UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
***
BRIEFING BY DOE ON STATUS OF HLW PROGRAM
***
PUBLIC MEETING
***

Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, Maryland

Wednesday, September 4, 1996

The Commission met in open session, pursuant to notice, at 9:36 a.m., the Honorable SHIRLEY A. JACKSON, Chairman of the Commission, presiding.

COMMISSIONERS PRESENT:
SHIRLEY A. JACKSON, Chairman of the Commission
KENNETH C. ROGERS, Member of the Commission
GRETA J. DICUS, Member of the Commission
NILS J. DIAZ, Member of the Commission
EDWARD McGAFFIGAN, JR., Member of the Commission

STAFF AND PRESENTERS SEATED AT THE COMMISSION TABLE:
JOHN C. HOYLE, Secretary
KAREN D. CYR, General Counsel
LAKE BARRETT, Deputy Director, Office of Civilian Radioactive Waste Management, DOE
DANIEL DREYFUS, Director, Office of Civilian Radioactive Waste Management, DOE
STEPHAN BROCOUM, Assistant Manager, Suitability and Licensing, Yucca Mountain Project, DOE

P R O C E E D I N G S
[9:36 a.m.]

CHAIRMAN JACKSON: Good morning, ladies and gentlemen, Dr. Dreyfus and Mr. Barrett.

This morning, the Commission will be briefed by representatives of the U.S. Department of Energy on the status of the Civilian Radioactive Waste Management Program.

This continues a series of semi-annual briefings by DOE for the Commission regarding the status of the high-level waste program. Our last briefing by Dr. Dreyfus and his colleagues and staff was on January 30 of this year.

Since last January, there have been considerable developments in the high-level waste area. These developments include technical issues. For instance, elevated chlorine 36 concentrations were found at the exploratories, studies facility level. The developments include management issues such as DOE's issuance of a draft revised program plan. They also include operational issues such as the progress of the tunnel boring machine which, I understand, has been substantial. And, finally, they include legislative and judicial issues that affect the future direction of the nation's high-level waste program.

Dr. Dreyfus, Mr. Barrett, the Commission looks forward to hearing from you today on the status of DOE's high-level waste program and how the DOE is responding to

the various developments. You are on film today, I should tell you, if you hadn't figured that out.

Do any of my fellow commissioners have any comments? If not, Dr. Dreyfus, please proceed.

DR. DREYFUS: Thank you, Chairman Jackson, members

of the Commission.

I am pleased to address the Commission on the status of the program. As is our custom, I would like to start with a few photographs to give this a sense of reality that sometimes is lost in the paperwork and if our media people are ready, we will put the first one up.

This is a graph that depicts the tunnel boring machine progress as of August 26. We remain well ahead of schedule.

We were, along about June 13, 155 days ahead of schedule but we re-benched the program at that time to develop a metric more consistent with what we had been able to achieve and since then, we are now again 25 days ahead of the new schedule, so progress despite somewhat difficult ground conditions and the necessity to take the time to do the science has been substantial.

The next photo --

CHAIRMAN JACKSON: Does this include the progress on the alcoves as well?

DR. DREYFUS: Yes, we are making progress on the

alcoves and in my statement I will summarize some of that as we go and I've got some pictures I think that will show some of that.

This is a photo of the tunnel boring machine taken from the photo mapping gantry behind the main machine itself. It probably looks much like photos you have seen before but it is, in fact, a new photo that shows the machine leaving the main drift and entering the turn into the ramp to the south portal, where it will exit the mountain, hopefully, early next year.

This progress, I think, signifies a shift in emphasis. We are done excavating the main drift in the repository formation and we will now be concentrating on the scientific experiments in that tunnel and in the alcoves.

The next picture is a view of the -- and I am going to make sure it is -- yeah, it's a view of the heater test array in the thermal mechanical alcove. We are beginning a single heater test. It began on August 26 and it will give us information on thermal effects and experience with the instruments. We will then proceed to a much larger, multi-element drift test -- drift scale test which will simulate a waste package and the heat from adjacent waste packages.

In the center of the picture, you can see the hole that the heater element has been emplaced in and you can see

the array of instruments that will measure the effect of the heat on rock and the effect of the heat on moisture within the rock.

The next photo is one of the heater element. The heater element itself being emplaced in the bore hole. The heater is five meters long and will put out about four kilowatts and will heat the rock in the vicinity to about 200 degrees Centigrade.

The next --

COMMISSIONER ROGERS: How does that compare with what you would expect a canister to deliver, roughly? About the same?

DR. DREYFUS: Well, we are expecting the temperature at the rock wall adjacent to a canister to be above the boiling point, above 100 degrees. So this will give us some feel for the immediate, near-term effects but not a -- not a canister heat. That is the second test. We will simulate an actual canister in place.

MR. BARRETT: The rock temperature should be similar in both cases. So this will bring near-term rock temperatures to what a repository would experience.

CHAIRMAN JACKSON: That implies a particular thermal loading strategy, right?

MR. BARRETT: Yes.

CHAIRMAN JACKSON: Okay, are you going to speak to

that at all in your remarks?

DR. DREYFUS: A little bit. I'll mention it.

Okay, the next photo is the construction of the northern Ghost Dance Fault alcove. The excavation has been completed now to the planned length of 90 meters. At this point, we will drill a discovery bore hole into the face of that alcove to locate the fault. If we do not locate the fault, then we will excavate further and again drill ahead of the drift. The idea is to get some data from the fault in a relatively undisturbed state before we actually drive a

drift through the Ghost Dance Fault for observation and testing.

I expect that the penetration of the Ghost Dance Fault will be a major source of data in resolving several issues that we are now dealing with.

The next picture is a technician measuring moisture in the heater alcove in the thermo-mechanical alcove. Again, this is a measurement to get a level of water content in the rock prior to heater tests. We will be looking at the influence on the heater test on the moisture content and moisture travel.

And the last photograph shows technicians measuring the dimensions of the opening near the entrance to the heater alcove to check mechanical stability. The thermal effects on rock stability are another important

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aspect of the heater tests.

Now, that concludes the graphics and I will summarize very briefly my statement that you have had.

When I spoke with you in January, the program was in transition. Now, during the past seven months, we have revised the program approach both to manage our 1996 funding reduction and to develop a new long-term plan which has been presented in the Administration's fiscal year '97 budget request.

The results of the effort are described in a revised program plan which we released in June. We have retained the objective that we adopted in 1995 to reach early convergence on the major scientific and engineering aspects of the investigation of the Yucca Mountain site. Since January, we have also been able to regain target dates for a formal site recommendation and for submitting a license application to the Commission.

Our ability to achieve these targets, of course, will continue to depend on funding in the future and upon the adoption of a more focused approach to evaluating site suitability. Our approach will be described in proposed revision to our own siting guidelines that we will issue shortly. It relies upon overall system performance as the basic test of evaluating a site.

Simply stated, a site can't be judged to be

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suitable in the abstract. The only logical measure of the suitability of the Yucca Mountain site is that it be able to host a repository design that will meet the applicable standards to protect public health and safety. Attributes of the site that significantly influence that capability are, of course, important. Attributes that do not are irrelevant.

The important attributes can only be identified and evaluated within the context of an assessment of the performance of a proposed, engineered repository in the specific geologic setting as we now understand that setting, based upon scientific investigations that have extended for over a decade.

Our revised program plan also includes non-site specific activities that will address the long lead time requirements of interim storage and spent fuel transportation. These activities are consistent with the Administration's position on interim storage and the pending legislation.

Despite the severity of the fiscal year 1996 budget constraints, we have made substantial progress in the project since I met with you in January. At Yucca Mountain, as the pictures have shown, we completed excavation of the main drift well ahead of schedule and the tunnel boring machine is now proceeding up the south ramp.

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Funding constraints have reduced the progress from time to time by reducing overtime on the shifts and things like that but we have been able to maintain much of our optimum progress on the tunneling. We expect to daylight the tunnel machine at the south portal early in 1997.

We have completed initial construction of thermal testing alcove, began the small-scale heater test last week. Initial construction of the first two alcoves that will provide access to the Ghost Dance Fault also was completed last week and we will begin the second alcove in October.

Several months ago, we reported to the Commission the observation of a zone of more highly fractured rock in the south part of the main tunnel. Preliminary information indicates that the zone of fracturing does not penetrate the overlying rock units. Although the existence of the

fracture zone was not apparent from surface-based studies, a zone such as this is not unexpected given the geologic history and characteristics of this site. Studies of this zone as potential significance to repository performance are continuing.

Isotopes are being used to date fracture fill materials and pore water samples collected in the exploratory study facility and from surface bore holes. The data indicate that most of the water currently distributed in the rock at the potential repository horizon is very old,

on the order of tens of thousands to hundreds of thousands of years.

In April, however, we reported detecting elevated levels of chlorine 36 in some rock samples collected from the exploratory studies facility. These concentrations are sufficiently above the background level for this isotope to indicate that small amounts of water containing elevated levels of chlorine 36 presumably generated by nuclear weapons tests in the Pacific has traveled from the surface in less than 50 years to the repository level, possibly along preferential pathways. Additional samples are being collected as the tunnel progresses and analyzed to confirm the results and to provide information on new areas of the tunnel. Additional studies will be performed to validate and evaluate the significance of these data to repository performance.

In January, I noted that we are making progress refining our waste containment and waste isolation strategy for the site and that we were within a few months of providing a draft to the Commission. Although a condensed version of the strategy was included in the revised program plan, we have not yet completed the strategy in detail. The continuing effort to arrive at that completion is, of course, serving its primary purposes by requiring integration of the work being done and the remaining work

needing to be done. I expect that a detailed version of the strategy will be completed in fiscal year 1997, hopefully early in '97.

In March, we published a report on the current level of detail for the repository waste package advanced conceptual design. This report gives us a new reference design that will serve as the benchmark for development of a repository designed to support our viability assessment in 1998.

In January, I informed you of our decision not to proceed with the certification of a multipurpose canister system for storage, transportation, disposal and commercial spent nuclear fuel. The Administration's fiscal year 1997 budget request does not include funding for this system and we do not intend to pursue its development beyond the completion of current activities.

As you know, the congressional appropriation action for '97 is not yet complete. The House has approved an appropriation bill that, with certain contingencies, would provide 382 million for the program. The Senate-passed bill provides the full 400 million that we requested.

Our revised program plan is based on an increased technical understanding of the repository for more than a decade of scientific and engineering work done at the mountain. Our site investigations and total system

performance assessments have allowed us to reach much better informed judgments regarding specific aspects of the site than are significant to performance. These judgments have enabled us to reduce the work required to support regulatory decisions and thereby to accommodate a substantial reduction in future funding while retaining our target dates for major actions with minimal slippage.

The revised plan defines three objectives that will maintain the momentum toward a national decision on

geologic disposal. First, we will update a regulatory framework in 1997 for evaluating the suitability of the Yucca Mountain site. That is our regulations. Second, we will complete the viability assessment in 1998 and, third, we will recommend a repository site to the President in 2001 if the site is suitable, and submit a license application to the Commission in 2002.

Consistent with this program plan and supported by our increased understanding of the site, we have decided to revise our siting guidelines. Guidelines will be revised

through a public rulemaking process initiated by a notice of proposed rulemaking later this year. Our goal is to publish a final rule in 1997.

As was done during the 1984 promulgation of the siting guidelines, we will obtain the Commission's concurrence with the revised guidelines and we will work

with your staff to facilitate that action.

Our near-term activities are focused on addressing the major unresolved technical questions associated with overall performance of the repository so that, by 1998, we can make an assessment of viability of licensing and constructing one. The viability assessment will include four components, a package of more specific design work on the critical elements of the repository concept and the waste package.

Second, a total system performance assessment based on that design concept and upon the scientific data and analysis that will be available to us by 1998, which is substantial. That performance assessment will describe the probable behavior of the repository in the Yucca Mountain site geologic setting.

Third will be an upgraded estimate of the cost to construct and operate the repository in accordance, again, with that design concept.

And, fourth, a plan and cost estimate for remaining work required to complete a license application.

Based upon these components, the program can make a measurably improved appraisal of the prospects for geologic disposal at the site. The Administration has stated its position that this appraisal should be available to inform any decision concerning the site for federal --

the use of the site for a federal interim storage facility for commercial spent fuel.

Pending legislation in both the legislation on interim storage and the appropriation bills also recognize the assessment as a significant benchmark in the program. The work completed for the viability assessment will be an integral step to reaching our central goal of submitting a successful license application to the Commission.

From our perspective, the near-term interactions with your staff should be concerned with reaching a common understanding regarding the issues that are significant to overall performance of the repository. Additionally, we hope to reach agreement on the adequacy of our methodologies and approaches to address important technical issues such as criticality control and seismic design. The goal is to reach a mutual understanding of the developing repository concept that will provide a basis for the Commission's preliminary comments on the sufficiency of our site characterization analysis and design for inclusion in a license application.

This is a departure from previous efforts to progressively address individual issues related to specific site characteristics in relative isolation from one another or from a specific design concept. In my view, the lack of a conceptual frame of reference for discussing repository

performance has been a source of discomfort in our interactions with the Commission and even in these briefings.

It seems to me that the sufficiency of site characterization and analysis generally can only be determined in relation to a coherent repository concept. Therefore, we will concentrate first on developing the overall concept for the repository system which I think we are now knowledgeable enough to do and perhaps were not several years ago and on communicating our progress to your staff rather than our reaching agreement regarding sufficiency and data analysis on isolated issues.

Although we were unable to proceed with work on the licensing support system in fiscal year '96, our revised program plan includes a budget and a schedule for system development. We will begin again in fiscal '97.

Certification of licensing support system is required six months before a license application is submitted. Our current plans will allow us to have a computer-based licensing support system in place and available for certification in time to support our new target dates.

Aside from the Yucca Mountain project, any future scenario of interim storage or ultimate disposal will

require a national transportation effort. We have developed
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a revised strategy that will enable us to acquire the capability to accept, store and transport spent nuclear fuel as rapidly and efficiently as possible when a federal storage or disposal facility is designated.

We would contract with private industry to provide equipment and services for delivering spent fuel to a federal facility. The strategy is in accordance with the Administration's objectives for re-engineering government and greater privatization.

In July, we met with the interested parties to discuss these plans and to receive comments to assist in shaping the concept. We are also currently developing a topical safety analysis report based on a non-site specific design for the first phase of a phased interim storage facility of the type that is contemplated in congressional discussions.

That facility would receive spent fuel in transportable storage casks or canisters. We expect to submit this topical report in fiscal year 1997 to the Commission. We believe that the staff's acceptance of the report would reduce the time required and the complexity required for a license application and time for staff review of a site-specific design when that becomes possible.

Over the past seven months, both of our organizations have been reacting to changes that are
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directed in the high-level waste program both by congressional edict, Administration policy and budget constraints. During this period, in spite of funding constraints on the scope of both our activities, I believe the staff interactions have continued to become better focused and more useful.

For example, a recent meeting on performance assessments completed by the staff was constructive dialogue that will improve both our understandings of subsequent performance assessment work. Our interactions on the methodology for evaluating seismic hazards has brought us much closer to agreement on the associated issues.

I hope that we can continue to build on this progress as we implement our new approach. I thank you for the opportunity to brief the Commission and I am happy to answer any questions that you might have.

CHAIRMAN JACKSON: Thank you, Dr. Dreyfus.

I will start. I will ask one or two questions and then I will come back.

I note that the first key objective in your revised program plan is to update the siting guidelines in 10 CFR Part 960 with Commission concurrence. Now, if you in fact plan to issue this in 1997, how are you accounting for EPA's schedule on establishing a site-specific radiological protection standard?
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DR. DREYFUS: I don't think that we necessarily have to have that standard in order to have the siting guidelines. The siting guidelines do, of course, contemplate that the measure of success is the ability to meet the standard but the standard doesn't have to be in the guidelines. So I think we are not time-dependent on EPA to do this.

CHAIRMAN JACKSON: How much time are you, in fact, planning for NRC review of the amended siting guidelines before Commission concurrence?

DR. DREYFUS: We have had some interactions with your staff on that and we have looked back at what happened the last time and we do have, of course, a contemplated schedule but we are obviously not in control. Let me see if it is going to be quicker for me to find the schedule or ask for assistance.

Six to eight months that we had allotted in our -- and I have it here -- came out about even. So we are looking at about six to eight months.

Of course, this took considerably longer the last time but that was with a brand new act and a complete new concept and I think this is a revision.

CHAIRMAN JACKSON: How large a scope do these proposed revisions have?

DR. DREYFUS: This is a very concise document. It
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has great significance but not much volume. It is a much simpler approach than the previous one.

CHAIRMAN JACKSON: Okay, and let me ask one last

question. You have noted that a phased peer review of the assessment, of the performance assessment results will be initiated later this year. Have you decided who will, in fact, conduct that peer review and what's going to be its role in 1996 and early '97 before, in fact, the results of the total system performance assessment are determined?

DR. DREYFUS: Well, the object of beginning early is to get a review group familiar with the process and the assessment that we have already done so that we can, in fact, have relatively rapid turnaround when we have the actual numbers. That's why we are starting early.

Do you want to comment on that?

MR. BARRETT: I suggest that Dr. Brocoum would be better.

DR. DREYFUS: Dr. Brocoum, who is our regulatory assistant manager and is directly involved can tell you about the status and planning.

DR. BROCOUM: The peer review will go on for several years, starting with the review of the 1995 TSBA and then the review of all the steps we go through for the other one. The exact composition of the peer review panel has not been determined. It will probably be either contracted

either by a technical support contractor if we have one in place or the MNOs but we have that -- we're still working on that so --

CHAIRMAN JACKSON: Okay.

Commissioner Rogers?

COMMISSIONER ROGERS: Well, just on this same general part of your presentation.

Can you just give me a little bit of a feeling of how the performance conformation program is going to relate to the performance assessment program starting and finishing? I know the performance conformation program will go out very long in time to all the way out to closure of the facility, presumably.

But when does it start and how does it relate to the performance assessment program? Is there an iterative process there that involves performance assessment, performance confirmation and then back to performance assessment again?

DR. DREYFUS: I think the performance assessment will be an iterative process that doesn't stop. And, of course, the way that the regulations are set up, and with the built-in provision for extended retrievability, we are going to be gathering data. The construction of this repository contemplates something like 100 miles of tunnel which, obviously, is an immense amount of information

underground that we don't now have which will either confirm or modify our understanding as we go. So we are looking at a learning process.

Now, it is incumbent upon us to make the safety case up front based on performance assessments associated with the data available at the time of license application. But the performance assessment process will continue to be used to deal with incoming information, I would imagine all the way through closure if not beyond.

COMMISSIONER ROGERS: It is the performance confirmation program that I don't understand enough about. That's -- I mean performance assessment program I understand. The performance confirmation program is the one I am really asking about.

DR. DREYFUS: Well, shall we ask Dr. Brocoum to come back and talk about that one? Because the metaphysics of that are basically in his area of expertise.

COMMISSIONER ROGERS: That's what I am having trouble with.

DR. BROCOUM: This year, we are conducting or completing a systems analysis on performance confirmation that focuses, from the engineering side of the house so the design that Dr. Dreyfus talked about can go on.

Next year, we will continue the performance confirmations that will focus more on the site so there is a

systems engineering study looking at all aspects of performance confirmation, both the engineering side and the scientific side. And we expect performance confirmation to start, individual performance confirmation tests to start about 1998, that time frame.

COMMISSIONER ROGERS: Not before 1998?

DR. BROCOUM: About. Probably not before, yes.

COMMISSIONER ROGERS: All right.

How would you characterize the difference between performance assessment and performance confirmation?

DR. BROCOUM: To do a performance assessment, you develop -- the scientists collect data, you develop models, what they call process models that model a particular aspect, for example hydrology or saturation zone. Then you take and you abstract those models to use in performance assessment, then you run the performance assessment, so it's all steps.

The performance confirmation, you focus on those process models and the data that went into them to make sure that if you collect -- that the bounds you put on the various parameters that feed those process models are, in fact, what you thought they were. So, you know, you collect more information. Maybe as you construct the repository, you know, you take more tests and samples and so on.

COMMISSIONER ROGERS: It doesn't seem to be a

really bright line that separates these processes; it is just that one confirmation tends to focus more on questions that reducing uncertainty bands and things of this sort, is that --

DR. BROCOUM: That's correct. I would say, in general, the performance confirmation focuses on the models that input into the performance assessments.

COMMISSIONER ROGERS: I know my fellow commissioners have probably got a lot of questions too, so I will try not to ask all my questions but, first, I wanted to say that your new approach that takes a total system approach is something I think we have all been looking for for a long time and I think it is a major step forward in our ability to deal with you in totality, which is really the thing that I think our staff and I think the Commission has been asking for for some time and I think this is very good to see the new direction in which you are going.

I will tell you, though, I do have a concern and that is that in your written statement starting on page 10, the bottom of page 10, going on to page 11, just what the implications of the sentence on page 11 that says, "It is appropriate for us to complete the technical work, develop a concept and satisfy ourselves of its ability to adequately protect public health and safety before we seek approval from outside parties."

Approval is one thing but what about dialogue? Do you -- it seems to me that that is really important, that you have the benefit of dialogue with outside parties and, presumably, we are an outside party from your point of view. I wonder if you could just indicate to what extent you do intend to continue dialogue with NRC staff on issues even though it is important for you to get your whole act together? I mean, that is what you are saying you want to do here.

DR. DREYFUS: Well, we, of course, I think probably the best evidence of that is in practice. We are doing it. We certainly don't intend to stop.

I think the focus of attention, the notion of what is on the agenda of management meetings and that sort of thing, may change to some extent but the intensity of the interaction should continue and in fact increase and in my judgment, from what I hear back from the staff interactions, the quality is improving and has improved immensely, in the sense of being on point and on what is important.

I don't foresee any less interaction in any respect but as I say, rather a chance in emphasis in the agendas. We have, of course, Technical Review Board which is always with us and which we meet with regularly and days at a time and on every aspect of the program and they pretty much make their own agenda so we are not the arbiters of

what will be talked about in any of these interactions.

What we hope to do is get the thought process channeled into the concept which provides a frame of reference. For example, your staff and contractors to do independent analysis. It has hard to do independent analysis if you don't know what of. That, I think, is the difference.

We, ourselves, I think, can no longer be in the position of at this stage in this program and considering the history of having every option remaining open and no focus, no ability to tell people what the proposal looks like.

CHAIRMAN JACKSON: I think we are going to have to

go on to Commissioner Dicus but if Commissioner Rogers will allow me, I had a slight follow-on to his question and that is, a lot it seems to rest with what you are calling your conceptual frame of reference.

On the one hand, you said that you will define a repository concept. This is on page 10, that includes a facility and waste package design consistent with the characteristics of the Yucca Mountain site. And then on page 11 you go on to say that you want a coherent repository concept that includes both a design and an assessment of its performance and that you will concentrate first on developing the overall concept for the repository system

rather than on reaching agreement regarding the sufficiency of our data and analyses to address isolated issues related to specific site characteristics in advance of a concept. But you have said that the concept has to do with design related to the characteristics of the site but then you're saying you don't want to be spending your time reaching agreement on what you would call isolated issues related to specific site characteristics in advance of such a concept.

Can you kind of put those together for me?

DR. DREYFUS: Yes.

Basically, the way this program has proceeded is in the beginning of the program when there was -- there was still a question of winnowing out sites, looking at many sites and comparative analysis among the sites, those who were involved at the time, and without a lot of data on any of the sites, sort of meditated over what would be an important consideration and came up with some notion of how one would evaluate a site, largely in order to see if it was a better prospect than another site.

We have now, for some time, had only one site and that site is not a very typical one. It is a dry site, which is a unique site, globally. So a lot of the generic stuff, thought process is irrelevant or certainly not appropriate directly to Yucca Mountain.

Where we are now is we have -- this is a perfectly

adequate scientific approach. We went out and collected a lot of data without very much focus because it was a question of what do you think about this site. Then it's a question of what are my systematic beliefs about this site, we've got hydrology, with regard to seismic, with regard -- now you have a conceptual notion of the site.

Somewhere along the way, you have to bring this thing together and say, here is how I would build a repository in this setting and then you say, oh, now I know this is very important and maybe it's something that is on that original checklist and maybe it's not and maybe something on that original checklist turns out to be pretty irrelevant to what you intend to do.

I think we are at the point where we have to get much more specific about what we intend to do. We have to know that the technologies we are postulating in these performance assessments can, in fact, be acquired. A specification for a waste package has to be related to I can build it and I can afford it, not just if there were, you know, assume a can opener kind of stuff.

So that's what we are talking about, getting from that first stage into the second stage and here is something we know how to build for which technologies exist. Let's see what the important considerations are for making that thing work as opposed to, here are some considerations that

might be important and let's study them all until we are conclusively sure we understand them.

CHAIRMAN JACKSON: Thank you.

I think, if I may, just for the record, I am happy that you are in fact focusing this way and I would just note that even long before I came to the Commission the Commission's perspective has been that there really needed to be a focus on waste isolation strategy including things like engineered barriers, what your thermal loading strategy is, things that would really focus you on a repository design that would then be referenced to the specific site. If that is where you are going, then I applaud you.

Commissioner Dicus?

COMMISSIONER DICUS: Thank you.

I have a couple of questions to begin with that address the elevated levels of chlorine 36. The first part, and maybe it's one question with two parts, but how do preferential flow paths affect the waste isolation and then

what could be done to mitigate their effects?

And then I guess the second part of the question is, could something like this become a show stopper?

DR. DREYFUS: Well, in the first instance, the -- there have -- first of all, what we -- we were looking for this so it was not something totally unexpected. When we took these samples specifically to look for evidence of

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preferential flow paths or rapid movement of water in the mountain, so that is not an unexpected situation.

It is -- the samples we got are actually deposition in fractures, they are not water, though they indicate relatively small amounts of water. We do not yet know precisely what the path was that got them there, whether it is a direct surface flow or some sort of flow through the upper layers that collects but, in any event, we have put that in perspective.

It need not be a critical problem but it could be, because we are in fact assuming that the waste isolation strategy expects there will not be a great deal of water or moisture to deal with here, as an ambient condition in the repository or as a path for radionuclides to get out and get into the accessible environment. So we are planning for a dry site.

How dry is dry? To what extent this is a pervasive situation throughout the entire area, these we don't have answers to yet. It is that kind of a situation. So I don't -- I think at the moment it is a data point and it is something that has to be accommodated first in the performance models that they in fact do reflect that kind of flow. They have expected there would be heterogeneous flow, not just matrix flow. We can accommodate that in the models but we have to be able to accommodate it in a way that

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conforms to what we find. And then see if that gives a design problem.

COMMISSIONER DICUS: Another question a little bit along these same lines.

You found the fractured zone, you said that was not unexpected, which leads you to believe that you expect to find more of these zones and how could this influence the repository?

DR. DREYFUS: Well, there are many different aspects. One of the things that we found out with the tunnel, which is something that you don't find out with surface boring, is that we can build a tunnel in Yucca Mountain. We have struggled with -- the tunnel is proven to have a fair amount of heterogeneity in it and some different rock conditions. We have wrestled with those rock conditions and I would say that the progress we made with the tunnel machine indicates we learned to work with them.

They are not easy conditions and yet we have managed them and we are getting more sophisticated even now with dealing with different kinds of support techniques. So we have learned to deal with it and a whole lot more about what the costs of repository construction would be.

So, as a structural matter, I think we can deal with it. We learned that this particular situation is something one -- given, you know, the volcanic

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circumstances, one might expect it but I would rather not have found it. On the other hand, on the other end of the tunnel, we found better conditions than we might have expected so you get some good breaks and some bad breaks.

Basically, as I said before, I have said that I have better confidence now than I had before the tunnel began. Now we've found some things that are problematic and have to be dealt with, but there are a whole lot of things that we didn't find that might have been down there and reliance on very widely spaced drilling and seismic work without underground references and that sort of thing is pretty iffy.

So I think the tunnel has given us hands-on knowledge of the thing and I don't think we have yet found anything we can't work with.

COMMISSIONER DICUS: Just one follow up and then we will pass, maybe, and then come back.

Given what you said about the importance of the tunnel work, as you know, the Nuclear Waste Technical Review Board briefed us I think it was toward the end of July and they are very supportive, very positive about the program. They also brought up a few things where they had some concerns and one of them was this east/west exploratory

route west of the Ghost Dance Fault that the board tends to think is important and I am not sure the program has

addressed.

Would you elaborate on that?

DR. DREYFUS: Well, simply put, I think that is a decision that is not yet ripe. We have, in fact, budgeted and anticipated additional underground exploration if it is needed. I am not prepared to agree yet that it's needed and I certainly am not prepared to buy into a specific drift design before I see the Ghost Dance Fault.

When we get the information that we will get out of the Ghost Dance Fault alcoves and out of the remaining ramp of the tunnel and have had the time to think about it, it may well be that we feel we have to do some exploration but I don't know where and I don't know how much and I don't have the input data upon which that decision should be based.

So I am not disagreeing with the board. I am just simply not as sure as they seem to be exactly what ought to be done.

COMMISSIONER DICUS: Thank you.

CHAIRMAN JACKSON: This is actually a follow on.

There were five locations, I think you said, where the chlorine 36 was above background. Were they spread through the ESF, the Exploratory Studies Facility, or were they concentrated in a particular area?

DR. DREYFUS: The sampling approach was to take a

sample every 200 meters and a sample where there were features that were inclined to make you take a sample, discernable fractures, for example.

We, in fact, found elevated chlorine 36 entirely in samples associated with features, none was found in the random or in the systematic, rather, sampling along the tunnel. So the presumption is they are associated with fractures.

CHAIRMAN JACKSON: I understand that but were they still concentrated in a particular area or was it spread out wherever?

DR. DREYFUS: Oh, along the entire tunnel? Well, let's see. I've got a diagram here that starts at the Bow Ridge Fault and goes to the Sundance.

MR. BARRETT: There are two types of sampling. One was the periodic, okay, and then they also went to look for any features where there might have been water at one time, so where there was a precipitant in a crack. So they also sampled in those places. Those were the places where they found the elevated chlorine.

DR. DREYFUS: There was an elevated sample at the Bow Ridge, so it is very close to the --

MR. BARRETT: Those were the ones, like the Bow Ridge Fault was the first one and they had elevated at the Bow Ridge Fault, as expected, very near to the surface.

Then also at the drill hole wash area at the corner, they also found it there as basically expected. The Sundance, they also found it as expected. Then there were two other locations that were not so discernable from any surface work as to what that would be, but there were fractures at that horizon where you could see precipitant.

Now, exactly where the water on those two came from, and there were only two initial samples that showed elevated chlorine 36 back in the original report back in the springtime, so that is what we are exploring.

DR. DREYFUS: They seemed to be pretty much along the entire length of this tunnel and we are not done yet because we haven't finished the sample analysis for --

CHAIRMAN JACKSON: Are you doing isotopic analysis for other radionuclides?

DR. DREYFUS: Yes, we are, but we don't have the confirmatory data, yet.

CHAIRMAN JACKSON: You don't have that.

Commissioner Diaz?

COMMISSIONER DIAZ: I have no comments or questions.

CHAIRMAN JACKSON: Commissioner McGaffigan?

COMMISSIONER McGAFFIGAN: In your testimony on page 5 and orally, you talked about the House appropriations bill and its contingencies and its funding cut. Could you

talk about what the implications of the $18 million cut in your budget for any of the work you need to do is, and the

contingencies, I expect, may have a larger effect on your program and what the implication of those contingencies would be for you?

DR. DREYFUS: Well, the $18 million cut is probably the easy one to work with. Eleven of that is associated with funding of the states and counties. The House Appropriation Committee directed that we not do that funding in the statutory language and then remove the 11 million, so that part is a wash in the sense that if I -- it was passthrough funding. So the net cut in program, if you take the House bill as is, is 7 million.

We were directed to take that out of cooperative agreements and program management. Cooperative agreements have been cut by about two-thirds last year so it is going to be very difficult to find much of it there; there isn't much there anyway. So it's a program management problem.

I am not pleased with it, by any stretch of the imagination, because we did some very severe cutting. We took a 40 percent cut in '96 and there is not a lot of fat left in anything so I think it is not -- it is not a good thing but I don't think it would affect major aspects of the programmatic stuff. It might make it difficult for me to manage a program.

The contingency is, I hope, associated with ongoing congressional action on the other bill and will be resolved. I would imagine by the time that appropriation bill becomes finalized, it will be clear what's going on in the other legislation and that the Committee will, I trust, in their judgment and wisdom, will not pursue that contingency if the other bill is clearly dead.

CHAIRMAN JACKSON: Actually, I am not going to -- I am going to come back to you in a second but this brings up an issue that relates to that.

The Commission is going to be appearing tomorrow before our House Oversight Committee and high-level waste funding is an issue that I may address. So how is DOE preparing to respond to any new direction from the Congress on the high-level waste issue? You alluded to some of it in your testimony and how will that response impact NRC, if you are willing to offer such an opinion?

DR. DREYFUS: Well, of course, should there be an interim storage bill, the world changes considerably and we'll all be looking to see what priorities are and how to deal with it. The program plan that we have on the street has in it an ability to address something like the large authorization bills but it anticipates in accordance with the Administration's position that that doesn't happen until 1999.

On the other hand, that lays out a framework for how we would propose to deal with such matters as licensing an interim storage facility or doing transportation but we assume the starting gun in 1999, as the President has proposed.

With regard to Yucca Mountain, the large bill changes some aspects of the process but no aspects of the program and in fact designates the program plan as the basis for going forward.

The appropriation bills both cite the new program plan and essentially lock in a viability assessment as one aspect of Congressional expectation, which I think is consistent with the Congressional attitude that they want some more concrete evidence of viability earlier, so I think everything that is going on in the Congress consistent with the program plan that we now have, with the exception of the time element on interim storage which the President of course has opposed any immediate steps on interim storage.

Appropriation-wise, of course, the major question is the contingency. If the contingency were to greatly restrict the available funds for the program, then I think we have serious problems and we have made the Congress aware of that and so has the OMB and I am sure that you share our concern.

CHAIRMAN JACKSON: Commissioner McGaffigan?

COMMISSIONER McGAFFIGAN: No other questions. Thank you. I discovered the problem of asking questions last.

[Laughter.]

CHAIRMAN JACKSON: Has DOE formulated a position on how it will implement the Court of Appeals ruling in July about DOE's obligation to start taking utilities' spent fuel

no later than January 31st of '98?

DR. DREYFUS: No, we have not.

Of course, the immediate question is one of appeal and the lawyers in both Justice and DOE are looking at the implications of the court decision, but we have not.

CHAIRMAN JACKSON: Commissioner Rogers?

COMMISSIONER ROGERS: Just one question on the interim storage facility area.

You are intending to contract with private industry to provide equipment and services for delivering spent fuel to an interim storage facility or a repository.

What is your view of any licensing issues that might have to be dealt with? Are you going to leave those all up to private contractors or have you thought about that at all? There might be some. I don't know exactly what they might be at this point, but if you are taking this approach, are you just simply going to say, well, come to us all licensed and offer us your services? Is that what your

approach would be to the private contractors?

DR. DREYFUS: Well, I want to be sure that we separate the notion of an interim storage facility from the notion of transportation.

COMMISSIONER ROGERS: No, I understand.

DR. DREYFUS: The market approach is to essentially go and get the waste from the reactors and move it to a Federal facility. We would rely upon the contract, that is, select technologies, to do that. Those technologies clearly have got to have the Commission certification so their range of selection is pretty much what you'd certified.

There will, I think, if this process goes forward, be immense amounts of marketplace interest and probably a desire to certify a good deal more technology over a very short period of time, but our intention is to leave the selection of technologies to the marketplace based on specifications for what can be handled at the facility.

The contractor would indeed be seeking certified technologies. I don't know of another licensing situation. Our only involvement at the technology level will be to pursue burn-up credit, which we will require in line with the repository and we are of course actively engaged with you on burn-up credit for actinides right now and we intend to stay in that game. It would have some advantage to

equipment manufacturers but we are pursuing it for our own purposes.

CHAIRMAN JACKSON: Commissioner Dicus?

COMMISSIONER DICUS: The licensing support system is very important to you and to us if you are going to, if the site is found suitable and a license application is submitted at the proposed date. I was sort of wondering if you feel pretty comfortable that the development and completion of your licensing support system would proceed on schedule according to this revised program plan that you have.

DR. DREYFUS: Well, I understand that it has to proceed on schedule in order to have a viable licensing process. When we got the budget cut in '96 and when I was here in January, we didn't know if we were going to have a license application target in this program and we didn't have at that time and it was only after the Administration's new program went forward that we regained it, so we didn't do anything in '96.

But on the other hand, the thought process did not stop in any place. I think that the breather may have advanced the cause because I believe that we have had technology advantages coming out of that year of delay and looking now on somewhat less elegant architecture and more reliance on some things like Internet and that sort of

thing, so I think when we reconvene the user groups and start doing this we may find we have gained some ground and not really lost a year in terms of thinking about this process.

We also are working on the corollary considerations of decision documentation. We have a study ongoing at Yucca Mountain of the existing documentation to look for, those areas where it may be deficient, and to improve the process, so we haven't stopped on that front.

Basically, I think we will find that we can do this easier and better now.

COMMISSIONER DICUS: Okay. The total system

performance assessment in your testimony said evaluations would be made under both normal conditions and conditions likely to be imposed by potential disruptive events.

What are some of those events that you have in mind?

DR. DREYFUS: The logical ones -- volcanic and seismic --

DR. BROCOUM: Those are the two --

DR. DREYFUS: -- basically are the biggest ones.

COMMISSIONER DICUS: So you are including the possibility of volcanoes?

DR. DREYFUS: Oh, yes.

COMMISSIONER DICUS: That was under discussion I

think at one point, that it wasn't being considered.

DR. DREYFUS: Oh, it is being considered. It is -- there's been some considerable discourse as to how to consider it, but never whether it would be considered.

COMMISSIONER DICUS: And one final question has to do with the transportation system. This is just for my own -- it's been awhile since I dealt with it, but at one point in time I believe it said that rail cars would generally be used for the transport of the casks. Is that --

DR. DREYFUS: Predominantly.

COMMISSIONER DICUS: Predominantly, rail cars, and there was some issue that the rail systems would be able to handle the weight of these cars.

Has that been resolved and gone away or was that a real concern in the first place?

DR. DREYFUS: I don't think it is a concern, but I have an expert here with me.

DR. BROCOUM: We don't believe it is a major concern. We're working with the American Association of Railroads on the approval of the cars and the number of axles. At one time the smaller casks were -- I think it was 240,000 pounds. It was free interchange for standard rail cars. There are other standard for heavier rail cars and that is what we are looking at for the casks that we would

probably be looking at now. At least the MPC was.

It is likely that most of the current technologies would be that weight, the 125 ton weight, which is very common. For example, the casks at Surry and in Palisades and all of those are in that weight range.

CHAIRMAN JACKSON: Commissioner Diaz?

COMMISSIONER DIAZ: I will save all my questions till the next time.

CHAIRMAN JACKSON: Commissioner McGaffigan?

COMMISSIONER McGAFFIGAN: I just have one comment on one other event that occurred that may help you in the licensing support system is in early '96, as part of the '96 Authorization Act for the National Defense, there was a significant change made in how the Government can purchase information systems.

Senator Cohen was the lead on that and I would encourage you to use the full flexibility of that law and use the DOE -- you know, get help from the DOE procurement people because it's one area where obviously the Government hasn't performed very well in the past across Government and there is an opportunity now and I think Congress, speaking in my old life, really intended to give you some flexibility, the whole Government, but you in particular some flexibility to go out and be more rational purchasers, so I wish you luck.

DR. DREYFUS: We're using whatever flexibility we can get.

COMMISSIONER McGAFFIGAN: Right.

CHAIRMAN JACKSON: Actually, a related question, you in fact stated that you would welcome changes, you know, with respect to the licensing support system that would take advantage of advances in computer technology and connectivity.

I mean do you have any particular ones in mind that you might wish to share?

I mean it's kind of related to Commissioner McGaffigan's question.

Do you have any specific recommendations for the Commission?

DR. DREYFUS: Well, I'm hesitant to get out of my depth on computer technology.

CHAIRMAN JACKSON: Does anyone have any specific

recommendations they wanted to make to the Commission in this regard?

DR. BROCOUM: I think a year or two ago we were thinking of, you know, developing, actually developing the system, writing the programs.

Now I think we are thinking of more off-the-shelf. As technologies advance a lot of things are available off-the-shelf so you don't have to reinvent the wheel so I think

the direction we would like to go in is use what is coming out in the Internet and all of these areas as opposed to contracting to develop a whole new system from scratch that is unique.

CHAIRMAN JACKSON: I wanted to ask you one last question having to do with your overall repository concept.

It is not a question. It's actually a comment.

I think we understand where you are trying to go, but I think it's important as you progress in the manner that you have outlined here that you do interact with the Staff in a way that we don't end up in a position in the future where there may be agreement on approaches, methodologies, and overall issues, but we are left with a hole relative to the sufficiency of data and the analyses of that data, you know, particularly as it does relate to total system performance, because in the end we don't want to be having you work along the line and we're doing our thing and we have a major issue where one has to end up backtracking in order to license repositories.

So I am just asking you to keep that in mind and we are also asking our Staff to keep that in mind.

Unless there are any further questions or comments, I would like to thank you very much, Dr. Dreyfus, Dr. Brocoum, Mr. Barrett for this briefing on a very important topic, not just for you and for us but obviously

for the nation, and as you know, we are briefed regularly by our Staff as well as other organizations involved in the high-level waste area, but hearing directly from you, the DOE, on a routine basis is helpful to the Commission in determining the status of your efforts and the direction of the high level waste program and particularly as it relates to what we have to do, and so I want to thank you for your continued willingness to come and do this.

In your prepared statement and in today's briefing, as we have been discussing, you have described a revised program approach for the high level waste repository and as I emphasized in January, it is important that we continue, and I think this discussion is part of that, to maintain clear communications between DOE and the NRC both at the level of Commission briefings but especially in the staff-to-staff interactions so that both organizations can appropriately manage our high level waste resources, which have various constraints attached.

Your statement in fact shows that DOE is addressing a host of very difficult issues regarding our high level waste management that span from chlorine concentrations to transportation issues to court decisions, and all of this is being done in an environment of reduced budget appropriations -- but your draft revised program plan is evidence that even with the reduced funding levels, DOE

is planning to move forward toward a national solution for the disposal of high level waste.

So again I thank you very much for an informative briefing, look forward to our next one, and unless my fellow Commissioners have anything to add, we are adjourned.

[Whereupon, at 10:43 a.m., the briefing was adjourned.]