

CONFIDENTIAL

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

**Title: BRIEFING BY DOE ON STATUS OF HIGH LEVEL
 WASTE PROGRAM - PUBLIC MEETING**

Location: Rockville, Maryland

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1 UNITED STATES OF AMERICA
2 NUCLEAR REGULATORY COMMISSION

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4 BRIEFING BY DOE ON STATUS
5 OF HIGH LEVEL WASTE PROGRAM

6 ***

7 PUBLIC MEETING

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11 Room 1F-16
12 White Flint Building
13 11555 Rockville Pike
14 Rockville, Maryland
15

16 Tuesday, January 30, 1996
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18 The Commission met in open session, pursuant to
19 notice, at 10:05 a.m., the Honorable SHIRLEY A. JACKSON,
20 Chairman of the Commission, presiding.
21

22 COMMISSIONERS PRESENT:

23 SHIRLEY A. JACKSON, Chairman of the Commission
24 KENNETH C. ROGERS, Member of the Commission
25

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1 STAFF AND PRESENTERS SEATED AT THE COMMISSION TABLE:

2 JOHN C. HOYLE, Secretary

3 KAREN D. CYR, General Counsel

4 DANIEL DREYFUS, Director

5 Office of Civilian Radioactive Waste Management, DOE

6 LAKE H. BARRETT, Deputy Director

7 Office of Civilian Radioactive Waste Management, DOE

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P R O C E E D I N G S

[10:05 a.m.]

CHAIRMAN JACKSON: Good morning, ladies and gentlemen, Dr. Dreyfus and Mr. Barrett. This morning, the Commission will be briefed by you, its representatives of the U.S. Department of Energy, on the status of the Civilian Radioactive Waste Management Program.

Back on June 9th of last year, Dr. Dreyfus and his staff briefed the Commission on the High-Level Radioactive Waste Program. Since that time, much has happened. Various pieces of legislation that could affect this country's high-level waste program have been considered in the Congress.

Budgets for both agencies, both DOE and the NRC, have been reduced, and each agency has taken a hard look and is continuing to take a hard look at its High-Level Radioactive Waste Program.

A briefing such as today's can prove to be very beneficial in times of diminishing resources. The free exchange of information can allow each agency to optimize the utilization of its resources to carry out its responsibilities effectively.

Dr. Dreyfus and Mr. Barrett, the Commission looks forward to hearing from you today on the changes that have and are taking place in DOE's High-Level Radioactive Waste

1 Program.

2 Commissioner Rogers, do you have anything you
3 would like to add at this time?

4 COMMISSIONER ROGERS: Not at this point. Thank
5 you.

6 CHAIRMAN JACKSON: If not, you may proceed, Dr.
7 Dreyfus.

8 DR. DREYFUS: Chairman Jackson and Commissioner
9 Rogers, I am pleased to have the opportunity to address the
10 Commission on the status of the program.

11 As has been the custom, I would like to start by
12 showing you a few slides of the activity at Yucca Mountain,
13 if we can get the first one up.

14 The Chairman will probably recognize our tunnel at
15 Yucca Mountain. This is a view of the first turn. The
16 tunnel has now reached a repository formation, and that is a
17 view of the turn from the ramp down into the drift that will
18 extend through the repository.

19 The second slide is the rear of the tunnel boring
20 machine, and in this one, you can see the laser beam that is
21 used as a guidance system to keep the machine on its
22 intended alignment.

23 Next, this is a view of the mapping gantry on the
24 tunnel machine. That platform up above is able to be held
25 stationary while the machine is boring, so that the

1 scientist geologist can do mapping and sampling without
2 stopping the machine.

3 One of the unique features of this machine -- of
4 course, nothing like that -- is that it's used anywhere in
5 normal mining or tunneling operations. It's one aspect of
6 why we needed to purchase a unique machine.

7 Next one. This is a view of an alpine miner.
8 That is the business end of an alpine miner. We have
9 resorted to using alpine miners for the alcoves, the test
10 alcoves which are off of the main tunnel.

11 We had been doing those. I think when you were
12 out there, you saw some that were done with drill-and-blast
13 methodology, and this is a better methodology if we can make
14 it work. It is a little less intrusive on the natural
15 situation. It makes a much neater alcove, and we have been
16 using this machine successfully and recently.

17 The next view is -- let me be sure what it is
18 before I say it. That is the alpine miner in operation.
19 That is the back of it and the spoil coming off of the back
20 of the conveyer belt. That is actually drilling an alcove.

21 We have, I think, one more view of an alpine
22 miner. I am not sure why it is, indeed, a different alpine
23 miner, but when you have seen one alpine miner, you have
24 seen them all. We will put it up there, anyway. It is a
25 different alcove and a different miner we have been

1 operating, too.

2 Next one. This is testing in progress in one of
3 the early alcoves, in Alcove Two. There are groundwater
4 hydrology studies underway here looking at permeability
5 changes across the Bow Ridge Fault which was the first major
6 fault that we encountered on the way in, and those tests are
7 in progress. Data is being gathered.

8 The last one, is a view of instrumentation of a
9 bore hole in the unsaturated zone. This, in fact, happens
10 to be a bore hole in which Nye County is conducting research
11 and support and in a regulatory position. This is
12 monitoring establishing a baseline on pneumatic gas flow and
13 hydrologic conditions in the unsaturated zone. It is an
14 issue that the County is particularly interested in, and
15 they have been monitoring the changes in pneumatic
16 conditions as the tunnel progresses.

17 That gives you some feel for the fact that there
18 is work in progress at Yucca Mountain. There has been
19 progress since your visit. I hope you can make another one
20 soon. We can show you pretty near two and a half miles of
21 tunnel at this point, and it is a different experience.

22 As you observed, a lot has happened since I last
23 spoke with you in June of last year. We are well into the
24 new fiscal year operating under a much reduced budget that
25 has required us to restructure our geologic disposal

1 program.

2 You have my prepared statement which I think is
3 comprehensive. I don't intend to read it to you, but I
4 would like to highlight a few pieces of it.

5 We are as yet without agreement between the
6 administration and Congress on any new policy regarding the
7 near-term management of spent fuel. Congress continues to
8 consider legislation to initiate construction of an interim
9 storage facility.

10 If that legislation is enacted, we would, of
11 course, be looking at another redirection of the program.
12 So, to the best of my ability at this point, I will share
13 with you our planning for the future of the program and our
14 response to the current fiscal year reduction.

15 We made substantial progress in 1995. We had a
16 40-percent increase, and almost all of it went to Yucca
17 Mountain, and almost all of it was, in fact, utilized at
18 Yucca Mountain. We completed the year with very little
19 carryover and with accomplishments that frequently exceeded
20 our targets.

21 We overcame the start-up problems with the tunnel
22 boring machine, excavated more than two miles ahead of
23 schedule and on the budget, and in fact, the ability to
24 manage that machine better gives us some hope that we can do
25 more in '96 with it than we have in our current baseline

1 plans.

2 The machine has past the point at which we will be
3 putting the first in situ thermal tests. The thermal test
4 alcove is being excavated with an alpine miner, and we
5 expect to have an in situ heater test scheduled before the
6 end of calendar year 1996.

7 The machine at present is about at the point where
8 we will have the alcove that will give us the first physical
9 access to the Ghost Dance Fault. We will drill through the
10 fault first to take samples of the situation as it now is
11 and eventually tunnel through the fault itself. I expect to
12 get substantial valuable information from that.

13 Progress to date on the tunnel has been important
14 because it has enhanced and confirmed our understanding of
15 site conditions. The tunnel has given us the first
16 opportunity to confirm that those conditions we were
17 imputing from surface operations and from drill holes are,
18 indeed, what exists in the repository itself.

19 The Office of Waste Acceptance, Storage and
20 Transportation also made substantial progress over the last
21 year. We entered into the environmental impact statement
22 for the multipurpose canister. We did, in fact, complete
23 scoping and an implementation plan.

24 The contract for the design and certification was
25 issued to Westinghouse in April, as I told you it would be.

1 Unfortunately, the decisions that the Congress made in the
2 fiscal year '96 appropriation process have made it
3 impossible for us to continue with that program, as we were
4 pursuing it.

5 The Act provided only 400 million for the program
6 and further froze 85 million of that amount pending possible
7 future enactment of interim storage authority. So the
8 result is a program level of 315 million. That is just
9 about half of the 630 we requested, and it is 40 percent
10 below our actual fiscal year '95 level of effort.

11 In anticipation of a constrained budget, we did
12 take action in September. We eliminated about 875
13 contracted jobs over this fiscal year in the September
14 action, and primarily impacted Yucca Mountain.

15 In November when we found out about the unexpected
16 loss of the additional 85 million, we had an action which
17 will eliminate an additional 200 jobs, mostly in support of
18 the Waste Acceptance Program, program management functions,
19 support contractor functions.

20 We have throughout this situation -- while we
21 were, of course, immediately constrained to manage the
22 financial situation to avoid an overrun situation in '96, we
23 have tried to preserve the vital program activities and to
24 look ahead and preserve those things which we felt had
25 continuity under a constrained budget.

1 A much reduced repository program will be
2 required. Congress did give us some guidance in the
3 Appropriation Act. They said that we should focus on the
4 core scientific activities at Yucca Mountain, and they
5 recognized that the preparation and submittal of a licensed
6 application would likely be deferred.

7 What new targets that are possible and practical
8 for us depends upon our future expectations for funding. So
9 the administration's fiscal year 1997 budget which is not
10 yet firm and which is still considerable flux within the
11 Department of Energy is a very important factor in what we
12 can aspire to do when we develop a new program outlook.

13 I want to make the point that the program
14 currently is in a transitional state, managing down on the
15 cash flow and doing what we must do, and we are doing a lot
16 of contingency planning in the expectation of what I hope
17 will be a more robust program when we know what the '97
18 outlook is.

19 The administration remains committed to geologic
20 disposal. However, given the funding that we already have
21 in '96 and the likely scenario for future funding, the only
22 practical approach that we see is to concentrate the
23 repository effort in the near term on the major unresolved
24 technical questions that we have to answer to complete the
25 conceptual design of the repository, describe its expected

1 performance, and indeed, that is the instruction that the
2 Congress gave us in a conference report, to concentrate on
3 the major unresolved, unknown issues.

4 In order to manage the program and in order to
5 explain and justify our continuing activity to the
6 stakeholders, we have defined a set of deliverables that are
7 consistent with the conference report guidance.

8 They consist of a package -- these are near-term
9 deliverables -- consist of a package of more specific design
10 work that is focussed on those critical elements of the
11 repository and a waste package including a concept of
12 operations which I believe will show us that the
13 technologies do exist to build a repository in the concept
14 we have.

15 Secondly is a total system performance assessment
16 that will be based upon those design concepts and that will
17 capture the wealth of information that we already do have
18 from the 15 years of work that has already been done.

19 Third is a plan and cost estimate for the
20 remaining work beyond that time that would be necessary to
21 complete a docketable license with this application for this
22 Commission.

23 Finally is an improved estimate of cost necessary
24 to construct and operate the repository, again based upon
25 this refined design concept.

1 These deliverables when completed, I think, will
2 give us a better understanding of the repository design and
3 of its performance than we now have and a much better
4 appreciation of work that is necessary to complete the
5 license application and, indeed, the repository itself.

6 We believe we can complete that package of
7 deliverables in 1998 and have, indeed, committed with the
8 administration to do so.

9 We have named it, for want of a better name, a
10 viability assessment. I will be free to say that one
11 criterion of the name is that it not have term of art
12 significance in the law of regulations because, obviously,
13 this package doesn't.

14 CHAIRMAN JACKSON: Would you repeat that
15 statement, please?

16 DR. DREYFUS: I say the reason we have
17 characterized -- we have to characterize what is basically a
18 package of deliverables that the Congress asked for some
19 way, and it was important to not characterize it with a term
20 of art that is in the statute or in the regulations because
21 it does not, in fact -- it is not concurrent, coincident,
22 with any particular one of the findings or formal actions
23 that are described in the Act.

24 It is a management target. The deliverables that
25 contribute to it will clarify the most uncertain aspects of

1 geological disposal of Yucca Mountain. If the judgment is
2 positive, then obviously, the work that is done will also
3 contribute to the requirements for a formal secretarial
4 recommendation to the President, and subsequently, those
5 will contribute also to a license application to the
6 Commission, but the assessment will not be sufficient for,
7 nor will it prejudice, these subsequent formal actions by
8 the Department.

9 Some of those deliverables are necessary and are,
10 indeed, mentioned in the statute as part of the necessary
11 work to make a formal recommendation to the President, but
12 they are not everything.

13 For example, they do not include an environmental
14 impact statement which is necessary both for the license
15 application and for the presidential recommendation.

16 In order to complete the deliverables, we have to
17 document our understanding of site conditions, incorporating
18 the data we already have collected and the new information
19 coming very largely from the exploratory studies facility.

20 We have to have sufficient understanding of the
21 critical factors affecting waste containment and isolation
22 strategy to know whether the geological disposal is, indeed,
23 technically feasible.

24 We will need to address the cross-cutting design
25 issues such as the use of backfill, criticality control, and

1 thermal loading.

2 We think we can complete the deliverables by '98
3 because we can rely on an enormous amount of information
4 already collected on site conditions, progress we have
5 already made on the advanced conceptual design for the
6 repository and the waste package, and the understanding that
7 we gain from our latest total system performance assessment.

8 Now, although our focus in the near term is not on
9 the submittal of a license application, we recognize that we
10 must keep you and your staff informed and engaged and
11 preserve the integrity of the work that we are doing, so
12 that it can be used in a licensing process.

13 We expect that your staff will provide us with
14 feedback, and if a significant technical issue is not
15 adequately addressed, and failure to do so would affect our
16 ability to continue toward licensing, that we will have the
17 necessary interchanges to deal with that.

18 We expect to develop a revised program plan over
19 the next few months. It has got to be consistent with the
20 1997 budget presentation to the Congress, and therefore, it
21 cannot proceed ahead of the President's '97 budget, but we
22 will try to have it follow that as rapidly as possible, and
23 it will describe our reconfigured program, and we, of
24 course, will keep you fully and continually advised as we
25 develop that.

1 Although the Congress has recognized repository
2 licensing activities would be likely to be deferred under
3 the reduced program, in our view, the long-range goal of a
4 successful license application remains central to our
5 mission, and we believe the program should include a plan
6 and a target date for the submittal of a license
7 application.

8 It is apparent from recent developments that any
9 such plan is going to have to recognize some limits on
10 funding because I think they are likely to persist.

11 I believe it is possible to move directly and
12 efficiently from this viability assessment to the other work
13 necessary for a license application if, indeed, we find that
14 it is a viable venture.

15 The objective should be to design a repository
16 that is compatible with the geologic setting, to develop a
17 safety case to support a proposal to construct that
18 repository, and the licensing process should focus on
19 examining that safety case to determine if public health and
20 safety and the environment are adequately protected.

21 The rigors of trying to get to this funding level,
22 while preserving the vital aspects of our work, have led us
23 to reevaluate what needs yet to be done based on 15 years of
24 experience, and I believe it is possible and probably
25 necessary to revisit the regulatory framework for geologic

1 disposal, and more importantly, the related expectations
2 that have given rise to earlier work plans.

3 I believe that the cost of submittal of a license
4 application can be significantly reduced if the focus of the
5 licensing review is on the safety case for a specific
6 repository design and its predicted performance, less than
7 on a comprehensive evaluation of the site.

8 If this were the case, I think we could aspire to
9 reestablish a target date for license application, not long
10 after 2000, and at the kind of funding that the Congress
11 might be willing to support.

12 This may be the only way the program can command
13 the resources to retain the geological disposal as a
14 national strategy.

15 Now, we have done a lot of planning. We intend to
16 explore this approach. We are considering the revision of
17 our own regulations which would be necessary to clarify our
18 intentions with regard to our future program. It would
19 provide a forum in which the discussion of what, indeed, is
20 the remaining necessary work could be done, and we will, of
21 course, keep you informed as we proceed with that process.

22 Briefly, with regard to the near-term management
23 of spent nuclear fuel, in the absence of an agreement
24 between the administration and Congress, we don't have new
25 policy direction regarding our role, and we have no access

1 to the 85 million that has been set aside for work on an
2 interim storage facility.

3 Our contract to develop the multipurpose canister
4 system was structured in three phases with three successive
5 decisions. The first phase of the contract, system design,
6 and preparation of a safety analysis report will be
7 completed as scheduled by April of this year.

8 When I met with you last June, I indicated we
9 anticipated proceeding with phase two certification and
10 prototype testing. That will not be possible, and we will
11 not proceed with phase two.

12 The GA-4/9 legal weight truck casks were also
13 being developed in our program. Certification process is
14 underway. Safety analysis reports were submitted to the
15 Commission in July and August of '94. We are going to be
16 unable to provide additional funds for that process.
17 Private industry may choose to pursue the certification.

18 We will continue to work on credit for burnup at
19 least through the partial credit for actinide burnup stages,
20 and we aspire to remain in the burnup credit process because
21 we believe it is central to so much of the system, whether
22 or not the transportation and storage is done in private
23 practice or with a bigger role for us, and in any event, for
24 the repository. So we do intend to, as our funding permits,
25 continue with burnup credit activities, and we will

1 certainly continue with the partial burnup activity.

2 Of course, if the administration and the Congress
3 come to agreement on policy direction regarding interim
4 storage, the program is prepared to aggressively act on that
5 direction.

6 We are looking at the issues of interim storage
7 licensing. We are looking at the issues of achieving the
8 capability for a very large-scale transportation venture,
9 campaign in the United States, and we believe we know how to
10 proceed once we are given the appropriate directions to
11 proceed.

12 I am grateful that the working relationship
13 between our staffs has been strengthened. We have had a lot
14 of hearings and a lot of interaction over 1995. I believe
15 there were 30 meetings, staff meetings in 1995.

16 There will be fewer in '96 simply because of lack
17 of resources. However, we are becoming more inventive at
18 that. We intend to do a lot of video conferencing. We
19 intend to remain engaged, and I think both of our staffs
20 understand the necessity to figure out more economical ways
21 to do that without sacrificing the relationship we now have.

22 I hope we can draw upon that experience to
23 maintain progress on the work we are doing and, of course,
24 to be able to respond to any new developments that may
25 occur.

1 At that point, I will stop and take your
2 questions.

3 CHAIRMAN JACKSON: Thank you.

4 Let me go back to a couple of things. You
5 mentioned in your written submission as well as your remarks
6 today that you thought that there needed to be changes in
7 the regulatory framework, and I would like you to speak with
8 a little more specificity about that and what you have in
9 mind.

10 DR. DREYFUS: Well, from our point of view, the
11 program has been evolutionary, and a good deal of the
12 descriptive work on what ought to be done in order to have a
13 complete site characterization venture was written, as you
14 know, culminating in about 1987.

15 It also was done under a statutory regimen that
16 contemplated comparison among multiple sites, a future
17 selection of the preferential site, and a quite different
18 outlook than we now have.

19 So, informed by 15 years of site-specific
20 information as to what is important and not important at
21 Yucca Mountain and what the true problems might be and, of
22 course, informed by the notion that we are not, in fact,
23 comparing sites, but simply characterizing a site for a
24 particular repository, we ought to be able to do a better
25 job of describing what is important and what needs to be

1 done from here on out.

2 It is pretty clear that our own regulation, 960,
3 is not held in high regard. I think that there have been
4 expressions, including draft legislation in Congress to
5 abolish it. It is time for it to be rewritten.

6 There also is always the notion that a program
7 plan, as you change a program plan, is evolutionary, but
8 somewhere along the way, it is appropriate to again restate
9 what is the job and what needs to be done.

10 I believe there are factors in the historical
11 literature that are no longer as significant as they might
12 have been. There are things that we now know we can bound
13 and dispense with, that we now know are not central to the
14 safety case at Yucca Mountain, and I believe that we can
15 describe a program that is a good deal less elaborate than
16 the one that is described historically.

17 To what extent that affects the regulatory
18 framework, I don't know, and until we get the description
19 written down, until we can say to you this is what we plan
20 to do, it would be hard for anyone to say whether that, in
21 fact, is different from the expectations in your
22 regulations. It is different from the expectations in our
23 regulations. I can stipulate that at the moment.

24 So what we would propose to do is to look at a
25 program that we think will support a safety case for a

1 repository at Yucca Mountain, describe it, and then have the
2 dialogue as to whether that, indeed, there are regulatory
3 requirements that lay outside that plant. If there are,
4 well, then there should be.

5 We are not further than that. We are doing the
6 planning to structure the program we think we need. We have
7 had discussions on what the key technical issues are, that
8 kind of thing which moves in the right direction, but I
9 don't think we have made any commitments as of yet.

10 CHAIRMAN JACKSON: Under the new viability
11 assessment, to use the revised terminology or the
12 terminology in this particular case, are NRC and DOE looking
13 at the same technical issues?

14 DR. DREYFUS: Well, the list of technical issues
15 that I have seen that have been discussed as technical
16 issues, I think there is a disagreement as to the
17 significance of a couple of them which is, I think, still
18 being discussed, and then, of course, we are talking in a
19 very high level of abstraction.

20 When we start to subdivide those, I would expect
21 to find a larger degree of disagreement, but that, after
22 all, is what we need to do. We need to know what the
23 Commission thinks are the issues that have to be resolved in
24 the licensing.

25 CHAIRMAN JACKSON: Let me see if I am paraphrase

1 or summarize what I think I heard you say. In doing this
2 approach of what you call supporting the safety case, there
3 seems to be three elements. One was a rewrite, a revision,
4 or withdrawal -- that's my term -- of 10 CFR 960, the siting
5 guidelines piece. Is that correct?

6 DR. DREYFUS: A restatement. Now, I don't know
7 whether that's what the format would be, but a restatement
8 of our proposed approach to completing the job.

9 CHAIRMAN JACKSON: The second -- okay. And I had
10 program plan changes. I mean, that is more broad than just
11 --

12 DR. DREYFUS: Program changes are definitely a
13 part of the outlook, yes.

14 CHAIRMAN JACKSON: Third, the increased use of
15 bounding.

16 DR. DREYFUS: In those areas, because we know
17 better what our waste isolation strategy is and what our
18 site is, in those areas, it appears now to be amenable with
19 that sort of bounding, and in peripheral areas, it should be
20 easier than in the central areas.

21 CHAIRMAN JACKSON: Let's focus on the second piece
22 a little bit more in fleshing out what program plan changes
23 you envision as being the most significant ones, that are
24 different than what has been the case heretofore.

25 DR. DREYFUS: Well, that's the area, in fact, in

1 which until we write it down, we can't be very specific. I
2 really am not in the position today to say we are dropping a
3 specific item of work, and I aspire to have a document that
4 says what we will do within the next couple of months. We
5 are looking at that now.

6 CHAIRMAN JACKSON: Okay. So you are saying that
7 your feeling is that there have to be changes, but today,
8 you are not prepared to say what those changes should be.

9 DR. DREYFUS: That is right.

10 CHAIRMAN JACKSON: I note that DOE intends to
11 terminate work on the licensing support system. Yet, you
12 state that you have an aspiration to able to reinstate a
13 license application date soon after the year 2000.

14 The question is, in looking at your revised
15 program, are you going to be addressing -- or how can you
16 ensure that there is the availability of a licensing support
17 system or the kind of documentary information and data that
18 would be needed in a licensing process in enough time before
19 the submission of license application?

20 DR. DREYFUS: Well, the LSS is caught in this
21 transitional thing that I mentioned. The first thing is '96
22 budget. In the '96 budget, as you recall, we had just
23 reached the stage of having an accommodation and agreement
24 among the user group and others, advisory bodies, as to what
25 it ought to be and how it ought to be managed or coming to

1 the point of knowing what we were doing.

2 We had funded it rather healthily in the '96
3 request. So the first thing is that in the '96 budget we
4 got, we simply can't afford what we were going to do in '96,
5 and in the original response to the '96 budget, we said,
6 whoops, licensing has now gone out over the horizon, and
7 that was, of course, the way it looked to us at the outset.

8 In some fiscal '97 scenarios, that is still the
9 case. I mean, I'm being a little optimistic, but the '97
10 budget will permit us to be more forthcoming.

11 So the first thing you see in '96 is that looking
12 at the constrained '96 budget and the expectation of much
13 deferred licensing, we deferred the LSS and would do nothing
14 with it now.

15 We are, in fact, struggling to hold our own
16 systems together in the '96 budget. It is, indeed, a tough
17 thing to manage to because not only is it a 40 percent
18 reduction, but it is a 40 percent reduction and a bunch of
19 termination costs that don't pay for new work.

20 So, when you look at what is available for new
21 work in '96, it is a lot less than 60 percent of what we
22 spent last year. So we just have a tough time this year.

23 Now, what we do in '97, I think, depends on what
24 we can come up with. If we put a licensing date back in
25 this program based on whatever the administration tells us

1 we can plan against, then yes, definitely, we have got to
2 get the LSS back into a time frame that will be adequate to
3 support that licensing date, and we are very cognizant of
4 that, and there are a lot of things that have to go -- if we
5 put a licensing date in that is reasonably close to the year
6 2000, there are a lot of things that have to get back into
7 the program in '97 when we get the money, and we are aware
8 of that.

9 So we are not going to try to do it without record
10 backup by any stretch.

11 CHAIRMAN JACKSON: No, no, no. I mean, I am
12 assuming that we all understand --

13 DR. DREYFUS: We all understand.

14 CHAIRMAN JACKSON: -- that that has to be there.

15 DR. DREYFUS: We will look very hard at the
16 timelines and be sure that we are not --

17 CHAIRMAN JACKSON: Well, there is also the issue
18 of putting Humpty Dumpty back together again.

19 DR. DREYFUS: That's right.

20 CHAIRMAN JACKSON: So my real statement to you as
21 opposed to a question, which is what I usually do, is that
22 since you are talking about a change to program, as you are
23 doing that, that you have at least in the background the
24 fact that a licensing support system or something of that
25 nature has to exist --

1 DR. DREYFUS: Yes.

2 CHAIRMAN JACKSON: -- and that it can't go out of
3 your thinking as you are developing --

4 DR. DREYFUS: It has not.

5 CHAIRMAN JACKSON: -- a new program in response to
6 constrained resources.

7 Let me ask you this particular question. Since
8 the waste isolation strategy is noted for providing the
9 basis for organizing and explaining the rationale for the
10 more limited testing program, when will the completed waste
11 isolation strategy be made available to the NRC?

12 DR. DREYFUS: We are working a draft. The
13 contractor's initial work is completed, and we are in the
14 process of the review of that draft.

15 Have you got a date on when we will meet?

16 MR. BARRETT: Let me ask Dr. Brocoum if he would
17 want to venture.

18 DR. BROCOUM A couple of months, we are informed.
19 It is in the final stages of review in our quality assurance
20 program now.

21 CHAIRMAN JACKSON: Let me ask you this question.
22 You also seem to be taking an approach that, in a certain
23 sense, will address the question of what can go right and,
24 you know, we're the regulators, and the question is will
25 this testing strategy permit you to realistically assess and

1 quantify factors that might detract from overall system
2 performance, as well as those that enhance.

3 This is, again, when you are talking about a
4 safety assessment.

5 DR. DREYFUS: Well, we certainly intend to totally
6 elucidate the safety case we make, and if there is a factor
7 that has significant impact, yes, we will have to deal with
8 it. We will deal with it either by demonstrating -- or it
9 does not have significant impact, or describing and
10 designing for it, one of the two.

11 CHAIRMAN JACKSON: At this point, can you say how
12 you feel a private initiative by industry on the
13 multipurpose canister development might interface or be
14 integrated into DOE's overall waste package design and
15 development activities?

16 You alluded to it in a generalized way.

17 DR. DREYFUS: There are a couple of things that
18 are reasonably sure. The Congress sequestered the money we
19 would have used to pursue our own in-house technology
20 development program, and as I read it, it said you will get
21 that money when you get a bill, and when I read those bills,
22 they say don't do canister work. So I see no eventuality in
23 which I get the money and the permission to do the canister
24 work.

25 On that basis, we have -- looking forward to the

1 notion that there has to be the evolution and development of
2 a suite of canister technologies in this country if we are
3 going to move 3,000 tons of spent fuel a year -- we have to
4 get that done through the private sector.

5 Now, since the canister program -- since we
6 announced our intention to stop the canister program, there
7 have been indications that industry intends to move into it.
8 There is a good deal of appreciation that there needs to be
9 a more comprehensive, more standardized storage and
10 transportation technology out there.

11 I think people are beginning to realize that in
12 the absence of that, we could create a situation in which
13 dry storage is so varied and so site-specific, both
14 economically and technically, it could create quite a
15 management problem when the time comes to go and get it and
16 move it, and I think that is appreciated in the private
17 sector.

18 Now, the question is you are talking about \$100
19 million worth of investment, one way or another, to get
20 these canisters built, and there is clearly a very large
21 market and a very large economic incentive some day. The
22 problem is nobody knows which day, and so capital funding
23 for the development of these technologies has got to have
24 some notion of when it is going to be returned.

25 I think there is going to be a lot of activity. I

1 think there is going to be -- there will be private ventures
2 approaching the Commission for the certification of more
3 comprehensive technologies capable of taking more of the
4 fuel and probably at least due purpose, if not at least
5 possible multipurpose.

6 We are getting a lot of inquiries about
7 specifications for storage and that sort of thing. So I
8 think yes, it is going to happen. What I am less sure about
9 is the timeline when somebody actually puts money on the
10 table and comes before you with a certification application.
11 That is a little hard to predict.

12 It will happen. We will when the time comes. We
13 are told we have a timeline. If we are given the job, we
14 will go out and look for transportation services, and those
15 who profess to supply them will have to have access to
16 technologies. That will create an incentive, and it will
17 happen. Whether it will happen prior to that incentive is a
18 question of how industry is guessing about the imminence.

19 CHAIRMAN JACKSON: I have some additional
20 questions, but I will defer them, and I would like to give
21 Commissioner Rogers a chance to raise some issues.

22 COMMISSIONER ROGERS: Thank you.

23 Just on this canister question, it does trouble
24 me, though, that there might be the possibility that the
25 canister program, a private canister program might start to

1 move quite rapidly for some reason, and the design submitted
2 to NRC might be entirely licensable according to our
3 requirements, but not necessarily fully compatible with what
4 the repository design might anticipate.

5 It would seem very desirable that you ought to be
6 able to provide some guidelines from your point of view on
7 what those requirements on canisters, if they are going to
8 be placed in a repository themselves, some part of an MPC
9 system, that that is laid down early on, as early as you
10 can.

11 Even though you are not funding it and you are not
12 supporting that work, it seems as if your ultimate design is
13 going to have to take into account what those things are
14 going to look like and what their characteristics are going
15 to be.

16 We might be able to very well license something
17 that really doesn't quite fit the final design of the
18 repository because it is entirely safe for other purposes,
19 but maybe not entirely suitable for your ultimate repository
20 design.

21 It seems that it is very important to try to make
22 sure that there isn't a disconnect there. As you cut off
23 your support for the financial support, it doesn't seem to
24 me that you really can cut loose entirely from design
25 considerations of those canisters for your purpose, and I

1 would just welcome any comments you might have on that.

2 DR. DREYFUS: Well, as we have said in previous
3 appearances here, the ability of the canister to be utilized
4 in the waste package has always been something that had to
5 be decided when you got to that point, and we were seeking
6 from the Commission an expression that our design in no way
7 a priori prohibited the use of it in a waste package rather
8 than a certification at this point that it would be okay,
9 and I think we had a mutual understanding that was
10 impossible to do at the moment.

11 Now, yes, we will facilitate to the best that we
12 can the development of a multipurpose canister. We will
13 tell the industry what we can tell them about what
14 specifications would be required.

15 It is not clear to me that the different scenarios
16 of the future inherently make a multipurpose canister the
17 economic bet, and therefore, we're going to see, and now
18 that we're going to do it through the marketplace, very
19 clearly, whatever the economic bet is, is what will come
20 forward. In other words, if we are going to have a scenario
21 extensive interim storage, that gives you one kind of
22 economics. If you don't, it gives you another. It is going
23 to be a little more a question of the economic outlook, I
24 think the shorter-term economic outlook, that being the way
25 the marketplace works. We will do the best we can.

1 COMMISSIONER ROGERS: It is a worry that that by
2 itself might dictate something that in the long run may give
3 a problem with a repository.

4 DR. DREYFUS: We have been approached, and we are
5 going to do the best we can to provide guidance, so that
6 should vendors wish to try to accommodate the waste package,
7 they will have the best shot at it. That is all we had is a
8 shot at it. So we will do the best we can.

9 I understand the problem, and I am concerned about
10 it.

11 COMMISSIONER ROGERS: Let me just say, in general,
12 I think your approach really is very impressive. You are
13 dealing with a very tough problem with your budget cuts, but
14 it seems to me that the approach that you are taking on this
15 viability assessment makes an awful lot of sense.

16 It might even be the way that the whole thing
17 might have gotten started a long time ago if one could have
18 seen how to proceed in a clearer light.

19 So I personally find it a very interesting
20 approach. However, I do have some problems in that I think
21 that once you have come to the -- and I think the Chairman
22 sort of touched on this. The viability assessment, it seems
23 to me, is really taking into account all of the positive
24 aspects of the site, your design, and so on and so forth,
25 and seeing when you put them altogether, do you wind up with

1 something that seems to make some sense and that it looks
2 like a totally -- at that point could look like a totally
3 viable approach.

4 It may be not so different from actually some work
5 that has been done in the past on this. I don't know.
6 However, there will be serious questions raised at that time
7 on all sorts of possibilities, and I think your statement
8 that it ought to be easy to move from the viability
9 assessment to license application is one I am not sure I can
10 agree with because it seems to me that is really where the
11 problems are going to start to surface.

12 The viability assessment may look very good from
13 your point of view. You may have a total design. You may
14 have all the elements in place that might seem to make very
15 good sense to you and all fit together. However, there will
16 be questions raised, and some very tough questions may very
17 well come up at that point, and that is not -- then they are
18 going to have to be dealt with, and they will involve
19 technical matters.

20 I think that unless there is some legislation that
21 says all of such things must be ignored, that the process is
22 going to be a complicated one from then on. I think what
23 you are doing right now makes a great deal of sense. It
24 looks like a very sensible engineering approach to trying to
25 come to a solution here.

1 However, that is different, as you know, from
2 achieving a license, and licensing is not just simply a
3 collection of engineering judgments. It is much more than
4 that.

5 I just feel uncomfortable about the idea that one
6 can move quickly from a rosy viability assessment that looks
7 pretty good to a successful licensing application without a
8 good deal more work of some sort. It may even just be
9 legal. I don't know, but there will be technical issues as
10 well, I am sure.

11 So I am concerned about the documentation. It
12 comes back to the LSS question, in a sense, not from the
13 standpoint of total access by everybody that might have a
14 right to access the LSS and so on and so forth, a very big
15 comprehensive system, but rather, some ongoing means for
16 documenting, and if I can use the word -- I don't like it --
17 memorializing decisions that are made along the way with
18 respect to how much data has already been collected and how
19 much data might be necessary in the long run.

20 It is going to be years down the road before one
21 has to return to what was the basis for stopping at that
22 particular point in the collection of some data, and I think
23 that documentation there is extremely important and some way
24 of preserving it.

25 To me, this is one of the features of the LSS that

1 has always justified its existence. So that, I know you
2 have said you are not going to forget about the data, but I
3 do think that it is very important that every kind of
4 decision -- tentative decision because we have said many,
5 many times, no decisions from the Commission's point of view
6 are final until all decisions final, but nevertheless, from
7 your point of view that when you proceed to a certain point
8 in your viability assessment, you say that is as far as we
9 have the funds to go, and we think it is far enough, and
10 then you move on to something, that that is well documented
11 and well recorded, so that 10 years from now when you have
12 to resurrect it, it is not a hard thing to do.

13 So that seems to me that that aspect of the LSS
14 cannot be simply turned off, and you know you have to deal
15 with it whether you call it LSS or you call it something
16 else entirely. It is of no great moment to me, but the
17 notion that the preservation of decisions with respect to
18 the collection of data are extremely vital for the future.

19 I am not going to have to be dealing with it.
20 Maybe none of us in this room will ever have to be dealing
21 with it, but somebody will have to, and at that point, you
22 don't want to run into a stone wall.

23 So that, I just guess that while I like very much
24 your approach and I admire the progress you have been making
25 and how you are approaching the financial problems, I don't

1 think that it really is intellectually defensible to say
2 that one can defer licensing considerations. Licensing
3 considerations are what you are into right now, every day,
4 in a sense.

5 You may ultimately decide not to even apply for a
6 license, but if you do, then what you do right now is a
7 vital part of licensing in the long run.

8 So it is a question of degree, of course, but I do
9 think that it is very important to give vital consideration
10 to the quality assurance question which relates to the
11 documentation. That is always going to be the one in the
12 long run that will be vital in a licensing decision or a
13 challenge to a licensing decision, and one cannot forget the
14 vital nature of that not necessarily right now and maybe not
15 in coming to your viability assessment, but ultimately in
16 dealing with the finalization of a license application.

17 So I just commend your work very much. I know you
18 have been struggling under enormous difficulties, and I
19 think you have got a very clear sense of how to proceed
20 here, but I do just come back to this point that the
21 documentation and quality assurance questions are just as
22 important in the long run as anything else that you do, and
23 somehow you have to find a way to see that they are not
24 lost; that there is no disconnect as you proceed along
25 because a gap, a vital gap in information and records could

1 be fatal in the final analysis.

2 Thank you.

3 CHAIRMAN JACKSON: Thank you.

4 I have kind of one follow-on, and in a certain
5 sense, one could argue in the same vein of not losing Humpty
6 Dumpty here.

7 How do you intend to handle the issue, the fact
8 that the Nuclear Waste Policy Act, as amended, requires that
9 in the recommendation of the Secretary to the President
10 vis-a-vis Yucca Mountain suitability, that there is a
11 requirement for an environmental impact statement, but all
12 work based on budget constraints on that is disappearing?
13 So if, in fact, this site is found to be viable in 1998, how
14 do you intend to address -- how do you intend to have that
15 issue addressed?

16 DR. DREYFUS: Yes. That goes back to, I think,
17 the note I made that you say I said it was easy to move from
18 the viability assessment of the license. I meant that in a
19 sense that the viability assessment is a subset of what we
20 need for the -- further, both the presidential
21 recommendation and the licensing, not that it was easy in a
22 workload sense because the amount of work necessary between
23 that viability assessment and a license application is a
24 critical question of whether we ever get there or not or how
25 long it takes.

1 What again is transitional is that our current
2 baseline work plan at Yucca Mountain does not contemplate
3 moving to licensing on the timeline. It contemplates
4 reduced funding, getting the funding under control, getting
5 the expenditures under control, preserving vital functions,
6 and doing the viability assessment.

7 In that mind set, which is the mind set we entered
8 '96 in when we were not sure at all how hard it would be to
9 get hold of the financial side of it, we were not
10 considering getting back on a licensing track in any short
11 period of time. So a lot of this stuff the moves out.

12 Not documentation. I fully agree that you do not
13 stop preserving the integrity of the data you have got, and
14 you have got to archive and you have got to have retrieval
15 capability and you have to maintain quality assurance, but
16 the rest of it, the workload stuff, the EIS, LSS, loading
17 and all of that stuff was viewed as "we will do that later,
18 if...."

19 Now, as we went through this process, we got a
20 little more hopeful that we could hang on to more of the
21 program. We had a very good year in '95. '95, a whole lot
22 of stuff came to fruition that had before been scattered
23 data.

24 The performance assessment was very, very
25 significant, and the tunnel itself confirmed a great deal of

1 what before was just hypothecy.

2 So '95 was a very big year, and when we started
3 looking at it, we said maybe there is more done than we
4 thought. Maybe we can, in fact, aspire to licensing in the
5 near term.

6 The key is you have got to have a budget level
7 that permits you to do things like the LSS and the EIS. If
8 we get it, then what we would do with the EIS is we would
9 restart the EIS sufficiently to make that timeline work.
10 Whatever the date of the presidential recommendation is, we
11 have got to back off it the appropriate length of time for
12 an EIS, and we have to restart it.

13 We did the scoping, and we suspended it. For all
14 practical purposes, what it basically means is that if we
15 get a budget that will permit it, we would restart that in
16 the '97 time frame in order to have it ready in time for a
17 formal recommendation.

18 We would also have to complete a design. A design
19 that we are looking at for the viability assessment is
20 concentrating on those aspects of the design that are
21 critical to performance assessment. In order to have a
22 design for an application, it has to be comprehensively up
23 to the same level of sophistication, and that would require
24 that we restart some of that work.

25 So there is a lot that has to be restarted.

1 CHAIRMAN JACKSON: Well, I think you have laid out
2 your own challenge here. I mean, obviously, you know that
3 from our perspective the kinds of safety assessments,
4 performance assessment tied to safety that would be
5 necessary for licensing is a particular focus of ours, but
6 what I would say to you is that in laying out these -- what
7 I'll call them, the three bullets that I discern constitute
8 the basis of your viability assessment approach at this
9 moment -- you talked about the increased use of bounding,
10 and I would just say to you that in order both to be in a
11 position to submit a license application that is complete,
12 one can't lose sight of issues having to do with the
13 documentary record, and then in terms of what the Nuclear
14 Waste Policy Act, as amended, requires in terms of
15 environmental impact statement.

16 So all I would say to you is that if you take
17 these and related issues in terms of how you do and work out
18 your revised program, that you should take them as part of
19 increased use of bounding, so that you are not creating
20 something that when one is back on to a licensing track that
21 one ends up having to redo a lot of material; that in
22 designing your viability assessment to respond to budgetary
23 constraints and what you have to take back to the Congress,
24 that you understand that it is happening within a certain
25 phase space that you also have to respond to down the line.

1 So it is pay me now or pay me later, but you know
2 you have to pay.

3 DR. DREYFUS: Yes, indeed.

4 CHAIRMAN JACKSON: Unless Commissioner Rogers has
5 any other questions or comments, Dr. Dreyfus and Mr.
6 Barrett, I would like to thank you and your staff for taking
7 the time to come to brief the Commission on this very
8 important topic.

9 The information and the exchange that we have had
10 today will be of great assistance to us in developing and
11 modifying our own high-level waste program here at NRC. We
12 have our own constraints and decision-making.

13 Clearly, this whole area is undergoing significant
14 change whose endpoint none of us can quite see at this
15 point, but I believe that in times of reduced resources, it
16 is more than ever important.

17 I didn't really question you about this, but you
18 talked about changes in interactions with the NRC, and I am,
19 of course, curious as to what those changes are, but the
20 lines of communication have to be kept open, and I think
21 this kind of inherent programmatic bounding that we have
22 talked about has to be kept clearly in mind.

23 Again, I thank you for an excellent briefing.
24 Unless you have any further comments you would like to make,
25 we stand adjourned.

1 DR. DREYFUS: No.

2 Thank you very much.

3 CHAIRMAN JACKSON: Thank you.

4 [Whereupon, at 11:10 a.m., the briefing was
5 concluded.]

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CERTIFICATE

This is to certify that the attached description of a meeting of the U.S. Nuclear Regulatory Commission entitled:

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

PLACE OF MEETING: Rockville, Maryland

DATE OF MEETING: Tuesday, January 30, 1996

was held as herein appears, is a true and accurate record of the meeting, and that this is the original transcript thereof taken stenographically by me, thereafter reduced to typewriting by me or under the direction of the court reporting company

Transcriber: Jennie Mallory

Reporter: Mark Mahoney

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
January 30, 1996

Introduction

Chairman Jackson and Commissioner Rogers:

A lot has happened since I last spoke with you in June of last year regarding the Civilian Radioactive Waste Management Program. We are now four months into the new fiscal year, operating under a reduced budget that required us to restructure our geologic disposal program and to terminate a large portion of our waste acceptance activities. We are, as yet, without agreement between the Administration and Congress on new policy direction on our role in the near-term management of spent nuclear fuel. Congress is continuing to consider legislation to initiate construction of an interim storage facility. If such legislation is enacted, we will need to further redirect our program.

To the best of my ability at this point, I will share with you our planning for the future of the program, considering the funding and the direction the Congress has provided through the appropriations bill enacted for the current fiscal year. I will also discuss our contingency planning in the event that the Administration and Congress agree on new policy direction for interim storage.

Fiscal Year 1995 Accomplishments

In my briefing to you in December 1994, I outlined our targets for implementing the program approach, which was described in the Program Plan we issued that same month. At that time, I noted the importance of gaining agreement by Congress to the 40 per cent increase in funding requested by the Administration for fiscal year 1995. The program approach was endorsed by Congress as a basis for 1995 funding. It also was generally supported by the Commission and other program stakeholders.

Almost all of the increase in funding for fiscal year 1995 was allocated to, and utilized by the Yucca Mountain Project, which completed the fiscal year with very little carry over and with accomplishments that often exceeded our targets. For example, we overcame startup difficulties

in tunneling and made important progress constructing the exploratory studies facility. Since December 1994, the tunnel boring machine has excavated over 3,800 meters (over 12,000 feet) into Yucca Mountain, well ahead of schedule. The machine is currently operating within the proposed repository formation. It has passed the location where the thermal testing alcove will be constructed and will soon reach the location of the first planned alcove to access the Ghost Dance Fault. Progress has permitted our scientists and engineers to begin direct observation and testing of subsurface geologic and hydrologic conditions, and studies of the engineering properties of the rock and its response to construction activities. This information has enhanced, and to a significant degree confirmed, our understanding of site conditions. We made similar progress in other scientific activities and we also initiated the process for development of the repository environmental impact statement, publishing a Notice of Intent in August and completing the comment period in December 1995.

The Office of Waste Acceptance, Storage, and Transportation also made considerable progress over the past year toward the goals established in the Program Plan. The scoping process for the environmental impact statement for a multi-purpose canister system was completed in January 1995 and the Implementation Plan was issued in August. The contract for design and certification of the multi-purpose canister system was issued to Westinghouse Government and Environmental Services Company in April 1995. The contract includes three phases, of which the first - system design and preparation of safety analysis reports - is scheduled for completion by April.

Fiscal Year 1996 Funding Situation

Unfortunately, the decisions made by the Congress in the fiscal year 1996 appropriations process have made it impossible for us to continue with the program approach. The Energy and Water appropriation bill that was enacted provided only \$400 million for the program and, furthermore, froze \$85 million of that amount pending the possible future enactment of interim storage authority. The result is a program funding level of \$315 million, only half of the \$630 million we requested for fiscal year 1996 to implement our Program Plan, and 40 per cent below our fiscal year 1995 level of effort. The program approach is no longer sustainable at this funding level and we are adjusting the program to meet our legal responsibilities.

We have proceeded to reduce our expenditure level to the degree necessary to conform to the fiscal year 1996 budget of \$315 million. Based on the expectation of a \$400 million budget, we took action in September 1995 to eliminate about 875 contractor jobs over this fiscal year, primarily within the Yucca Mountain project. In November, we further reduced the program to reflect the unexpected loss of another \$85 million. This resulted in the elimination of over 200 additional contractor jobs. These latest reductions primarily affected the work of our Office of Waste Acceptance, Storage and Transportation, and our Program Management functions. As we took these actions we tried, within our existing authorities, to preserve vital program activities.

New Program Outlook

In the early stages of the recent policy debate, the Congress seriously considered terminating the geologic disposal program. As the debate evolved, however, political and practical considerations about the consequences of abandoning geologic disposal gave way to a more rational and prudent approach. The Commission's testimony supporting continued progress toward development of a geologic repository undoubtedly helped. Congress has continued to fund the disposal program, but at a much lower level than the President's budget request for fiscal year 1996.

The Congress recognized that, because of the significant reduction in funding, a much reduced repository program would be required. The Conference Report directed that the reduced scope should focus on the core scientific activities at Yucca Mountain and that preparation and submittal of a license application to the Commission should be deferred. As a result, the target dates in our program approach for the construction of a geologic repository and for emplacing waste underground also have been deferred. What new targets are possible and practicable will depend upon the expectations for future funding of the program.

As directed by Congress, we have refocused the repository program on addressing the major unresolved technical questions regarding the conceptual design of the repository and its expected performance in the geologic setting. Consistent with this guidance, we have defined a new milestone for the Yucca Mountain Project in the form of a specific set of deliverables that contribute to a "viability assessment." This work will resolve the critical current uncertainties and provide the requisite information for a determination in 1998 of the viability of continuing with actions leading to the licensing of a geologic repository at the Yucca Mountain site.

With appropriate policy and reasonable funding support, we can regain a license application target, but at a later date than anticipated. We will continue to implement our quality assurance program in a manner that is consistent with available resources, however, further submittals of revisions to the repository license application annotated outline and work on the licensing support system can not be sustained. Expectations regarding various forms of interaction and information exchange between our staffs are not likely to be met in the reduced funding situation.

National policy for the near-term management of spent nuclear fuel is also being considered in the Congress, but there has been no resolution of the issue as yet. With severely limited funds, and in the absence of agreement between the Administration and Congress on new policy direction, we are trying to maintain our ability to respond to this new direction, to the extent that our limited resources permit.

The drastic curtailment in funding for fiscal year 1996 has made it necessary for us to terminate most of our waste acceptance, canister development, and generic transportation work. We will not proceed with certification of the multi-purpose canister system once the safety

analysis report design phase is completed. All related activities, including our involvement in the preparation of the environmental impact statement, will also be terminated. Continued work on development and certification of legal-weight truck casks for transportation of spent fuel can not be supported. We also can not sustain our dialog with interested parties on transportation issues at the same level as last year. Our cooperative agreements will be funded at substantially reduced levels.

We will continue to pursue our interactions with your staff on burnup credit. We will also undertake contingency planning to maintain our ability to respond aggressively should we get agreement between the Administration and Congress on new policy direction regarding interim storage.

Disposal

The Administration remains committed to geologic disposal. The issue that confronted us in our planning for this fiscal year was whether the program can sustain meaningful progress toward a future decision on geologic disposal with a funding profile that is significantly below that required for the program approach described in the Program Plan. The target dates that we had aspired to in our program approach for the submittal of a license application to construct a geologic repository and for emplacing waste underground had to be deferred, of course, as the Congress acknowledged. What new targets are possible and practicable will depend upon the policy and regulatory framework within which the program must operate and expectations for future funding, up to and beyond 1998. In planning this program, I am reluctant to assume that we will receive future funding levels that are inconsistent with the current outlook. Such optimistic assumptions of large future increases in annual funding have been a major factor in discrediting the program in past years.

Although the focus of our activities has changed, we must not jeopardize our ability eventually to go forward with licensing. We will maintain our programs for quality assurance and technical data management at appropriate levels, consistent with available resources. I believe that the Department and the Commission must both rethink their roles, and work together to define the purpose and nature of their interactions in this changing environment.

Viability Assessment

Given the funding for fiscal year 1996 and the likely scenario for the foreseeable future, the only practical approach is to concentrate the repository effort on the major unresolved technical questions that must be answered to complete the conceptual design of the repository and to describe its expected performance in the geologic setting. Indeed, this is the instruction given to us in the Conference Report accompanying the Appropriations Act. In order to manage the program, as well as to explain and justify the continuing activity to its stakeholders, we have defined a specific set of deliverables, consistent with the Congressional guidance we received.

These deliverables will include the following:

- a package of more specific design work on the critical elements of the repository and the waste package, including a concept of operations that identifies available technologies to accomplish the objectives of geologic disposal;
- a total system performance assessment, based upon this design concept and the data available to us, which will describe the probable behavior of the repository;
- a plan and cost estimate for the remaining work required to complete a license application; and
- an estimate of the costs to construct and operate the repository.

These deliverables, when completed, will provide a better understanding of the repository design and its performance in the geologic setting, a better appreciation of the remaining work needed to prepare a license application, and a more precise estimate of the cost of a repository. The completion of these deliverables constitutes a logical convergence point at which we can make a measurably improved judgement of the prospects for geologic disposal at the Yucca Mountain site and present this information to the Administration and Congress. We have characterized this convergence point as a "viability assessment."

This viability assessment is not the same as the technical site suitability evaluation that was a target in our program approach and that I have discussed with the Commission previously. Our technical site suitability evaluation was based on making a sequence of higher-level findings for the qualifying and disqualifying conditions of our siting guidelines, 10 CFR Part 960. In making these findings we would have followed the process for evaluating site suitability that we finalized in December 1994. The funding we can now expect will not support that process. The viability assessment is a management target and its technical components do not correspond to the siting guidelines in 10 CFR Part 960. The deliverables that contribute to this assessment are intended to clarify the most uncertain aspects of geologic disposal at Yucca Mountain. If the judgment on the viability of geologic disposal at Yucca Mountain is positive, the components that contributed to this judgment also will contribute to the requirements for a Secretarial recommendation to the President, and, subsequently, to a license application to this Commission. The assessment will not be sufficient for, nor will it prejudice, these subsequent formal actions by the Department.

In order to complete the deliverables we have defined, we must document our understanding of site conditions, incorporating the data already collected and the new information being gained from the exploratory studies facility. We must also have sufficient understanding of the critical factors affecting our waste containment and isolation strategy to select the technologies to be used and to gain confidence that geologic disposal at Yucca Mountain is technically feasible. In addition, we will need to address cross-cutting design issues, such as use of backfill, criticality control, and thermal loading.

We anticipate completing the deliverables that contribute to the viability assessment by 1998, or sooner, if possible. Completion of the deliverables by 1998 will be possible because we can rely upon the large amount of information already collected on site conditions, the progress already made on the advanced conceptual designs for the repository and waste package, and the understanding gained from the latest in our series of iterative total-system performance assessments. This year, we are compiling the information we have collected to document our current understanding of the site. This information will support the additional design work needed in certain critical areas and the next planned assessment of the expected performance of our design concepts in the geologic setting.

We will develop a revised program plan over the next few months, consistent with the fiscal year 1997 budget cycle. We will describe our reconfigured program to the Commission as our plans develop.

Waste Containment and Isolation Strategy

We have been refining and documenting our waste containment and isolation strategy for the Yucca Mountain site over the past year. When complete, it will reflect our acquired knowledge of the site and its natural barriers, as well as the likely influence of site conditions on the performance of potential engineered barriers. The strategy focuses on two technical objectives: first, to limit the annual dose to members of the general public following permanent closure of the repository; and second, to provide total containment of the waste within the emplaced waste packages for thousands of years, during the period of highest radionuclide inventory and temperature.

A general description of this strategy was included in our Program Plan in December 1994. During the past year, as we refined the strategy, we provided status briefings to your staff, the Advisory Committee on Nuclear Waste, and the Nuclear Waste Technical Review Board. In these briefings, we discussed the elements of our strategy and the links to our testing program. Feedback from your staff on our strategy would be welcomed.

The essence of our strategy is the articulation of specific working hypotheses as testable bases for assessing how a waste isolation system at Yucca Mountain will perform. These hypotheses were developed based on the information already collected. The working hypotheses relate to specific hydrologic attributes of the natural system, as well as to specific physical characteristics of materials that may be part of the engineered system, and the important interactions between the natural and engineered systems, so that we can design the engineered enhancements that provide defense-in-depth. Taken separately, the hypotheses provide the bases for organizing, managing, and explaining the rationale for our work. Taken together, the hypotheses comprise a structure for the assessment of the waste isolation capability of a repository at Yucca Mountain.

The strategy enables us to concentrate our efforts on a more limited testing program to answer questions about a small number of specific hypotheses that may be crucial to the viability assessment. In the longer-term, we hope to use the strategy to help us define the critical work that remains to be done to enable us to complete a license application.

Repository and Waste Package Design

The goal of the repository advanced conceptual design phase has been modified from that which we had originally envisioned under our program approach. Given the likely funding profile and the need to provide design information to support the viability assessment, our plan for fiscal year 1996 is to document the current conceptual level of detail for the repository design. This will provide us with a reference design, or a benchmark, based on the work performed to date. A summary report on the repository advanced conceptual design is being prepared by our Management and Operations Contractor and will be submitted to the Yucca Mountain Site Characterization Office in March. This report will identify those areas of the design requiring further refinement. This report will also facilitate a review of the current design concept against the design and safety requirements.

In the next phase, selected aspects of the design will be advanced to resolve key issues that will allow us to demonstrate that the construction, operation, and closure of the repository are technically feasible. The design information we compile over the next few years will be the basis for our assessment of the expected performance of the system in terms of radiological safety and waste isolation. Outputs of this design phase will also support the evaluation of the additional design work that may be needed to support our license application for construction of a repository. It will also support preparation of an updated cost estimate for construction and operation of a repository.

Thermal Loading

We must have sufficient understanding of thermal loading issues to define our concepts for the repository and waste package, to evaluate the performance and environmental consequences of these concepts in the geologic setting, and to estimate the costs associated with construction and operation of the repository. Our approach toward selecting a thermal load must take into account the required size and capacity of the proposed repository and the cost implied by the design. The imperatives associated with capacity and cost have been re-emphasized in the debate occurring in Congress on the future direction and funding for the program.

We are currently considering a range of design thermal loads that will accommodate at least the full statutory capacity of a single repository. This approach is consistent with our understanding of currently available information and meets the broad objectives of our program. Our assessment will be based on a design concept and associated thermal loading that is supported by the information available at the time. We will continue to examine alternative

thermal loadings. We will maintain design and operational flexibility in our design concept to accommodate new information.

Long Term Criticality

Criticality control for the period following closure of the repository must also be addressed. The Department, as part of its efforts to demonstrate compliance with the Commission's criticality control requirements for any material being considered for disposal, will carefully evaluate the risks of potential criticality events in order to ensure the protection of the health and safety of the public. Our topical report on partial burnup credit, which we submitted in May 1995, is intended to initiate consideration by your staff of burnup credit as one element of a disposal criticality control strategy. Our near-term objective is to gain sufficient confidence in our approach to support our design activities.

Performance Assessment

Our latest assessment of the performance of a repository at the Yucca Mountain site was completed in late 1995. This iteration evaluated the performance of the repository without incorporating the effects of disruptive events such as volcanism and fault displacement. Earlier analyses showed that disruptive events do not appreciably affect the calculated results. Periodic climate changes, however, were included in the analyses in terms of potential changes in both infiltration rate and water table elevation. The latest assessment utilized more representative conceptual models of the site. More importantly, it also incorporated more realistic models for the behavior of the engineered system.

Two system-level performance measures were evaluated. The cumulative radionuclide releases from the repository were calculated for 10,000 years. The peak doses resulting from radionuclide releases were calculated over hundreds of thousands of years. The results indicate that the engineered barriers could provide containment and contribute to waste isolation for extended periods. The results also indicate that, under certain assumptions, the natural system by itself can contribute to isolation of the radionuclides for a very long time-period. The analyses tend to confirm our understanding of the importance of the rate and distribution of ground-water movement to the performance of the natural system.

A combination of waste package and site performance can be shown to contribute to containing and isolating radioactive wastes within the Yucca Mountain area for some tens to even hundreds of thousands of years. When the period of concern is extended up to 1,000,000 years, only a few factors dominate the calculated response. In addition, only a few, long-lived radionuclides contribute significantly to this response. Our results indicate that the very long-term peak release-rate and the peak dose are affected predominately by dispersion and dilution processes. For example, hydrologic conditions that limit transport to diffusion-controlled processes can delay releases from the engineered barrier system and significantly reduce the peak release rate. In addition, the peak dose resulting from these releases is significantly affected by

dilution and dispersion in the underlying aquifer. Our waste containment and isolation strategy reflects this understanding of the factors that affect long-term performance, as well as recognizing the importance of those factors that ensure complete containment of radionuclides during the early time period when the radionuclide inventory is highest.

Our next assessment of system performance, which is being scheduled for the 1997-1998 time-frame, will be based more directly on the process-level models that we are developing for the site and engineered system. A more sophisticated biosphere model is also expected to be in place to allow calculation of dose and the associated risk to a representative individual in an affected population. The objective for this assessment is to evaluate both the expected performance of the system and its performance under conditions imposed by potentially disruptive events, considering appropriate ranges of probabilities of occurrence and of consequences.

The 1997-1998 assessment will consider and reflect the site and engineered system process-level understanding and data available at that time, and will therefore represent the best estimate of system performance we are likely to have for some time to come. Because our 1995 assessment used site and design information that is not expected to change drastically, however, the results from the 1997-1998 assessment will likely indicate better performance, with lower releases and doses than the 1995 analysis, but not "orders of magnitude" better. Uncertainties will continue to exist in the characterization of both engineered component and natural system processes. These uncertainties will be reflected in the alternate conceptual models and parameter distributions that are considered in the analyses.

We understand that your staff will continue to conduct iterative performance assessments to help integrate their review across technical areas and to assist in identifying the critical technical issues for licensing. We received the report on your latest iterative performance assessment results and are reviewing it. We will keep the staff informed as to the progress of our assessment and welcome comments on our results. It would facilitate potential future licensing activity if our approaches to performance assessment were generally consistent, and if we were to be in general agreement on the key technical issues and uncertainties. We met with your staff in November 1995 to exchange views on the key technical issues. Another meeting is scheduled at the end of February to discuss the progress we have made in our respective performance assessment activities.

Understanding of Site Conditions

We will not attempt to resolve all issues concerning site conditions during the next few years. We will, however, seek to define and understand them well enough that a measurably improved judgement can be made on the feasibility of repository development at Yucca Mountain. This understanding will also enable us to define a defensible set of studies and tests to resolve the issues remaining for licensing.

Exploratory Studies Facility

Our tunnel boring machine (TBM) operations have advanced significantly, exceeding our fiscal year 1995 milestones. As of January 18, 1996, the TBM had excavated 3,895 meters (almost 12,800 feet) into Yucca Mountain, well ahead of schedule. Four underground test alcoves have been completed, and sampling and hydrologic testing are underway. The machine is currently operating within the proposed repository formation. It has passed the location where the thermal testing alcove will be constructed and will soon reach the location of the first planned alcove to access the Ghost Dance Fault. We expect to complete the separate excavation by July that eventually will allow us access to the Ghost Dance Fault itself. Construction of the alcove that will be used for thermal testing is expected to be complete by September. The first in situ heater test is scheduled to begin in December 1996.

Our progress into the mountain over the past year has permitted our scientists and engineers to begin direct observation and testing of subsurface geologic and hydrologic conditions, and studies of the engineering properties of the rock and its response to construction activities. This information enhanced, and to some degree confirmed, our understanding of site conditions. For example, we have yet to observe any water dripping or flowing into the excavation, even in fractured or faulted zones, or any zones of perched water. This is consistent with our hypothesis regarding the character of ground-water flow in the unsaturated rock at Yucca Mountain. Information on rock properties and their response to construction enhanced our understanding of the construction outlook and aided our design of the exploratory studies facility and the repository. The rock at the repository level is, in fact, better than we had anticipated and easier to mine. We have confirmed our general understanding of the three dimensional geology and structure at the north end of the repository block, increasing our confidence in our ability to model subsurface conditions. No unexpected features, such as major new faults were observed. In addition, we found that the Drill Hole Wash structure, identified at the surface as a fault several tens of meters wide, is a less significant feature at repository depth than expected and is unlikely to be a preferential pathway for water movement. These observations led to elimination of the need for a planned test alcove.

Installation of the conveyor system in July 1995 allowed us to replace the muck cars used during the early phase of construction and, in combination with an aggressive management strategy that consolidates outages and minimizes TBM downtime, has helped to increase the rate of progress and reduce the unit cost of construction significantly. Our aggressive approach to construction management is being continued into fiscal year 1996. We expect to complete the separate excavation that eventually will allow us to access the Ghost Dance Fault itself by July. We are looking at opportunities for increasing operating efficiency that could allow us to continue TBM excavation beyond this point.

Surface-Based Testing

During fiscal year 1995, we continued to collect information from our surface-based testing activities, including data on the properties of the rock at depth to support design and construction of the exploratory studies facility, data on the characteristics of water movement in the unsaturated and saturated zones, and data relevant to the evaluation of the waste package environment. We continued to monitor precipitation and meteorological conditions, infiltration from precipitation events, streamflow and runoff, water levels in wells, and seismicity. We analyzed groundwater samples to assess their age and the characteristics of infiltration since nuclear weapons testing began at the Nevada Test Site. We also continued our program to monitor natural infiltration in unsaturated zone boreholes.

In response to concerns expressed by your staff, the State of Nevada, and Nye County, we implemented a program to collect information on the base-line characteristics of pneumatic flow in Yucca Mountain. Continuous pneumatic monitoring of selected boreholes, before, during and after TBM penetration of the non-welded unit of the Paintbrush Tuff, indicates that Yucca Mountain consists of three distinct pneumatic regimes. The uppermost regime consists of the Tiva Canyon welded units, which are extensively fractured, highly interconnected, and show an immediate response to atmospheric pressure changes. The Paintbrush Tuff non-welded unit, which underlies the Tiva Canyon units and overlies the formation in which the repository would be constructed, shows high matrix water saturations and low fracture density. Monitoring indicates that this unit acts as a partial barrier to gas flow, attenuating and delaying response to atmospheric pressure changes. This pneumatic data confirms the results from hydrologic investigations, which indicate that the non-welded unit acts to absorb water infiltrating through the overlying Tiva Canyon units and to divert it away from the repository horizon. These results will be utilized in modeling gas flow in a thermally perturbed repository as part of our next performance assessment iteration.

Our results continue to confirm that, consistent with our waste isolation and containment strategy, the natural system at the site contributes significantly to waste isolation:

- precipitation and infiltration are low, and potential evapotranspiration is high;
- the geologic layer above the repository horizon limits downward movement of water through the repository;
- most water moves slowly through today's ground-water system;
- the repository horizon is about 400 meters above today's water table and about 300 meters above the highest water table indicated in the geologic record for Yucca Mountain during the Quaternary period;
- the mineralogy of rocks underlying repository horizon will slow the movement of radionuclides to the water table; and
- dilution and dispersion in the aquifer underlying the repository will help limit the doses to members of the public.

Only a few surface-based tests are planned for fiscal year 1996. Those tests that are conducted will focus on the hypotheses in our waste containment and isolation strategy. Testing at the C-Well complex will continue to obtain data to characterize flow in the saturated zone. Monitoring related to characterization of seismicity, meteorological conditions, pneumatic pathways, and saturated and unsaturated zone hydrology will be continued.

Attention continues to be focused on the synthesis, analysis, and documentation of the substantial amount of data collected to date. Key models of natural processes, including those for flow and transport in the saturated and unsaturated zones, will be documented and available by the end of fiscal year 1996. This documentation will provide input for the design work and for the next iteration of total system performance assessment that support the viability assessment.

Interactions between the Department and the Nuclear Regulatory Commission Related to Geologic Disposal

During fiscal year 1995, our funding permitted extensive interactions with your staff. We met at more than 30 technical exchanges, technical meetings, bi-monthly exploratory studies facility meetings, and management meetings. Our respective staffs have met several times over the last few months to discuss the general outlook for the disposal program, given the funding situation for fiscal year 1996 and uncertainty over agreement by the Administration and Congress on new policy direction. In October, we briefed your staff on the results of our preliminary planning for fiscal year 1996 for the Yucca Mountain Project. At that meeting, we noted that submittal of a license application has been deferred. We also noted that our previous mutual expectations regarding various forms of interaction and information exchange are not likely to be met because of our reduced staff and funding. We anticipate that any interactions that do occur will be smaller, less formal, and rely heavily on the use of videoconference and teleconference facilities. We will continue our periodic meetings on the exploratory studies facility. We are also committed to continuing our periodic management meetings at which higher-level program issues can be discussed.

We recognize that although our focus in the near-term is not on submittal of a license application, we must keep you and your staff informed and preserve the integrity of the work that is done so that it can ultimately be used in the licensing process. We expect that you will provide us feedback if a significant technical issue is not adequately addressed and if failure to do so would impair our ability to continue progress toward licensing at some point in the future. For planning our activities and reaching program decisions, it is important that we have an adequate understanding of what the critical issues are and what activities are required to resolve them. Resolution of all of these issues in the near term may not be possible. Rather, we seek to advance our knowledge of these issues to help define a clearly achievable path forward to their resolution.

We intend to keep the Commission and your staff informed of our technical work and products, and of the evaluations we make. We believe that our semi-annual Site Characterization Progress Report is an important vehicle to sustain this communication. We also suggest that the

Commission's On-Site Representatives assume a greater role in communicating to the Commission and its staff changes in our disposal program, serving as a focal point and conduit for questions from the staff. I believe that we need to work together to define effective means of communication that are appropriate given the necessary changes in our respective roles.

Topical Reports and Issue Resolution

During the past year, we continued to pursue our issue resolution initiative in technical exchanges and through submittal of topical reports. We have focused on resolving key issues and I believe that communications have continued to improve. The utility of the process for issue resolution has not yet been reflected in resolved issues; however, your staff has informed us that they are committed to work toward resolution of several of the issues that we have been discussing. We look forward to formal communications regarding these issues. We have resolved 94 of the original 198 open items from your staff's Site Characterization Analysis, including 6 since December 1994. Twenty four items are presently being reviewed by your staff.

Your staff accepted our first topical report on the assessment of seismic hazards for review in fiscal year 1995. We will be providing responses to questions from your staff on this report in the near future. Our second Topical Report on seismic design methodology was submitted in October 1995 and in December your staff accepted it for review. We look forward to your staff's completion of their review of that report.

Quality Assurance and Design Control

Significant progress was made in the past year in terms of enhancing the overall effectiveness of our quality assurance program. We verified through audits that all affected organizations are satisfactorily implementing the Office of Civilian Radioactive Waste Management Quality Assurance Requirements and Description (QARD) document. The QARD is the singular document that describes the quality assurance program used by all affected organizations.

We realigned the verification function so that the program's Office of Quality Assurance performs all audits for affected organizations. This realignment included establishing a process for implementing a consolidated Qualified Suppliers List and auditing suppliers. We also developed a program-wide system for identifying and correcting conditions adverse to quality, and for performing trend evaluations. This included establishment of a trend program database.

We have been engaged for some time in a dialog with your staff about those aspects of our quality assurance program that are relevant to design control. We agree with the Commission that it is our responsibility to execute a quality assurance program that meets your requirements. We will live up to that responsibility. Even under a reduced budget, we will implement our quality assurance program to ensure that what we do during the next few years, in

site characterization, and in the design and construction of the exploratory studies facility, is adequately documented for use in licensing.

In October 1994, your staff raised concerns regarding our design control process for the exploratory studies facility. They questioned the traceability of the applicable requirements from 10 CFR Part 60 into our design products. Our submittal of the Regulatory Compliance Review Report in March 1995 was the first step towards addressing these concerns. This report provided evaluations of 15 selected 10 CFR Part 60 requirements. In August 1995, we submitted a supplement to the March report that presented an evaluation of the balance of applicable 10 CFR Part 60 requirements. We also have evaluated our design control process. We concluded that the improvements we instituted in early 1995 and those in process ensure proper consideration of the applicable requirements in the development of the exploratory studies facility design.

In April of last year, your staff conducted an in-field verification to determine if acceptable corrective actions had been effectively implemented in our design control process. They made three recommendations regarding exploratory studies facility design. We are committed to addressing the recommendations and have taken steps to do so. Your staff was planning to conduct another in-field verification following its review of the reports that we submitted in March and August. Given our reduced resources for the current fiscal year, we would appreciate the opportunity to discuss the timing and scope of this second in-field verification before it commences.

License Application Annotated Outline

We will not complete Revision 1 of the License Application Annotated Outline in fiscal year 1996. The framework and content of the annotated outline will be used as an internal information management tool to help guide the development of the technical reports, scientific reports, and design products that we produce to support the viability assessment. Further revisions to the annotated outline text are not planned for the foreseeable future.

Licensing Support System

I briefed you in May 1995 on the status of the Licensing Support System. The substantial progress we made over the past year in defining the Licensing Support System and in planning for the development of this system was a direct result of the collaborative participation of your staff and the stakeholders. Unfortunately, under the current funding constraints and direction, further action on the Licensing Support System is deferred until such time as we are better able to define our plans and schedule for submittal of an application for construction authorization and Congress authorizes us to proceed.

Yucca Mountain Standards

At present, there are no environmental standards for protection of the public from the radioactive waste that might be disposed of in a geologic repository at the Yucca Mountain site. The uncertainty associated with this situation requires some flexibility in defining our strategy and plans. The Energy Policy Act of 1992 directed the Environmental Protection Agency to promulgate new standards for a repository at the Yucca Mountain site based on and consistent with the recommendations developed by the National Academy of Sciences. The 1992 law also directed the Commission to modify its requirements to be consistent with the new standards.

National Academy of Sciences Report

The National Academy of Sciences formed the Committee on Technical Bases for Yucca Mountain Standards to prepare its recommendations to the Environmental Protection Agency. The Committee's report was submitted to the Agency in August 1995.

The Committee's report observes that there are both technical and institutional dimensions to the development and approval of a geologic repository. This observation is consistent with our view, and what we believe is the Commission's view, that science cannot provide unqualified assurances over many thousands of years. The ultimate decisions regarding disposal will involve societal and economic, as well as technical elements. We believe that the Committee's report basically reaffirms the feasibility of geologic disposal. The report also recognizes that policy makers need to make decisions regarding a number of issues that lack a definitive scientific basis. Through its recommendations, the report puts the question of how society and policy makers should deal with inter-generational equity on the table for discussion.

The report notes that predictions of human behavior, even for hundreds of years in the future, have no scientific basis. At the same time, however, the report goes on to recommend compliance assessments against quantitative standards for geologic disposal that would apply for hundreds of thousands of years into the future, to include the peak annual risk, whenever it occurs. It is not clear that quantitative predictions for a period of up to one million years can be defended in a licensing environment, especially if the attendant uncertainties are not explicitly recognized and the standard is based on a risk limit that is overly conservative in light of these uncertainties. A quantitative standard that focuses the licensing debate upon highly speculative calculations of exposures as much as one million years into the future, it seems to me, is more likely to obscure than enlighten the societal decision on the acceptability of geologic disposal at Yucca Mountain.

In the absence of a scientific basis for predictions about human behavior and the biosphere as they relate to the evaluation of individual risk in the far future, the Committee declared that it is really a policy issue. The Committee suggested that appropriate (but certainly hypothetical) assumptions for such evaluations should be made, based on current population and living habits,

and incorporated in the rulemaking. We believe that this approach is implementable, provided that the required hypothetical assumptions are explicitly defined in the standard.

In developing its recommendations, the Committee also made several technical assertions that should be carefully evaluated during the rulemaking process. For example, the Committee concluded that the geologic framework at Yucca Mountain was either geologically stable or was expected to vary in such a way as to be predictable over a period on the order of a million years. We are not certain that it is reasonable to expect that science can demonstrate and that we can defend that contention in the licensing process as the basis for conclusions about compliance. In general, we believe that some of the technical assertions made by the Committee are also inherently a matter of judgement and will have to be determined by policy decisions at the appropriate stage in the rulemaking process and stipulated in the standard or the Commission's implementing regulation.

Consequently, we believe that great care needs to be taken by the Environmental Protection Agency and the Nuclear Regulatory Commission in addressing the Committee's recommendations in their subsequent rulemaking actions. Whatever standard results from this process must protect public health and safety and the environment. It must also be implementable. That is, demonstrating compliance with the standard should not require a greater degree of scientific proof than can reasonably be provided and should not leave policy judgements to be defended in a licensing process as if they were technical judgements supported by factual analyses. Promulgating a standard that cannot be implemented may result in the de facto rejection of the Yucca Mountain site, or even a rejection of the option of geologic disposal. Such rejection will not avoid the consequences of long-term radioactive waste management, it will simply require society to resort to a different, and currently undetermined, long-term approach.

We are pleased to note that your staff has established a liaison with the Environmental Protection Agency and a task force to follow the Agency's rulemaking activities. Since the Department will ultimately have to demonstrate compliance with whatever standard is promulgated, we also intend to be very involved in the rulemaking process. We provided our comments on the Committee's report and our recommendations to the Environmental Protection Agency in November 1995. We will follow the rulemaking process closely and comment when appropriate. We believe that the critical policy issues for rulemaking are: 1) the level of risk that is considered acceptable and whether that level of risk should depend on the time frame; 2) the time frame for quantitative compliance assessment and demonstration; 3) the definition of the reference biosphere, including the critical group and exposure scenarios; and 4) how human intrusion will be treated.

Revisiting the Regulatory Basis for Geologic Disposal

Although Congress has directed that repository licensing activities should be deferred, the long-range goal of submitting a successful license application to the Commission remains central to the Program's mission. We believe that the program should include a plan and target date for

the submittal of a license application. It is apparent from recent developments, however, that any such plan must recognize the budgetary realities or it will have little possibility of being implemented.

As you may recall, the Program Approach for the Yucca Mountain Project that we adopted in fiscal year 1995 reduced the previously projected cost to submittal of a license application by about \$1 billion. That plan, which we were pursuing in fiscal year 1995, still contemplated the expenditure of an additional \$3.2 billion on Yucca Mountain from fiscal year 1996 through submittal of the license application in 2001. We are now expecting to spend only about \$1 billion through fiscal year 1998.

The implication of these numbers is that, based upon the 1995 program approach, the completion of a license application would entail an additional \$2.5 billion of expenditures after 1998, if the cost of extending the schedule is considered. It is clear to me that the Congress will be reluctant to provide those resources, even if the outlook from the viability assessment is promising.

It should be possible to move directly and efficiently from the viability assessment to a license application, if we find that a repository at Yucca Mountain is indeed viable. Our objective should be to design a repository that is compatible with the geologic setting and to develop a safety case to support a proposal to construct that repository. The licensing process should then focus on examining the safety case to determine if public health and safety and the environment are adequately protected.

I believe that it is both possible and necessary to revisit the regulatory basis and the related expectations that have given rise to our earlier work plans. Most of the scientific factors central to those work plans have, or will have, been addressed by 1998. Testing related to long term performance can be done as part of the performance confirmation program during construction and operations, prior to closure of the repository. Much of the cost subsequent to 1998 is expected to be associated with the documentation, presentation, and defense of the results. In my view, that cost can be significantly reduced if the focus of the licensing review is on the safety case we make for a specific repository design and its predicted performance in the geologic setting, rather than on a comprehensive evaluation of all possible aspects of the site.

With a licensing process that concentrates on the adequacy of a specific proposed facility, we can aspire to reestablish a target date for a license application soon after the year 2000 at a sustainable level of funding. I believe this is the only way the program can command the resources needed to retain geologic disposal as a national strategy. We intend to explore this approach and we are considering the revisions to our regulations that would be needed to clarify our intentions. We intend to keep the Congress, our stakeholders and oversight groups, and, of course, the Commission, advised of our evaluation.

Waste Acceptance, Storage, and Transportation

We do not yet have new policy direction regarding our role in the near-term management of spent fuel and we have no access to the \$85 million that the Congress set aside for work on an interim storage facility. My remarks will be limited, therefore, to the practical considerations of the major adjustments we had to make to accommodate our funding constraints for this year. I will also discuss our contingency plans to maintain the ability to respond should the Administration and Congress agree on new policy direction.

Technology Development

Multi-Purpose Canister System

The contract to develop the multi-purpose canister system was structured in three phases. The first phase of the contract - system design and preparation of safety analysis reports - will be completed, as scheduled, by April of this year.

In June 1995, I indicated that we anticipated proceeding with phase two of the contract - certification and prototype testing - and that applications would be submitted to your staff by April to support decisions on certification of the multi-purpose canister system for storage and transportation. Because of our fiscal year 1996 funding situation, we will not proceed with this action.

If the Administration and Congress agree on new policy direction that requires interim storage to be operational within the next few years, other commercially available technologies certified by the Commission will have to be utilized. Private industry may even elect to carry the design of one or more multi-purpose canister systems forward.

Multi-Purpose Canister System Environmental Impact Statement

The scoping process for preparation of the environmental impact statement for a multi-purpose canister system was completed in January 1995 and the Implementation Plan was issued in August. In response to a comment received from the Navy during the scoping process, the scope of the environmental impact statement was broadened to include naval as well as civilian spent nuclear fuel. Since work on the development of the multi-purpose canister system will not continue past the design phase, further work on the draft environmental impact statement for the fabrication and deployment of multi-purpose canisters also has been terminated. Argonne National Laboratory, our support contractor for development of the environmental impact statement, has been directed to complete the preliminary draft document, which will be filed for future reference.

The Navy has decided that it will proceed with that part of the environmental impact statement covering naval spent nuclear fuel by becoming the lead agency. The Department will

participate as a cooperating agency. Since all naval spent fuel is shipped to and stored at Idaho National Engineering Laboratory, the evaluations will be specific to that location.

Multi-Purpose Canister - Part 60 Design Considerations Report

In order to enhance the likelihood that the multi-purpose canister would be found suitable as a component of the waste package during the repository licensing review, we proposed to your staff that we develop a technical report that discusses the effects of the use of a multi-purpose canister on the waste package, the repository environment, and repository operations. Having decided not to proceed with submittal of the applications for certification of the multi-purpose canister system for storage and transportation, we have terminated further work on the Part 60 technical report and will not be submitting it for review by your staff. We will continue to interact with your staff on burnup credit as part of our approach for criticality safety, however, as I will discuss later.

General Atomics Transportation Casks (GA-4/9)

The GA-4/9 Legal Weight Truck casks were being developed as part of our overall waste management system. The certification process for these two truck casks is underway. The safety analysis reports were submitted to the Commission in July and August of 1994. There are several major issues that have been discussed between your staff and General Atomics, dealing with the structural aspects of the design. Half-scale-model drop tests were completed last month for the GA-4 cask and initial results indicate that decelerations and strains on the model were consistent with the analytical predictions.

We are unable to provide additional funds for the certification of these casks. We intend to make this technology available to private industry and they may elect to pursue certification.

Dry Transfer System

Over the last few years, we have also been working with the Electric Power Research Institute on the design of a dry transfer system for spent nuclear fuel. The system will enable the transfer of individual spent fuel assemblies between conventional, top-loading casks and canister systems. The design of the system is being developed by Transnuclear under a subcontract with the Electric Power Research Institute. The proposed design incorporates technology and experience from the French dry-transfer operations at La Hague and from Federal and commercial facilities in the United States.

The Electric Power Research Institute delivered a final design report to the Department in December 1995 and a draft Topical Safety Analysis Report is expected in February. We plan to submit the topical report to your staff later this year for review and acceptance.

We are currently negotiating with the Idaho Operations Office of the Department's Office of Environmental Management regarding a cost-shared project to fabricate and demonstrate the dry transfer system at the Idaho National Engineering Laboratory. The system could assist the Department in meeting its near-term spent fuel management commitments to the State of Idaho. It could also benefit early operations at any interim storage facility. Our intent is to begin fabrication this fiscal year and complete the demonstration by the end of 1997.

Dry Storage Research

The program maintains spent nuclear fuel in storage casks at the Idaho National Engineering Laboratory. This spent fuel has been in dry storage longer than any other fuel in this country. The casks are routinely monitored to provide information regarding the behavior of the spent fuel in storage and could provide valuable information for licensing by the Commission of extended dry storage. This work has been funded from the Civilian Research and Development appropriation, since the Nuclear Waste Fund cannot be used for generic research. The appropriations bill for fiscal year 1996 did not provide funds to continue this activity and we have asked your staff to consider taking over this project.

Criticality Safety

Criticality safety is an important issue that must be addressed in the design and operation of our integrated nuclear waste management system. Obtaining appropriate credit for burn up of fissile material in the spent fuel continues to be a priority for the Department. The Department believes that efficient geologic disposal at a reasonable cost requires consideration of burnup credit for the design of waste packages. Burnup credit also allows spent fuel transportation cask capacities to be maximized, which provides benefits in terms of both reduced public risk and cost savings. Considering the large quantity of spent nuclear fuel to be handled by the federal waste management system, there are substantial incentives for using burnup credit in the design of storage, transportation, and disposal packages.

In May 1995, we submitted to your staff a topical report on burnup credit for actinides only. In December, we responded to initial comments from your staff. This first topical report provides what we believe is the basis for your acceptance of the use of partial burnup credit. It includes a special cask loading procedure that would provide the assurance necessary for later consideration of full burnup credit. We intend to continue our interactions on the use of partial burnup credit.

We had intended to continue to gather data and conduct tests and experiments to support the use of full burnup credit. Once we had obtained sufficient data, we would have submitted a second topical report on full burnup credit to your staff. Under our restructured program, we have deferred our work to establish the basis for use of full burnup credit until a later date.

Contingency Plans

We have done some contingency planning for interim storage to maintain our ability to respond aggressively should the Administration and Congress agree on new policy direction. Our contingency planning has considered development of a market-driven national transportation capability. This capability would utilize commercially available transportation and storage equipment that has been certified by the Commission. Our contingency planning also considered non-site specific engineering work and preparation of a Topical Safety Analysis Report that would be needed if we were to begin the licensing process.

If Congress and the Administration agree to new policy direction authorizing the development of a federal interim storage facility at a specific site, the program will aggressively act on that direction and submit a license application to the Commission at the earliest practicable date. We believe that the establishment of the Commission's Spent Fuel Project Office will facilitate the licensing of such a facility.

Interactions between the Department and Nuclear Regulatory Commission Related to Federal Interim Storage

The level of interactions between the Nuclear Regulatory Commission and the Department regarding interim storage and related topics is expected to increase dramatically if the Administration and Congress should agree on the policy direction for the development of this facility. In the meantime, and under our current funding limitations, we will continue interactions with the Spent Fuel Project Office on generic issues associated with interim storage.

The Department understands that the Commission is currently engaged in rulemaking to update its criteria applicable to new commercial reactors for seismic hazard evaluation and design in 10 CFR Part 100. The proposed revisions direct an applicant to provide a probabilistic seismic hazard evaluation in its safety analysis report. We believe that 10 CFR Part 72 should be revised to refer to the new provisions of Part 100, as they would relate to the design of an interim storage facility, once the rulemaking for Part 100 is complete.

Conclusion

I am grateful that the working relationship between our staffs has been strengthened. In light of the funding situation for the current fiscal year and the continuing debate in Congress, it is likely that these relationships will be tested and that both of our organizations will have to accommodate new and possibly dramatic policy redirection. At a minimum, we will have to accommodate the significant change in focus and expectations that will govern the activities of the repository program for at least the current fiscal year. We may also have to respond to intense, near-term licensing interactions undertaken in response to enactment of legislation providing new policy direction on interim storage. I hope we can draw upon the experience of many years and

the strength of our organizational relationships to maintain progress toward development of a geologic repository as we address whatever policy redirection we get.

Thank you for the opportunity to brief the Commission. I would be happy to answer any questions you may have.















