

**UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION**

Title: BRIEFING BY DOE ON STATUS OF CIVILIAN
HIGH LEVEL WASTE PROGRAM

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BRIEFING BY DOE ON STATUS OF CIVILIAN
HIGH LEVEL WASTE PROGRAM

PUBLIC MEETING

Nuclear Regulatory Commission
One White Flint North
Rockville, Maryland

Wednesday, December 20, 1989

The Commission met in open session, pursuant to notice, at 2:00 p.m., Kenneth M. Carr, Chairman, presiding.

COMMISSIONERS PRESENT:

KENNETH M. CARR, Chairman of the Commission
THOMAS M. ROBERTS, Commissioner
KENNETH C. ROGERS, Commissioner
JAMES R. CURTISS, Commissioner
FORREST J. REMICK, Commissioner

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STAFF AND PRESENTERS SEATED AT THE COMMISSION TABLE:

SAMUEL J. CHILK, Secretary

WILLIAM C. PARLER, General Counsel

LEO DUFFY, Assistant to the Secretary for Coordination of DOE Environment and Waste Management; and Director, Office of Environmental Restoration and Waste Management, DOE

FRANK PETERS, Deputy Director, Office of Civilian Radioactive Waste Management, DOE

CARL GERTZ, Manager, Yucca Mountain Project Office, OCRWM

RALPH STEIN, Associate Director, Systems Integration and Regulations, OCRWM

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

2:15 p.m.

CHAIRMAN CARR: Good afternoon, ladies and gentlemen.

The purpose of today's meeting is to hear from the Department of Energy on the status of the Civilian High Level Waste Program. As directed by the U.S. Congress in the Nuclear Waste Policy Act, the Department of Energy has been conducting a program for siting the nation's first geologic repository for disposal of high level radioactive waste.

The Nuclear Regulatory Commission has been proceeding in parallel with its responsibilities for the licensing and regulation of this first of a kind facility.

The Commission last met with the Department of Energy on this subject in December of 1988. In the course of a year, many significant activities have occurred, including NRC's review and comment on the Site Characterization Plan for the Yucca Mountain site. Most recently, Secretary Watkins provided a report to the Congress on the reassessment of the Civilian Radioactive Waste Management Program.

The Commission is happy to have with us today Mr. Leo Duffy, Director of DOE's Office of

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1 Environmental Restoration and Waste Management.

2 That's your title?

3 MR. DUFFY: That's one of them.

4 CHAIRMAN CARR: And Mr. Frank Peters as
5 well, Deputy Director of the Office of Civilian
6 Radioactive Waste Management, to discuss the status of
7 the program.

8 Do any of my fellow Commissioners have any
9 introductory remarks?

10 If not, Mr. Duffy, please proceed.

11 MR. DUFFY: Thank you, Mr. Chairman. It was
12 the Secretary's desire to bring the NRC up to date on
13 what we've been doing at the Office of Civilian
14 Radioactive Waste Management during the last year. We
15 have some accomplishments, some new initiatives, some
16 recommendations. I believe that progress has been
17 made, even though we've had significant impairment on
18 our access to the site and we have had some
19 recommendations from committees on methodologies to
20 look at with regard to the exploratory shaft.

21 In the Secretary's review of the program in
22 the last five months, we've made five major
23 elemental -- what we feel are improvements. We
24 formalized the program starting with a bottoms up
25 analysis of the schedule. It is the Secretary's

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1 belief that this is the first time a true bottoms up
2 of the 5,000 elements associated with the schedule has
3 been made. The original 1998 program was identified
4 as part of the Nuclear Waste Policy Act. The 2003 was
5 based on a comparison with the 1998, but in our
6 evaluation, looking at the detailed design of the
7 facility, we did not have what we felt was a true
8 bottoms-up schedule evaluated and looked at from the
9 scientific characterization of the site.

10 We also looked at the present project
11 management operation and felt that a restructuring was
12 required. We got an outside consultant to look at the
13 total organization of the program. We looked at the
14 efficiency as we saw it in the present day on the
15 basis of changes in the exploratory shaft to surface
16 characterization as a priority.

17 The gaining access to the Yucca Mountain
18 site for a comprehensive, scientific investigation has
19 been delayed over the last 22 months. We felt on the
20 basis of this delay and on the basis of the additional
21 scientific investigation that we feel is necessary to
22 justify or disqualify this site, that the program or
23 programmatic schedule was too optimistic. We felt
24 that in order to achieve the requirements of the
25 Department of Energy to accept fuel in 1998, we had to

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1 decouple the MRS scheduling from the identification of
2 a site for the repository.

3 In looking at the methodology for
4 accomplishment, the Secretary felt that the decision
5 plan would give us a better accountability for
6 performance than we've had in the past.

7 So, these are the key elements that directed
8 our performance to develop the decision plan. We feel
9 that there are still major areas that have to be
10 resolved to move the program forward. The nomination
11 of the Director of the Office of Civilian Radioactive
12 Waste Management is a major area. The White House
13 will have to nominate this person after clearance. We
14 anticipate this will be done in the January time
15 period when Congress returns.

16 COMMISSIONER ROBERTS: But has the
17 nomination been announced?

18 MR. DUFFY: No, sir.

19 COMMISSIONER ROBERTS: Thank you.

20 MR. DUFFY: There has been some suggestions
21 in both Congress and in the press on a potential
22 candidate, but the nomination has not --

23 COMMISSIONER ROBERTS: I certainly don't
24 think either of those is any source of great accuracy.

25 MR. DUFFY: I wouldn't either, but I think

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1 that a lot of people have.

2 We felt that the organization structure
3 required a direct line reporting operation from the
4 Yucca Mountain project operation to the Director's
5 office in order to get direct line responsibility. We
6 are working on that aspect of it now and seeing what
7 organization changes have to be made.

8 We believe that we've made significant
9 progress in the application of the quality assurance
10 to the program. Seven of our eight contractors have
11 been audited and successfully completed. One has not.
12 There are two still major areas both in the Department
13 of Energy that have to be audited and that is
14 scheduled to be accomplished by July.

15 In addition to that, we felt that the
16 present methodology for technical cost and scheduled
17 base lines was not to the satisfaction of the
18 Secretary and a new methodology would be accomplished
19 within the April time frame. We will define the
20 criterion objectives against which the program
21 performance will be measured and progress can be
22 measured for both ourselves, yourself, the State of
23 Nevada and the utilities who are the recipients of
24 this program.

25 From the standpoint of the Secretary's

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1 review, we've also looked at a comprehensive
2 reevaluation for the overall program schedule, both
3 repository MRS and transportation. From a repository
4 license application standpoint, based on our opinion
5 of the amount of scientific information that's
6 required, the amount of what we feel is necessary peer
7 review to establish criteria, we did not feel that we
8 could satisfactorily apply for a license until October
9 of 2001, if we find a suitable site. I think that's a
10 key element of the Department's program, is to ensure
11 ourselves that we have scientifically demonstrated
12 there are no disqualifying characteristics for the
13 present identified site characterization.

14 The start of the repository operations would
15 then be revised to the 2010 time frame. Based on the
16 NRC's evaluation of on-site storage, we feel that this
17 does not affect the application of nuclear power to
18 the nation's energy needs. They're a safe capability
19 during that time period.

20 A revised schedule assumes a surface
21 disturbing scientific investigation to start in
22 January of 1991. That is dependent upon a Department
23 of Justice -- litigation between the Department of
24 Justice of the United States and the State of Nevada
25 on the basis of laws that have been passed in Nevada

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1 that are presently assumed by the State of Nevada to
2 allow them to prevent access to the site.

3 We have initiatives underway to evaluate --

4 CHAIRMAN CARR: Is that -- you said in San
5 Francisco they were going to give them 30 days. Has
6 that suit been filed yet?

7 MR. DUFFY: Not yet, sir. We have discussed
8 with the Department of Justice and they aren't ready
9 to pursue that. There's a discussion between the
10 General Counsel and the Department of Justice today.
11 That memorandum is being prepared and is on internal
12 review at the Department.

13 Initiatives are underway to evaluate
14 alternative strategies for improving a repository
15 schedule, but we think we're in the early stages of
16 the scientific investigation. We feel that this is
17 the first of a kind operation. Looking at the
18 international community, we look at a time table that
19 is compatible with what's been done in the other
20 countries who are using nuclear power as a source of
21 energy and we feel that the evaluation that we have
22 made is consistent with those programs.

23 The waste acceptance at MRS on a limited
24 basis we feel can be accomplished as early as January
25 1998, if we get a negotiator to negotiate the site

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1 independent of the Department of Energy. We feel
2 that's a very significant methodology. We believe
3 that on the basis of having a negotiator that will
4 take us out of the polarized situation between the
5 Department of Energy and the states, the negotiator
6 does not have any preconceived location for sites and
7 we're working with the states on an impairment basis,
8 on financial programs and assistance that the states
9 would think were necessary if they accepted the MRS
10 location. He could also negotiate on the time period
11 associated with when it would be removed and would be
12 dealing on what we feel is a level playing field
13 versus the Department of Energy.

14 CHAIRMAN CARR: Have you recommended a
15 negotiator yet to the President?

16 MR. DUFFY: We do not have that
17 responsibility. It's a congressional -- White House
18 responsibility, reports to the White House. We do
19 not --

20 CHAIRMAN CARR: Okay.

21 MR. DUFFY: A negotiator has been considered
22 and has been investigated and I believe it's up to the
23 negotiator to make his decision known to the White
24 House on whether he will accept the assignment.

25 The MRS strategy assumes siting through the

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1 efforts of this negotiator. We feel that's extremely
2 important. It also assumes that the Nuclear Waste
3 Policy Act linkages are modified with regard to its
4 connection with the site selection. We do not ask for
5 any other linkage changes at this time.

6 A DOE-directed siting process would result,
7 in our opinion, in extensive delay, 2002 if the
8 linkages are modified, 2007 if the linkages are not
9 modified. I think that's a speculative situation.
10 From the past operation with the Department, the first
11 thing we have to do is maintain credibility or obtain
12 credibility. We do not have credibility associated
13 with these programs at the present time. That would
14 be a significant delay. We think a negotiator would
15 have the capability to improve and expedite the
16 communication between desired community, states,
17 municipalities.

18 From a comprehensive schedule, we're looking
19 at the universe -- use of transportable storage casks
20 to achieve the 1998 as an option. The cask would
21 require NRC certification under 10 CFR 71 and
22 licensing for storage under 10 CFR 72. If we go to a
23 dual storage shipping capacity cask, that would put us
24 in a unique situation from a cask standpoint with both
25 licensing and certain features of that same cask. I

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1 don't believe that's been done yet. So, again, it's a
2 new approach. Not a new approach, it's a new aspect
3 of the program that would require new approaches by
4 both us and the NRC.

5 We believe that on the basis of the
6 Secretary's discussion with the President, we will get
7 action on a nuclear waste negotiator in the near term.

8 From the scientific investigation of the
9 Yucca Mountain operation based on the Nevada Attorney
10 General's issued opinion on site disapproval 11/1/89,
11 that's when Secretary had sufficient cause to
12 demonstrate the need for litigation. Up until that
13 time, we did not have what was considered satisfactory
14 legal precedent to go in and sue.

15 DOE will pursue all available options to
16 gain access to the site within the legal framework.
17 The Secretary has, up until this time, made every
18 effort to negotiate on the basis that the site is not
19 a selected site, that he is under the direction of
20 Congress to characterize this site and if there are
21 any disqualifying characteristics it would be the
22 Secretary's decision not to pursue this site.

23 We feel that the changes that we've made on
24 the basis of doing surface characterization will give
25 us a more rapid understanding of the items that were

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1 identified as significant by both people within the
2 NRC and the State of Nevada with regard to volcanism,
3 with regard to seismic and tectonic assumptions and
4 with regard to surface water and subsurface water,
5 hydrology. Differences of opinion, let's put it that
6 way. The only way to resolve those, in our opinion,
7 is to resolve them on a scientific basis with an open
8 peer review, community, state and governmental
9 discussion.

10 The major site-specific repository design
11 work therefore will be deferred until more information
12 on the immediate site suitability is available from
13 the surface evaluation and the completion of the
14 exploratory shaft alternative studies, which we feel
15 are significant from the standpoint of the advice we
16 had received from the technical review board, and
17 looking at alternatives to a dual shaft exploration
18 that we had identified versus the ramp reverse boring
19 shaft operation that was identified by a technical
20 review board.

21 With regard to the MRS facility, the MRS
22 Review Commission reported to Congress and recommended
23 two facilities and a reevaluation of need in the year
24 2000. We think we're compatible with the MRS
25 Commission's review. We do feel that two sites may be

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1 even an exponential or cubic function in the degree of
2 difficulty rather than a single site. The Department
3 of Energy site is a modular design. It can
4 accommodate 2,000, 5,000, 10,000, 15,000 on the basis
5 of need. So, we feel from that standpoint we do
6 accommodate the major recommendations from the MRS
7 Committee.

8 The DOE considers that the MRS is an
9 integral and critical portion of the waste acceptance
10 disposal schedule and system flexibility, since we do
11 have a contractual obligation with these utilities to
12 accept fuel in 1998. Under the present schedule, we
13 cannot do that with a repository. We believe that
14 again this is consistent with the international
15 community who are looking at MRSSs at present mode of
16 storage while they examine their options with regard
17 to geologic repositories.

18 The Department is working with Congress to
19 modify the linkage. We have no guarantee that we will
20 get legislation concerning the decoupling, but we are
21 pursuing legislation and will have a draft legislation
22 to the Congress in the first month of next year.

23 We have been working with various committees
24 on a communication basis, telling them of our opinion
25 and what we intend to do and they're aware of our

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1 present strategy. DOE is also considering the DOE
2 siting in coordination with the negotiator efforts,
3 but I don't think we would pursue that unless there
4 was a significant delay with regard to the appointment
5 of a negotiator because that would be in conflict. We
6 would have two parties pursuing the same effort. We
7 believe the negotiator should be doing that.

8 We have issued -- as an accomplishment, as
9 you identified, Mr. Chairman, the Site
10 Characterization Plan was issued in 1988 and the NRC
11 issued a site characterization analysis in July.
12 There were two objections, quality assurance program
13 and exploratory shaft Title I design.

14 Control process, we are working on a
15 demonstration of our capability with regard to the
16 design control process and applicability of previous
17 data to that. From the quality assurance program
18 already identified what we feel is our accomplishment
19 in that area. There were 133 comments, 62 questions
20 and we are evaluating the analysis and requested a
21 formal program for resolution of that and will
22 recommend to the Secretary that the new director
23 establish a methodology where we are in constant or
24 real time communication with the NRC in resolution of
25 that. I don't think that has been established in the

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1 past and we expect that to be established as soon as
2 the new director comes on. In fact, we will have
3 action taken on that in the meantime.

4 The Office of Civilian Radioactive Waste
5 Management QA requirements documents have been issued,
6 QA programs for Fenix and Sessions, Holmes and Narver,
7 Reynolds Electric, Sandia, Los Alamos, USGS, LLNL have
8 been accepted by DOE and the NRC. All seven groups
9 ordered, except LLNL, have been accepted by DOE. The
10 Yucca Mountain project and the OCRWM audits are
11 scheduled for June of '90 and July of '90, which we
12 feel is a potential problem, but we think we have the
13 methodology under control that would demonstrate the
14 capability in that area. New site characterization
15 will not be initiated until the quality control
16 assurance activity is in place.

17 We think that the meetings with the NRC
18 staff on the exploratory shaft design control process
19 has been very beneficial and we would -- I'll discuss
20 later on -- we would like to increase our dialogue in
21 the technical area prior to rulemaking with both the
22 staff and with the ACNW and with the scientific peer
23 groups so that -- which we feel is the most
24 significant portion of this project. This is the
25 first of a kind. We do not have criteria that are

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1 applicable in all cases to a geologic repository. We
2 think it's going to be an iterative process to
3 establish this criteria and we think we need more
4 dialogue to establish this before a rulemaking
5 process.

6 Eight study plans have been submitted to the
7 NRC. Two have been accepted so far. Both of those
8 would allow us to pursue surface characterization if
9 we had the permits necessary for the disturbance of
10 the site.

11 The Site Characterization Plan comments were
12 received from the State of Nevada, other government
13 agencies, Edison Electric Institute, and the public.
14 We would expect to have a formalized plan for
15 resolution of those comments and identification of
16 action on those.

17 We've made ten in-depth technical
18 presentations to the Nuclear Waste Technical Review
19 Board. It has recommended extensive underground
20 drifting, use of tunnel boring machines, alternate
21 shaft construction, replacing a shaft with ramp and
22 shaft design, which I identified on the basis of a
23 reverse boring operation with a boring machine of
24 different design characteristics than the exploratory
25 explosion operation in rock removal that we had

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1 identified in a dual shaft, which identified some
2 questions concerning the proximity of the shaft and
3 the effect of location on those shafts.

4 So, from that standpoint, that's why we're
5 looking at the alternate design. We're looking at how
6 this will effect the underground design and we think
7 the delay necessary to do that will be very
8 beneficial.

9 DOE is evaluating the recommendations and
10 the alternatives and that's on our new schedule. NRC
11 staff, ACNW and state have suggested extended surfaced
12 based exploration in the past. It's now recognized by
13 the Department of Energy that that offers the most
14 rapid methodology for identifying surface
15 disqualification so we can get on with the exploratory
16 shaft operation if this is not a disqualifying
17 characteristic.

18 Three types of technical interactions with
19 the staff taking place in technical meetings,
20 technical exchange and site visits. We feel those
21 have been very productive and have offered the
22 Department a new perspective on the design and on the
23 schedule and on the scientific method. Neither DOE
24 nor NRC have ever licensed a repository and the 10,000
25 year projections at the present time are, as one

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1 member of the public in its comments have made, sort
2 of an arrogance on our part since the recorded history
3 of man is less than that. To project that in a time
4 period requires extensive scientific demonstration and
5 that's why the Secretary believes the extension of the
6 schedule is necessary so that we don't seem to have
7 technical arrogance about a first time repository.

8 NRC and DOE pre-licensing relationship, we
9 believe with the NRC guidance on regulations, DOE can
10 implement site investigations to establish criteria.
11 The need to develop better understanding of site
12 characteristics in order to enable us to establish a
13 reasonable set of regulatory criteria is what we think
14 one of the most important points that we would like
15 discuss with the staff and with the Advisory Committee
16 on how to develop that before it gets to rulemaking.

17 DOE proposes an initiative on a
18 collaborative interaction with the NRC, DOE, industry
19 and the peer committee to identify what we think are
20 uncertainties associated with present criteria and how
21 we could establish a more certain or at least a band
22 of interaction and iterative process before rulemaking
23 process takes place.

24 DOE's regulatory approach to rulemaking,
25 regulatory guidance will be discussed later. It has

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1 been transmitted to you in an August 18th letter. We
2 think there are areas where we believe additional
3 interaction between the NRC and the Department of
4 Energy is necessary to give us guidance in that area,
5 so we can come up with an iterative process before
6 rulemaking.

7 Topics suitable for rulemaking are accident-
8 dose guidelines, emergency planning with relationship
9 to a repository and the implementation of EPA
10 standards which again are first of a kind and we think
11 should be scientifically based.

12 Topics requiring additional consideration
13 are amplification of regulatory terms such as the
14 anticipated and unanticipated processes and events,
15 disturbed zone, substantial complete containment, pre-
16 waste and placement, groundwater time travel and the
17 time period for evaluation of 1.8 million years is
18 considered to be areas for additional discussion.

19 We want to evolve definitions as we learn
20 more about the site. We feel that the DOE topical
21 reports is a methodology for doing that. We have
22 never done that. We do not have any record on topical
23 reports, but the NRC has used as an effective
24 communication mode for the utility operation in the
25 nuclear power industry and other facilities that are

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1 licensed by the NRC and we believe that this is a
2 methodology that we should pursue aggressively where
3 we have areas of concern.

4 Methods for demonstrating compliance with
5 EPA standard, we think we need flexibility on that to
6 use alternative compliance approaches. We believe
7 that the topical report and NRC guidance on those will
8 be beneficial. We believe that the change in Part 60
9 subsystem requirements into regulatory guidance versus
10 regulation would be helpful.

11 Topics requiring additional consideration
12 are the engineered barrier. We believe that credit
13 should be allowed for waste package lifetime greater
14 than 1,000 years, based on engineering submittals and
15 topical reports. We believe it's premature to
16 restrict by regulation and prior to understanding a
17 site. Therefore, that's why we're looking at peer
18 review and topical reports and scientific discussion
19 before a rulemaking order is issued.

20 The content of license application, we
21 believe an expansion of the license application
22 content requirements in rule is not appropriate. We
23 believe the regulatory guide is an appropriate vehicle
24 in the early stages and we believe that working with
25 the staff we can develop such a guide on a non-

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1 controversial basis.

2 We believe that topics that require
3 additional consideration are greater-than-Class-C low-
4 level waste. We feel that may be a significant
5 problem unless we can define it better on where to put
6 it, why to put it, and whether the health and risk
7 based methodologies for establishing that. It has not
8 been evaluated in sufficient depth to make a decision
9 at this time. Based on the calculated volumes, it
10 could require a second repository if it's not looked
11 at in a scientific method.

12 Other areas of concern are the definition of
13 anticipated processes and events, which I discussed
14 before. We believe that we should be working on a
15 probabilistic basis, not a deterministic basis in the
16 approach.

17 Other areas of concern are in the
18 application of repository criteria from 10 CFR 100,
19 Appendix A, which was originally identified for power
20 plants. Some of the language is still defined in the
21 power plant area. We think that from that standpoint
22 there should be an evaluation based on a geologic
23 repository to see what applies in Appendix A and what
24 does not and then a specific appendix associated with
25 the geologic repository. We believe it would be more

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1 beneficial. We also believe that the working with the
2 scientific community, the staff, the ACNW, would allow
3 us to do that in the time period for license
4 application.

5 The schedule for the licensing support
6 system development, we believe a memorandum of
7 understanding between the Department of Energy and NRC
8 needs to be developed. I'll make recommendations to
9 the Secretary on the basis of documentary load versus
10 repository schedule as a significance in adapting the
11 LSS system. We think that a memorandum of
12 understanding between our mutual staffs will result in
13 a more aggressive approach to that if you look at it
14 on the basis of need, on the basis of current
15 capability rather than schedule.

16 The other areas of concern, we believe that
17 on the basis of the scientific aspect of this program,
18 that the Advisory Committee on Nuclear Waste resources
19 may not be sufficient to review the types of areas
20 that we're looking at and we would look to the NRC and
21 its staff to give us advice in that area on whether or
22 not they feel that additional resources would be
23 necessary on the basis of what we discussed here this
24 afternoon.

25 The ACNW depends primarily on staff

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1 briefings. We believe that a more open dialogue
2 between the various interested parties would be very
3 helpful as far as the Department of Energy is
4 concerned and DOE needs to provide separate and
5 independent detailed briefings to the concerned
6 parties.

7 We believe that there are initiatives that
8 should be worked on from a collaborative standpoint.
9 There's a considerable amount of expertise in the
10 program and in view of the developmental nature of
11 this project, we believe that more input should come
12 from peer review, scientific community to establish
13 criteria before rulemaking. We need to use collective
14 program resources rather than proceeding on a
15 potentially divergent path and then finding out we
16 cannot achieve that criteria. So, it is, in our
17 opinion, a mandatory need that we have more scientific
18 input before we get to a rulemaking process.

19 DOE proposes to use the experts from DOE,
20 NRC and other federal agencies, the nuclear industry,
21 Nuclear Waste Technical Review Board, Advisory
22 Committee on Nuclear Waste, State and other to work
23 together. And that, again, puts complexity in the
24 review of scientific data and could extend the program
25 if we did not have a coordinated method with the NRC

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1 to achieve that.

2 Concepts of establishing standards
3 committees in areas of uncertainty similar to the ANSI
4 Committee, the instrumentation committees and
5 electrical code committees to review this with peer
6 experts with assignments, in our opinion would be
7 beneficial to narrowing down the uncertainties as we
8 approach the rulemaking position. This approach
9 allows for full advantage to be taken in a
10 prelicensing consultation period.

11 Therefore, the Department asks the
12 Commission, as site characterization and other
13 elements of the repository program are implemented, to
14 evaluate this methodology. We'd like to resolve
15 issues raised specifically in this presentation on a
16 scientific peer review basis. We'd like to initiate a
17 collaborative interaction and we -- as far as the MRS
18 and transportation strategies, to look at that from
19 the standpoint of ensuring timely waste acceptance,
20 which is a major requirement for the Department of
21 Energy.

22 That is a formal statement. I'll open up to
23 the Commission to evaluate our program.

24 CHAIRMAN CARR: Commissioner Remick?

25 COMMISSIONER REMICK: I have two questions,

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1 Leo. You mentioned what I'd say was an optimistic
2 outlook on the status of your QA programs. I think
3 that has been a continuing concern. You did make the
4 statement, I believe, that you would not undertake any
5 characterization without QA program being in effect.

6 MR. DUFFY: Right.

7 COMMISSIONER REMICK: But how about -- is it
8 limited just to characterization? How do you stand in
9 other areas where you have been proceeding for a few
10 years and QA has been criticized?

11 MR. DUFFY: I think there are two specific
12 areas, as I understand the situation. Number one, we
13 do have now the audits of seven major out of eight and
14 we do understand what the deficiencies were in the
15 audit of LLNL. Within our own organization, we are
16 implementing the guides that we have given to the
17 contractors. We have not audited our own operation. I
18 believe that's a significant deficiency on the
19 Department. It was a strategy that was implemented.
20 I think it's a viable strategy to get the major
21 portion of the implementors qualified under the QA
22 program even though the Department itself has not had
23 an audit. The work that is being done in the field is
24 now being done by qualified quality assurance
25 personnel. We've trained over 1,000 people. I hope I

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1 wasn't too optimistic in the aspect of addressing the
2 program, but I think the implementors in the field are
3 the key and we do have a methodology that we will
4 submit to you in January concerning all data that has
5 been acquired prior to the quality assurance program
6 so that you can review that. If it's not
7 satisfactory, then we can discuss that dialogue and
8 see that we do have the satisfactory justification for
9 using any data that was achieved before quality
10 assurance audits.

11 COMMISSIONER REMICK: Another question. I'm
12 not sure I understand. You indicated that ACNW might
13 need more resources so they can entertain
14 presentations from the Department. I can understand
15 if they're just hearing from the staff, but do you
16 request an opportunity to brief ACNW --

17 MR. DUFFY: Yes.

18 COMMISSIONER REMICK: -- and being turned
19 down because they don't have adequate resources? I'm
20 not sure I understand.

21 MR. DUFFY: No, but if we look at it on the
22 collaborative basis that we discussed, which would
23 make more presentations available in areas of
24 uncertainty, which we feel there are quite a few, if
25 we go to the committee methodology of assigned

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1 committees to look at various points of the future, we
2 believe that the ACNW would be called upon more by
3 both us and the staff to receive presentations on
4 these criteria and give the Commission back an
5 evaluation.

6 We think there are very many areas that will
7 have to be resolved as we get into the exploration
8 operation. We do not have the potential at the
9 present time on an iterative process, refine
10 something. What is the significance in the scientific
11 endeavor? We will have other committees looking at
12 that and we hope that that will present to the staff
13 and to the Advisory Committee a dilemma, an anomaly
14 that may, as we move this data forward, produce a
15 larger demand than in the past.

16 In the past, we've been looking at paper and
17 we will be looking at real time problems when we get
18 to the field type application. That's why we believe
19 that's something to be considered.

20 COMMISSIONER REMICK: One other question. I
21 know DOE has a history of an experience and you plan
22 in high-level waste of performing operational
23 readiness reviews along the way, I think of
24 characterization and construction and so forth. Do
25 you feel that you adequately know what the Commission

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1 might want you to demonstrate at those various hold
2 points or when you perform operational readiness
3 review? Are we providing any input of the type of
4 things beyond what you might have identified that
5 might be helpful to the NRC and being satisfied at
6 that point that you're ready to proceed?

7 MR. DUFFY: I think you have provided that,
8 but I think you've also asked for additional access to
9 our laboratories on the basis of what we're doing.
10 I'm sure that on the basis of what you see and what we
11 can get into in exploratory ESF Title II design, that
12 there will be more areas of interface, not necessarily
13 hold points, but evaluation points before proceeding
14 because I think we're both walking down a path of
15 potential unknown in this area and I do believe that
16 there will probably be more hold points than in the
17 past.

18 COMMISSIONER REMICK: Well, I'm hoping we've
19 learned from the --

20 MR. DUFFY: Right.

21 COMMISSIONER REMICK: -- power reactor area.
22 Then along the way there's some things, hopefully, we
23 can do early on rather than waiting six, eight, ten
24 years and then having to go back and try to
25 reconstruct what took place. I think that requires

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1 both identification by DOE and by the NRC of the type
2 of things that should be looked at at those hold
3 points.

4 MR. DUFFY: We believe that to be the case
5 also. One of the reasons why we wanted a more up
6 front peer review and possibly contact with the ACNW
7 was to preserve the NRC's regulatory aspect while we
8 discussed the scientific points before our rulemaking
9 operation. It's a fine line of perception more than
10 distinction. If we're working very close with the NRC
11 and we're making collaborative decisions, then there
12 can be some loss of objectivity, at least perceived by
13 the public, and we feel that there should be more
14 scientific discussion up front that allows you to be a
15 regulator even though you are contributing to the
16 scientific criteria.

17 COMMISSIONER REMICK: Thank you.

18 CHAIRMAN CARR: Commissioner Roberts?

19 COMMISSIONER ROBERTS: It's my impression,
20 and if it's a false or erroneous one in your opinion
21 I'd like for you to say so, but it's my impression
22 that in the past, at least, within the Department of
23 Energy, the emphasis or reliance has been on the
24 geological site rather than the method of packaging or
25 encapsulation of high-level waste. Would you comment

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1 on that?

2 MR. DUFFY: I can't comment specifically on
3 the basis that that has been the strategy. I believe
4 we were working in parallel on that. I believe the
5 initial concept of geologic repository was to rely
6 strictly on the site characteristics as the primary
7 barrier that may or may not have influenced the
8 judgment on the aspect of canister design, air gap or
9 other auxiliary barriers. But that has been the
10 demonstration qualification of a geologic site. You
11 have to look at is it satisfactory from a geological
12 repository standpoint on its own. It may have given
13 then an unjustified perception that we're working only
14 on the site, but we are working on canister design, we
15 are working on refueling design, we are working on
16 transportation design.

17 COMMISSIONER ROBERTS: Well, that leads to
18 my follow-up question. On page 14, 3.2.3, does that
19 represent any change in the Department's emphasis or
20 direction?

21 MR. DUFFY: From the aspect of --

22 MR. PETERS: In the oral testimony, I think.

23 MR. DUFFY: Yes, I have it here. I just
24 didn't have it to that point.

25 COMMISSIONER ROBERTS: I'm sorry. I'm

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1 looking at your handout.

2 MR. DUFFY: Yes. I was looking. Do you
3 have it there?

4 Yes, that is, I think, a modification in our
5 strategy, yes, sir, that the air gap between a
6 canister would be an additional barrier between the
7 geologic repository and would give us the capability
8 for going for greater than 1,000 years.

9 COMMISSIONER ROBERTS: Who coined the cutsie
10 phrase "pondering the imponderable?"

11 MR. DUFFY: It's not mine, so I can't
12 guarantee it, but I'm sure somebody used it before us.
13 I don't think it's an original by the Department of
14 Energy.

15 COMMISSIONER ROBERTS: That's all I have.

16 CHAIRMAN CARR: Commissioner Rogers?

17 COMMISSIONER ROGERS: Just on that same
18 subject, do you have any idea of what you're thinking
19 about with respect to the greater than 1,000 years?

20 MR. DUFFY: In time element? No. I think
21 that's one of the things that we would like to iterate
22 on with the scientific community, what is a reasonable
23 probabilistic time frame that we can justify rather
24 than identifying 1,000 years, which I don't think has
25 any significant scientific merit either. So, from

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1 that standpoint, iterating on 1,000 years without a
2 base for the thousand is a questionable way to do
3 business.

4 COMMISSIONER ROGERS: Well, it's just a
5 scale.

6 MR. DUFFY: Yes. Right.

7 COMMISSIONER ROGERS: It's like an inch
8 in --

9 MR. DUFFY: Right. If it's good on a semi-
10 log or log-log scale. Other than that, it's divisible
11 by 2, 4, and 8.

12 COMMISSIONER ROGERS: Yes. Well, some of
13 these numbers, it's hard to see where they ever came
14 from, scientifically anyhow.

15 MR. DUFFY: That's right. I think that's
16 the major point that we would like to bring to the
17 Commission today. We believe that there will be
18 scientific bases that we can establish as criteria for
19 rulemaking. There will be iterative processes that we
20 believe that we will find as a result of a broader
21 cross section with the community and as we get the
22 site characterization. What we will find will
23 probably be anomalies more than it will be definitive
24 parameters. On that basis, we think that there's a
25 lot of dialogue necessary in this program to assure

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1 the citizens of the country that we're not going down
2 a path to achieve a need rather than a scientific
3 evaluation.

4 COMMISSIONER ROGERS: There may be
5 difficulties closing that process.

6 MR. DUFFY: Yes, sir, and that is one of the
7 reasons why we see the need for the extension, so that
8 we're not driven by a need or driven by a schedule,
9 that we're driven by a valid scientific evaluation.

10 COMMISSIONER ROGERS: Just looking at some
11 of your old dates and new dates, I noted that on an
12 old schedule you were to start the exploratory shaft
13 facility in 11/89 --

14 MR. DUFFY: Yes, sir.

15 COMMISSIONER ROGERS: -- and the license
16 application in 1995. And your new schedule calls for
17 the start of the ESF in 11/92, and license application
18 in 2001. Now that's a 50 percent increase in the
19 time--

20 MR. DUFFY: Yes, sir.

21 COMMISSIONER ROGERS: -- between those two.
22 Is that just to give yourself more flexibility, or is
23 there something that you actually have identified as
24 requiring --

25 MR. DUFFY: Well, when we did the bottoms-up

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1 on the basis of the 5,000 data points, we had time
2 elements that we felt are realistic and on the
3 conservative side, rather than arbitrary and on the
4 accelerated side. I think we could supply you with
5 which ones were the determining path on the subnetwork
6 schedules that we have, different from the ones we've
7 seen.

8 COMMISSIONER ROGERS: Well, any single or
9 large one, or whether it's a collection of --

10 MR. DUFFY: I think it's a collection.

11 MR. STEIN: In-situ testing, essentially.

12 MR. DUFFY: We're looking at, well, from the
13 standpoint if we went to the two mile ramp and the
14 reverse boring operation and the various segments. As
15 we find things -- it gives us a broader area that
16 evaluates the acceptability of site, but it's also
17 giving us a significant increase in the amount of area
18 that we have to characterize. We're going to have a
19 two mile ramp and a reverse bored shaft. A two mile
20 ramp is a significant -- we've asked for additional
21 drifts. In fact, the TRB was very pointed in looking
22 at the more drifts you look at the better
23 understanding you have of the site.

24 So from the scientific characterization
25 standpoint, we're going to have a hell of a lot more

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1 data to look at. We got a lot of data to look at now
2 with relationship to 300 bore holes and --

3 COMMISSIONER ROGERS: But this new schedule,
4 though, it does assume that you're going to --

5 MR. DUFFY: Yes, sir.

6 COMMISSIONER ROGERS: -- use a ramp for one
7 of the --

8 MR. DUFFY: Well, we're looking at that. As
9 you see on the schedule, we had the exploratory shaft
10 alternatives evaluation. We are looking at that at
11 the present time, and we'll have that as evaluation in
12 the later part of '90.

13 COMMISSIONER ROGERS: Just turning to
14 another item of interest to us, have you thought not
15 only about the schedule for the LSS that might be
16 modified, but what kind of resources are required in
17 the near term for that?

18 MR. DUFFY: We have, but we would like to
19 discuss that prior to the memorandum of understanding
20 to assure ourselves that we haven't biasly locked into
21 a methodology that you disagree with.

22 COMMISSIONER ROGERS: Do you have a schedule
23 for discussing that with NRC staff?

24 MR. DUFFY: We have a letter from you to us,
25 and the response back will request a meeting to

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1 discuss the purpose of a memorandum of understanding.
2 The Secretary was very interested in getting that
3 resolved, because there was a difference of opinion
4 there.

5 COMMISSIONER ROGERS: Right. Okay. Very
6 good. I'm going to ask one that's maybe a little
7 difficult.

8 MR. DUFFY: I don't think we have any that
9 are easy.

10 COMMISSIONER ROGERS: I think you're used to
11 those. But just in looking at the whole -- this whole
12 history of this kind of an effort, and hearing from
13 the state utility boards and their concerns about some
14 of these things -- more than \$5 billion has been
15 collected in fees from utilities over the years
16 towards a repository, and more than \$2 billion have
17 been expended of that to date, and of course there's a
18 great deal of groaning and moaning about that -- but I
19 wonder is there anything positive that you can say
20 with respect to those expenditures that in a sense
21 will be useful for -- really useful for the
22 repository, whether it is Yucca Mountain or not Yucca
23 Mountain?

24 MR. DUFFY: I definitely think that's the
25 case. I think the Secretary has been in exceptional

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1 dialogue with the utilities and the public utility
2 commissions over the last four months on that
3 expenditure. I think \$1.2 billion was identified as
4 expenditures on programs other than Yucca Mountain,
5 which were not under the control of the present group.

6 But the methodologies, certainly in respect
7 to BWIP, identify the need for improved control and
8 custody of corings, core samples, dialogue with the
9 laboratories on the methodology. There were
10 considerable packaging methodologies that were
11 examined so that we could take cores. As I remember,
12 the latest design on that is a package that will
13 contain the existing moisture for 50 years, that we
14 could go back and retrace the cores.

15 If you look at the methodology for dry core
16 boring, if you look at the vacuum extraction
17 operation, can I justify \$2 billion expenditure on the
18 basis of all the positive aspects? I don't think so.
19 I don't think I would even attempt to try. But of the
20 last \$700 million, the majority of that has been
21 identified in the transportation operation, in the
22 canister design, refueling cask operation, handling
23 operation, emergency plans operation. So there is
24 certainly beneficial operation, but I think you'd get
25 a wide variance in the audience's opinion on whether

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1 or not we spent it effectively.

2 COMMISSIONER ROGERS: Is there any -- have
3 you produced a piece of paper on that that puts some
4 of these things down?

5 MR. DUFFY: Yes, sir. We have a tabulation
6 of what was spent. That has been given to the
7 Secretary.

8 COMMISSIONER ROGERS: Yes. Just in terms of
9 what is generally useful that can be used regardless
10 of how we go in the future --

11 MR. DUFFY: Ralph?

12 COMMISSIONER ROGERS: -- things that are
13 not--

14 MR. STEIN: We have spent a great deal of
15 time looking at our expenditures in the past and what
16 they have gone for. We have, for example -- I believe
17 that we have, with the expenditures in the past,
18 referring back to Mr. Duffy's comments that we can't
19 account for the \$2 billion plus in detail, but we can
20 say that those expenditures have resulted in what we
21 believe is a strong technical and scientific basis for
22 the repository leading to the Site Characterization
23 Plan, which is a document I think that everybody will
24 agree is rather comprehensive in nature and does
25 describe the program that I think that we need to

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1 implement in the scientific investigation of site.

2 We have established a really -- what we feel
3 is a quite incredible MRS program, which requires a
4 number of studies, an extensive amount of studies.
5 Looking into the future, we will have established a
6 very credible -- what we believe is a transportation
7 program, altogether an integrated program. It's money
8 that may be challenged, the expenditure of it, but
9 nevertheless one needs to do a lot of these things in
10 order to be able to solve where we go from here.

11 MR. DUFFY: I think we show a positive
12 aspect to a lot of the expenditure, but I don't think
13 we could detail a justification.

14 COMMISSIONER ROGERS: Thank you.

15 COMMISSIONER CURTISS: I've got a number of
16 questions that I guess I'd like to pursue. We've just
17 gotten your detailed statement. Haven't had a chance
18 to take a careful look at it, but let me just sort of
19 go down them in no particular order.

20 You're going to spend a couple of additional
21 years now on surface-based testing?

22 MR. DUFFY: We're going to surface
23 characterization testing for the two to three year
24 period while we're in Title II design, yes, sir.

25 COMMISSIONER CURTISS: Could you expand upon

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1 how you intend to integrate the surface-based testing
2 into the Site Characterization Program?

3 MR. DUFFY: Yes, sir. In the Site
4 Characterization Program, what we're doing at the
5 present time, and it's in the Site Characterization
6 Plan, is we're prioritizing what was initially
7 anticipated to be done after the start of exploratory
8 shaft into the up-front to see that we are doing the
9 right priority with respect to ground water intrusion,
10 with respect to vulcanism, which we think can be
11 easily identified as whether it's recent or ancient in
12 relationship to eras. And the other aspect of the
13 trench application, 1,500 feet, 48 feet deep, X number
14 of feet wide, where they're going to be, what faults
15 are going to be looked at, that is reprogrammed,
16 rescheduled, and reprioritized.

17 COMMISSIONER CURTISS: Okay. So the work
18 that you're going to do is covered already in the SCP.

19 MR. DUFFY: Yes, sir.

20 COMMISSIONER CURTISS: And it doesn't--
21 it's just going to get shuffled around --

22 MR. DUFFY: Right.

23 COMMISSIONER CURTISS: -- and done up front.

24 MR. DUFFY: Initially, I think this -- you
25 know, this decision was a recent decision on our part.

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1 It's been identified in the past by both your
2 Technical Review Board and the state of Nevada as what
3 they felt was an early methodology for finding site
4 disqualification in view of the potential for faults.

5 COMMISSIONER CURTISS: Well, I certainly
6 think it makes a lot of sense from the standpoint of
7 focusing on the disqualifying conditions that might
8 exist.

9 Let me turn to your testimony that begins
10 really on the regulatory process. It starts on page
11 11. I've got a number of questions just from a quick
12 once-over that I'd like to ask you about now--
13 prepared to address them. We'll follow up on them.

14 Beginning with the question that
15 Commissioner Roberts raised, on page 14, with the
16 engineered barriers, really I have two questions.
17 One, you indicated that's an evolution or a change in
18 the Department's position from the standpoint of
19 reliance that you're going to place on the engineered
20 barrier vis a vis the repository.

21 MR. DUFFY: Well, I don't think it's -- I
22 wouldn't exactly state it in that manner. There may
23 be a question.

24 COMMISSIONER CURTISS: State it the way you
25 would state it.

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1 MR. DUFFY: Okay. We still rely primarily
2 on the geologic site. I mean, that has not changed.
3 What we're saying is that the credit that was taken in
4 the past by, I think, Commissioner Roberts'
5 identification and perception at least --

6 COMMISSIONER CURTISS: Right.

7 MR. DUFFY: -- that the Department was not
8 looking at the engineered barrier as an additional
9 part of the total systematic capability of the
10 repository. What we're saying is we think that should
11 be explored in greater depth. And from that
12 standpoint, the barrier offers another retardant to
13 any release type operation.

14 COMMISSIONER CURTISS: Do you intend to,
15 beyond the 1,000 year period that you read the current
16 regulations as limiting you to, do you intend in
17 looking at container performance to seek out a
18 container that would give you the maximum protection
19 and seek reliance on that, or is there -- give me some
20 feel of whether we're talking 1,000 years or a
21 million.

22 MR. DUFFY: Frank wants to take a shot at
23 that.

24 MR. PETERS: We're developing a strategy
25 which will include long-life waste packages to help in

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1 this particular area.

2 COMMISSIONER CURTISS: Well, how much
3 further than 1,000 years are we talking about? There
4 are a lot of forms out there.

5 MR. PETERS: It's premature to really answer
6 that.

7 MR. DUFFY: I think, again, we're going back
8 to the deterministic versus probablistic situation.
9 We would present a scientific evaluation on a
10 probablistic basis on what additional container design
11 would give us with regard to confidence level on
12 leakage with regard to the pH, the water
13 concentration, and the specifics of the site we
14 selected. Okay? So that is the probablistic
15 standpoint.

16 The deterministic standpoint would say,
17 based on this failure due to corrosion we might be
18 able to get another 250 years because this pH is less
19 than we anticipated or the water concentration is not
20 as great as we expected or we're going to use a
21 different material.

22 COMMISSIONER CURTISS: Okay. The second
23 question on that subject, you note that, as I
24 mentioned, that you read the current regulations as
25 limiting you to a package life of 1,000 years, and you

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1 would like that changed or modified in some way so as
2 to permit you to take credit for a container that goes
3 beyond 1,000 years. We've talked about that subject
4 here in earlier briefings and it's a concept that I'm
5 not unsympathetic to. I'm just curious to know, from
6 your standpoint, what do you mean by taking credit?
7 Less groundwater travel time or greater confidence or
8 margin?

9 MR. DUFFY: If it comes out to a balance
10 between equals, that might be one of the aspects. If
11 we find a deterministic point that says we have a
12 different matrix structure and flow, then the design
13 of the canister may compensate for that. It may stay
14 at 1,000 or it may, if we find a better matrix, give
15 us the capability to say that it is a longer period of
16 time. So it has both sides, and that's why we wanted
17 to get into the scientific dialogue to see what areas
18 we should be looking at in the test program to
19 evaluate whether or not we can use the extended time
20 period in the container.

21 I think in the Swedish characteristic
22 evaluation they used the container as a major
23 retardant, and so looking at that it has its
24 advantages.

25 COMMISSIONER CURTISS: And your current

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1 reading is that Part 60 would have to be modified to
2 permit you to take that credit?

3 MR. DUFFY: We think so, yes.

4 MR. STEIN: Well, there is another approach
5 too, in addition to modifying it. There are parts of
6 Part 60 that talk about that we could come back to the
7 Commission with additional information and seek credit
8 for a container beyond 1,000 years. There needs to be
9 some further amplification of that. There have been
10 discussions between DOE and the NRC staff as to ways
11 that we might get a greater confidence from the NRC
12 that containers that were built to -- designed and
13 hopefully could perform greater than 1,000 years would
14 be given credit, whatever we want to define credit as.
15 Certainly credit, in one way of defining it, is that
16 it gives added confidence that we're isolating the
17 waste beyond 1,000 years.

18 COMMISSIONER CURTISS: Okay. Let me jump
19 back up on page 14, because there was a statement
20 there that intrigued me under 3.2.2, last sentence.
21 "In addition, the Department suggests that certain
22 regulatory requirements that may be overly restrictive
23 and conservative when compared to the EPA standard,
24 such as the subsystem performance objectives, be made
25 regulatory guidance instead."

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1 I guess I'd like your view or what you mean
2 by that statement. What in particular are you looking
3 at in the subsystem performance criteria that in your
4 judgement suggests that that set of criteria may lead
5 to a more restrictive result than the EPA standard
6 contemplates?

7 MR. STEIN: One example of a restrictive
8 statement is the 1,000 year groundwater travel time
9 that is in the regulation. What we really need a
10 focus on, I believe, is total system performance. And
11 I think that that's, at least in my perspective -- if
12 we can demonstrate total system performance for the
13 repository and demonstrate compliance with the EPA
14 standard whenever it appears again, I think that we
15 will demonstrate that the repository is satisfactory,
16 whether or not 1,000 year groundwater travel time is
17 achieved.

18 It's really the total system performance
19 that is important, and not just the fact that we have
20 1,000 year groundwater travel time. If you had
21 something other than 1,000 year groundwater travel
22 time, but it really ended up that you weren't
23 releasing any radionuclides to the accessible
24 environment, that to me is demonstrating that the
25 repository is satisfactory.

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1 COMMISSIONER CURTISS: You've essentially
2 got that framework in the WIPP proceeding --

3 MR. STEIN: Yes.

4 COMMISSIONER CURTISS: -- where you've got
5 the EPA standard, but you don't have the subsystem
6 performance criteria. Could you give us maybe your
7 thoughts on --

8 MR. DUFFY: In the WIPP standard and in the
9 WIPP operation, what we've found is we have less
10 permeability than we had anticipated. That's a very
11 positive aspect from a sealant standpoint.

12 The aspect of the closure rate. The closure
13 rate is a more rapid closure rate than had been
14 anticipated by a factor of two. That's also a
15 positive from a standpoint of closure. It's a
16 negative from the standpoint of lifetime of the
17 facility and the maintenance operation.

18 If we look, then, at the gas generation, an
19 uncertain portion that's going to be developed during
20 the five year test program, we have taken the most
21 conservative generation of gas with respect to the
22 container, with respect to the internals to the
23 container, with respect to radiolysis, with respect to
24 microorganism interaction. And so on the basis of
25 that, if you take the permeability to be the least and

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1 the gas generation to be the most, you have an
2 accident condition.

3 If you take a gas generation and find out,
4 in the case of what Ralph indicated, the hydrology
5 difference and the permeability difference, they may
6 compensate. And so you now have an iterative process
7 wherein the present systematic approach is a
8 definitive process. But we need to iterate on the
9 characteristics of the existing site, rather than on a
10 deterministic methodology.

11 COMMISSIONER CURTISS: What you're proposing
12 here -- and I'd like to read this more carefully--
13 but what you are proposing in this body, talking about
14 the regulatory framework, is that in some respects we
15 need to add things to our regulation. For example,
16 the petition that you're going to file here with us
17 shortly on the 5 millirem EDE --

18 MR. DUFFY: Five rem.

19 COMMISSIONER CURTISS: Five rem, excuse me.

20 In some respects, you're proposing, such as
21 the engineered barrier, that we need to go back in and
22 either through the language that Ralph referred to
23 find some way to accommodate a container that would
24 last beyond 1,000 years or amend the regulations.

25 MR. DUFFY: I think one of the things we're

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1 asking for is an up-front evaluation period and
2 dialogue before rulemaking, so that we have the
3 capability during the exploratory scientific aspect to
4 determine whether that's achievable.

5 COMMISSIONER CURTISS: That's what I'm
6 trying to get a feel for. On the rulemakings that
7 focus on the uncertainties, I take it you're
8 suggesting that we ought to slow down to permit what
9 you called the "iterative process" to move forward and
10 allow the kind of flexibility that you've described as
11 you get into characterizing the site.

12 MR. DUFFY: Where that additional scientific
13 input from peer groups or other groups, international
14 community, has questions, that we resolve this as part
15 of the experimental performance assessment before we
16 make a rulemaking.

17 COMMISSIONER CURTISS: Okay. In this area,
18 the one that has to do with the relationship of the
19 Commission's Part 60 criteria to the EPA standards,
20 just a point of clarification. Are you proposing that
21 that issue needs to be addressed by the Commission in
22 the fairly near future because the regulations as
23 they're currently written prescribe more than we need
24 to prescribe to meet the EPA standard? Are you
25 suggesting that we need to move forward in that area

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1 now?

2 MR. STEIN: First, relative to the EPA
3 standard, one of our suggestions is that we defer--
4 hopefully, NRC will defer any rulemaking action until
5 we see the standard, because we have the potential of
6 having two separate regulatory documents out in the
7 public --

8 COMMISSIONER CURTISS: Right.

9 MR. STEIN: -- if NRC were to go ahead now
10 and based on some interpretation put out a revised
11 Part 60 and then EPA comes out with its standard,
12 revised standard. So we could have real conflict.

13 So we're asking that you consider holding
14 off on putting any -- doing any rulemaking relative to
15 the EPA standard at this point in time.

16 COMMISSIONER CURTISS: Even if that's as
17 long as three or four years to get the EPA standard
18 out?

19 MR. STEIN: I don't see where that would
20 have an impact on our program.

21 COMMISSIONER CURTISS: Okay.

22 MR. DUFFY: We'll be looking at --

23 COMMISSIONER CURTISS: So there's no
24 immediate impact if we would defer our conforming
25 rulemaking for a period of what, four or five years?

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1 MR. STEIN: Well, EPA is projecting two
2 years.

3 COMMISSIONER CURTISS: I understand that.

4 MR. DUFFY: I put it in your time period.

5 COMMISSIONER CURTISS: Let me ask one
6 question on the EPA standard. Mr. Duffy, you
7 indicated that you thought the EPA standard is a first
8 of a kind standard and should be scientifically based.

9 MR. DUFFY: Right.

10 COMMISSIONER CURTISS: Is it your assessment
11 today that that's where EPA is, or is that a
12 suggestion that we ought to reexamine -- EPA ought to
13 reexamine that issue?

14 MR. DUFFY: I think -- well, I hate to be
15 more definitive than what I already said. I think we
16 need to look at the scientific basis for some of our
17 decisions. I'm not sure that that is done in depth at
18 the present time. I think there are some
19 deterministic criteria that we reevaluate from a risk-
20 based standpoint, from a health standpoint, and from
21 an achievability standpoint, and an economic
22 standpoint, safety being number one with regard to
23 health, and establish a risk-based analysis that can
24 be justified. I don't think that exists at the
25 present time.

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1 COMMISSIONER CURTISS: Okay. I guess I just
2 have two more questions. On the suggestion that we
3 beef up the ACNW, could you expand upon what you see
4 as the relative roles of the ACNW and the Technical
5 Review Board in terms of what they provide you as
6 independent organizations? What are --

7 MR. DUFFY: I haven't had the direct -- only
8 from the discussions I've had with the people in the
9 project. I'll give you what my impression was, that
10 the ACNW advises you and staff. In the aspect of
11 dialogue, as they need our input they would ask for
12 it. It's not on the basis of we have access to give
13 more than what they think is needed. That may not be
14 a clear definition.

15 But in the future, we would expect to have
16 more access to present the technical justifications
17 for some of our positions in concert with the staff
18 and the ACNW. And as we get into these areas of
19 uncertainty, we feel that there may be more dialogue
20 required than we've had in the past.

21 COMMISSIONER CURTISS: Okay.

22 MR. DUFFY: Is that an accurate portrayal?

23 MR. STEIN: Yes, I think it's accurate. I
24 do think, though, that they do offer one additional
25 characteristic, as opposed to the Technical Review

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1 Board. And that is that they have a regulatory
2 perspective. They're scientists and they're
3 regulatory perspective. The Technical Review Board,
4 very competent people, they're not focused as much on
5 the regulatory side of things as the ACNW is.

6 COMMISSIONER CURTISS: Okay. One final
7 question on the LSS. Do you have a feel, based upon
8 your latest schedule, as to when you think it would be
9 appropriate to begin loading documents into the
10 system?

11 MR. DUFFY: I think we have a feel, based on
12 the statistics of the documents we have available. We
13 have, what, 1,300,000 pages, and the new office has
14 1,100,000 pages of documents ready for loading. It's
15 a systematic methodology versus the hardware that
16 we're talking about, whether or not the hardware is
17 the key or whether the system for documentation on
18 existing hardware is compatible to future hardware.
19 We do have a time table. I think there's a further
20 dialogue required within the Department of Energy
21 before we come to a memorandum of understanding with
22 the NRC.

23 COMMISSIONER CURTISS: As to exactly when
24 documents ought to be loaded into the system, okay,
25 we'll wait to hear. Thank you.

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1 MR. DUFFY: That was a key discussion that
2 we had.

3 COMMISSIONER CURTISS: Okay. Thank you.

4 COMMISSIONER REMICK: I don't think you
5 should be reluctant to suggest the ACNW. If you want
6 to participate, make presentations, I would assume
7 they would welcome it. One of the functions of a
8 committee like that sometimes is getting staff and
9 applicants together and hearing both sides and
10 sometimes making helpful suggestions. I doubt very
11 much that they'd be reluctant to have you.

12 MR. DUFFY: I think one of the things that
13 we're looking at in the recommendation is based on the
14 future need it may be an overload situation if we get
15 into what I consider the characterization portion,
16 which has a lot of data associated with it. They are
17 your advisory group. And from that standpoint, any
18 more loading we put on them takes away from their
19 ability to advise you. So that's why we looked at it
20 in anticipation of an increased load.

21 COMMISSIONER CURTISS: That's all I have,
22 Ken.

23 CHAIRMAN CARR: I'm surprised that you think
24 greater-than-Class-C waste is a problem.

25 MR. STEIN: Why do you think that?

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1 CHAIRMAN CARR: My impression was there was
2 going to be a minor little corner of the repository--

3 MR. DUFFY: I haven't seen it defined in
4 volume yet, but from what I identified in potential,
5 it could be the potential for long-term burn-up fuel
6 with structural capability that has to be taken. We
7 haven't seen a reasonable volume.

8 You don't understand that?

9 CHAIRMAN CARR: No. Give me a -- tell me
10 what you're thinking of that I don't know about.

11 MR. DUFFY: Well, the first thing we're
12 thinking about, the small --

13 CHAIRMAN CARR: We made a big study of how
14 much greater-than-Class-C waste there was out there,
15 didn't we?

16 MR. DUFFY: No, not as far as I know.

17 MR. STEIN: The answer is that we made a
18 study, not a detailed or extensive or necessarily an
19 accurate study. But we made a judgement, and we had a
20 lot of caveats in our --

21 CHAIRMAN CARR: But all studies are detailed
22 and necessary and accurate.

23 MR. STEIN: By definition.

24 CHAIRMAN CARR: I thought that's why we made
25 them.

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1 MR. DUFFY: The terminology that we had with
2 regard to greater-than-Class-C, I've seen as much as a
3 second repository required to handle greater-than-
4 Class-C. From the standpoint from -- maybe you
5 haven't seen that study.

6 CHAIRMAN CARR: I haven't seen it. If
7 you've got it, I sure need to see it.

8 MR. DUFFY: And then, we've seen the ones on
9 the --

10 CHAIRMAN CARR: Will you send it over?

11 MR. DUFFY: -- greater-than-Class-C that
12 have immediate need which we can handle within the
13 Department's operation on pins, on sources, and things
14 of that nature. So, two different approaches to the
15 need for greater-than-Class-C. We think we need to go
16 back, take a look at that, take a look at the detailed
17 projections and see whether or not we do need a second
18 repository.

19 CHAIRMAN CARR: I request that you would
20 send us whatever you've got on Class C we don't know
21 about, because obviously you know something we don't
22 know.

23 MR. DUFFY: I'm not sure. That may be the
24 case. We may have different information that you
25 don't think is reliable.

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1 CHAIRMAN CARR: That's hard to believe.

2 I'm a little concerned, I guess, about your
3 collaboration idea. You know, we like to think we're
4 going to be independent from you. You've got to
5 design it and build it, and we're going to license it.

6 MR. DUFFY: Right.

7 CHAIRMAN CARR: I don't want to get in bed
8 with you and say, you know, this is the way we're
9 going to do it. That takes away my independent look
10 at it. How far do you want that collaboration to go?

11 MR. DUFFY: I tried to make that point in my
12 presentation, that we looked at that as a very
13 sensitive area and that's why we wanted to have more
14 peer review before rulemaking, so that when we did
15 come up with a rulemaking that it was defined as an
16 acceptable process. We don't want to jeopardize the
17 NRC's --

18 CHAIRMAN CARR: I guess I'd go so far as to
19 say we'll be happy to tell you when we think you're
20 heading into trouble.

21 MR. DUFFY: I'm sure that that's the case.
22 We just thought we needed more dialogue on what your
23 definition of trouble was.

24 CHAIRMAN CARR: I guess my concern on
25 waiting for rulemaking is it sounds -- if you look at

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1 all this together, it looks like we're going to wait
2 and make the rules to fit the site.

3 MR. DUFFY: There may be some areas that we
4 think that would be an advisable opportunity, but we
5 don't think that's the general trend.

6 CHAIRMAN CARR: I have a little problem with
7 that, I think. We'd like to think we can make the
8 rules fit public health and safety and some site has
9 to fit those rules.

10 MR. DUFFY: Right. We think the same thing.
11 I think that's what we identified as our first rule of
12 concern was safety.

13 CHAIRMAN CARR: As far as a realistic
14 schedule, which you've now come out with, I have a
15 little bit of problem with that, because I'm not sure
16 you've allowed enough time for suit settlement and
17 site access.

18 MR. DUFFY: That may be the case.

19 CHAIRMAN CARR: About a year in there,
20 right?

21 MR. DUFFY: We had --

22 CHAIRMAN CARR: And you haven't filed the
23 suit yet.

24 MR. DUFFY: We had discussions with --

25 CHAIRMAN CARR: Your lawyers are better than

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1 ours.

2 MR. DUFFY: We had discussions with the best
3 legal minds available to us at the time, and they gave
4 us a varying set of time tables. One, which was on
5 the basis that the federal judge who reviewed the case
6 would have definitive information based on a
7 comparative evaluation of permits that are in
8 existence, that the degree of environmental impairment
9 associated with what we were doing in this scientific
10 characterization may or may not be different and he
11 would judge it on that basis. The other would be that
12 we did not have enough information available on a
13 comparative basis.

14 There's also a fight -- a Nevada state
15 engineer who has -- as they used to say in Idaho, was
16 the "water king." And in fact, they used to say that
17 in Pascagoula, as I recall. And he has the
18 deterministic aspect of the use of water. That may be
19 a legal problem that we have to resolve if we bring in
20 a train load of water. He may have the right to tell
21 us how to use that. So those are the things that got
22 into a year. If it's more than a year, we may have to
23 go for other options.

24 CHAIRMAN CARR: Is it fair to say that it's
25 a day for day slip, depending on site access?

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1 MR. DUFFY: I don't think it's a day for day
2 slip. I think we have capability, but we can't do
3 disruptive activities on site. It's pretty close to a
4 day for day slip, though, in the surface
5 characterization past '91.

6 MR. PETERS: That's correct. When you get
7 to the exploratory shaft, we have some flexibility
8 beyond a year before it begins to impact us, and we
9 see that as critical path, essentially, for site
10 characterization.

11 MR. GERTZ: Exploratory shaft is the
12 critical path for site characterization right now. We
13 have the two years of surface-based testing until we
14 get up to that point of starting the exploratory
15 shaft. That provides some opportunity for
16 flexibility.

17 MR. DUFFY: Yes. I think the key from a
18 schedule standpoint is if we did find a disqualifying
19 characteristic, the sooner we find it the sooner we
20 are looking at the next site for evaluation. So that
21 aspect of the schedule I think is very important.

22 CHAIRMAN CARR: You're going to continue
23 designing the ESF, though?

24 MR. DUFFY: Yes, sir.

25 CHAIRMAN CARR: You don't know yet where

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1 we're going to put it, I guess?

2 MR. DUFFY: We're going to continue to
3 design it, starting on the schedule which shows we're
4 going to have a restart in '91 -- '92.

5 CHAIRMAN CARR: Maybe I better look at the
6 chart.

7 MR. DUFFY: The chart says that we stop the
8 exploratory shaft Title II until we completed the
9 alternative evaluation, and then we restart the Title
10 II operation.

11 CHAIRMAN CARR: But doesn't it indicate the
12 design goes on?

13 MR. DUFFY: It says evaluation and design.

14 MR. PETERS: There are two components to
15 that. That's a little bit confusing.

16 CHAIRMAN CARR: Design is going to stop.

17 MR. DUFFY: The design of Title II has
18 stopped.

19 MR. PETERS: Yes. The design that was
20 ongoing previously has stopped. We are now evaluating
21 the new alternatives and we're going to restart again
22 at the appropriate --

23 MR. DUFFY: The question that was raised to
24 assure we continue with the two shaft design versus
25 the ramp shaft design.

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1 CHAIRMAN CARR: Okay. Go over with me once
2 more about standardized casks for shipping and
3 storage.

4 MR. DUFFY: There are casks that have that
5 capability at the present time, but have not been
6 requested for license.

7 CHAIRMAN CARR: You know, it seems to me
8 that the design of the cask is either going to control
9 some of the repository design or visa-versa. But out
10 there we've got plants who are trying to do something
11 with casks and it seems to me it would be a lot
12 smarter if they only did one thing and they had a cask
13 with the fuel stored in it that they could send to
14 your MRS and you could send to the repository and
15 store.

16 MR. DUFFY: That may be the case unless we
17 looked at it from the standpoint of the number of
18 times you have to handle the fuel utility at the
19 present time. If you take it out of the fuel pool and
20 put it in a concrete canister, put it out on the pad,
21 bring it back into the fuel pool and unload it, if the
22 time schedule were such that we could have an MRS at a
23 given time period, it would reduce the amount of
24 handling to get the earliest fuel to the MRS with a
25 minimum amount of handling and a minimum number of

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1 casks.

2 CHAIRMAN CARR: But if they take it out of
3 their pool and store it in the cask, that you can then
4 take to the MRS. and then take to the repository, that
5 would solve all the problems, wouldn't it?

6 MR. PETERS: Single cask would.

7 MR. DUFFY: A single cask would, but a
8 single cask might be very expensive and those are the
9 kind of things that we're looking at right now. As a
10 matter of fact, we have a five cask program going on
11 for storage. One of those casks I know of had
12 original design for both storage and shipment. It has
13 not been asked for licensing on the shipment portion.
14 It's only been asked for licensing on the storage
15 portion, certification on the shipping, license for
16 the storage.

17 MR. STEIN: I think there's two elements of
18 the issue at this point. One is that there are a
19 number of utilities that I believe will need to have
20 some interim storage capability.

21 CHAIRMAN CARR: Already do.

22 MR. STEIN: Already do. And --

23 CHAIRMAN CARR: The longer we wait, the more
24 there will be.

25 MR. STEIN: Exactly. And some of those

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1 utilities have already decided on a way to dry store
2 their spent fuel. Some are storing them on casks that
3 are just on the site which are not transportable
4 casks. Some are storing them in a facility where they
5 actually move from the pool with a cask to that
6 facility on their site. Those different designs are
7 really the designs that we hope would someday be
8 brought into a standard design. There have been lots
9 of discussion that the Commission has had in the past
10 on a standard design for those --

11 CHAIRMAN CARR: But you realize if you
12 decided on a design, they'd all use it today because
13 that saves a lot of time and effort and money.

14 MR. STEIN: But, you see, that's their
15 decision. That again is their decision.

16 CHAIRMAN CARR: It's really not their
17 decision because there's no design that you've decided
18 on.

19 MR. STEIN: But our design --

20 MR. DUFFY: Yes, but we do have a test
21 program to come up with a design by '92, which in our
22 operation meets the '98 criteria for receipt of fuel.
23 We have multiple designs being tested at Idaho at the
24 present time --

25 CHAIRMAN CARR: Okay. You've got my point

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1 anyway.

2 In your judgment, if you get a negotiated
3 site, doesn't that eliminate that linkage?

4 MR. PETERS: Not automatically.

5 MR. DUFFY: Not by law.

6 CHAIRMAN CARR: I thought it did.

7 MR. PETERS: It permits the negotiator to go
8 back to Congress --

9 MR. DUFFY: Right.

10 MR. PETERS: -- to seek --

11 MR. DUFFY: It's a different way of
12 disrupting the linkage. He has to go back and say he
13 has a negotiated site and then they have to change the
14 law which presently identifies --

15 CHAIRMAN CARR: I thought it allowed them--
16 I thought the linkage only tied in if it wasn't a
17 negotiated site. That's the way I read it.

18 MR. DUFFY: I don't think that --

19 COMMISSIONER CURTISS: It's not our
20 understanding.

21 MR. DUFFY: It's not our understanding,
22 but --

23 COMMISSIONER CURTISS: The slide has to be
24 authorized by Congress.

25 MR. DUFFY: Right.

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1 COMMISSIONER CURTISS: Isn't that correct?

2 MR. DUFFY: Right.

3 COMMISSIONER CURTISS: But in the absence of
4 any --

5 MR. DUFFY: We may not have a site
6 identified. Okay? And the site for the MRS can be
7 authorized by Congress. But presently, as I read it,
8 but I'm not the lawyer here so I'm reading it on the
9 basis that you have to -- the President has to
10 identify -- we have to identify to the President that
11 we have a site and then at that point we can start the
12 MRS. We can go selective, but we can't do anything
13 with it until we have identified a site. That's my
14 interpretation. That could be wrong. It wouldn't be
15 the first time.

16 COMMISSIONER CURTISS: Because I see -- I'm
17 not sure I disagree with you -- the site for the MRS
18 has to be authorized if there's a volunteer, but the
19 Congress does not have to actually decouple the site
20 from the limitations that would currently apply to the
21 non-voluntary site. That linkage would not apply --

22 MR. PETERS: They do not have to, but one
23 would expect that that might be part of the package.

24 CHAIRMAN CARR: When do you think you'll
25 have your next plan out? I mean something so we can

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1 make sure we're not on your critical path.

2 MR. DUFFY: We expect if it's -- we expect
3 to have another one out in January with new data. I
4 think the Secretary expects to issue it on a bimonthly
5 basis from that standpoint. But we'll have to give
6 you a copy of our internal schedule to show the
7 progress because it is, in addition to a long-term
8 decision plan, it's a performance plan on the basis of
9 our own internal performance, not necessarily
10 external. The Secretary is extremely interested in
11 achieving a performance-based evaluation for all our
12 projects.

13 CHAIRMAN CARR: Okay. Any other comments or
14 questions?

15 COMMISSIONER CURTISS: Ken, let me clear up
16 a couple of items here.

17 Based upon what you've learned at WIPP, are
18 we going to have a mixed waste problem with spent
19 nuclear fuel? Is the --

20 MR. DUFFY: If you wanted to look at a Rod
21 Serling operation, I'd say that possibility exists.
22 Somebody could say that there's heavy metals in there.

23 COMMISSIONER CURTISS: Do you know of
24 anything today such as the --

25 MR. DUFFY: No, sir.

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1 COMMISSIONER CURTISS: -- gas that you've'
2 seen at WIPP that would suggest that RCRA has got to
3 be considered in this context?

4 MR. DUFFY: Not yet, no. I think the
5 problem that we have at WIPP is that we have a
6 scientific extrapolation of potential that says if we
7 take the worst case considerations the canister could,
8 under an aerobic situation, corrode and produce a
9 large quantity of gas. In an anaerobic situation, it
10 can produce a certain quantity of gas that could or
11 could not permeate this --

12 COMMISSIONER CURTISS: Is that answer to
13 that question affected by whether you put greater-
14 than-Class-C waste in the repository or have you
15 looked at that yet?

16 MR. DUFFY: I don't think so from the
17 standpoint of what -- the greater-than-Class-C in most
18 cases is in the stainless category. I don't think the
19 gas generation on the stainless projection was as much
20 as the carbon steel, but I don't remember that in
21 exact detail. But I could get you the --

22 MR. GERTZ: It could have some hazardous
23 complements.

24 MR. DUFFY: It could have some hazardous
25 complements, but I think in a gas situation, I just

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1 don't remember the numbers, but I thought when we
2 looked at it that under certain conditions, like in
3 tough, it wouldn't be the same as in salt. The
4 corrosion rate would be significantly less.

5 COMMISSIONER CURTISS: One final question.
6 On your petition for the accident-dose guideline, you
7 say you're going to submit that, is it later this
8 year, as in later in '89 or later in the fiscal year
9 or --

10 MR. STEIN: '90.

11 MR. DUFFY: '90. That's one of our
12 conservative schedules.

13 COMMISSIONER CURTISS: Okay. Do you have a
14 feel for -- from the standpoint of your schedule, how
15 urgent action by the Commission is on that? When do
16 you think we need to move forward given your other
17 activities?

18 MR. STEIN: If it's a design criteria, then
19 we'll have to apply. So, as we go through our design
20 activities, particularly as we proceed to Title II, we
21 would like to hopefully have some resolution by that
22 period of time, which is '91.

23 COMMISSIONER CURTISS: '91?

24 MR. STEIN: Yes, hopefully '91.

25 CHAIRMAN CARR: Well, gentlemen, I'd like to

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1 thank you for being with us today to discuss the
2 status of the Civilian High Level Waste Program. I
3 agree with Secretary Watkins' view that this program
4 is a scientific endeavor of critical significance to
5 the nation's ability to safely manage and dispose of
6 the nuclear waste and to the reestablishment of
7 confidence in the nuclear energy option in the United
8 States.

9 We at the Commission are pleased with the
10 Secretary's commitment to ensure that the scientific
11 investigations are the focal point of the program, so
12 that the results are technically sound and uncoupled
13 from a scheduling process which may constrain the
14 collection of sufficient information for a
15 determination of site suitability and a thorough and
16 complete license application.

17 As the NRC staff commented in its recent
18 comments to DOE on the Site Characterization Plan, we
19 urge that DOE give early priority to addressing those
20 issues which may most significantly impact any
21 determination regarding site suitability.

22 In my view, today's meeting has been most
23 worthwhile in providing exchange of views on the
24 status of the program and I believe we should continue
25 such meetings as events warrant. Also, I can't

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1 emphasize enough the importance of the pre-licensing
2 consultation between DOE and NRC as well as the
3 interactions with the state and tribes.

4 You've placed a lot on the table today and
5 we appreciate it. Such dialogue contributes to the
6 early identification and potential resolution of
7 issues as they arise.

8 Finally, I would like to comment on that
9 area of the program which is of particular interest to
10 me as it impacts on our ability to complete the
11 license review in the three year time frame prescribed
12 by Congress. It's my strongly held view that as long
13 as the potential repository site is under
14 consideration and site characterization is either
15 ongoing or actively planned, development of the
16 licensing support system should continue. Since it is
17 reasonable to expect that problems and delays may be
18 encountered in the development of such a large and
19 complex automated system, it's important to continue
20 an aggressive development schedule to help ensure the
21 licensing support system never gets on the critical
22 path of the license review of the repository.

23 I offer my help to you in support of this
24 view and defense of our respective budgets. So, if
25 you need help, holler.

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1 Do any of my fellow Commissioners have any
2 additional comments?

3 COMMISSIONER ROGERS: Just that if DOE can
4 accomplish things as rapidly as Mr. Duffy can deliver
5 information to us, you're in great shape.

6 MR. DUFFY: We'll try.

7 CHAIRMAN CARR: Thank you and we stand
8 adjourned.

9 (Whereupon, at 3:39 p.m., the above-entitled
10 matter was concluded.)
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HIGH LEVEL WASTE PROGRAM

PLACE OF MEETING: ROCKVILLE, MARYLAND

DATE OF MEETING: DECEMBER 20, 1989

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