

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

Location: Rockville, Maryland

Date: Friday, June 9, 1995

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7 LEVEL WASTE PROGRAM - PUBLIC MEETING
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11 Nuclear Regulatory Commission
12 One White Flint North
13 Rockville, Maryland
14

15 Friday, June 9, 1995
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17 The Commission met in open session, pursuant to
18 notice, at 9:02 a.m., Ivan Selin, Chairman, presiding.
19

20 COMMISSIONERS PRESENT:
21

22 IVAN SELIN, Chairman of the Commission
23 KENNETH C. ROGERS, Commissioner
24 E. GAIL de PLANQUE, Commissioner
25 SHIRLEY A. JACKSON, Commissioner

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1 STAFF AND PRESENTERS SEATED AT THE COMMISSION TABLE:

2 JOHN C. HOYLE, Secretary

3 MARTIN MALSCH, Deputy General Counsel

4 DR. DANIEL DREYFUS, Director, Office of Civilian
5 Radioactive Waste Management, U.S. Department
6 of Energy

7 MR. LAKE H. BARRETT, Deputy Director, Office of
8 Civilian Radioactive Waste Management, U.S.
9 Department of Energy

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P R O C E E D I N G S

[9:02 a.m.]

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CHAIRMAN SELIN: Good morning, ladies and gentlemen. We have the second and third session in our animated and extended discussion on High Level Waste Program. We're very pleased to welcome Dr. Dreyfus and Mr. Barrett this morning.

As you know, Dr. Dreyfus, the Commission has been favorably with the strategic direction that you've been taking in the program. Obviously, as you get into new areas, questions come up and these are questions for which we would like to share your understanding as you develop it, as you develop it yourself. So we're looking forward to your overall presentation.

We believe that the nation will be best served as you continue this close -- I don't want to say cooperation -- but close, close communication between your program and the NRC, that the approach to no surprises has been pretty successful so far and we would like to see it continue at all levels, the overall program and the at the MPC that you'll talk about later on this morning, your progress on an intermediate storage facility, as well as, of course, the basic work on the repository.

The Commission has taken the position that we are supportive of the other things that you're doing, but, of

1 course, not at the expense of progress on the repository,
2 which is the overall objective.

3 And I think without further ado, we'll just turn
4 the floor over to you unless the other commissioners want to
5 say something.

6 Dr. Dreyfus, welcome once again. Thank you for
7 coming.

8 DR. DREYFUS: Thank you, Mr. Chairman. As we have
9 customarily done in these briefings, I'd like to begin with
10 a little show and tell on work we're doing. It seems to add
11 some reality to otherwise narrative presentations. So I'll
12 ask for the first of a series of pictures to be put up on
13 your screen.

14 [Slide.]

15 DR. DREYFUS: This picture shows work of making
16 adjustments to a compressed air pipeline in the tunnel. At
17 the bottom of the picture, you can see the rail lines for
18 the muck haulage which we are currently -- the process we
19 currently are using for bringing out the muck from the
20 tunnel boring machine.

21 You can see the steel sets that we in the bedrock,
22 the heavy number of steel sets and lagging in the forefront
23 of the picture. A little further back you'll see a section
24 of better rock in which there are rock bolts and mesh are
25 satisfactory. We have, of course, ran into a good deal of

1 the fractured rock, which has resulted in a lot more of that
2 foreground type of development than we had expected.

3 Slide two is a -- this is worker on the TBM
4 platform and in the foreground is an orange rock bolt drill.
5 You can see again the steel sets in the background. That
6 particular section the rock is pretty good. They're putting
7 in rock bolts and mesh simply for personnel protection.

8 The next one. This is an area where we're
9 excavating the second test alcove. As we go along, we're
10 building alcoves off the main tunnel shaft in order to put
11 in scientific testing material. You see the perimeter of
12 the excavation in green and the orange crosses will be drill
13 holes for blasting. That black stuff is old automobile
14 tires and it's a blast cushion for the explosion as we build
15 the alcove.

16 In the next one, here you can see these white,
17 white brackets are the beginnings of the underground portion
18 of what will be a conveyor belt, which will bring the muck
19 out and which will replace the muck car operation. As we
20 get further into the mountain, the conveyor belt adds a good
21 deal more efficiency to the operation of the machine.

22 The next picture will show the continuation of the
23 conveyor system outside of the tunnel and over to the muck
24 pile. So we're close to installing the conveyor system.

25 The tunnel, again, is not the only thing that's

1 going on. The next slide are thumper trucks, which are used
2 to generate sound to do detection of underground formations,
3 particularly fault and volcanic features.

4 The next slide is the upgrade of the C hole
5 complex, in which we're going to be carrying out long term
6 pumping tests in the saturated zone. This is a complex of
7 three drill holes and they have been drilled to a depth of
8 3,000 feet, beginning of studies of the full and the
9 saturated zone below the repository.

10 Then I have a couple of charts. The first one is
11 a chart that shows the baseline of the tunnel boring machine
12 progress against the actual accomplishments, and it's
13 instruction in the sense that if you look at the lower left-
14 hand you can see that in the early days of start up when we
15 began to run into more difficult rock conditions than we
16 thought and we were shaking down the tunnel machine, we feel
17 well below the projected accomplishment.

18 We have caught up, and in the upper right-hand
19 corner we are now ahead of the accomplishment. Basically
20 that was done by, of course, learning to understand the
21 machine, making some modifications of the machine, which is
22 not unusual in this kind of work, but also creative
23 scheduling. The machine was scheduled to be out of action
24 for periods of time when we built alcoves. We have
25 rescheduled it so that the down time gets three and four

1 things done at once and, therefore, we will be, I think,
2 ahead of schedule at the end of this year.

3 There is one more that's a similar chart that
4 simply gives you a feel for the progress of the work as
5 compared to the overall job. You can see there the five
6 mile loop to the other portal. The lower portion of the run
7 is the portion that parallels the Ghost Dance fault in a
8 repository level. We will hit the repository level about
9 the time we make that first turn. Then we'll be in it, and
10 the other portal is access.

11 So that completes the -- if you have no comments.

12 MR. MALSCH: When do you expect to make that turn,
13 Dr. Dreyfus?

14 MR. BARRETT: Next year.

15 DR. DREYFUS: Early next year. We'll be down
16 close to it by the end of this year.

17 As you know and as the Chairman alluded to, we're
18 involved in a broad policy debate regarding the future of
19 this program. The discussion is focused on interim storage
20 issues and related budget problems. In my view, it's time
21 for the Congress to readdress the issue. It's a practical
22 matter. The program does need guidance and it probably
23 needs new authority to define its role in interim storage
24 and near term management of spent fuel.

25 The debate, however, is taking form in a broader

1 consideration of the structure and cost to government in
2 general, the Department of Energy in particular, and we've
3 had a lot of news on that in the last few days. My report
4 will focus on the status and outlook of the program we are
5 currently conducting. I think it's premature to speculate
6 on what kind of additional instructions we are likely to
7 get, although I'm happy to answer questions related to that
8 to the extent that we have done contingency planning.

9 We made substantial progress during the first half
10 of '95. My written testimony highlights progress made in a
11 variety of activities of tunnel excavations preceding well
12 and I have already I think said enough about that.

13 When I spoke to you last December, I described the
14 intent of our technical site suitability evaluation. There
15 seems insuperable for it to be continuing concern about the
16 purpose for that and I'd like to say a few words about it.

17 We see that as a management tool to guide and
18 measure the progress of the engineering and scientific
19 programs. We have literally hundreds of discreet underway
20 in Yucca Mountain and I think one of the failures of the
21 program in the past has been that those activities were
22 being conducted with specific purposes of the science or
23 engineering of the activity and without sufficient
24 relationships among them or sufficient agreement on when all
25 of the individual investigators would be prepared to answer

1 to the question of whether they now thought they knew enough
2 to make definitive remarks about the feasibility of this
3 program.

4 The purpose of the technical site suitability
5 determination, which is not a statutory requirement nor a
6 regulatory requirement and which I have no interest in
7 turning into either a statutory or regulatory requirement,
8 is to pick a point on the accomplishment chart at which I
9 would expect all of the disciplines on the job to be able to
10 tell me that they either now thought they had good solid
11 theory or knew precisely what remaining tests were going to
12 be done to get there.

13 One view is that, that would be the appropriate
14 point to reach that convergence would be the license
15 application. But, in my view, that is not the right place
16 because the license application includes a number of other
17 considerations that are not central to having completed the
18 necessary work to have theories about the salient technical
19 issues. It includes all of the other weight of proof that's
20 necessary to adequately support regulatory findings, and I
21 think that's a broader spectrum of information.

22 Also there are things like the Environmental
23 Impact Statement, which while our ancillary and while are
24 certainly necessary to make ultimate decisions, they do not
25 indicate when we know what we're doing with the science.

1 I want to clarify to the best of my knowledge the
2 technical site suitability determination will not require
3 activities or cost that are not otherwise for either the
4 Secretary's recommendation to the President or this
5 Commission's decision on the licensing. I find that the
6 concept and the schedule in the six months or so that we
7 have had it has already resulted in substantial
8 rationalization, simplification of the work.

9 It's a guideline to deciding which are the
10 critical path issues and it has, in fact, forced us to think
11 about things like thermal loading strategies and when we
12 were going to be done with them that sometimes have been
13 viewed more as ongoing work and not so much as to when they
14 get finished.

15 So we have a schedule. I have held open the
16 prospect that that schedule is not yet down to the detail
17 level, may have to be revised as we find out that the
18 critical paths are, in fact, longer or if we find that out,
19 but that's basically the story on technical site
20 suitability.

21 Turning to some other ongoing issues, we recognize
22 that many of the strategies that address some important
23 technical issues have yet to be fully developed.

24 CHAIRMAN SELIN: Let's stop at suitability for a
25 minute.

1 DR. DREYFUS: Yes, sir.

2 CHAIRMAN SELIN: I'd like to clarify the record.
3 It's clear that you could reasonably misunderstand what I
4 believe because what I wrote is not what I believed. So
5 it's understandable that that might -- the first thing is
6 you quoted me wrong and second is you quoted me out of
7 context, the third is, well, you knew I didn't mean what I
8 said, and this is someplace between the second and the
9 third.

10 What my own belief is that what the Department
11 does to decide for itself whether that's a good site is the
12 Department's business and certainly not only does NRC not
13 have an opinion on that, I don't personally have an opinion
14 on that.

15 But that there is a statutory requirement for a
16 fairly formal finding by the Secretary and the President and
17 we don't think -- I mean I personally do not believe that's
18 a good idea. It's not a regulatory issue, but I don't think
19 that's a good idea. I think that's the treatise that's left
20 over from a previous situation. That was the intent of my
21 testimony.

22 The second thing is that once you're doing your
23 technical suitability work it would be useful if you try to
24 identify all of the regulatory issues and make some progress
25 on them in the suitability and share it with it. Or if you

1 don't make progress, make sure you talk to us so that while
2 you're doing it you get a leg up on the thing.

3 But the real intent of my personal position is
4 that there only be one formal adjudicatory procedure in
5 which the public's interest are taken, not two, because two
6 procedures is just too much waste of time and effort. So we
7 weren't talking about any DOE manage -- or I was talking
8 about any DOE management process, how you decide whether you
9 were going to go forward with or the President decides
10 whether he's going to go forward with the license
11 application. That's executive branch business.

12 What we're talking about is mandatory procedures
13 called for in the legislation, which given where we are
14 today as opposed to when we had half a dozen sites, do not
15 seem to me personally to be useful. They look to be like
16 just a waste of time and money. That was the intent of --
17 it's actually what I said, but my written testimony was not
18 as clear on that as it should have been. So I apologize to
19 you.

20 DR. DREYFUS: Well, I would make two comments.
21 First of all, I did not intend this to be directed --

22 CHAIRMAN SELIN: Well, but what you said --

23 DR. DREYFUS: To you because basically I'm having
24 problems defining this with the review board of the state
25 and others. I mean there's -- it's difficult to convey the

1 intent.

2 I fully agree with you. I have no interest or
3 desire in having this turned into some sort of a statutory
4 requirement or being recognized in rules and regulations
5 because if that happens, we do create a whole new process
6 that nobody needs. We'll have legal interpretations. What
7 I want in this situation is management flexibility, not
8 legal interpretations.

9 We still have got to do what we have got to do at
10 the end of the road and so it doesn't resolve licensing in
11 any respect and it is not our intention that it preempt or
12 prejudice any later decisions. We are working with your
13 Staff on that to make sure that to the extent that they feel
14 they need to be involved in any aspect of the technical site
15 suitability they will be. We don't intend to sort of make a
16 decision that then the Commission has to rebut and the
17 decision will be only partial in any event. So that I think
18 we can work out.

19 I don't know that we have a difference of opinion.
20 I was making sure everybody knows what we're doing. I think
21 we've been misunderstood as well by the Congress in the
22 drafting, as well as in other rooms.

23 Turning to some of the other ongoing issues, as I
24 said, a lot of what we're doing is still work in progress
25 and the thermal strategy situation I think is a classic and

1 right now a salient example of that. We have not progressed
2 --

3 COMMISSIONER ROGERS: Excuse me. Are you jumping
4 to thermal loading now?

5 DR. DREYFUS: Yes, sir.

6 COMMISSIONER ROGERS: Just before it -- I mean are
7 you going to say anything about the expert judgment
8 guidelines?

9 DR. DREYFUS: I was not, but I'm prepared to
10 discuss --

11 COMMISSIONER ROGERS: There's something I wanted
12 to ask you about with respect to that. But just a little
13 technical point.

14 The last paragraph on page 6 of the section that
15 just precedes the expert judgment guidelines, you say the
16 revised sections of the annotated outline will be submitted
17 to the NRC Review in comment in compliance with requirements
18 in 10 CFR Part 60.

19 It's just a technical question there. I don't
20 think Part 60 refers in any way to the annotated outline so
21 I don't know what you had in mind there. I guess that
22 sentence needs to be translated a little way into some other
23 -- a slightly different thought. But there is no
24 requirement in Part 60 for that refers to the annotated
25 outline as far as I know.

1 DR. DREYFUS: Well, in my judgment is that the
2 sentence refers back further than that. Is there -- does
3 anybody want to talk --

4 COMMISSIONER ROGERS: I don't think we have to --

5 DR. DREYFUS: Yes, it's a sentence structure
6 problem.

7 COMMISSIONER ROGERS: Yes.

8 DR. DREYFUS: Seems that the resubmittal refers to
9 the --

10 COMMISSIONER ROGERS: It's sort of in the spirit
11 of Part 60.

12 DR. DREYFUS: It's in the spirit of Part 60.
13 That's exactly right.

14 COMMISSIONER ROGERS: That's all right. The
15 expert system judgment guidelines though I think they're are
16 -- they're are some tricky questions involved there. In
17 particular, the last paragraph of your presentation, I'd
18 like to have a little better understanding of what you
19 expect do with this probabilistic volcanic hazard assessment
20 investigation, just how you intend to use that, because I'm
21 a bit concerned about the statement, "The NRC Staff is
22 participating as an observer and its contractors are
23 providing direct input to the panel."

24 That begins to drag us into something that may be
25 okay if it's not a part of the formal decision making, but

1 I'm a bit concerned about a separation of functions question
2 here. What do you intend to do this assessment?

3 DR. DREYFUS: Well, the reason that that was
4 called out is it is since the expert judgment discussion
5 took place it's an excellent example of a situation which
6 expert judgment is going to figure very largely, prediction
7 of volcanic activity being something that's fairly imprecise
8 and this will be, therefore, a laboratory of whether our
9 approach to using expert judgment works.

10 With regard to the specific role of your
11 contractor in that, I'm going to have to call on someone
12 who's a lot closer to the daily meetings than I am.

13 MR. BARRETT: This is April Gill. She's the
14 Deputy Assistant Management for Licensing and Site
15 Suitability.

16 MS. GILL: Yes. This is a concern that has been
17 brought up at a management meeting where Margaret Fedderline
18 and John Graves spoke about the concern on the part of the
19 NRC with a potential conflict of interest.

20 Now what we want to do with the volcanic hazards
21 assessment is get people who are the most familiar with the
22 volcanic hazards at Yucca Mountain site and panel these
23 experts. But we have requested that the NRC participate as
24 observers to take care of the conflict of interest problem
25 that is of a concern.

1 COMMISSIONER ROGERS: Well, I'd certainly like to
2 get an opinion from our general counsel on whether our
3 contractors being brought into this then, some how or other,
4 taints them in some way that they wouldn't be as useful to
5 us as they might be once they participate in this -- play
6 that role in this panel.

7 MR. MALSCH: Well, my understanding is that our
8 contractors and experts are not participating as panel
9 members as such. They're simply there as observers and
10 providing information in a public forum as they could
11 provide information in any other context. So I don't see
12 that causes a problem. It might be a problem if they were
13 to actually become part of the panel which contributed to
14 the results of the elicitation. But I think we've said no
15 to that.

16 COMMISSIONER ROGERS: Okay. So the key word is
17 "direct input to the panel, but not part of the panel."

18 MR. MALSCH: Yes, they can just -- it's like
19 offering public testimony or public views on whatever
20 results of our research involves.

21 COMMISSIONER ROGERS: Very good. All right.

22 COMMISSIONER DE PLANQUE: Also on expert judgment,
23 I notice to two of NRC's documents on expert judgment. Is
24 DOE going to produce its own policy statement with respect
25 to the use of expert judgment?

1 DR. DREYFUS: We have one, and this is one of the
2 first test under it.

3 MS. GILL: Yes. April Gill again with Yucca
4 Mountain Project. Yes, we have a position statement on
5 expert judgment and we forwarded that to the NRC. I believe
6 it was on June 1, and we're using that as back up
7 information to try to resolve your comment, SEA Comment
8 Number 3 on the SEP which dealt with expert judgment.

9 COMMISSIONER DE PLANQUE: Okay.

10 MS. GILL: So I know that your Staff has that and
11 are looking at it. We're also having a technical exchange
12 this fall, September, on expert judgment.

13 COMMISSIONER DE PLANQUE: Great. Thank you.

14 CHAIRMAN SELIN: We'll take a vote on whether we
15 allow Ms. Gill to sit down.

16 [Laughter.]

17 CHAIRMAN SELIN: Please come, Dr. Dreyfus.

18 DR. DREYFUS: We have not progressed to the point
19 where we can decide on a design thermal load. Clearly the
20 thermal loading strategy must be compatible with the
21 objectives of the programming. Our approach to selecting a
22 thermal load has to take into the required size and capacity
23 of a proposed repository and the cost implied by the design.

24 We have had several exchanges and we have had
25 several theories of how we would proceed, and in the last

1 meeting with you I told one of them that we had some
2 discussion about it. We have concluded that that approach
3 does need to be revised and we intend at this point to try
4 to come to a more definitive judgment of what the thermal
5 loading will be earlier in the game, recognizing that it
6 will be supported by theory until the tests are available,
7 as opposed to using some other theory to simplify the thing
8 and being more -- doing it more in stages.

9 So we believe that we are developing a new
10 approach and our intention to focus on design thermal load
11 early in the process will assist you in your ability to
12 follow the action and concentrate your work on what we
13 actually intend to do. In fact, that's what we have decided
14 we must do as well.

15 We'll keep the Commission informed as we develop
16 the thermal loading strategy, especially regarding the data
17 that we're going to be able to provide in the annotated
18 outline, in the license application and in the ultimate
19 update for placing waste that will be -- a lot of
20 information gathered during that period of time.

21 MR. MALSCH: I know this may be difficult, but do
22 have a schedule in mind vis á vis the design thermal load?

23 DR. DREYFUS: We have -- no, I do not at this
24 time. We have to yet come to closure to how exactly we're
25 going to handle thermal loading. What we're looking at now

1 is a notion of having a robust design that would accommodate
2 a range of thermal loads, but to design against one which is
3 appropriate for the objectives of the program, which is
4 probably a hot loading and to justify that one early on.

5 We had originally thought that we could reach a
6 more simple conclusion on a cooler design and then gradually
7 ask for updates. We will not do that. We will continue,
8 though, to try to design the waste package and the ancillary
9 operating equipment so that it would be able to operate over
10 a range of thermal loading so that if we find as we go
11 forward that we have to shift, we will do so.

12 But, basically, you know, one of the situations
13 here is we've got to design a repository that does the job.
14 It would not do us any good to license a repository that
15 doesn't do the job. So focus on that and we're going to go
16 on --

17 CHAIRMAN SELIN: I think that's the right thrust.
18 When I was a graduate student, I had to design an amplifier
19 and my professor said someplace between DC and light is the
20 right frequency. And I didn't find that too helpful.

21 [Laughter.]

22 CHAIRMAN SELIN: So you know you don't need to get
23 into a rigid design. But the license application has to
24 have a design that you're willing to live with it, (a) it's
25 detailed enough so that it can be analyzed even though

1 during the process you may improve and (b) that allows you
2 to put enough spent fuel into the ground that you might go
3 ahead and build -- I mean it's a 10,000 -- to take an
4 extreme case -- a 10,000 ton design, even if it passes all
5 our test, you and we know you're not going to build a
6 repository at such a low capacity. So I think that's a much
7 more healthy approach.

8 DR. DREYFUS: Yeah, well I think it's a good
9 example of an interchange among the various interested
10 parties because we have had long discussions with the review
11 board and with the responses from the Commission and it was
12 rationale to rethink. We'll try to refine this approach and
13 inform you on it as soon as we can. But internally it's not
14 yet gelled.

15 CHAIRMAN SELIN: Thank you.

16 DR. DREYFUS: Now several months ago the news
17 media highlighted a report on the criticality related risks
18 associated with the disposal of weapons grade plutonium in a
19 geologic repository. We don't intend to dispose of weapons
20 grade plutonium in this repository, although there are
21 studies in the Department of various ways of disposing of
22 weapons grade plutonium and this report came out of that
23 thought process.

24 Controlling criticality, of course, is no new
25 issue. It's been investigated in our program and its

1 predecessor since the '70s and your regulations clearly
2 include the criticality control requirements that we are
3 going to have to comply with.

4 Recent reports are concerned with the possibility
5 of catastrophic consequences from the selective accumulation
6 of fissile material in geologic setting. That is a subject
7 that was explicitly considered in reports commissioned by
8 the Department as early as 1978. So, again, it's not a new
9 idea. It's not something -- it's been overlooked. It's not
10 a revelation.

11 I won't attempt to evaluate the validity of the
12 specific theories that are now being discussed in the
13 community. I will simply state once again the Department,
14 as part of its efforts to demonstrate compliance with the
15 Commission's criticality control requirements for any
16 material being considered for disposal will evaluate the
17 risk of potential criticality events. So we will and will
18 have a program and licensing will have dealt with all of
19 these issues.

20 We have been engaged in a dialogue for some time
21 about those issues of the Quality Assurance Program --

22 CHAIRMAN SELIN: Before you get on to that, could
23 you explain this discussion about changes to 10 CFR Part 60?
24 I can't figure out what the paragraph in your written
25 testimony says about that.

1 DR. DREYFUS: Can you refer me?

2 CHAIRMAN SELIN: We're trying to bring Part 60 up
3 to date and you're saying that we've gotten from the '70s to
4 the '80s. You'd like us to get more up to date. Would you
5 a little bit more --

6 DR. DREYFUS: Yes, it's a specific issue in Part
7 60 on criticality. Yes.

8 MR. BARRETT: The design basis events.

9 CHAIRMAN SELIN: I'll call on expert help on that
10 one as well.

11 MS. GILL: Yes, to help you a little bit, Dr.
12 Dreyfus, we have -- you had a proposed rulemaking change and
13 we have made comments on that and I believe the comments are
14 due towards the end of this month. Your proposed rulemaking
15 we thought was good, but it didn't go quite far enough in
16 clarifying criticality requirements through the 10,000 year
17 repository stage.

18 So the NRC will be seeing our comments on the
19 proposed rule. I think it's June 22 that the comments are
20 due.

21 CHAIRMAN SELIN: So we'll just take a rain check
22 on it.

23 DR. DREYFUS: Hopefully. It's just an awareness
24 thing, I think, where the dialogue is ongoing.

25 CHAIRMAN SELIN: Fair enough. Thank you.

1 DR. DREYFUS: With regard to the Quality Assurance
2 Program relevant to ESF design, we agree with the Commission
3 it's our responsibility to execute a Quality Assurance
4 Program that meets your requirements and we're going to live
5 up to that responsibility.

6 Our submission of the regulatory compliance review
7 report on March 14 is a first step to addressing the Staff's
8 longstanding concern on flowdown of regulatory requirements
9 in the ESF design. We will submit by July 31 an evaluation
10 of the balance of ESF related requirements that were not
11 addressed in that report. It has taken us essentially
12 longer than we had thought to get down to the lower levels
13 of the flowdown. But the work is in progress to conclude
14 that.

15 At this point in time, my belief is that the
16 dialogue between us and the Staff has been satisfactory,
17 although we understand we're not finished.

18 CHAIRMAN SELIN: Well, on the this whole question
19 of vertical slice, the particular issue, let me explain what
20 we're trying to do and then we'd be very interested in your
21 feedback either now or later as to whether you see it as --
22 what we're trying to do is find areas where instead of just
23 looking at one functional area or another, what we're trying
24 to avoid is where you pass -- you get a correct score on
25 each of the tests -- the questions, but you don't pass the

1 test.

2 In other words, you want to make sure that the
3 questions that we're discussing together, if addressed
4 satisfactorily, lead to a go ahead and say you seem to be
5 pretty well off at this stage and let's continue. So how I
6 did the vertical slice was to take a bunch of individual
7 technical issues and put them together in a major area so
8 that they would add up to a satisfactory understanding, not
9 an approval, but an understanding in a given end use area
10 before you go on to the next stage.

11 If it looks to you as if we're asking you to do
12 things that either (a) you wouldn't do otherwise or (b) that
13 don't add up to this, we need to keep talking. This is not
14 a new pre-regulatory audit that we're putting on. It's an
15 attempt to take what would otherwise just be a stovepipe
16 approach or each one of our little technical groups would
17 ask you questions, but you'd have no assurance that they
18 would add up to a green light, a preliminary green light,
19 and put them in the context of what we understand you're
20 trying to do in your center.

21 So if it doesn't come across that way, either
22 there's a communication problem or we're not doing it right.
23 So we must continue to discuss these vertical slices with
24 you.

25 DR. DREYFUS: Well, yes. The situation -- and I

1 have some -- I have discussed it in my prepared statement.
2 I intended to touch on it here, but let me touch on it now.

3 Basically, we understand the objective and are in
4 accord with the objective. The only -- and there was some
5 questions that were addressed to us, which I have not
6 specifically answered in this statement. I apologize for
7 that, but that again is a question of the fact that we felt
8 we didn't know enough about it and didn't want to
9 prematurely start to state our views before we understood
10 for sure what we were expressing views on.

11 The considerations that we have are pretty prosaic
12 and they go to the fact that, first of all, the process, the
13 implementation process that seems to be associated to it,
14 looks like a fair amount of data intensive interaction that
15 is not currently going on. We're very sensitive to
16 additional workloads and particularly to the timing of the
17 workloads in the sense that if the NRC's views of what they
18 want to look at now is not consistent with our view of what
19 we're doing now, it'll divert resources from the currently
20 salient issues we're dealing with to the one that has been
21 selected.

22 So I think what we have is a need to understand
23 better what the Staff views as the implementation approach,
24 how we are going to be related to it and, secondarily, how
25 we are going to go about deciding which of the many major

1 issues we're going to address now.

2 CHAIRMAN SELIN: That's fair enough. We have
3 neither the authority nor the desire to set your priorities.
4 When we do this, it's based on one of two assumptions. The
5 first is that it's a long lead time item for us, and if you
6 don't help us get started on that, it's going to hold you up
7 further down the road. Or the second is we just assumed you
8 were doing it because it made so much sense and, therefore,
9 you know let's take a look and see if you're not doing it.
10 Maybe you should be, but if you look at it and say, no,
11 that's not on our schedule yet, then that's your call. It's
12 not our call.

13 DR. DREYFUS: Well, I think it's that kind of
14 thing where what we have is a need for a little more
15 interaction between the staffs to sort of clarify what is
16 intended and to discuss seriously what the work load
17 implications are and what the respective roles are. And
18 we're doing that. We're in -- Lake has been to the
19 meetings. He might want to add a few words.

20 MR. BARRETT: Yes, we have a letter from the Staff
21 on the first one on volcanism and we've had many internal
22 discussions and we'll be responding back to the Staff.

23 CHAIRMAN SELIN: Yes, the thing is you could say
24 we're not prepared to address this for three years and
25 that's your call. But then we'll say that's fine, but

1 that'll cost us three years in the license application. Do
2 you really want to do it that way? That's the kind of
3 conversation that I would expect --

4 MR. BARRETT: And the level of the details and the
5 costs involved with those levels of details and how much is
6 enough and those kinds of things is what we are discussing
7 with the Staff.

8 CHAIRMAN SELIN: Thank you.

9 COMMISSIONER ROGERS: I think if you do get to a
10 point though where -- I mean I can understand timing
11 questions, that you don't want to have to supply data on
12 something to meet an NRC vertical slice program until you're
13 ready to do that. You don't want to bend your program out
14 of shape to supply some data.

15 But I'm a little concerned about where there might
16 be a question of there just isn't data and you'd have to
17 take more data because that's seems to me it may flag one of
18 the kinds of problems that the vertical slice approach is
19 supposed to address. How do you -- do you have enough
20 information so that things all do hang together?

21 So there's two separate aspects of that additional
22 data question. One is the timing and the other one is why
23 it's necessary at all? I mean if it looks like it's a
24 problem that you have to take data that you didn't think
25 you'd ever take before submitting the application, then I

1 think there is an issue of whether everything's being
2 covered and you just have to thrash that out.

3 DR. DREYFUS: Yes, sir. But one is going in;
4 another is coming out. We agree we've got an issue that
5 requires -- that's ripe for looking and requires looking at
6 and at the end of the looking there is insufficient data.
7 That's, of course, what this is all about. That's why we're
8 doing it. That's why you're doing it. That's why we're
9 doing it because that gives us the early warning.

10 That's not what I'm talking about. I'm talking
11 about is whether the requirement to service the actual
12 activity of the vertical slice is out of pace with what
13 we're doing now. So we divert people from something to do
14 something else. You know that -- and it's a coordination
15 thing.

16 I think if we understand more of what the process
17 will be and how we're going to arrive at which things are
18 going to be looked at, which I agree is an interactive
19 question, not an arbitrary one, but reasonable dialogue
20 ought to be able to resolve it. We just haven't got that
21 done yet. This is pretty new.

22 CHAIRMAN SELIN: Yes, we're just trying to
23 understand it.

24 DR. DREYFUS: This is pretty new. We've only done
25 it once in a specialized case and we've talked about it in

1 the generic sense in a couple of meetings. So it's a little
2 early and I expect we'll work it out.

3 COMMISSIONER ROGERS: Are you going to say
4 anything more about this vertical slice approach or you're
5 going to move on to something else?

6 DR. DREYFUS: Well, I won't now. I will --

7 [Laughter.]

8 DR. DREYFUS: I'll answer questions about it.

9 COMMISSIONER ROGERS: Well, there's some other
10 aspects of what's in your report that certainly are not
11 necessarily what we've just been talking about because I
12 really couldn't quite understand on page 10 at the bottom
13 really what that last sentence really was saying. It didn't
14 seem perfectly clear to me.

15 We're also concerned about the relationship
16 between NRC's key technical issues, which are drawn from key
17 technical uncertainties, and the lack of one-to-one
18 correlation between the key technical uncertainties
19 identified by the NRC and the Department. I could interpret
20 that sentence in several different ways, one where there's a
21 disconnect between issues and uncertainties or whether
22 there's a disconnect between what NRC sees as key technical
23 issues or uncertainties and what DOE sees as key technical
24 issues and uncertainties and I wanted you to clarify.

25 DR. DREYFUS: I think there's a little bit of both

1 involved. It's a little bit of both. One is, are we doing
2 a vertical slice on something that's really important and
3 the other one is do we agree on what the set of important
4 things are that we be putting these resources into talking
5 about?

6 And I think that's what I alluded to earlier. We
7 need to sit down and discuss how we arrive at what it is
8 we're going to put this effort into and there will be, I'm
9 sure, a certain amount of disagreement because I would be
10 amazed if the Staff's view of what is important happens to
11 be identical to what our staff's view of what is important.

12 So I think that's going to be an iterative
13 negotiated thing. Right now I think we see two things, are
14 we, the way the issue has been defined, going to reveal the
15 scientific data significance and, secondly, are we on the
16 same issues? Are we on the same uncertainties? Key ought
17 to be uncertainty. Key ought to be what are the things we
18 don't know here that we really need to know that are going
19 to turn on yes or no?

20 COMMISSIONER ROGERS: Right.

21 DR. DREYFUS: And not do we happen to have a
22 disagreement on how to do it. So I mean the set of things
23 to deserve this attention should be the real uncertainties.

24 COMMISSIONER ROGERS: Right.

25 DR. DREYFUS: We may or may not agree about those.

1 Next one is, when we look at them, what are
2 looking at? We're looking at an argument between experts or
3 we're looking at the basic problem. I think there's a
4 little of both in this situation and we -- I would much
5 prefer to let the staffs deal with this a little while
6 before we raise it to another issue and that's one reason we
7 didn't address the questions directly. We didn't feel
8 competent to do it yet.

9 COMMISSIONER DE PLANQUE: Let me see if my concern
10 is related to this. I'm not sure from the discussion. But
11 looking at some earlier comments that DOE submitted on
12 proposed amendments to Part 60, I got the impression that
13 there wasn't a clear agreement between DOE and NRC on how
14 you look at the potentially adverse conditions, especially
15 the ones where you're not sure they exist or not.

16 Has that been resolved between your staff and ours
17 or is that still a question as to how you determine what you
18 have to look at?

19 DR. DREYFUS: Well, we have indeed changed our
20 approach to that and have a position on it. I don't want to
21 characterize agreement with your Staff because I was not at
22 the staff meetings. Lake may be able to come closer to
23 that.

24 MR. BARRETT: April is closer to it.

25 MS. GILL: Well, my understanding is that the

1 Commission has a rulemaking on clarification, as you
2 mentioned, of potentially --

3 COMMISSIONER DE PLANQUE: On our plate, yes.

4 MS. GILL: Can you tell us what the status is of
5 that?

6 CHAIRMAN SELIN: I can tell you what the status
7 is. We're probably going to sit on it for a little while
8 and see whether this new legislation -- we don't want to go
9 through two rulemakings on Part 60.

10 MS. GILL: I can tell you a little more
11 specifically how we're handling potentially adverse
12 conditions. A couple of years ago we were talking about
13 doing topical reports on each of the 24 potentially adverse
14 conditions.

15 Now since our experience with the topicals that
16 we have submitted so far, we decided it would be more
17 beneficial for both DOE and NRC to decrease the number of
18 topicals. We've discussed this with your Staff at a number
19 of meetings and addressed the potentially adverse conditions
20 in the annotated outline for license application, which
21 would give a more integrated approach.

22 COMMISSIONER DE PLANQUE: Okay.

23 DR. DREYFUS: The gist of what we did is we agreed
24 we're going to look at them. But we're not going to make
25 formal findings. That was sort of halfway between where we

1 were before and I think it resolved it, but I'm not --
2 again, I don't want to characterize that you agreed, your
3 Staff agreed, because I wasn't there. I wasn't at the
4 meeting.

5 COMMISSIONER DE PLANQUE: So this underlying
6 misunderstanding is a potential problem down the road and
7 something that --

8 DR. DREYFUS: I hope not. I think it's okay, but
9 as I say, I don't want to declare it to be okay. I'm only
10 one party. My belief is that we've come to an agreement on
11 how to deal with it. We may not have totally endorsed that
12 in the documentation, but that there is not a disagreement.
13 If there is one, I'm happy to readdress it.

14 CHAIRMAN SELIN: Let me answer Ms. Gill's question
15 more precise. The Staff has come to the Commission with a
16 recommendation which we choose to read as, if we are to
17 change Part 60 now, here's what we would like to change.

18 The Commission has not addressed that
19 substantively. We've said rather than go through that,
20 let's -- first of all, we asked was there anything in there
21 that you need changed today so that you can work in the next
22 year and the answer is no. The second is much of the case
23 we can address substantively on a contingent basis. Let's
24 sit back and see what happens with the Congress and your
25 legislation. So that's exactly where legislation sits.

1 MS. GILL: Thank you. I appreciate that.

2 CHAIRMAN SELIN: I mean the rule sits at this
3 point.

4 Dr. Dreyfus? Don't look around.

5 [Laughter.]

6 MS. GILL: Your turn.

7 DR. DREYFUS: On one other point, we had in the
8 last meeting also I think the open issue of the pneumatic
9 pressure data and the tunnel. We did place a hold on TBM
10 operations. We have indeed collected pneumatic pressure
11 data through several barometric pressure fronts from units
12 above, below and in the paint brush tough unit. We have
13 lifted the hold and on the basis of that data and indeed
14 penetrated that contact on May 22.

15 I have in the prepared statement discussed a
16 fairly long list of areas in which we've made progress
17 through staff interactions and I'm pleased about that. I
18 think a lot of things that have been open issues between us
19 for years are, in fact, coming to closure, at least on our
20 live discussions now that admit of coming to closure.

21 CHAIRMAN SELIN: I think the time is most
22 productive by going on to the program approach discussion to
23 see if you can --

24 COMMISSIONER ROGERS: Well, just before we leave
25 that, I wanted to commend you for that really dramatic

1 progress that you've made in reducing those open items.

2 But the question I had is, is the NRC Staff able
3 to keep up with you now? I mean things weren't happening
4 very much for a long time and it wasn't hard to keep up with
5 that. But now with this new pace that you're going out, are
6 we now holding things up? Are we being able to deal with
7 your submissions in a timely way?

8 MS. GILL: Would you like me to answer that, Dr.
9 Dreyfus?

10 DR. DREYFUS: Certainly.

11 [Laughter.]

12 MS. GILL: You really put me on the spot here. I
13 would say in general we're very pleased with the level of
14 responsiveness from your Staff. And I can say specifically
15 in the last year or so the level of communication has gone
16 up exponentially between us.

17 We were very pleased that you appointed on site
18 reps at Yucca Mountain. That's helped the communication a
19 lot, and they're formal full time as of January and that's
20 really been beneficial. Also you appointed a Yucca Mountain
21 Project Manager, Mark Delagotti, and that's been very good
22 to keep the communication back and forth.

23 There are some SCA open items that you've had for
24 some months. I think some may be even a year, but it's not
25 holding back our program if that was your concern.

1 COMMISSIONER ROGERS: Well, I just wanted to be
2 alert if, for instance, we are not devoting sufficient
3 resources to this to keep up with you, then I'd like to know
4 about that.

5 MS. GILL: One other thing, if I could point out,
6 we're working with you for document submittal reduction
7 because we're both aware of the level of paperwork on both
8 sides. Sometimes it's difficult to deal with. So we've had
9 some really good discussions that Lake has been actively
10 involved with at the management meetings about how we can
11 decrease the load of papers so that your staff can use their
12 time more efficiently. And we're actively working on that
13 back and forth between the two agencies.

14 COMMISSIONER ROGERS: Fine. Thank you.

15 CHAIRMAN SELIN: On the program approach, I
16 understand the philosophy, but I don't know what you're
17 doing on the ground. It's different from what you would
18 have done without the new program approach. I've read the
19 material. I assume the commissioners have read the
20 material.

21 The idea of focusing on characterization and not
22 trying to do construction work on the side, et cetera, and
23 that's all attractive, but could you give us a little more -
24 - I was going to say concrete example, but I don't mean to
25 make a bad pun -- but a little more definitive example of

1 what you're doing? What you will do under the program
2 approach that you wouldn't have done on the old approach or
3 conversely what you won't do on this approach that you would
4 have done in the program approach in the next year or two?

5 DR. DREYFUS: Well, I don't think that the work on
6 the ground is immensely different than it was before,
7 although there are -- in the simple matter of budgeting,
8 there are things that have been deferred or eliminated. The
9 only thing in the program approach that I think is
10 philosophically different is to, first of all, look at
11 convergence, look at the notion of when do we know the
12 central things we need to know and bring them all together
13 at a similar level of competence?

14 In other words, at what point will we be able to
15 give you the design that I know you want now that says this
16 is what this repository is going to look like and I have got
17 geologic and hydrologic and metallurgical and whatever
18 scientific data adequate that the people in those
19 disciplines think that design will work, they know how to do
20 the different things that must be done?

21 We have a thermal loading approach that is
22 defensible and that is consistent with the corrosion and the
23 waste pay. When will that happen? It was not that theme
24 in the earlier program. There is now. The things that are
25 central to that get the attention. The things that are not

1 central to that some will be done, some will be deferred,
2 that sort of thing.

3 Now consistent with that, we're beginning to learn
4 more about what our state of competence will be at different
5 stages along the way. What will we know at license
6 application? And there is a binary situation here. There
7 is, as you appreciate what you will know, that we need to be
8 telling the Commission this is what we think we're going to
9 know and find out is it going to work.

10 I think before the mind set was there some not
11 necessarily defined, not very necessarily well known, but
12 some standard that this is what the application will look
13 out. We're out here milling around and when we finally get
14 everything that sort of fits that picture, we'll file it.
15 That lead to the kind of a program we've had, which has been
16 described by several important members of Congress -- if
17 anybody can think of anything, they do it. I believe that
18 was a fairly close characterization of how things got added.

19 Wasn't clear why that enlightened the salient --
20 the important points. It wasn't clear when you were going
21 to be done and nobody had really focused on what is indeed
22 feasible to do in anything like a time frame that anyone
23 will wait for because one way to not have this repository is
24 to simply put a 100-year study plan in place and we were
25 very near there.

1 So what the program approach is, I think, is to
2 figure out what's important, decide what practically we can
3 know about what's important in a license application and
4 tell you.

5 CHAIRMAN SELIN: Are there analyses you've
6 identified that you think are unnecessary? Is there a
7 change in your construction plan to be more tightly focused
8 on -- I mean are there specific differences, things you now
9 plan not to do that you had planned to do or vice versa or
10 is it more of a philosophy in we still have to wait to see
11 what the results of the findings are?

12 DR. DREYFUS: I think it's more characterized like
13 something like the thermal strategy, a reality in the fact
14 that we are going to have to decide what the thermal
15 strategy is and design around it and we will have gaps in
16 our knowledge.

17 CHAIRMAN SELIN: But thermal strategy you said
18 you're not going to come in with an application until you
19 have a tenable thermal and a tenable design. It may not be
20 your final design, but if you didn't come up with any better
21 ideas, it would be something you'd be willing to live with.
22 That's pretty definitive statement. Is there a comparable
23 statement that you can make on the open --

24 DR. DREYFUS: Yes. If you look at the critical
25 issues in this thing, they are we are going to model the

1 mountain under ambient conditions and we are going to have
2 to understand what the fluid flow is, in terms of the
3 fractures in the matrix? What is -- what are the
4 significant paths for fluid flow? How do you decide that
5 and when do you decide it and what is enough? What is our
6 basis for this, for telling you to your satisfaction, we
7 know what the important path of flow is in this mountain?

8 Now if you looked at those pictures, you can see
9 this is not a homogenous mountain. There is never going to
10 be a definitive statement of the granules in that mountain.
11 We have got to decide how much are we going to do, how are
12 we going to do it, what is the theory upon which we rest our
13 case, how much data does it take to support that theory, and
14 get done with it.

15 Share that and say if you say it's not enough,
16 we've got to revise the study. But the point is that
17 dialogue has not been taking place. Nobody has said this is
18 what I'm going to give you because this is all I think I can
19 do or this is the best theory I've got and heard back that
20 it won't work or it will work. We're trying to drive in
21 that direction realistically and not say, well, let me think
22 about it another couple of years. That's all.

23 When you do that, you find that some pieces don't
24 seem to make much of a contribution and we'll stop doing it.
25 I'd hate to pick one out right now without sitting down with

1 the staff, but essentially say well why will I know any more
2 when I know that? And the answer is it doesn't really add
3 anything. We'll let's don't do it.

4 By the same token, some things we will not know
5 until later. They're verification. We'll have to rest our
6 case earlier on theory. So I think it's that kind of a
7 philosophy, plus the fact of saying, you know, getting these
8 interactions and making sure everything comes together some
9 day. It's management --

10 CHAIRMAN SELIN: What I hear you saying is instead
11 of coming to us and saying what would you like, you're going
12 to say we, the Program Office, will take the initiative. We
13 will propose that this will be the form and content of our
14 application and if you don't think that's enough, tell us
15 now before --

16 DR. DREYFUS: I think we have to do that. I don't
17 think that in 1982 the people who wrote the original rags
18 had any magic as built from which they could decide what the
19 license application would look like and I don't think you
20 can discover anything in that. You've got to look at as you
21 learn and say this is what is possible.

22 CHAIRMAN SELIN: But, conversely, you're not
23 prepared to say that the following things that we've already
24 asked for are unnecessary or inappropriate or -- I don't
25 want to put it all --

1 DR. DREYFUS: I don't know of an example where we
2 have come to that conclusion. No.

3 CHAIRMAN SELIN: But the thing that's missing in
4 my mind in addition to some specific examples, is I think -
5 - have you just focused on the DOE/NRC aspect to the program
6 approach? I assume that's it's not just to take control
7 back from us, but to take control of the project to satisfy
8 yourselves that the information is there.

9 DR. DREYFUS: I did not perceive that the program
10 was being controlled by the NRC when I arrived. I'm trying
11 to seize control of the program within.

12 CHAIRMAN SELIN: I see.

13 COMMISSIONER ROGERS: That's what I hear you
14 saying.

15 DR. DREYFUS: I fully understand --

16 COMMISSIONER ROGERS: It wasn't under control and
17 now it is.

18 DR. DREYFUS: I fully understand the applicant's
19 role here vis á vis regulator.

20 CHAIRMAN SELIN: You were going to seize the
21 control, period, and satisfy the NRC, other constituents, et
22 cetera, that the program you've designed for your own
23 purposes will met other stakeholder interest.

24 DR. DREYFUS: When we have -- I believe the
25 appropriate role we have with you is to keep you fully and

1 currently advised and when you see something that you think
2 isn't going to work, we have to go back to the drawing
3 board.

4 CHAIRMAN SELIN: And you would make that same
5 statement to other stakeholder as well, both inside and
6 outside the Department?

7 DR. DREYFUS: Oh, I do that daily, yes, sir, in
8 other rooms and other forum.

9 CHAIRMAN SELIN: Fair enough. Okay. You're done
10 I take it?

11 DR. DREYFUS: I'm done.

12 CHAIRMAN SELIN: I would like to repeat something
13 I said to you earlier. You know in spite of the fact that I
14 said it's not our business to say what you should do in what
15 order, I would like to stress, not because you didn't hear
16 it, but because I didn't mean -- I still believe what I said
17 last time, that the LSS is on the critical path and every
18 month lost in the LSS is a month lost in the license
19 application.

20 I believe from our Staff we're starting to make
21 some real progress. Did you want to offer up the name of a
22 person who's your full time LSS Manager?

23 [Laughter.]

24 DR. DREYFUS: Mr. Brocum is not here, but he has
25 that under advisement and we will get someone on that job.

1 CHAIRMAN SELIN: Fair enough. Thank you very
2 much. What I'd like to do is we'll take a 15 minute break
3 and not wait till 10:30 for the second presentation, but
4 start at 10:15, if that's acceptable to you.

5 [Whereupon, the meeting was 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 HIGH LEVEL WASTE
PROGRAM - PUBLIC MEETING

PLACE OF MEETING: Rockville, Maryland

DATE OF MEETING: Friday, June 9, 1995

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: Tracy McQueen

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
JUNE 9, 1995**

Introduction

Chairman Selin and Members of the Commission:

I am pleased to address the Commission on the status of the Civilian Radioactive Waste Management Program. My briefing will provide a general overview of the progress we have made in activities across the Program, review the repository investigations we have conducted during the first-half of 1995, and then address the issues raised in the NRC letter of May 12, 1995, that relate to questions posed by the Commission during the NRC staff briefing on April 25, 1995.

As you know, we are involved in a broad policy debate regarding the future direction of the Program. A number of bills have been introduced in the Congress and hearings have been held with the Senate Committee on Energy and Natural Resources. The discussion currently is focused on the interim storage issue and the related aspects of the budget. It is certainly timely for Congress to readdress this issue. As a practical and political matter, the Program does need guidance, and probably new authority, to define its role in the near-term management of commercial spent fuel. The debate, however, is taking form within a broader consideration of the structure and cost of government in general. The final policy revisions may impact the repository program in terms of both the scope and the pace of the work. My report today will focus on the status and outlook for the Program as we are now conducting it. It would be speculative to anticipate redirection at this point in the policy process.

Progress During First-Half of 1995

We have made substantial progress during the first-half of 1995. We met regulatory milestones identified in the Program Plan by completing the first Technical Basis Report on surface processes and by submitting the DOE Annotated Outline for the License Application. Tunnel excavation is proceeding well despite ground conditions that have been more difficult than anticipated. We have provided submittals to you related to the Exploratory Studies Facility (ESF) design control and the characterization of pneumatic pathways.

Your staff accepted for review the first Topical Report on seismic hazards. We are continuing our waste package and repository advanced conceptual design effort. We were encouraged to receive NRC staff acceptance of our performance goal based approach related to the substantially complete containment requirement. We are developing the notice of inquiry for the repository environmental impact statement. We continued surface-based and ESF testing to collect hydrologic, geologic, and geotechnical data to meet the needs of our suitability and licensing activities. We are continuing our iterative total system performance assessments (TSPA) and plan on completing the summary report for the next assessment by the end of FY 1995.

We have made additional organizational changes that will contribute to our progress. Our new project manager for the Yucca Mountain Site Characterization Office, Wesley Barnes, has extensive project management experience in industry and government. He has held senior management positions within the Department of Energy including serving as the Director of the Office of Major Projects.

The Lawrence Livermore, Sandia, Lawrence Berkeley, and Los Alamos National Laboratories have arrived at formal working agreements with the M&O contractor that will better integrate the work. A memorandum of understanding with the United States Geological Survey has been arrived at that provides for the Survey to receive technical direction from the M&O as part of an integrated work effort while continuing to recognize their status as an independent Federal agency.

I briefed you on the status of the Licensing Support System (LSS) on May 12, 1995. We will continue to communicate with your staff about the LSS regularly and address the organizational issue you noted at that meeting.

I am going to brief you separately on Multi-Purpose Canister (MPC) related issues later today. I will now only provide an overview of other activities related to waste acceptance, storage, and transportation. As you know, the Department has recently concluded that it does not have an unconditional statutory or contractual obligation to accept high-level waste and spent nuclear fuel beginning January 31, 1998, in the absence of a repository or interim storage facility constructed under the Nuclear Waste Policy Act.

We are continuing to develop policies and procedures to address the requirements of Section 180(c) of the Nuclear Waste Policy Act which requires the Department to provide technical assistance and funding to States and Tribes to train local public safety officials in jurisdictions through which spent nuclear fuel will be transported. We issued a Notice of Inquiry on Section 180(c) which solicits stakeholder input on the Department's options in implementing the Program.

Consistent with the milestones in our Program Plan, we submitted to the NRC on May 31, 1995, a Topical Report on burnup credit for actinides only. 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. We are hopeful that NRC staff will approve this Topical Report by the end of FY 1996. The Department will continue to gather data and conduct tests and experiments that support NRC acceptance of full burnup credit. Once we have obtained sufficient data, a second Topical Report on full burnup credit will be submitted to the NRC.

Specific Issues

Repository Investigations

The Department's approach to repository investigations recognizes that our Program remains exploratory in nature. We will be continually revising and narrowing the scope of our working hypotheses as we gain new understanding of both the technical aspects of the Program and the requirements of the policy setting.

- **TBM Operations**

TBM operations have encountered operational difficulties due to difficult ground conditions such as uncemented fractured rock. We encountered voids during TBM operations at the Bow Ridge Fault Zone and in the Tiva Canyon unit. We believe these voids resulted from naturally occurring openings being enlarged as the TBM penetrated them. We stabilized the voids with shotcrete and filled them with grout. Although we concluded that the voids have no significant impact on repository performance, we informed the NRC of the condition. We expect to exceed our original milestone of 1280 meters down the North Ramp by the end of FY 1995. We expect to complete the installation of the conveyor system, which will replace muck cars, this summer.

To improve the efficiency of TBM operations, the Department instituted an aggressive management strategy that consolidates outages and minimizes TBM downtime. For example, we had anticipated four weeks of downtime for the TBM in order to excavate Alcove 2 and an additional four weeks for excavating Alcoves 3 and 4. By combining two shifts of TBM excavation with one shift of combined alcove excavation and TBM maintenance, the TBM advance rate was only slightly reduced during alcove excavation rather than being halted for several weeks. We now anticipate TBM downtime of only ten days for alcove excavation and conveyor installation instead of the original eight weeks. This aggressive approach will be continued beyond FY 1995 so as to advance underground excavation at a rate consistent with the schedule for the Technical Site Suitability decision.

- **Surface-Based Testing**

The Department's surface-based testing activities are continuing to collect geologic information, data on the properties of the rock observed in the ESF, characteristics of the

unsaturated and saturated zones, and data relevant to the evaluation of the waste package environment. In on-going site characterization activities, we are continuing to monitor precipitation and meteorological conditions, streamflow and runoff, water levels in wells, and seismicity. We are continuing to analyze groundwater samples for chlorine-36 to assess the progress of infiltration since nuclear weapons testing began at the Nevada Test Site. We are also continuing to monitor natural infiltration in unsaturated zone boreholes.

We continued field volcanism studies at two analog sites to investigate the subsurface effects of small basaltic intrusions and collected geochemical samples from test pits at Lathrop Wells. We continued geologic mapping and map compilation for the 3.7 million year old basalts of Crater Flat and the 1 million year old basalts of Little Cones and Makani Cone. These data will be combined with geochemical data to assess the number of magma pulses involved in the formation of volcanic cones. In our investigations of the hydrologic characteristics of the unsaturated zones, we performed gas chemistry sampling and air permeability testing of the unsaturated zone in one borehole (SD-12). We placed pneumatic instrumentation in two other boreholes (NRG-6 and NRG-7a) and have monitored pneumatic pressure fluctuations in these boreholes. We refurbished the C-Hole complex instrumentation and upgraded the C-Hole complex pad to support long term pumping tests to characterize saturated zone flow that will be completed in FY 1995 and FY 1996.

In our geophysical studies, we made standard geophysical measurements in a number of boreholes. We collected geophysical data on the 22-mile long regional east-west seismic reflection profiling lines crossing Crater Flat, Yucca Mountain, and Midway Valley. We completed the task of mapping Quaternary faults in the vicinity of Yucca Mountain. We also completed collection of field data from 14 seismic reflection lines in the vicinity of Yucca Mountain which provide 25 miles of shallow high-resolution seismic data. In support of climatological investigations, we continued to collect precipitation samples from seven sites on Yucca Mountain and 12 regional sites within 100 kilometers of Yucca Mountain to provide samples to be compared with paleoisotopic climate data.

- **Site Suitability**

When I spoke to you last December, I described the intent of our Technical Site Suitability evaluation, our plan to sequence the making of higher-level findings, our treatment of favorable and potentially adverse conditions, our use of bounding analyses, the extent of our testing program, and our intent in constructing the ESF.

There seems, however, to be a continuing concern about the purpose for a Technical Site Suitability evaluation. The Department views Technical Site Suitability as a management tool to guide and measure the progress of the engineering and scientific programs.

The engineering and scientific programs supporting the site characterization effort include hundreds of discrete activities. Each of them has been initiated for a reason, has an

intended result and schedule, requires a commitment of resources, and, hopefully, will make a necessary contribution to the ultimate decision to construct or not to construct the repository.

These activities, however, are not independent. Researchers or designers in one activity must rely on the outputs of other activities. The interdependencies must be appreciated. The priorities, critical paths, and resource allocations must be managed. Non-essential activities must be evaluated and eliminated. Finally, there must be a point at which the activities essential as input to top-level management decisions are completed. The Program must converge on a judgment about the viability of the repository undertaking. That judgment must be based upon a collective agreement, among the diverse scientific and engineering participants, that they understand the systems sufficiently well to support a competent design and cost estimate.

One view is that the appropriate point for that convergence is the License Application. But I do not agree. The License Application includes other considerations beyond the management judgment of feasibility. It includes the weight of proof adequate to support regulatory findings.

In any event, the Nuclear Waste Policy Act requires the Secretary to recommend Presidential approval of the site prior to licensing and the Secretary must base that recommendation, in part, upon the results of the scientific investigation and the repository design. Effective management of the Program must bring the complex network of core scientific and engineering activities to convergence and to an adequate level of completeness to support such a judgment by the Secretary. The Technical Site Suitability determination is simply a management tool to measure progress toward that objective.

The Technical Site Suitability determination does not necessitate activities or costs that would not otherwise be needed for the Secretary's determination or for licensing, and it does not prejudice either of these subsequent determinations. The concept and schedule laid out for Technical Site Suitability have already resulted in substantial rationalization and integration of the ongoing work. I have held open the prospect that the schedule may require further refinement. That is part of dynamic management.

The use of this concept as a management tool also facilitates planning at lower functional levels, helps us to establish priorities, allocates appropriate resources, and demonstrates accountability and progress to external stakeholders.

Since I spoke to you last December, the Department has finalized its process for evaluating site suitability after extensive interactions with external participants including the NRC. The NRC staff were concerned whether the Department would evaluate the favorable conditions and potentially adverse conditions in the DOE siting guidelines as a part of the site suitability process. We recognize that favorable conditions and potentially adverse conditions are indicators for the presence or absence of qualifying and disqualifying conditions.

The Department will make formal findings on qualifying and disqualifying conditions. We will also explicitly consider the potentially adverse conditions and favorable conditions in the compliance assessment for each guideline but will not make any formal findings. The Technical Basis Reports we prepare will present the scientific and engineering information required to support evaluations of the site against the qualifying and disqualifying conditions. They will present a current understanding of specific technical subject areas. They will set forth and discuss alternative models and hypotheses permitted by the data and present the results of bounding analyses and evaluations of uncertainties. As a part of our Program Approach, we linked the schedule and scope of Technical Basis Reports to the testing and analyses needed to support the Technical Site Suitability evaluation in 1998.

I am pleased to inform you that a month ago we submitted the first Technical Basis Report for Surface Characteristics, Preclosure Hydrology, and Erosion, to the National Academy of Sciences for independent peer review by the National Research Council Board on Radioactive Waste Management. Following peer review, the Department will develop a guideline compliance assessment for each guideline condition. Each assessment will receive a review by external stakeholders prior to any higher-level finding by the Department regarding compliance with the guideline conditions under evaluation.

The NRC will have the opportunity to review the Technical Basis Reports and provide technical comments to the National Academy of Sciences. The technical information presented or referenced in the Technical Basis Report will be incorporated in the Annotated Outline for the License Application. The revised sections of the Annotated Outline will be submitted to the NRC for review and comment in compliance with the requirements in 10 CFR Part 60.

- **Expert Judgment Guidelines**

Expert judgment will play an important part in the technical determinations and licensing process for the repository. Predicting the behavior of man-made and geologic systems for thousands of years will surely involve important elements that lie beyond empirical measurements or deterministic proof.

To ensure that expert judgment is used in a consistent and defensible manner, the Department has developed a statement of principles and guidelines for the formal application of expert judgment methods. We completed the guidelines last week and have submitted the statement to NRC staff for resolution of the Site Characterization Analysis (SCA) (NUREG-1347, 1989) Open Item related to comment 3 on the use of expert judgment.

Our preparation of principles and guidelines is responsive to recommendations made at a workshop sponsored by the Department in 1992 and to the Nuclear Waste Technical Review Board's Tenth Report. In its response to comment 3 of the SCA, the Department stated that it does not plan to rely on expert judgment as a substitute for objective,

quantitative analyses based on empirical data. However, where appropriate mechanistic models are not available or the collected data are consistent with differing interpretations, we plan to rely on expert judgment as appropriate. We intend to preserve the flexibility to define the level of judgment or review to be applied in each specific case when use of subjective methods becomes necessary. The Department is committed to documenting the results of any reviews and our decisions in accordance with established quality assurance procedures. The principles and guidelines are also consistent with the general approach to the formal use of expert judgment presented in the NRC contractor report Elicitation and Use of Expert Judgment in Performance Assessment for High-Level Waste Repositories (NUREG/CR-5411, 1990) and the NRC's generic technical position Peer Review for High-Level Waste Repositories (NUREG-1297, 1988).

In a current practical application, the Department, in its Probabilistic Volcanic Hazard Assessment investigations, is using a formal process for eliciting expert judgment to assess the probability of a magmatic event (intrusive or extrusive) disrupting the potential repository at Yucca Mountain and to quantify the associated uncertainties. The NRC staff is participating as an observer and its contractors are providing direct input to the panel. The final report on the assessment will be completed by mid FY 1996.

- **Thermal Loading**

We recognize that many of the technical strategies that address very complex program technical issues have yet to be developed. These technical strategies can be broadly categorized as work in progress. Development of a thermal loading strategy is a currently prominent example of such work in progress.

As I told you last December, the waste disposal concept we are developing calls for in-drift emplacement of large, robust, multi-barrier waste packages in a repository. We have not at this time progressed to the point where we can decide on a design thermal load.

We are now considering a design thermal load that, taking into account design options and operating parameters, will accommodate the full statutory capacity of the repository. This approach is consistent with our understanding of currently available information and meets the broad objectives of our Program. Our License Application would then be based on a thermal loading that is supported by the information available at the time of submittal in 2001. We will continue to examine alternative thermal loadings as well and will consider appropriate risk-limiting options.

Clearly our thermal loading strategy must be compatible with the broad objectives of the Civilian Radioactive Waste Management Program. It is a national Program that must be accomplished within cost and schedule constraints for both the site suitability evaluation and the potential 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.

In our publications and briefings, we are still presenting working hypotheses which we are refining as we obtain new information and perform the analyses that will ultimately support selection of a preferred thermal load. We expect that we will modify our thermal loading approach as we obtain more data and refine the analyses. It is imperative that we remain flexible in our approach rather than adopting rigid concepts early and steadfastly defending them.

We believe that our intention to focus on a design thermal load earlier in the process will be of assistance to you. We will keep the Commission informed as we develop the thermal loading strategy especially regarding the data we will be able to provide in the Annotated Outline, in the License Application for a construction authorization, and in the License Application update for a license to emplace waste.

Long Term Criticality

Several months ago, the news media highlighted a report on the criticality-related risks associated with the disposal of weapons-grade plutonium in a geologic repository. Controlling criticality, of course, isn't a new issue. It has been investigated in our Program since the 1970s, and your regulations include criticality control requirements with which we must comply. The recent reports were concerned with the possibility of catastrophic consequences from the selective accumulation of fissile material into a critical mass in a geologic repository, a subject that was explicitly considered as early as 1978.

I will not attempt to evaluate the validity of specific theories now being discussed. I do, however, want to state once again that 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.

The Program has developed a draft technical approach for controlling criticality in the repository and it is under review. In this approach, waste packages would be designed to ensure criticality control through the waste isolation period. Criticality for disposal will be evaluated using appropriate methodology in three phases: deterministic for the operational period (preclosure, approximately 100 years); deterministic and probabilistic for the substantially complete containment phase (0-1,000 years after permanent closure); and probabilistic for the waste isolation phase (1,000-10,000 years). We currently plan to submit a Topical Report on disposal criticality control to your staff in FY 1998.

In a related matter, the Department is presently reviewing the NRC's proposed revisions to 10 CFR Part 60 related to design basis events. One of the intentions of the proposed revisions was to clarify the existing incongruity regarding the reference to the

application of criticality control for postclosure timeframes. The Department welcomes the clarification but believes that it does not go far enough. We are considering an alternative approach which, if adopted, would clarify the requirements for criticality control and remove potential uncertainties between the application of design criteria for the period of repository operations and the period following permanent repository closure.

Quality Assurance

We have been engaged in a dialog for sometime about those aspects of our quality assurance program that are relevant to ESF 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. We have heard your concerns and recommendations about our quality assurance program and we are continuing to be responsive.

- **ESF Design Control**

In our response on November 14, 1994, to the concerns expressed by your staff in its letter of October 13, 1994, we addressed many of the specific comments. We stated that we needed more time to fully implement all corrective actions. We committed to your staff that within 120 days or by March 14, 1995, we would provide a single document that describes how we have incorporated into the current design the 10 CFR Part 60 requirements applicable to the ESF.

Our submission of the Regulatory Compliance Review Report on March 14, 1995, is the first step towards addressing the staff's long-standing concern on the flowdown of applicable 10 CFR Part 60 requirements in the ESF design. Showing discrete traceability for every applicable 10 CFR Part 60 requirement into the ESF design would be extremely time consuming. Consequently, our Report provided the evaluations of 15 selected requirements that are parents to more than half of the 10 CFR Part 60 requirements contained in the ESF design requirements documents that will be applied to the total ESF design effort. To provide additional confidence that we have fully addressed the issues, we will submit by July 31, 1995, an evaluation of the balance of ESF related 10 CFR Part 60 requirements that were not addressed in the Regulatory Compliance Review Report.

In April, your staff conducted in-field verifications to determine if acceptable corrective actions had been effectively implemented. They commended the Department regarding the MGDS design guidelines manual and made three recommendations regarding ESF design. We are committed to addressing the recommendations and have already taken steps to do so. We note the staff's intention to conduct another in-field verification later this summer after the Department has submitted an evaluation of the flowdown of additional 10 CFR Part 60 requirements in the ESF design.

- **Pneumatic Pathways**

In our response of November 14, 1994, we also stated that we are confident that we have adequately considered the pneumatic pathways issue in terms of potential site characterization impacts.

We have been very sensitive to concerns expressed by your staff, the State of Nevada, and Nye County on the pneumatic pathways issue. We committed to providing to the staff by April 1, 1995, a description of the conceptual models of air flow through the mountain used to develop the Accelerated Surface Based Testing Plan and a discussion of how the Department will determine if the Paintbrush Tuff nonwelded unit over the site, the Topopah Spring unit outcrop in Solitario Canyon, and the Solitario Canyon fault are pneumatic barriers. We provided this information to the staff on March 31, 1995.

We placed a "hold" on TBM operation beyond the upper Paintbrush Tuff contact until we could collect pneumatic pressure data through several barometric pressure fronts. We stated that we would lift the "hold" once initial data had been collected. Pneumatic pressure data from units above, below, and in the Paintbrush Tuff unit have been obtained and we lifted the "hold" on May 12, 1995. Our decision was based on pneumatic response data obtained from boreholes which exceed the minimum data set established as a requirement. Subsurface responses to barometric fluctuations in another borehole obtained by Nye County generally agree with the data we obtained and therefore help to confirm our decision. I am glad that the NRC staff has agreed with our position. We penetrated the Paintbrush Tuff contact on May 22, 1995.

Vertical Slice Approach

Your staff developed and has been discussing with us its "vertical slice approach" over the past two months. As we understand it, this approach is intended to focus and increase the effectiveness of NRC efforts to evaluate our Program. Your staff intends to use this approach which will include quality assurance activities, data reviews, site visits, and in-field verifications to obtain real-time information in its evaluation of our work in key technical areas.

We understand the Commission's needs, but we also need to understand your intentions in the implementation of this approach. We are concerned that it could result in the diversion of Department resources to support in-field verification activities and that it might affect the respective roles and division of labor between NRC and the Department. We are also concerned about the relationship between NRC's key technical issues, which are drawn from key technical uncertainties, and the lack of one-to-one correlation between the key technical uncertainties identified by the NRC and the Department.

In light of our concerns and possible misinterpretations, I urge that our respective

staffs continue to work toward an understanding of, and agreement on, the implementation aspects of the vertical slice approach before it is fully institutionalized.

Interactions With NRC Staff

During the first-half of 1995, we and your staff held more than 17 technical exchanges, technical meetings, bi-monthly meetings and management meetings. We have focused on resolving key issues and I believe that communications are continually improving.

During a technical exchange on licensing, your staff explained its new strategy for reviewing our work products. We are encouraged by it. It calls for the staff to provide Prelicensing Evaluation Reports after reviewing the Department's Annotated Outline for the License Application. We agree to work with your staff to define and streamline your new strategy and we are encouraged by it.

Issue Resolution and Topical Reports

We continued to pursue our Issue Resolution Initiative in technical exchanges and in our submittals of Topical Reports. Our recent focus was on substantially complete containment, seismic hazards assessment, and groundwater travel time.

In March, we were finally able to resolve the Site Characterization Analysis (SCA) open item on comment 80 which dealt with the "substantially complete containment" performance goal. The resolution of this SCA open item was crucial to the related issue resolution initiative on substantially complete containment. The staff has agreed that the Department's new performance goal, a mean waste package lifetime well in excess of 1,000 years with less than 1 percent waste package failures predicted during the containment period, is a reasonable implementation of the NRC's substantially complete containment requirement. At the 74th Advisory Committee on Nuclear Waste (ACNW) meeting, the staff discussed its proposal for additional quantitative guidance on substantially complete containment. We expect to discuss the staff's suggestion and express our own views on the need for additional guidance at a technical exchange next month.

We also discussed your staff's concerns on the acceptability of our first Topical Report on the assessment of seismic hazards. Our discussions were productive. The staff accepted the Topical Report for review and is reviewing it. We expect to submit the second Topical Report on seismic design methodology sometime in the fall of this year.

We first presented our approach for calculating groundwater travel time at a technical exchange in December 1994. We considered the staff's suggestions presented at that exchange and at the 72nd ACNW meeting in March. We revised our approach and discussed it with the staff at a technical exchange on March 29 and at the 73rd ACNW meeting in April. We are encouraged, but see the need for further discussions with the staff.

We have also resolved 94 of the original 198 SCA open items including 8 from October 1994 through April 1995. Approximately 30 items are presently being reviewed by NRC.

In April, we provided our responses to the staff's comments on the Topical Report on extreme erosion. The responses provide independent geological evidence that corroborates our erosion estimates and shows that the site is geomorphically stable. These lines of evidence strengthen the Department's position that the potentially adverse condition on evidence of extreme erosion during the Quaternary period does not exist at the Yucca Mountain site. In addition, the Department will be providing cosmogenic dating information later this year that will confirm the Department's position. This information supplements and will confirm our conclusions provided in the Topical Report.

Program Approach to Licensing

The new Program Approach was implemented in late 1994 to realign the Program with the original intent of the statutory and regulatory framework. We believe that the original intent of the Nuclear Waste Policy Act was for a program of site characterization that provided sufficient information for a decision by the Department on the suitability of the site, and findings by the Commission on the construction, operation, and closure of a repository. The Program Approach reflects our views of the information required for the Department's decisions and our interpretation of what should be required to support the Commission's reasonable assurance findings. Our approach is consistent with the National Academy of Sciences' 1990 report, "Rethinking High-Level Radioactive Waste Disposal," which stressed that it is not practical to assume that all information will be available prior to constructing the repository.

We believe the development of a first-of-a-kind geologic repository cannot be undertaken in the same manner as the siting and construction of a nuclear reactor. The regulatory framework for nuclear reactors is now based on over 40 years of operational experience and the precedents of over 100 licensing proceedings. In the case of the repository, we do not have either the technical certainty or the precedents for such a regulatory framework. Our approach must make the showing needed for decisions within the practical bounds of scientific feasibility and within the cost and schedule constraints that society is willing to accept. In establishing requirements for these showings, we must recognize that the repository evaluation and design process is heuristic. The knowledge and understanding that will be used to support a design and inform a regulatory decision will be developed over time and cannot be specified in advance. We must ultimately demonstrate, consistent with your reasonable assurance standard, that we have proposed a repository design within a geologic setting which will protect public health and safety and the environment. But unlike a reactor which is largely a manufactured product, the predominant aspects of repository design and its relationship to the geologic setting cannot be determined in advance of information gained from site characterization, testing, and analyses.

It is also incumbent upon us to define a Program for developing the information we believe is required to address issues in a manner that meets rational cost and schedule expectations. We developed the Program Approach and offered it to the other parties in this endeavor to comment on. We are engaged in a dynamic planning process and expect that we will have to modify our approach on the basis of the information we obtain and the feedback we receive from the Commission as well as other parties, not the least of which will be the Congress.

Although our knowledge of the Yucca Mountain site and our comprehension of the institutional setting for nuclear waste management decisions have progressed over the past years, we are still far from the point where we can set forth a definitive concept for a repository and contend that it will adequately address all of the demands and expectations of society. At this stage, the Program remains exploratory in nature in the sense that we are evaluating alternative hypotheses and design options. We will be continually refining and sometimes revising our working hypotheses and designs as we gain new understanding of the technical aspects of the physical setting and the theoretical concepts.

Conclusions

I have reported to you today about the progress we have made including that of our substantially improving interactions with your staff and in constructing the ESF. I am pleased that our staffs are making an effort to resolve issues we have been discussing for many years. I am also pleased that despite difficult conditions, we have tunneled more than 2000 feet into the Yucca Mountain site which is somewhat simplistic but graphic evidence of momentum in the program.

I am grateful that the working relationship between our staffs have been strengthened. Over the next year it is likely that both of our organizations will have to accommodate to new, possibly dramatic policy redirection. I hope we can draw upon the experience of many years and the strength of our organizational relationships to maintain the momentum of the national waste disposal strategy as we address whatever policy redirection we get.

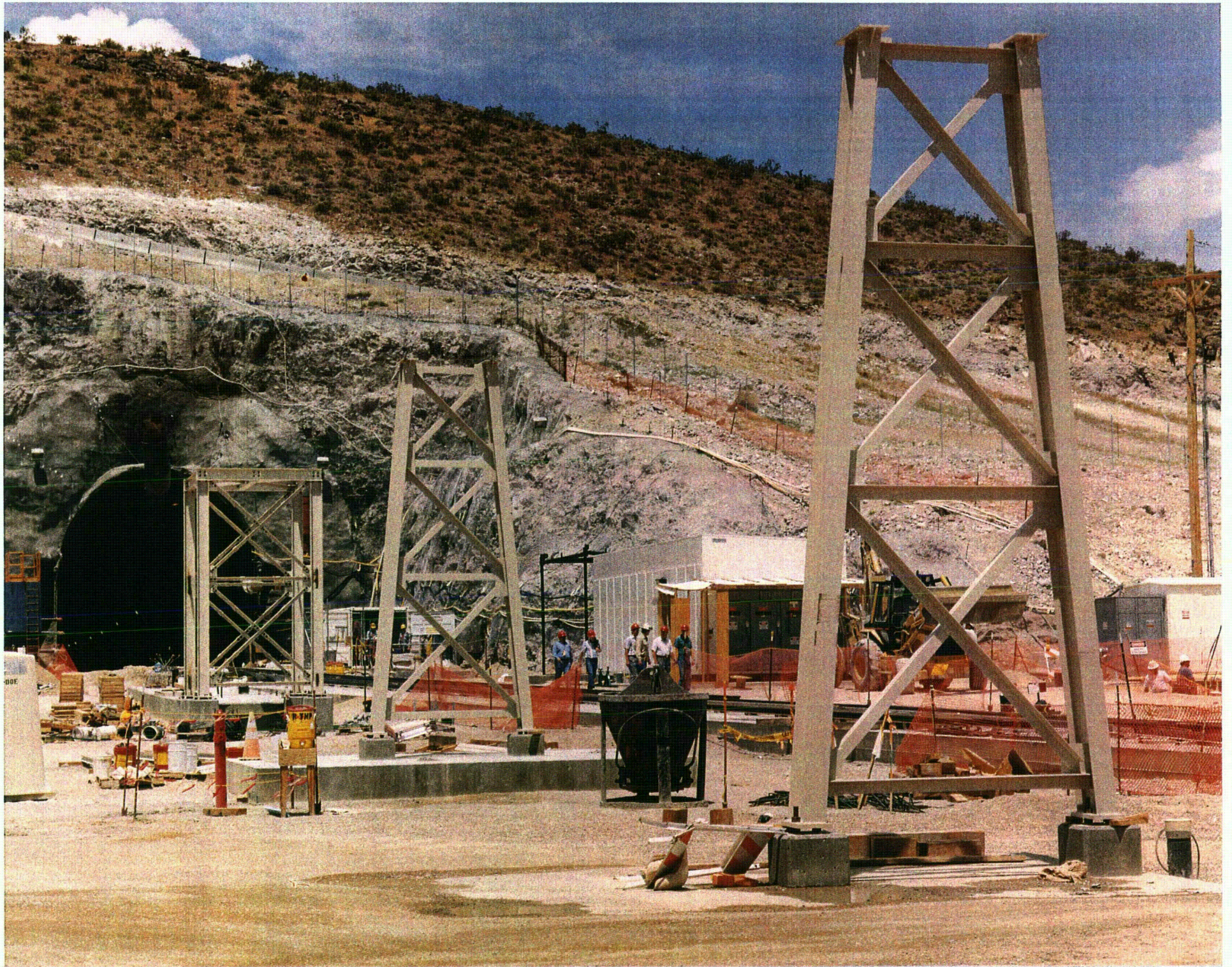
Thank you for the opportunity to brief the Commission. I would be happy to answer any questions you may have.









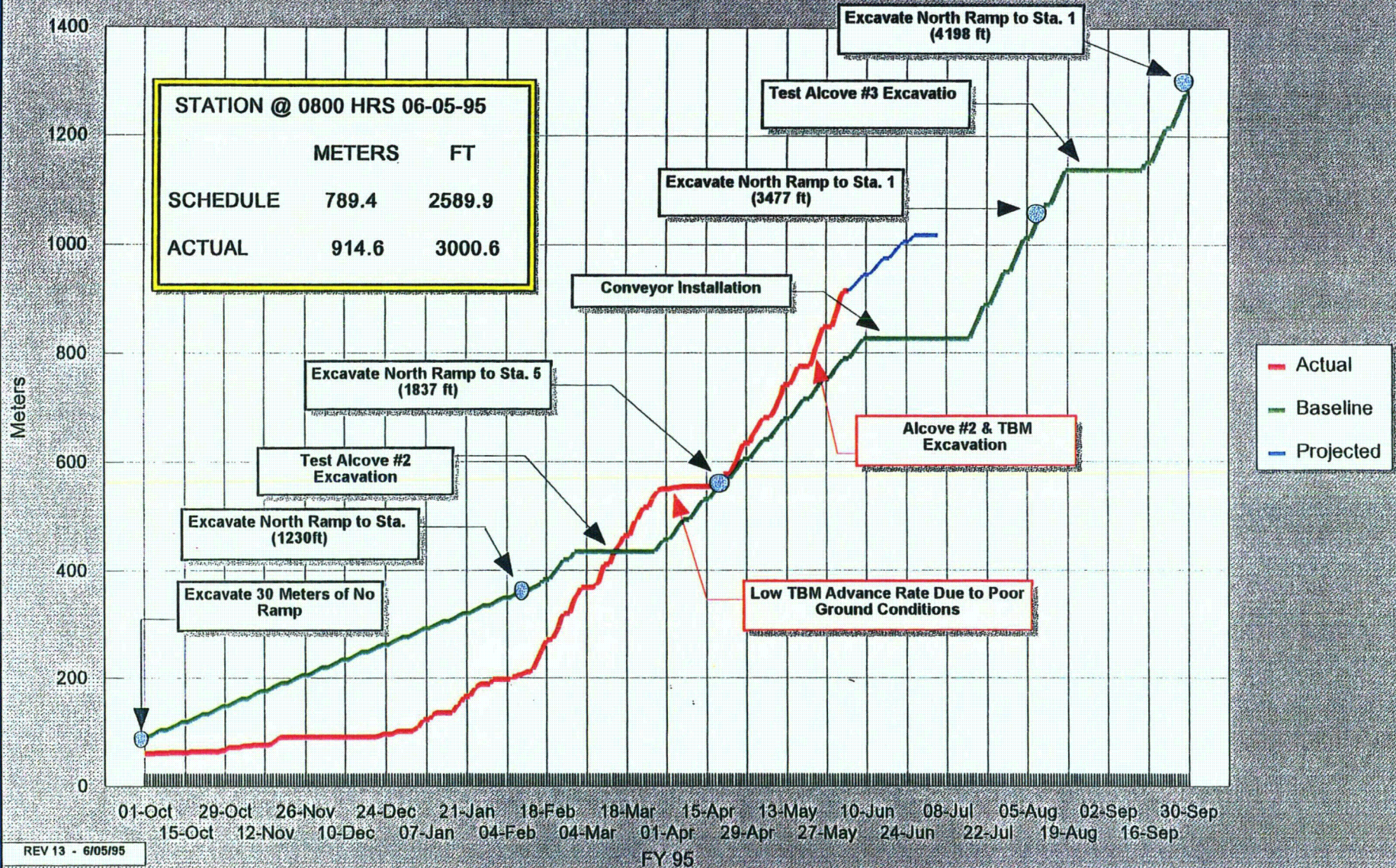






TBM Progress

Baseline vs Actual



TBM PROGRESS

North Portal

South Portal

Starting Date
September 20, 1994

00+60

Alcove #2

Bow Ridge Fault

5+00

3+75
2/16

5+61
4/20

Alcove #3

10+00

Alcove #4

10+60
8/11

12+80
9/29

15+00

20+00

Alcove #5

Drill Hole Wash Fault

25+00

30+00

35+00

40+00

45+00

50+00

55+00

60+00

65+00

70+00

75+00

78+57

Total Scheduled Progress in

METERS

FEET

789.4

2589.9

Total Actual Progress in

914.6

3000.6

Data Posted on

6-5-95



Scheduled



Actual

TBMFGHQ 125 CD-04-14-95