a shared understanding of an issue. You  
6 pointed out volcanism as a case in point. Could you  
7 elaborate a little bit on what the nature of those  
8 difficulties are? Are they differing expert opinions?  
9 Are they procedural questions? Where do you find the  
10 difficulties or are they so variable that you can't  
11 characterize them in any particular --

12 DOCTOR DREYFUS: Well, fundamentally in a  
13 lot of these and I think the volcanism one is probably  
14 a good example. There is sketchy data and very long  
15 times to make judgments about things and therefore  
16 what you are going to run into continually is a matter  
17 of differences in judgment. I think that whenever  
18 experts site down and start to extend the data into  
19 these rather etherial questions of the long distance  
20 future, you'll find inherence to one or another  
21 approach. In this case, if I recall what the issue  
22 is, it's a question of the extent to which one does a  
23 very thorough exploration of every kind of model or  
24 bounds the conditions. It's a classic, analytical,  
25 judgmental difference of opinion. When I used to be

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1 an analyst, I ran into that sort of thing regularly.

2 We will have those in all of these areas.  
3 They wouldn't be issues if they were not subject to  
4 judgment and a lot of this is subject to relatively  
5 more judgment as compared to hard data than in most  
6 scientific pursuits.

7 COMMISSIONER ROGERS: Well, let me just  
8 say that I thought your written statement was very  
9 helpful and very clear and I compliment you on it.  
10 Thank you.

11 DOCTOR DREYFUS: Thank you.

12 CHAIRMAN SELIN: Commissioner Remick?

13 COMMISSIONER REMICK: In addition to a  
14 general welcome, I'd like to issue a special welcome  
15 to Lake Barrett back involved in NRC activities.

16 I have several questions related to the  
17 MRS. You did mention that you've completed a  
18 conceptual design. I'd be interested just what that  
19 design looks like. I assume it's some kind of dry  
20 storage. Last year in the presentation DOE pointed  
21 out that some federal sites were being explored for a  
22 possible MRS and I was wondering what the status of  
23 that is or was and what's the overall role of MRS in  
24 the total high-level waste strategy at DOE now?

25 DOCTOR DREYFUS: Well, I'll dispose of the

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1 biggest question first. The program has evaluated a  
2 number of federally owned sites. It did that at the  
3 direction of the previous secretary. So, we know what  
4 they look like and we know what the capabilities are.  
5 There is nothing ongoing at the moment in DOE that is  
6 aimed at selecting a federal site for a designated MRS  
7 capability. So, to the extent, that initiative is not  
8 active at the moment.

9 The MRS is looked upon as being a  
10 potential asset in dealing with at-reactor storage,  
11 particularly if at-reactor storage should take place  
12 longer and more extensively than the earlier program  
13 plans contemplated. It has several attributes. One  
14 is that there would be some advantage in  
15 standardization if there were a lot of at-reactor dry  
16 storage, because otherwise proliferations of  
17 technologies will add to the complexity of dealing  
18 with the situation at a later date when the time comes  
19 to go and get it.

20 The objective would be to reduce total  
21 system costs and reduce exposure by multiple handling  
22 of fuel elements as they are moved from the pool to  
23 some kind of at-reactor storage, some kind of  
24 transportation container to some kind of potentially  
25 interim storage to some kind of disposal waste

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1 package. So the idea is to try to simplify all of  
2 that, standardize it and come up with something that  
3 is economically a better deal and certainly  
4 technically in terms of exposure overall a better  
5 deal. That's the concept.

6 Mr. Barrett can give you a few basics on  
7 how the current conceptual design stacks up, because  
8 I haven't learned all the terminology yet.

9 MR. BARRETT: The conceptual design as far  
10 as storage looked at the thick wall. That would be a  
11 typical heavy wall cask, storage cask similar to what  
12 the Commission has approved at Surrey Nuclear Power  
13 Station. Also looked at the newer thin-walled  
14 concepts, the horizontal for the NUHOMS concept and  
15 also the vertical type as well, as well as we updated  
16 and continue to look at the dry well storage and some  
17 of the engineering vault type storage as well. So,  
18 you cover the entire range of the technologies that  
19 are in existence today for fuel storage, as well as --

20 COMMISSIONER REMICK: But definitely dry  
21 storage?

22 MR. BARRETT: Yes.

23 COMMISSIONER REMICK: No thought of wet  
24 storage whatsoever?

25 MR. BARRETT: It was all dry storage, and

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1 also we were looking as we were at the time hearing  
2 from some of the jurisdictions that had some further  
3 interest in storage, basically some of the Indian  
4 nations, and they had different concepts and we wanted  
5 to be sure that we would be compatible with any  
6 potential host as well, but it's all dry storage, no  
7 wet storage.

8 COMMISSIONER REMICK: Well, do you see the  
9 MRS as playing an important role in the overall  
10 strategy? I'm not quite clear.

11 DOCTOR DREYFUS: Well, at the moment we  
12 don't have an MRS site and not one in prospect. I  
13 think what is happening -- at the moment, I believe  
14 what is happening is people are contemplating the  
15 prospect and the problems of extended at-reactor  
16 storage pending the availability of a repository. My  
17 guess is that as that discussion progresses it will  
18 become apparent that some sort of interim storage is  
19 still a useful thing, if not an absolutely necessary  
20 thing, simply in managing a system of some 100 or so  
21 independent storage situations over a period of time.

22 We all have to remain cognizant of the  
23 fact that what we're doing at Yucca Mountain is  
24 characterizing the site. That admits of the  
25 possibility that it might not work. And if it doesn't

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1 work you're back to resiting and a relatively extended  
2 period before there's going to be something in place,  
3 so management of the fuel I think will ultimately  
4 display a need for some sort of ability to physically  
5 consolidate or move it. What that is at this point  
6 and what the political process is for selecting the  
7 site is kind of up for grabs, because the political  
8 process that was chosen by the Congress is not now  
9 terribly operational. Congress has expressed its  
10 views recently that it apparently was not satisfied  
11 with the progress because they have terminated the  
12 approach that we were using.

13 COMMISSIONER REMICK: Something that  
14 contributed to my understanding of the role of the MRS  
15 was when you talked about the MPC. You indicated on  
16 page 7 that with the MPC the canisters could be  
17 available for use near the 1998 goal, but without an  
18 MRS or without a repository -- I thought the goal was  
19 to remove it from at-reactor sites by 1998. And even  
20 if you have an MPC, you wouldn't have anywhere to ship  
21 them if there's no MRS.

22 DOCTOR DREYFUS: No, certainly the goal  
23 that is expressed in the contracts was to remove it or  
24 start removing it as it came up in the queue beginning  
25 in '98. The prospect for doing that at the moment is

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1 not very likely.

2 And so the point now is a cask like that,  
3 if it were available in '98, would be an option for  
4 dry storage at reactors as that became necessary and  
5 would have the attributes, as I say, of guarding  
6 against -- or assisting in maintaining a future system  
7 that has the economics and the standardization that  
8 we're seeking.

9 COMMISSIONER REMICK: Well, would you view  
10 that, if those canisters were ready by 1998, would you  
11 see that as replacing the need for an MRS?

12 DOCTOR DREYFUS: No, I don't think --  
13 well, it certainly doesn't replace physical acceptance  
14 of the fuel in any material sense to the individual  
15 faced with the problem. I mean, it would be -- that  
16 can't be an equal exercise. It would mitigate the  
17 prospect of simply not doing anything, or it could.  
18 It's a tool and a possible option for dealing with the  
19 technical and economic problems of at-reactor storage.

20 COMMISSIONER REMICK: In that same  
21 statement and in your oral presentation you mentioned  
22 "subject to timely Commission approval" and I didn't  
23 know if you were hanging this around the NRC's neck,  
24 that if we don't approve an MPC for storage  
25 transportation and emplacement in the repository that

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1 not meeting the 1998 goal could be hung on us. Is  
2 that the intent of the statement?

3 DOCTOR DREYFUS: No, I think not.

4 The intent of the statement is to  
5 recognize that when we sit down and put an end point  
6 on when this cask will be available, we understand  
7 that between now and then is a Commission process  
8 which has to have the time it has to have. And when  
9 we guess at what that time is, we ought to recognize  
10 that, and that's the intention of it.

11 We don't in any respect feel that the  
12 Department's responsibilities with regard to '98 are  
13 somehow transferred to the cask and then in a further  
14 iteration to the Commission's licensing time by any  
15 stretch of the imagination.

16 COMMISSIONER REMICK: Good.

17 You did mention the fact that you had  
18 petitioned for rulemaking and I don't know if you're  
19 prepared today or want to take the time today, but I  
20 would appreciate any elaboration on your arguments of  
21 the important safety issue that's in that proposed  
22 rulemaking.

23 DOCTOR DREYFUS: The one for the single  
24 shell shipment of --

25 COMMISSIONER REMICK: No, I'm sorry. This

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1 is on the revisions to Part 60 and the question for  
2 surface facilities and the question of how do you  
3 determine the importance for safety. We've been  
4 batting this around and so forth and I'm not sure I  
5 understand exactly what the DOE position is and I  
6 don't know if you're prepared today.

7 DOCTOR DREYFUS: Well, I certainly am not.

8 MR. BARRETT: Just as soon we do that  
9 later. It would be more efficient for both of us, I  
10 think.

11 COMMISSIONER REMICK: One last question,  
12 then. Do you foresee, based on the information you  
13 have at hand, any impact of the National Academy of  
14 Science study on your overall program?

15 DOCTOR DREYFUS: Oh, yes.

16 COMMISSIONER REMICK: Do you foresee any  
17 at this time?

18 DOCTOR DREYFUS: Massive, but I don't know  
19 what it is. I sat in on a meeting the other day when  
20 Mr. Bernero presented an erudite discussion and I  
21 listened to the discussions of his discussion and came  
22 away not willing to predict what might come out of  
23 that. We've got another almost a year or more, I  
24 guess, of deliberations in that body. I think they're  
25 about at the point where they've stopped taking input

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1 and they're about to start thinking and talking, but  
2 clearly this could be the essence of what we have to  
3 do, depending on how they come out.

4 COMMISSIONER REMICK: I was hoping you had  
5 a bigger and clearer crystal ball than we have.

6 Thank you very much.

7 CHAIRMAN SELIN: Commissioner de Planque?

8 COMMISSIONER de PLANQUE: I'd also like to  
9 welcome you and thank you for coming today, and I'd  
10 also like to thank Commissioner Remick for asking all  
11 of my questions.

12 But I would like to press you a little bit  
13 on one more issue, if you can, the discussion about  
14 the initiative to look at federal sites. I realize  
15 you said that initiative is not active right now. Has  
16 it been dismissed or is it just kind of sitting on the  
17 table awaiting further information?

18 DOCTOR DREYFUS: I wouldn't say it's been  
19 dismissed. The Secretary has said that we are in the  
20 business of looking at all options for dealing with  
21 the '98 obligation. She has also said that she thinks  
22 what we need is some indication of what the community  
23 at large thinks about this. And given the fact that  
24 in my judgement the selection of a site anywhere,  
25 whether it be on or off federal lands or on or off

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1 military reservations, is largely a political decision  
2 made appropriately in the political process, until we  
3 sense some kind of a consensus forming in the  
4 community, I don't know that it's possible to just go  
5 forward and put a pin in a map even if the Department  
6 of Energy has title. I think, in any event, that will  
7 be a licensed activity which has to start off with  
8 some basis of support.

9 So at the moment we are watching and  
10 listening and technically we could respond rather  
11 rapidly, I think, with evaluations of the pros and  
12 cons of identifiable Department facilities. We know  
13 quite a bit about them. Some of them have assets and  
14 capabilities that others don't, but that's pretty well  
15 catalogued.

16 COMMISSIONER de PLANQUE: Fine. Thank  
17 you.

18 CHAIRMAN SELIN: Following up a little  
19 bit, Doctor Dreyfus, on the 1998 situation, does the  
20 Department have a current view on the question of  
21 taking title to the fuel?

22 DOCTOR DREYFUS: There is a live and  
23 continuing discussion between the Secretary and the  
24 General Counsel about all aspects of how we can deal  
25 with that. And while the Secretary has made it quite

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1 clear that she feels an obligation and intends that  
2 the Department assist in dealing with the difficulties  
3 that might be caused, we have not yet stated our  
4 intentions as to how we're going to deal with the  
5 contract terms.

6 CHAIRMAN SELIN: Well, one topic on which  
7 there has been some statement of intentions but it's  
8 not quite crystallized in my understanding and  
9 probably the Commission's understanding, is the High-  
10 Level Waste Fund and the idea of taking credits  
11 against the fund for on-site storage from '98 on.  
12 Would you care to say a little bit about the current  
13 status on this topic?

14 DOCTOR DREYFUS: Again, when one gets down  
15 to the narrow legal interpretation as to whether, for  
16 example, the Waste Fund could be used to pay for  
17 canisters that would then be used by utilities, I'm  
18 going to leave that to the General Counsel and I think  
19 he's not done yet. The construct that I have used in  
20 the thought process is that the intention of Congress  
21 was that the full cost of doing business was to be  
22 paid by the ratepayers or stockholders, as the case  
23 may be, depending on regulatory decisions of the  
24 nuclear industry.

25 That being the case, they basically said

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1 that up until the Department takes title, this cost  
2 will be paid by activities at the reactor, are being  
3 and will be paid by the user and then the expectation  
4 was that we would come and take title and take it away  
5 and the costs of what we did thereafter would be paid  
6 out of the fund. To what extent you can declare one  
7 of these costs at this moment to have moved across the  
8 line because it would be a cost we would have incurred  
9 in any event when we took position, physical  
10 possession and put the Waste Fund collections on the  
11 other side of the line, I don't know. It's a  
12 complicated issue which may ultimately have to be  
13 clarified by Congress.

14 CHAIRMAN SELIN: I think that, as my  
15 colleagues are, I'm quite impressed with the breadth  
16 of discussion that you've gone through in the  
17 statement of issues. As you've said, you're yourself  
18 quite new to this progress in this particular  
19 capacity. You've done a very good job of stating what  
20 I believe to be the full range of issues that are  
21 facing you and the considerations that will be  
22 involved as you and other senior people make the  
23 decisions, but that it's rather early in this set of  
24 decision making from your personal point of view.

25 I think what we'll probably do is ask you

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1 not to wait a year to come back because in effect it  
2 is gracious of you to come up so early before you're  
3 prepared to announce projects and progress, let alone  
4 decisions in some of these areas and lay out your  
5 thinking on this situation. The Commission would be  
6 very interested in the progress and in addition to our  
7 multiple hours of communication we may very well ask  
8 you if you would be kind enough to come back in  
9 something less than a year when you've made some  
10 decisions on these points, to share them with us in an  
11 equally comprehensive overall presentation.

12 Commissioners, do we have some other  
13 questions?

14 Well, thank you very much for coming up.  
15 It's very good to see a new person -- old person in a  
16 new job, so to speak.

17 DOCTOR DREYFUS: Old person and the job is  
18 a little more like it, yes, sir.

19 Well, thank you and certainly we'd be  
20 pleased to come whenever called and we appreciate it.

21 CHAIRMAN SELIN: Well, no, I'd rather do  
22 it a little differently, just sort of to tell you that  
23 we are very interested when you believe the time has  
24 come to come back and give something of an update, but  
25 not just a transaction, a revisit of the comprehensive

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1 piece and I hope we won't have to wait a year for  
2 that. I hope you'll have some progress and that  
3 you'll feel desirous of sharing that with us before --

4 DOCTOR DREYFUS: I think once this  
5 budgetary situation resolves itself, we'll have a much  
6 clearer view of our course and we'll probably have  
7 some meaningful interesting issues to share with you.  
8 So, we'll accept the invitation and let you know when  
9 we have something.

10 CHAIRMAN SELIN: Very good. Thank you  
11 very much.

12 DOCTOR DREYFUS: Thank you.

13 (Whereupon, at 3:33 p.m., the above-  
14 entitled matter was concluded.)  
15  
16  
17  
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CERTIFICATE OF TRANSCRIBER

This is to certify that the attached events of a meeting  
of the United States Nuclear Regulatory Commission entitled:

TITLE OF MEETING: BRIEFING BY DOE ON HIGH-LEVEL WASTE PROGRAM

PLACE OF MEETING: ROCKVILLE, MARYLAND

DATE OF MEETING: DECEMBER 20, 1993

were transcribed by me. I further certify that said transcription  
is accurate and complete, to the best of my ability, and that the  
transcript is a true and accurate record of the foregoing events.

Carol Lynch

Reporter's name: Peter Lynch

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STATEMENT FOR THE RECORD  
PRESENTATION TO THE U.S. NUCLEAR REGULATORY COMMISSION

STATUS OF THE CIVILIAN RADIOACTIVE WASTE  
MANAGEMENT PROGRAM

BY

DANIEL A. DREYFUS, DIRECTOR

OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT  
U.S. DEPARTMENT OF ENERGY

DECEMBER 20, 1993

INTRODUCTION

I appreciate this opportunity to brief the Commission. As the Director of the Office of Civilian Radioactive Waste Management, I am pleased to represent President Clinton's Administration and Secretary of Energy O'Leary on behalf of the program. Secretary O'Leary has thus far made a number of important decisions:

- The key to determining the suitability of the Yucca Mountain site lies in the investigation of the site's geology through tunnel exploration. Therefore, the Secretary has ordered the excavation and tunneling activities for the Exploratory Studies Facility (ESF) to continue as planned.
- She has directed the program to continue the development of a design for standardized containers to support spent fuel transportation, storage, and disposal.
- The Secretary has recommended that the Administration propose revolving fund legislation which will provide greater access to the Nuclear Waste Fund collections for the conduct of the program.
- She has also directed the program to explore the full range of options for the near-term storage of spent fuel pending ultimate disposal, and to consider alternative licensing strategies for the repository. Options to address both of these issues will be reviewed formally with substantial external consultation.

As has been customary in this annual meeting, my prepared statement provides you with a full report on the broad progress the program has made in the past year. The statement reviews Mined Geologic Disposal System development; Storage and Transportation System development, with emphasis on the Monitored Retrievable Storage (MRS) facility and the related Multi-Purpose Canister (MPC) activities; and the associated technical integration of the program. We have continued to work with your staff on the Repository Annotated Outline and issue resolution initiatives and the closure of Site Characterization Analysis

open items, and the Licensing Support System. These are all matters in which the Commission had expressed particular interest last year. My statement also covers the ESF design control issues, the effect of budget uncertainties on the program, and our plans for interacting with the Commission in 1994. These matters are vital to the progress we intend to make in the years to come.

To begin this briefing, I will note my own observations thus far in my relatively short tenure as Director. The Department's program has been in progress since 1982. We have gained a great deal of experience. We have gained data and increased our comprehension of the technologies of repository site characterization, waste package development, and transportation of spent nuclear fuel and high-level radioactive waste. The decade of experience, however, also encompasses the development, along with the Congress, the Commission and other participants, of a legal and regulatory framework for dealing with a first-of-a-kind facility which must serve for a very long period of time. We have gained experience as well with the related issue of developing social acceptability for the management and disposal approach for such materials. This decade of experience, in both its successes and failures, constitutes a major asset upon which we should build for the future.

Major redirection of the program have been made along the way. In my view, it is a continuing responsibility of the program to review progress and the outlook and to initiate, or propose, new directions whenever experience warrants such initiatives.

### PROGRESS IN 1993

In our report to you last year, we stated that 1993 would be a very busy year. The following highlights of our progress validate that prediction.

#### ● Repository Development

At Yucca Mountain, we accelerated our efforts to design and construct the ESF. We completed the 200 foot long starter tunnel for the tunnel boring machine 11 days ahead of schedule, just recently completed the initial phase of excavating and testing of Test Alcove #1, selected the design for the ESF launch chamber, ordered the first tunnel boring machine, and continued very comprehensive ESF Title II design activities. The NRC staff has expressed concerns about the adequacy of our design control activities for the ESF. This is a matter of considerable importance to the Department and will be discussed later in some detail.

During 1993, the surface-based testing activities were also expanded. We completed the 24-hole drilling program required for neutron source investigation of water infiltration, conducted geophysical logging activities in three boreholes, continued gas-phase testing activities, and established a Geophysical Integration Task Force. We established the Geophysical Integration Task Force to assist in the integration, coordination, and planning of the geophysics testing program. This program of geophysical

surveys includes surface (seismic monitoring and seismic reflection lines) and borehole logging activities. The borehole activities are concerned with obtaining data on heat flow, gravity, and magnetic fields. The program will use these data to determine the best techniques for gathering information on geologic contacts. These activities provide information for the identification of faults not expressed on the surface and the determination of the subsurface geometry of mapped faults.

In the early phase of ESF development, the program is conducting scientific investigations that include geologic mapping activities and hydrologic tests. The geologic mapping of zonal features (e.g., faults) and the mapping of the features and geology in the ESF will provide information on the stratigraphy and structure of Yucca Mountain. The gas-phase testing activities include the collection of pre- and concurrent-ESF pneumatic, gas chemistry, and *in situ* moisture, pressure, and temperature data that will be used to account for the effects of the construction of the ESF on site characterization.

We are integrating the scientific findings of the surface-based and ESF tests into a long-range plan. This plan will be developed around a broad scientific framework to achieve specified levels of confidence in the scientific knowledge of the Yucca Mountain site. The plan will rely on iterative modeling and will respond to the needs of other activities including Total System Performance Assessment, development of the annotated outline for a potential license application, issue resolution, and design schedules.

The program made good progress in the repository and waste package advanced conceptual design efforts. As a result of this work the program proposed improvements to the design of the ESF. These proposed design improvements offer more repository layout flexibility than the current arrangement, allow for the use of a larger MPC, eliminate the need for repository emplacement drifts to cross the Ghost Dance fault, allow repository drifts to be placed further above the water table, and provide for characterization of the Ghost Dance fault at a number of points along the main drift. Flatter grades in the ESF will allow the use of conventional rail haulage for excavation and operation in the ESF.

The scope of performance assessment activities has been expanded. We conducted test interference and waste isolation evaluations in support of ESF construction and surface-based testing to preclude test-to-test interference and to ensure that construction and testing activities would not affect waste isolation. We have completed initial calculations for Total System Performance Assessment II which is focused on parameter sensitivity, uncertainty analysis, and the comparison of simplified and more complex flow models. The report is expected to be completed in the spring of 1994.

Associated with these and related programmatic efforts were approximately 30 technical exchanges, meetings and site visits with the NRC staff and meetings with the Advisory Committee on Nuclear Waste (ACNW) on a variety of subjects. These exchanges and meetings are becoming more and more productive as we learn how to interact with one another.

- Storage and Transportation

Our efforts to develop the MRS and Transportation elements of the Civilian Radioactive Waste Management System have seen progress as well as frustration. We completed the conceptual design of the MRS, and the related evaluation of off-the-shelf technologies. The program is ready to begin license application design should a site be designated. The program supported the efforts of the Nuclear Waste Negotiator to identify a host for an MRS by conducting on-site assessments of potential MRS sites on Mescalero and Skull Valley Goshute tribal lands. No significant problems were identified at either location. With the recent passage of the modified Bingaman amendment, however, FY 1994 funds for follow-on Phase IIb grant studies will not be available. Consistent with Congressional direction we are continuing to support the efforts of the new Negotiator, Richard Stallings.

We are continuing our efforts to develop truck casks and have completed the final design of a legal weight truck cask.

The role of the MPC in our program has grown in importance and we have devoted a great deal of attention to its development. The program completed the MPC feasibility study announced to you last year and, just recently, completed an MPC conceptual design study. Because the MPC would be employed in storage, transportation, and, potentially in disposal activities, The program will have to satisfy applicable requirements under three NRC regulations. The issues of burnup credit, criticality, and thermal loading are very significant to Commission approval of our designs. We have briefed your staff on the MPC conceptual design and discussed the issue of burn-up credit. We will continue to keep the staff fully informed. We have not, as yet, decided to implement the MPC. If we decide to proceed, this approach could permit availability of canisters to utilities for use near the 1998 goal subject to timely Commission approval. Implementing the MPC will require a consistent program approach to compliance and coordinated implementation of Commission regulations (10 CFR Parts 60, 71, 72) for storage, transportation, and disposal; an effort that will challenge the Department and the Commission staff. It will involve the program pursuing certificates of compliance for storage and transportation before we can be specific with regard to all of disposal-related considerations. We need appropriate NRC guidance so that we can proceed to develop the MPC approach to certification without compromising our ability to comply with the disposal requirements of 10 CFR Part 60 relative to criticality control. We have begun interactions with your staff and appreciate the time they have already spent with us. To ensure that the MPC development program will be responsive to utility needs and will take advantage of the knowledge and experience the cask manufacturing industry has developed, we have and will continued to involve utility and industry representatives in the development process.

- The Annotated Outline Initiative

The Annotated Outline initiative is an excellent example of a Department/NRC effort that is working to take advantage of the experience we have obtained to ensure future success for the program. We first briefed you in detail on this

initiative and on the related issue resolution initiative in June 1992. The initiative is a mechanism for developing potential license applications for the geologic repository and MRS in stages, for the Commission staff to provide guidance and comments at each stage, and for the timely identification and eventual resolution of licensing issues. In the case of the annotated outline for the potential repository license application, the initiative is also a mechanism for the Department to provide comments to NRC on the Draft Regulatory Guide DG-3003, "Format and Content for the License Application for the High-Level Waste Repository" based on actual Department experience in applying this draft regulatory guide in the development of the Repository Annotated Outline.

To date, the Department has submitted four iterations of the Repository Annotated Outline to your staff. The most recent revisions, Revisions 2 and 3, were provided in May and at the end of November 1993. The program appreciates the guidance and comments received from your staff on Revisions 0, 1, and 2. The program, in turn, submitted for the staff's consideration comments on the draft regulatory guide in September 1991 and July 1993. We plan to submit Revision 4 of the Repository Annotated Outline in 1994.

Our experience with the MRS Annotated Outline has been comparable. To date, the Department has submitted three iterations of this document, the last in June 1992, and has received staff guidance and comments on Revisions 0 and 1. We do not plan to update this document further until such time as an MRS site has been identified.

#### ● The Issue Resolution Initiative

As we noted in our meeting with the staff in November 1991 and in our briefing for you in June 1992, we define an issue to be any regulatory concern with technical and/or programmatic impacts that must be resolved through research, position development, and presentation to the staff, to allow the licensing process to move forward for the MRS or repository. This definition is broad enough to include issues identified as a result of the staff's review of annotated outlines, issues identified during the course of the staff's review of site characterization activities, and open NRC staff Site Characterization Analysis comments and questions. We recognize that issue resolution, with the exception of rulemaking, is limited to resolution at the NRC staff level and may be achieved in a variety of ways. This process involves the guidance and comments provided by the staff. For example, on November 30, 1993, we submitted a petition for rulemaking requesting an amendment to 10 CFR Part 71 exempting vitrified high-level waste from the double containment provision, 71.63(b). Spent nuclear fuel is currently excepted from this provision. The Department looks forward to Commission action on this petition.

In the past year, consistent with the emphasis we have placed on the development of the MPC system, we expanded the scope of our issue resolution activities. They now actively address repository and storage and transportation issues. The program has conducted technical exchanges with your staff on issues such as substantially complete containment and the engineered barrier system, volcanism, seismic hazard assessment methodology,



the conceptual design of the MPC, and the related issues of burnup credit, criticality control, and thermal loading. In April 1993 the program submitted for staff review a topical report entitled "Evidence of Extreme Erosion During the Quaternary Period" at Yucca Mountain, and the annotated outline for a topical report entitled "Seismic Hazards Methodology for Yucca Mountain." With respect to the erosion topical report, we are awaiting the staff's reaction to our document and are planning, at the staff's request, a site visit in February 1994. This site visit will examine outcrops relevant to the conclusion in our topical report. The program has continued to work toward resolving Site Characterization Analysis open items. At this point in time, 78 of the original 198 items have been closed by the NRC staff including 17 in FY 1993. Approximately 20 of the remaining 120 open items are being reviewed by the staff. To resolve many of the remaining items, the program will have to obtain and evaluate data from our site characterization program and we are pursuing such efforts aggressively.

We have learned a lot as a result of these efforts including the following:

- One of the keys to successful interactions involves keeping the staff well informed and providing it with up-to-date information. Our successful technical exchange on substantially complete containment and the engineered barrier system illustrates this point.
- Rulemaking takes a substantial amount of time. The Department's petition for rulemaking (PRM-60-3) requesting that the Commission amend its regulations in 10 CFR Part 60 to include a specific dose criterion for design basis accidents was filed in 1990 and we understand will receive a draft response in March 1994.
- Even with the best of intentions, we may have difficulty in reaching a shared understanding of an issue. The issue of volcanism is a case in point that we must continue to address.
- The Licensing Support System (LSS)

During the past year, NRC has reexamined the Licensing Support System and searched for ways in which costs could be reduced. In April 1993, in SECY-93-107, "Licensing Support System Program and Budget Responsibilities," the NRC staff recommended that 10 CFR Part 2, Subpart J be amended to require that the Department design, develop, install, operate, and maintain the Licensing Support System information storage and dissemination capability. The NRC LSS Administrator would be responsible for oversight activities and for developing and conducting a program designed to ensure the integrity of the information stored within the system. This NRC staff recommendation, was reviewed by the Licensing Support System Advisory Review Panel in October 1993. Panel members representing the State of Nevada, affected units of local government and others expressed concern for the proposed changes in Subpart J, which provided for Department involvement in the operation of the system. We, like NRC, are awaiting the comments of the panel members.

## EXPLORATORY STUDIES FACILITY (ESF) DESIGN AND DESIGN CONTROL PROCESS

The NRC staff, in a letter to the Department dated August 20, 1993, reiterated previously expressed questions about the Department's ESF design and design control process. We take the staff's concerns seriously.

Subsequent to our receipt of the staff's letter, we met with the staff on September 17, 1993 to discuss its concerns in detail, conducted a previously postponed technical exchange on ESF on October 4-5, 1993, and conducted a meeting to resolve certain technical matters on October 8, 1993. The program also provided a detailed and formal response to the staff's letter on November 18, 1993, conducted a now regularly scheduled bi-monthly ESF status meeting with the staff on December 8, 1993, and briefed the Advisory Committee on Nuclear Waste on ESF-related matters and conducted a site tour for the Committee during its 59th meeting on December 13-15, 1993.

The Department is satisfied that the rationale for proceeding with ESF design and construction activities is sound for the following reasons:

- Each deficiency identified in either design or construction activities which was considered "adverse to quality" was documented in Corrective Action Reports written in accordance with applicable program and Management and Operating contractor procedures.
- Each deficiency was evaluated in accordance with applicable criteria and procedures to determine if the deficiency or condition was a "significant condition adverse to quality."
- Each of the significant deficiencies was evaluated in accordance with applicable work classification criteria, and applicable procedures to determine whether work should be stopped.
- As a result of these evaluations the program concluded that the deficiencies identified did not warrant the institution of a stop work order.
- The program's Office of Quality Assurance conducted a surveillance of the Management and Operating contractor in September 1993 to evaluate the effectiveness of the quality assurance program for the development, preparation, review, and issuance of the Mined Geologic Disposal System Requirements Document, the Site Design and Test Requirements Document, the Exploratory Studies Facility Design Requirements, the Surface Based Testing Facilities Requirements Document, and associated design documents. Emphasis was placed on the flowdown of requirements from the Civilian Radioactive Waste Management System Requirements Document. The surveillance team, despite its identification of three deficiencies and issuance of three corrective action requests, determined that, overall, the process for preparing and issuing these documents was effective and that the documents were adequate for their intended purpose. NRC staff members acted as observers during this surveillance activity.

- The contractor has acted aggressively and comprehensively to improve compliance with applicable quality assurance requirements. As part of these efforts the contractor developed and is implementing the Management and Operating contractor Mined Geologic Disposal System Design Control Improvement Plan. This plan is designed to respond to open Corrective Action Reports and to improve the design control process and, thereby, preclude the occurrence and recurrence of such deficiencies. Revision 1 of this Plan was transmitted to your staff on September 28, 1993. The lessons learned in implementing the Plan will be applied to design activities carried out in other program activities.

Recognizing that we have responded to the staff's concerns, provided the information it has requested, and are taking corrective action, it is also appropriate that I share with you my views on this very important problem and the corrective action we are taking to preclude its recurrence. The problem had management and technical dimensions that encompassed the transition of work from one contractor to another. The intent of the Design Control Improvement Plan referred to above is to address these aspects of the problem.

The Department plan to keep the NRC staff better informed of ESF and geologic repository operations area design changes is simple and we are implementing it. The plan includes:

- ensuring that progress and changes to the ESF Geologic Repository Operations Area are included in each edition of our semiannual progress report,
- promptly providing revisions of the Site Characterization Program Baseline to the NRC staff,
- conducting weekly teleconferences between the Department, ESF Branch Chief and the NRC Geotechnical Section Leader during which items of interest are to be discussed,
- conducting bimonthly ESF update meetings to discuss issues and selected topics, and
- improving the process by which the NRC staff can participate in the 50% and 90% design reviews conducted by the Project Office for ESF design packages.

We intend to do much more than keep you informed. The program must also perform better if we are to conduct this program to our satisfaction, to yours, and to the satisfaction of the public at large.

#### THE EFFECT OF BUDGET UNCERTAINTIES ON THE PROGRAM

Our program is moving into a phase of both underground and above ground site characterization. We therefore have a need for a funding profile higher than the FY 1994 level if we are to maintain program progress and achieve greater management efficiency. The program has been planned in the expectation of a

higher funding level than we have achieved in FY 1994. To make the collections for the Nuclear Waste Fund available to the program as needed, the Secretary has proposed to the Office of Management and Budget a new funding mechanism that result in increased funding levels in FY 1995 and later years.

Funding constraints affect our ability to conduct this program consistent with legislative goals. If the Administration and the Congress should conclude that other resources requirements must continue to restrict the funding profile for the program in FY 1995, we will have to restructure our program plans. We are developing alternative concepts that would permit us to continue to make an effective and efficient progress toward the program objective, but that recognize the realities of future funding expectations. As the funding outlook clarifies, we will consult with you and with the other interested participants in the program concerning any alternatives we intend to consider.

#### CONCLUSION: INTERACTIONS WITH NRC IN 1994

We are going to be very busy early in 1994. We will be evaluating alternative approaches consistent with the funding outlook. The Program Change Control Board is expected to approve the proposal to modify the design of the ESF, and if it does, we will act to change the ESF baseline configuration accordingly. We also expect to make a decision on implementing the MPC. If that decision is positive, we will go forward to industry in the spring with a request for proposal for the design of the MPC. The tunnel boring machine is scheduled for delivery in April and we plan to start boring the main drift in the summer. We will continue ESF Title II design, repository and waste package advanced conceptual design, surface-based testing activities and site characterization testing activities.

We will interact with your staff and the Advisory Committee on Nuclear Waste extensively in the first half of 1994. These interactions will include technical exchanges and meetings on a whole host of MPC- and repository-related subjects such as burnup credit; the status of work relevant to the characterization of saturated and unsaturated flow; total system performance assessment; ESF design and construction; a two-day site visit devoted to erosion-related subjects; and a three-day site visit devoted to surface-based and underground site characterization activities such as mapping studies relevant to the characterization of faults and fractures, stratigraphy and rock properties. Efforts on our part will be made to close out open Site Characterization Analysis comments and questions in the areas of substantially complete containment and seismic hazards.

Over the course of the year, we will submit documents to your staff for review, guidance, and comments. They will include safety analysis reports for the GA-9 and GA-4 casks in April and June, our report on Total System Performance Assessment II in the spring, our topical report on the methodology for assessing seismic hazards at Yucca Mountain in the first half of 1994, our topical report on burnup credit in September, and Revision 4 of the Repository

Annotated Outline in November. All of these will be in addition to our efforts to keep your staff informed about the status of ESF and Geologic Repository Operations Area design and construction activities discussed above.

We look forward to working with your staff on the progress being made to develop the License Application Review Plan, and to our mutual efforts in support of the Committee on the Technical Bases for Yucca Mountain Standards of the National Academy of Sciences. We learn a great deal from interactions with the staff and they are an integral part of our progress. I will do my best to make sure that they remain productive.

In conclusion, I would like to express my belief that we - the Department and the Commission - must expect and plan for mid-course corrections in the progress of the national nuclear waste disposal program, possibly including major changes in policy, over the next few years. These changes will be based on the experience we have obtained since 1982. As I have indicated, the Department will be developing alternatives and will welcome the Commission's participation in the process. As Secretary O'Leary has stated, we are aspiring to address a national environmental priority and to grasp an opportunity for the United States to set the standard for international waste management. Our success in realizing these aspirations can have immense consequences for the future.





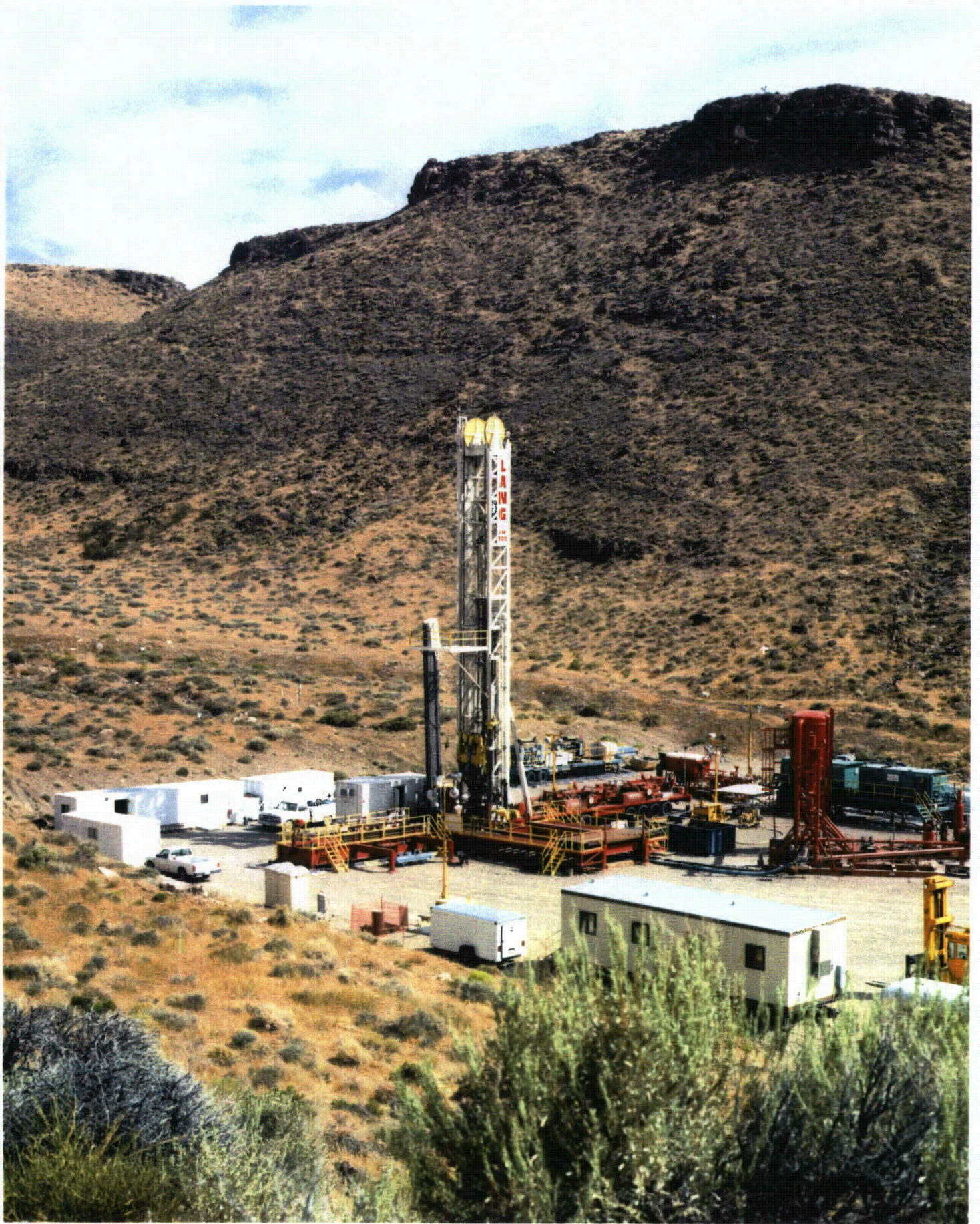










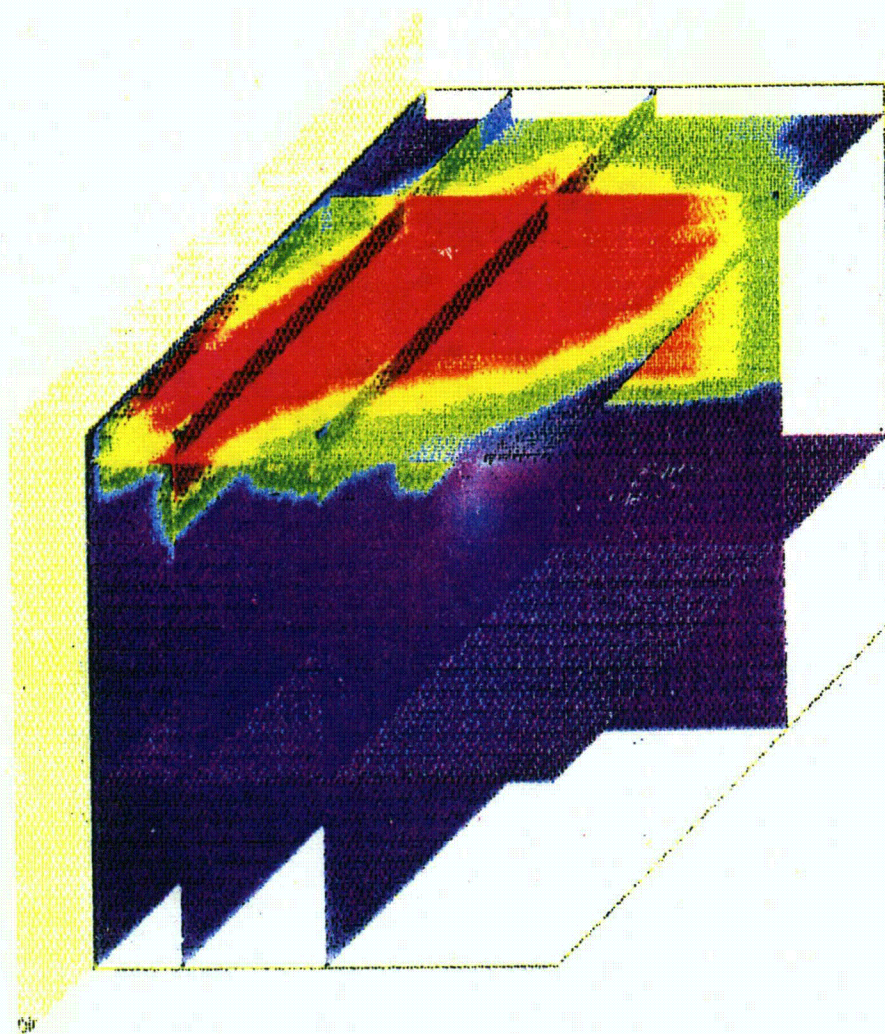






**Computer-Aided Design (CAD) Workstation Used for Modeling and Simulations**





**Three-dimensional computer model of radionuclide ( $^{135}\text{Cs}$ ) migration at the proposed repository site Yucca Mountain**









## Department of Energy

Washington, DC 20585

January 21, 1994

Mr. Samuel F. Chilk, Secretary  
Office of the Secretary  
of the Commission  
U.S. Nuclear Regulatory Commission  
11555 Rockville Pike  
Rockville, MD 20555


Dear Mr. Chilk:

My staff has reviewed the transcript of my December 20, 1993, briefing to the Commission on the status of the Department of Energy's High Level Waste Program. This review has noted some mistakes in the transcript. It is therefore requested that the following revisions be made in the transcript:

- o page 5, line 8, "mine" should read "mined",
- o page 9, line 8, "designed" should read "designated",
- o page 25, line 15, "at" should read "and",
- o page 33, line 2, "some" should read "come" and
- o page 42, line 9, "position" should read "possession".

Thank you for your consideration in this matter.

Sincerely,



Daniel A. Dreyfus, Director  
Office of Civilian Radioactive  
Waste Management

cc:

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