

ORIGINAL

**OFFICIAL TRANSCRIPT
PROCEEDINGS BEFORE**

NUCLEAR REGULATORY COMMISSION

COMMISSION MEETING

PUBLIC MEETING

DKT/CASE NO.

TITLE OPTIONS REGARDING HIGH-LEVEL WASTE
RULE TECHNICAL CRITERIA (PART 60)

PLACE WASHINGTON, D. C.

DATE NOVEMBER 18, 1982

PAGES 1 - 129

8211240218 821118
PDR 10CFR
PT9.7 PDR

AR
ALDERSON REPORTING

(202) 628-9300
440 FIRST STREET, N.W.
WASHINGTON, D.C. 20001

1 UNITED STATES OF AMERICA
2 NUCLEAR REGULATORY COMMISSION

3
4 OPTIONS REGARDING HIGH-LEVEL WASTE RULE
5 TECHNICAL CRITERIA (PART 60)

6 PUBLIC MEETING

7 Nuclear Regulatory Commission
8 Room 1130
9 1717 H Street, N. W.
10 Washington, D. C.

11 Thursday, November 18, 1982

12 The Commission convened, pursuant to notice, at
13 2:05 p.m.

14 COMMISSIONERS PRESENT:

15 NUNZIO PALLADINO, Chairman of the Commission
16 VICTOR GILINSKY, Commissioner
17 JOHN AHEARNE, Commissioner
18 THOMAS ROBERTS, Commissioner
19 JAMES ASSELSTINE, Commissioner

20 STAFF AND PRESENTERS SEATED AT COMMISSION TABLE:

21 S. CHILK
22 M. MALSCH
23 G. CUNNINGHAM
24 P. COMELLA
25 W. DIRCKS
J. DAVIS
M. BELL
B. HEWETT
F. COFFMAN
S. BREWER
R. DeJu
D. EGAN
P. MEYERS
K. KRAUSKOPF

* * *

DISCLAIMER

This is an unofficial transcript of a meeting of the United States Nuclear Regulatory Commission held on November 18, 1982 in the Commission's offices at 1717 H Street, N. W., Washington, D. C. The meeting was open to public attendance and observation. This transcript has not been reviewed, corrected, or edited, and it may contain inaccuracies.

The transcript is intended solely for general informational purposes. As provided by 10 CFR 9.103, it is not part of the formal or informal record of decision of the matters discussed. Expressions of opinion in this transcript do not necessarily reflect final determinations or beliefs. No pleading or other paper may be filed with the Commission in any proceeding as the result of or addressed to any statement or argument contained herein, except as the Commission may authorize.

P R O C E E D I N G S

1
2 CHAIRMAN PALLADINO: Good afternoon, ladies
3 and gentlemen.

4 Today's meeting addresses the Commission's
5 proposed technical rule for disposal of high-level
6 radioactive waste in geologic repositories.

7 Proposed technical criteria were published for
8 public comment in July 1981. Today's speakers will
9 touch on several questions concerning the timing and
10 content of a final technical rule.

11 Our first presentation will be made by the NRC
12 staff under the EDC, Bill Dircks. The staff has
13 recently highlighted for the Commission the potential
14 problems in finalizing the technical rule before the
15 Environmental Protection Agency issued an effective
16 standard for high-level waste disposal.

17 In particular the staff noted that the NRC's
18 performance objectives for waste package containment
19 time and the release rate from the engineered barrier
20 system are closely linked to the EPA standard. The
21 staff argues that the two performance objectives ought
22 not be finalized until the EPA standard is published.

23 Following the NRC staff will be the Department
24 of Energy represented by Shelby Brewer, Assistant
25 Secretary for Nuclear Energy and by Dr. Frank Coffman,

1 Deputy Assistant Secretary for Nuclear Energy.

2 In a letter dated October 29th, 1962 DOE
3 expressed a fundamental objection to the NRC's numerical
4 performance objectives for the individual barriers of
5 the geologic repository. DOE requested the opportunity
6 to address the Commission before the Commissioners act
7 on the staff's approach to finalizing the NRC technical
8 criteria, including the individual performance
9 objectives.

10 Following DOE we have allotted time for the
11 EPA represented by Dan Egan of the Waste Management
12 Branch and the National Academy of Sciences represented
13 by Dr. Konrad Krauskopf who is the Chairman of the Board
14 on Radioactive Waste Management. The representatives
15 may wish to comment on the presentations of the NRC and
16 DOE and the Commissioners will probably also wish to ask
17 some questions.

18 We have allotted roughly 30 minutes apiece for
19 the NRC staff and DOE speakers and five minutes apiece
20 for the remaining two speakers. That doesn't mean
21 though that we won't interrupt with questions.

22 (Laughter.)

23 CHAIRMAN PALLADINO: If there aren't any other
24 Commissioner remarks at this time ---

25 COMMISSIONER GILINSKY: I have a question I

1 would like to ask. I guess I would like to understand
2 what it is we are letting ourselves in for. Are we
3 starting another round of comments or are we going to
4 entertain comments from others who participated in this
5 rulemaking? I guess I would like to ask the General
6 Counsel what happens if we modify our views as a result
7 of today's meeting? Would we then have to put a rule
8 out for comment again?

9 MR. MALSCH: It would depend on what the
10 change was. If the data is already basically in the
11 record and what you are hearing are sort of elaborations
12 or arguments based upon data already submitted in
13 comments, I would say there is no need to go out again
14 for comment.

15 If we get, you know, laid before the
16 Commission at a late date an entirely new rationale for
17 an entirely different rule, then, yes, there is a
18 possibility you would have to go out again for comment.
19 It would depend on the nature of the comments.

20 MR. CUNNINGHAM: I would agree with that, but
21 I would add specifically if the changes go to the
22 systems approach rather than the engineering barriers
23 approach and eliminate those subcriteria, that would be
24 a major change which I think would require renoticing.

25 COMMISSIONER GILINSKY: And are we going to

1 entertain comment from others?

2 CHAIRMAN PALLADINO: What is that?

3 COMMISSIONER GILINSKY: Are we going to
4 entertain comment from others who are not here today?

5 CHAIRMAN PALLADINO: I think that would depend
6 a little bit on what we hear.

7 COMMISSIONER AHEARNE: Or on whether it makes
8 any modification to the rule proposed.

9 COMMISSIONER GILINSKY: Whether we change our
10 views.

11 COMMISSIONER AHEARNE: That is right.

12 CHAIRMAN PALLADINO: Any other comments or
13 questions?

14 (No response.)

15 CHAIRMAN PALLADINO: Okay. Then I will turn
16 the meeting over to Mr. Dircks.

17 MR. DIRCKS: We had one primary objective when
18 the meeting was scheduled, and that was to discuss the
19 five alternatives that we presented to the Commission in
20 SECY-82-427, and John Davis will go through those
21 alternatives.

22 I have to emphasize that all those
23 alternatives are based on the multiple-barrier
24 quantitative criteria approach. So we didn't intend to
25 get into an argument over whether or not you should have

1 multiple-barriers and numerical criteria. That we
2 thought was established by the Commissioner in its
3 guidance to the staff and when we issued the proposed
4 rule. If that were changed, we would have to go back
5 and have further discussions on that subject.

6 I thought before we got to the alternative
7 questions, I do think it is necessary though to address
8 some of the points raised in the DOE October 29th
9 memorandum. Again, I don't want to get into a debate on
10 the technical issues they raised, but I do think it is
11 important to address I think the allegations that were
12 made that we didn't follow a rulemaking process that had
13 integrity.

14 I think in our rulemaking process in the
15 addressing of comments, I do think we have followed a
16 legitimate and correct path. There were comments made
17 in the DOE memo that gave examples of how we were
18 unresponsive or did not adequately address comments and
19 I do think we want to get into that issue because that
20 did question the integrity of the whole rulemaking
21 process.

22 COMMISSIONER GILINSKY: You say you do or you
23 don't?

24 MR. DIRCKS: We do. Now in some cases it is
25 going to be difficult because the memo goes back and

1 forth between the comments that were made in the context
2 of the rulemaking process and some comments that were
3 quoted I think out of context. So we are going to try
4 to match the two and I am going to ask Pat Comella to
5 try very briefly to address that issue.

6 After she is finished, I would like to then go
7 back to John Davis to go over the options that we
8 presented in our memorandum to the Commission.

9 MR. CUNNINGHAM: All right. To just recap a
10 few facts connected with the public comments that we
11 received, to date we have received and documented 91
12 comment letters of which the most recent was the October
13 29th memorandum from DOE. Those letters were
14 distributed. We had about nine from other federal
15 agencies, 11 from state and local governments, two from
16 foreign countries who were very interested in the
17 question of waste disposal, and, oh, about 20 from the
18 industry professional societies, consulting firms and
19 the remainder from private individuals. There were two
20 letters from Congressional either committees or
21 Congressmen.

22 The summary of the public comments received,
23 it is going to be difficult to avoid getting into
24 content, but I will do my best.

25 (Laughter.)

1 MR. CUNNINGHAM: There was general support for
2 the multi-barrier approach, and let me characterize that
3 as general acceptance that both engineering and geology
4 should contribute to waste isolation in the geologic
5 repository.

6 Concern, however, was expressed over the
7 numerical performance requirements. There was concern
8 about specifying numerical requirements for subsystems,
9 and the comments generally fell into two categories.
10 One would be no numerical criteria for subsystems at all
11 specified in the rule, or, if you do, have some
12 provision for flexibility.

13 The lack of an EPA standard was noted. It was
14 noted in two respects. How can you finalize criteria if
15 you don't have a standard and how can you show a
16 relationship between the subsystem performance
17 requirements and an overall system requirement without
18 the standard in place?

19 The question of the meaning of reasonable
20 assurance, that evoked quite a lot of concern. What is
21 the nature of the proof required during the licensing
22 process in order to arrive at a licensing decision given
23 the very long periods of time involved and the
24 uncertainty associated with this particular enterprise?

25 There was comment on the retrievability,

1 specific detailed requirements, the TRU requirements
2 that were in the proposed rule and there was discussion
3 of disposal in the unsaturated zone. If you will
4 recall, the proposed rule was limited to disposal in the
5 saturated zone, a fact that a number of commenters
6 offered very helpful comment upon.

7 COMMISSIONER AHEARNE: Pat, just one
8 question. On those that raised questions about the
9 level of detail, did they suggest elimination of the
10 detail from the rule and placing it in something else or
11 just the elimination of the detail?

12 MR. CUNNINGHAM: It was varied, if I recall
13 correctly. Some suggested elimination of very specific
14 requirements. Generally I think that there was not
15 difficulty with putting into another form of guidance.
16 It was just the question of whether or not that was
17 appropriate for a regulation.

18 COMMISSIONER AHEARNE: So that it was not
19 necessarily then complete disagreement with the approach
20 that the detail represented?

21 MR. CUNNINGHAM: I wouldn't say that. Yes, I
22 would say that there was not difficulty with it. It was
23 where it was.

24 COMMISSIONER AHEARNE: So that something like
25 a reg. guide might be an appropriate route.

1 MR. CUNNINGHAM: Yes.

2 In the next few viewgraphs I am going to just
3 quickly step through how we went about analyzing public
4 comments. I don't think that there was anything
5 different from the approach that we took in analyzing
6 these comments for this rulemaking versus other
7 rulemakings.

8 I would say, however, that the staff was
9 particularly sensitive to the great importance and
10 visibility attached to this rulemaking and the fact that
11 that recent rulemakings of the Commission have come
12 under scrutiny by the courts and have come in for
13 criticism, and I think that that provided additional
14 incentive to do a very fine job in terms of providing
15 systematic and documented identification and
16 consideration of all of the issues addressed by the
17 commenters of showing how they were considered, what
18 changes resulted from the proposed rule and why those
19 changes were made.

20 We went through a very detailed process then
21 to identify all of the topics, to collect the individual
22 comments of which there were several hundred and to
23 place them into proper context. We were quite concerned
24 about that I know and went through a number of
25 iterations before we felt that we had them properly

1 contexted.

2 We then categorized them by topic, and then we
3 did topical analyses. The results of those analyses
4 occur in three different documents. Each comment is
5 responded to individually. It may be a cross-reference
6 to the policy overview in the section-by-section
7 analysis which shows where the changes were made and
8 there may be some discussion in the individual response.

9 The third document that is provided is the
10 treatment of the technical issues and those are treated
11 in the rationale document which you received in July.

12 In order to provide some idea of what we did,
13 what the comments were and how the staff responded to
14 them, I have used the DOE letter of November 5th, 1981
15 for three examples and I have selected the most recently
16 arrived letter from DOE for the fourth example. I did
17 that because they are the ones who have expressed the
18 most concern about how we have handled the comment
19 analysis. So it seemed to me to be most appropriate to
20 use their letter.

21 I have quoted hopefully not out of context or
22 misrepresented what they said. "We have long recognized
23 the need for a multi-barrier approach and the objectives
24 which the Commission is seeking to achieve." The staff
25 response to that in terms of reference to the draft

1 final rule would be that the multi-barrier approach is
2 retained. The individual repository subsystems are
3 identified, containment within the waste packages,
4 controlled release from the underground facility and a
5 minimum groundwater travel time to the accessible
6 environment, those are treated qualitatively as well as
7 then numerical requirements specified quantitatively.

8 Also in comment letter No. 48 "The Department
9 considers that a more appropriate way of accomplishing
10 the objectives expressed by the Commission would be to
11 provide specific subsystem performance goals by
12 providing the flexibility to select numerical subsystem
13 criteria on a case-by-case basis." Language was also
14 provided as part of the DOE submittal at that time. The
15 staff considered the language as well as the comments.

16 I would note, too, that similar comments were
17 received. These are in other letters and these are
18 merely illustrative. The numerical performance
19 objectives for individual subsystems are retained.
20 However, there is provision for flexibility to propose
21 alternative numbers.

22 The third example DOE expressed concern, "It
23 is not clear how the individual performance objectives
24 are related to the EPA release limits using the
25 techniques of performance analysis and an understanding

1 of the geologic and hydrologic environments." I would
2 make reference here to the rationale document in which
3 the staff has shown the relationship between the assumed
4 EPA standard which is Draft 19 referenced by a number of
5 commenters in their letters and the numerical
6 performance objectives that are in the draft final rule.

7 The Sandia performance assessment models were
8 used to perform this analysis and there was a detailed
9 discussion in the document of the uncertainties
10 associated with the geologic and hydrologic environments
11 now that have been typical for a repository system.

12 For my last example I have gone to the most
13 recent DCE letter which has been assigned Docket No.
14 91. We are seriously concerned over the numerical
15 requirements for components. We believe that the need
16 to demonstrate compliance will unnecessarily complicate
17 and prolong the licensing process.

18 While I have provided a preliminary staff
19 response that points out the fact that in licensing the
20 individual subsystems would have to be identified
21 wherever DCE wants credit for the performance of a
22 particular subsystem or component of the geological
23 repository, be it an engineer component or a geologic
24 barrier, it would have to be able to demonstrate why
25 such credit should be given.

1 Ultimately a criterion is specified
2 numerically and performance is measured against that
3 particular criterion. So there is potential for
4 litigation involving compliance demonstration in the
5 licensing process regardless of whether you specify the
6 performance criterion now in advance in the rule or
7 whether you await the licensing case.

8 The question then is whether or not you bound
9 the litigative risks more readily by specifying the
10 criteria in advance or whether you do so by waiting
11 until you get to licensing. On that point I would like
12 Guy to address the advantages as the staff sees it of
13 specifying the requirements now.

14 MR. CUNNINGHAM: The point was made in DOE's
15 most recent letter that in their view licensing would be
16 much more difficult if these performance criteria were
17 specified in the rule. Our experience in licensing
18 would suggest that the case is probably just the
19 opposite.

20 You have two features here, identifying the
21 criterion and measuring performance against the
22 criterion. If the criterion is identified in the rule,
23 that cannot be litigated. If you don't have the
24 criterion, you will litigate it.

25 The classic example, of course, was ECCS.

1 Back in the early 70's the only criterion was abundant
2 emergency core cooling and we litigated months and
3 months what is abundant. Then after you define what is
4 abundant, then you have to say do you have that much.
5 This rule would prescribe what is abundant and that
6 would not be litigated.

7 I might add that when we went to rulemaking
8 the ECCS we eliminated that issue and we don't litigate
9 ECCS any more.

10 COMMISSIONER GILINSKY: What you say is I
11 think right, but reading what DOE has sent to us my
12 impression is that what concerns them is having to come
13 in and ask for an exemption will be an awkward thing.

14 MR. CUNNINGHAM: Well I think that is a
15 separate issue.

16 COMMISSIONER AHEARNE: Well, you see, your
17 description was quite right, if the criteria could be
18 met.

19 MR. CUNNINGHAM: That is right.

20 COMMISSIONER AHEARNE: And if it is a
21 different assumption, you get a different answer.

22 MR. CUNNINGHAM: That is right. If they
23 choose to avail themselves of the flexibility which we
24 have in this proposed rule, then they are back to the
25 situation where there were no criteria and you have to

1 litigate both issues.

2 COMMISSIONER GILINSKY: Right.

3 MR. CUNNINGHAM: What are the criteria and do
4 you meet it.

5 MR. DIRCKS: That is the other issue, are the
6 criteria reasonable criteria and can they be met. Of
7 course, that is the other issue that I think we would be
8 prepared to discuss, but I didn't know whether you
9 wanted to get into that issue.

10 COMMISSIONER AHEARNE: I was just commenting
11 on Guy's description, and he started with an unspoken
12 something.

13 MR. CUNNINGHAM: You are correct. If you meet
14 the criteria, then you eliminate a major issue. If you
15 don't eliminate and meet the criteria and just to
16 justify some other approach, then you litigate both
17 issues.

18 CHAIRMAN PALLADINO: I gather they felt they
19 might be, as Commissioner Gilinsky said, in an awkward
20 position if they have to come back and ask for less
21 stringent criteria.

22 COMMISSIONER GILINSKY: Well, it is something
23 that ought to get very careful scrutiny.

24 CHAIRMAN PALLADINO: Sure. I am just saying
25 what their argument was.

1 MR. CUNNINGHAM: Well, I think that is true.
2 Part of their argument was that there is a regulatory
3 mind stand against ever granting exemptions.

4 COMMISSIONER ROBERTS: And they say that
5 pretty emphatically.

6 COMMISSIONER AHEARNE: I think it is certainly
7 true that for the first repository it will be very
8 difficulty to get away with many explicitly stated
9 exemptions.

10 MR. DIRCKS: Of course, that is why we put the
11 Alternative B in there. We didn't want them looking at
12 that as an exemption but as an alternative path than the
13 one they are taking.

14 You are finished?

15 MS. COMELLA: Yes.

16 MR. DAVIS: Now if I can focus on why the
17 staff felt we were originally coming down here, and that
18 is to get some guidance.

19 COMMISSIONER GILINSKY: The original purpose
20 of the meeting.

21 COMMISSIONER AHEARNE: No, those are two
22 different things.

23 (Laughter.)

24 MR. DAVIS: Why we thought we were coming
25 down.

1 COMMISSIONER AHEARNE: There were two meetings
2 that turned out to be combined into one.

3 MR. DAVIS: This is the part that the staff
4 was asking for, and that is basically to receive from
5 the Commission some guidance on how to proceed to go to
6 a final on Part 60 in the absence of the EPA standard.

7 As you all know, the EPA standard is used as
8 the overall performance goal for Part 60. We in
9 developing this rule, which has been in the works for
10 some years, never anticipated that we would be at this
11 point without the EPA standard. We were well mindful of
12 some recent experiences which we have had with regard
13 to, and I think the term is getting ahead of EPA in our
14 rulemaking.

15 COMMISSIONER GILINSKY: Which isn't hard to do.

16 (Laughter.)

17 MR. DAVIS: So consequently we thought it was
18 time to pause and come back to the Commission and say we
19 would like to have some guidance on how should we now
20 proceed.

21 Now of course the major issue that has arisen
22 is this performance objectives appearing in the rule.
23 As Mr. Dircks has already mentioned of course, this was
24 a Commission position previously taken and the staff has
25 gone through and followed through on what we considered

1 to be the Commission direction and we have ended up with
2 the rule which does have the numerical performance
3 criteria within it.

4 Now the criteria that we are suggesting as in
5 the options, we are not suggesting that we remove the
6 numerical performance criteria for the geological
7 setting.

8 COMMISSIONER AHEARNE: You mean the ground
9 water travel time.

10 MR. DAVIS: I am sorry, the ground water
11 travel time. The concept of geologic disposal suggests
12 isolation over a long period of time and we believe that
13 the time of the criteria within the rule is a prudent
14 number. I also might comment that this is not a matter
15 in issue. This has not been brought to us as a matter
16 in issue.

17 COMMISSIONER AHEARNE: Let me see if I
18 understand that last comment, John. There are three
19 numerical criteria in the proposed rule.

20 MR. DAVIS: Right.

21 COMMISSIONER AHEARNE: You are saying that two
22 of them are the ones that you are going to talk about.
23 The third one, the ground water travel time, is not
24 going to be one of items that is listed either in or out
25 of these options because it is not an item at issue.

1 MR. DIRCKS: No. That was a side statement.
2 The real reason is because we think the concept of
3 geologic disposal calls for a long time and that that
4 number which we have is a prudent time. Parenthetically
5 it has not been raised as an issue.

6 COMMISSIONER AHEARNE: What I am puzzled by is
7 that I thought that all three numbers were in there
8 because deep geologic disposal and prudent planning
9 requires the barrier concept and the numbers are in
10 there to try to get confidence that the overall limit
11 can be met. I am having difficulty seeing why one of
12 them is treated so differently than the other two.

13 MR. DAVIS: Well, the geologic number is of
14 course a matter of geology. The other two numbers are
15 matters which can be influenced by engineering. So
16 consequently what has been focused upon are those
17 numbers which are subject to some degree of influence by
18 man and engineer.

19 COMMISSIONER AHEARNE: The geological one is
20 subject to selection.

21 MR. DAVIS: That is right.

22 COMMISSIONER AHEARNE: In other words, where
23 you choose the site ---

24 MR. DAVIS: --- will determine the degree of
25 the geologic barrier, right.

1 Now the next slide shows why we need the
2 standard and I think we are all aware why we need the
3 standard. It does specify the quantities of radioactive
4 material that can be released to accessible
5 environment. It does set the time period over which
6 performance must be assessed, in other words, 10,000
7 years. It does provide the definition for the
8 accessible environment. Then we are relying on the EPA
9 EIS, on its standard to address the radiological impacts
10 of a high-level waste disposal.

11 As I have mentioned, we did fully anticipate
12 that the EPA standard would be in place before we got to
13 this point.

14 COMMISSIONER AHEARNE: Now when the comments
15 were out or when our rule was out, and it was Draft 19 I
16 think was the EPA standard that you were talking about,
17 is that still the latest draft or are there any major
18 changes since that time?

19 MR. BELL: The draft that was available at the
20 time the proposed rule went out and the one that we used
21 in our analysis was Draft 19. The current working draft
22 of the EPA is Draft 21. There have been some changes to
23 the definitions and to the guidelines, but the numerical
24 quantities in the standard itself haven't changed at all.

25 COMMISSIONER AHEARNE: So the 10,000 year, for

1 example as the period of assessment is still the same?

2 MR. BELL: It is still the same and the
3 quantities that could be released over that period would
4 be the same.

5 MR. DAVIS: Now if we can turn to the five
6 options that are called out in the staff paper ---

7 COMMISSIONER GILINSKY: Did you say Draft 21?

8 MR. BELL: Yes.

9 MR. DAVIS: Under Option 1 what the staff is
10 proposing is that you finalize the rule except for the
11 numerical substance then of the two numbers associated
12 with the performance objectives of the engineered
13 barrier system, that is the waste package containment
14 time and the EPA barrier system, and move forward with
15 the rule.

16 These two numbers would be reserved until
17 after the EPA publishes an effective standard at which
18 time the staff would look at that which it has done and
19 see if it needs to be modification to the rule and
20 proceed to insert the numbers.

21 COMMISSIONER GILINSKY: If there were any
22 major departure from numbers that have been put out for
23 comment, wouldn't you go out for comment again?

24 MR. DAVIS: It would have to back out for
25 comment. Now of course what this would do ---

1 COMMISSIONER GILINSKY: Do you have any sense
2 for how long that process would take?

3 MR. DAVIS: It would depend on when the EPA
4 standard comes out of course.

5 COMMISSIONER GILINSKY: For going out for
6 comment again.

7 MR. DAVIS: For going out for comment?

8 COMMISSIONER GILINSKY: Yes.

9 MR. DAVIS: What would you think?

10 MR. BELL: On a narrow issue like this, fixing
11 the couple of numbers, given an EPA standard, we think
12 that could be done fairly quickly in a fairly narrow
13 scope of the rule.

14 MR. DAVIS: Now the major points in item 1 are
15 it does get ahead of the EPA standard and it would get
16 the major portion of the rule into place and remove
17 whatever uncertainty there is in those portions.

18 Option 2 is the same as option 1 with the
19 exception that the staff proposes to go out on limited
20 public comment on the removal of the two numbers; that
21 is, comments would be asked on should we reserve the
22 numerical objectives until the standard is publicized,
23 or should we finalize numerical objectives in the
24 absence of the standard and rely on flexibility
25 provisions which are in the current version of the rule.

1 CHAIRMAN PALLADING: The rule you are talking
2 about does have additional information about saturated
3 versus unsaturated?

4 MR. DAVIS: Yes, sir, it does, and we would
5 have to go out for comment on that. In anything we do
6 we will have to go out for comment.

7 CHAIRMAN PALLADING: Well, the first one,
8 okay, you are not asking for comments.

9 MR. DAVIS: Right, but in the first one, sir,
10 when we publish the final rule we would have to ask for
11 comments on the saturated and unsaturated also.

12 COMMISSIONER GILINSKY: Let me ask you, if
13 there any suggestion in these various reiterations of
14 the EPA that their basic numbers are going to be changed
15 or is it a matter of additional criteria or guidelines?

16 MR. DAVIS: There is an EPA person here to
17 address that. I don't believe we have such an
18 indication.

19 COMMISSIONER GILINSKY: Aren't the EPA numbers
20 the only thing that would affect the numbers in our
21 rule, and if those aren't changing what prospect is
22 there for our changing our numbers?

23 MR. BELL: EPA will be in the process of
24 publishing these for comment for the very first time and
25 we expect that it may be a very controversial standard

1 on some of the issues being dealt with, the time periods
2 involved and how you treat issues such as intrusion and
3 other potential disruptive events.

4 COMMISSIONER GILINSKY: Well, let's see, are
5 we talking about waiting till EPA has a final rule or
6 until EPA has a proposed rule?

7 MR. BELL: A final rule.

8 COMMISSIONER GILINSKY: Oh, that is a long
9 time, isn't it?

10 MR. DAVIS: It can be a considerable period of
11 time.

12 COMMISSIONER GILINSKY: Because they are not
13 even proposing yet.

14 MR. DAVIS: That is right, the proposed rule
15 is not yet packaged.

16 COMMISSIONER GILINSKY: So we might be taking
17 about years.

18 COMMISSIONER AHEARNE: Yes.

19 MR. DAVIS: Based on the issue, we are talking
20 about years.

21 COMMISSIONER ASSELSTINE: What is the impact
22 of that kind of a delay given all of the ongoing work
23 that is planned over the next several years?

24 COMMISSIONER GILINSKY: The impact I take it
25 on the waste program.

1 COMMISSICNER ASSELSTINE: Yes. Doesn't it
2 really call into question the whole foundation of the
3 program over the next several years?

4 (Simultaneous conversations -- Inaudible)

5 (Laughter.)

6 MR. DAVIS: I think what the benefit of what
7 we are proposing to do is that it makes clear if we
8 publish the rule either under one or two in the final
9 form it is merely subtracting out these two numbers.
10 Now if the Commission has firmly decided on the
11 comparative approach, then all it is waiting for is what
12 should these numbers be. If you don't publish the rule,
13 in other words, if you don't do anything at the present
14 time or sit back and wait, then that decision is not
15 yet ---

16 MR. DIRCKS: And I think it allows the site
17 selection and site characterization process to go
18 forward.

19 COMMISSIONER GILINSKY: Well, If you don't
20 gave numbers, what the public knows or DOE knows is that
21 there is a box and something is going to go in there
22 between zero and infinity.

23 COMMISSIONER AHEARNE: But, Vic, we can't
24 choose the final numbers no matter what we do. The
25 final number, Congress at the moment says that final

1 number is EPA's.

2 COMMISSIONER GILINSKY: We can put out a
3 number which is subject to change or subject to
4 modification upon receiving EPA's final number.

5 CHAIRMAN PALLADINO: What is the force of
6 doing that, Vic?

7 COMMISSIONER GILINSKY: Well, it keeps things
8 moving and it gives people guidance and the chances are
9 on the basis of what we are hearing that it is probably
10 going to be about right.

11 COMMISSIONER AHEARNE: John, let me ask you
12 what would happen if we had something slightly
13 different, if we put out our final rule as final and we
14 took those two numbers and put them in a regulatory
15 guide?

16 MR. DAVIS: Well, of course, that I am sure is
17 an approach that certainly could be taken. It would of
18 course, if the decision is made at a later point to
19 change those numbers, make it procedurally less
20 difficult to change. I think the downside of that would
21 be again a question of Commission resolve as much as
22 anything else.

23 COMMISSIONER AHEARNE: Except that these are
24 the two numbers that you have pointed out in your
25 proposal, at least several of them. Several of your

1 options are ones that we are supposed to be saying that
2 they aren't final.

3 MR. DAVIS: That is what we are saying now,
4 right.

5 COMMISSIONER AHEARNE: So that it would appear
6 to me that if you put them into a regulatory guide then
7 that is I thought a clear statement that these are the
8 numbers the staff believes are the right numbers to be
9 used and in the absence of an EPA final number it would
10 also seem to avoid the court challenge or the type of a
11 challenge that we have recently been going through of
12 how can we firm up a final answer in the absence EPA
13 because we would not have firmed up the final answer,
14 but if the final rule went out it would still have the
15 multi-barrier concept, wouldn't it?

16 MR. DAVIS: Are you suggesting removing the
17 numbers at any time from the final rule?

18 COMMISSIONER GILINSKY: When we have final
19 numbers, I assume we could put them in the rule if we
20 wanted to, but in the meantime to publish them but in a
21 less formal manner.

22 COMMISSIONER AHEARNE: Yes.

23 CHAIRMAN PALLADINO: But I understand under
24 your route you wouldn't even have to put them in a final
25 rule.

1 MR. DIRCKS: Then you would lose the advantage
2 on the litigation.

3 COMMISSIONER ASSELSTINE: That is right.

4 COMMISSIONER GILINSKY: It sounds like if they
5 do not do everything you are suggesting plus publish a
6 regulatory guide with a number.

7 MR. DIRCKS: John is saying keep them there
8 temporarily until you firm them up and then put them
9 back in the rule.

10 MR. DAVIS: That is not what I understood him
11 to say.

12 COMMISSIONER AHEARNE: Once they are finally
13 firmed up, but it looks like years if that is going to
14 happen. This just cleans up to my mind that you have
15 got a final rule and you have got a regulatory guide
16 that says here is the way we traditionally treat
17 regulatory guides.

18 CHAIRMAN PALLADINO: Then what would you do,
19 have another final rule when you get the numbers?

20 COMMISSIONER AHEARNE: If we ever get the
21 numbers.

22 CHAIRMAN PALLADINO: But I am assuming we will.

23 MR. DAVIS: Let me ask so I clearly understand
24 this, Commissioner. Are you suggesting that we would go
25 with option 1 or 2 and then have a regulatory guide?

1 COMMISSIONER AHEARNE: I would say option 1
2 except rather than saying they are reserved until the
3 EPA standard, you could say up in the beginning, and
4 depending upon your belief, you could say if or when an
5 EPA standard final rule is published then final
6 performance criteria can be put into this rule. You
7 would publish a regulatory guide, however, that would
8 say here are the ---

9 MR. DAVIS: Concurrent with this final rule.

10 COMMISSIONER AHEARNE: Yes.

11 COMMISSIONER GILINSKY: It seems to me you
12 could achieve the same result by just putting in the
13 numbers and labeling them as provisional and subject to
14 change upon receipt of EPA's final ---

15 CHAIRMAN PALLADINO: But there is still this
16 point though that if you wanted to go final and you
17 wanted to include some of the material on unsaturated
18 soils you would still have to get comments, would you
19 not?

20 MR. DAVIS: On that particular aspect.

21 CHAIRMAN PALLADINO: So we wouldn't be final,
22 at least for that exception ---

23 MR. DAVIS: Except for that particular aspect,
24 it would be.

25 CHAIRMAN PALLADINO: It would be final except

1 for that ---

2 MR. DAVIS: Except for that particular aspect.

3 CHAIRMAN PALLADINO: But could you call that a
4 final rule?

5 COMMISSIONER ASSELSTINE: Except for that
6 particular aspect.

7 (Laughter.)

8 CHAIRMAN PALLADINO: Would you say that in the
9 rule then, that this is final except ---

10 MR. DAVIS: You would say it when you publish
11 the final rule.

12 (Laughter.)

13 CHAIRMAN PALLADINO: No, I am following John's
14 approach where you say this is the final rule right now
15 and you would have identified except for this part and
16 which you are asking comments for this part.

17 MR. DAVIS: Right. That is what we would do
18 with regard to that saturated zone.

19 CHAIRMAN PALLADINO: So that portion would not
20 be final.

21 MR. DAVIS: Right.

22 CHAIRMAN PALLADINO: The reason I was asking
23 is if we are going out for comments on that we wouldn't
24 be lengthening the period if we went out on option 2.

25 MR. DAVIS: If you went on option 2 we would

1 answer to that regardless of what option we took.

2 CHAIRMAN PALLADINO: What would option 2 do
3 for you?

4 MR. DAVIS: Option 2 would give us some advice
5 and comment from the public on how this thing should
6 proceed. Now it may be well if the Commission at this
7 point wanted to go with Commissioner Ahearne's approach,
8 that would be an another option.

9 CHAIRMAN PALLADINO: You are recommending
10 option 2 if I recall.

11 MR. DAVIS: Right.

12 CHAIRMAN PALLADINO: And I think it is
13 important for us to know why you recommend it and what
14 you hope to get out of it as opposed to any other option.

15 MR. DAVIS: If they would put the rest of the
16 rule in place as a final rule and remove whatever
17 uncertainties may exist in that part of the rule, that
18 would be firm.

19 COMMISSIONER AHEARNE: That is the same as
20 option 1.

21 MR. DIRCKS: It has all the advantages in our
22 eyes of option 1, plus it covers the extra base of
23 making sure we have gotten public input into this
24 decision. I think that is the only added advantage.

25 Now I think when you talk about, as the

1 discussion went here, of moving ahead with a final rule,
2 which I think is essentially option 3 in a variation,
3 although we discussed in our memorandum to the
4 Commission the issue of the environmental impact
5 statement, it was not discussed here today and you might
6 want to hear from Guy Cunningham on that issue. If we
7 move ahead with a final rule we do have some
8 environmental impact statement considerations that
9 should be kept in mind.

10 CHAIRMAN PALLADINO: I didn't follow that,
11 Bill.

12 MR. CUNNINGHAM: The consideration is that the
13 Commission did not prepare an environmental impact
14 statement on this rule. That decision was made at the
15 time of the proposed rule and the rationale was that
16 there would be both an EIS done by the Department of
17 Energy, its programmatic environmental impact statement,
18 and there would be one from the EPA dealing with its
19 standard and that those two would cover the entire area
20 and that we could essentially adopt those conclusions.

21 The problem we have now of course is that one
22 of those assumptions is false, that there is not
23 presently an EPA EIS. I think its absence poses some
24 litigative risk if we were to go ahead with a final rule
25 now.

1 COMMISSIONER GILINSKY: Who is going to
2 litigate it?

3 MR. CUNNINGHAM: It could be an
4 environmentalist type group, NRDC or Sierra Club. If
5 your answer is it is likely to be the Department of
6 Energy, I doubt it.

7 MR. DIRCKS: Well, anyhow, we wanted to
8 mention that in case you got on that track of ---

9 COMMISSIONER GILINSKY: I am on that track.
10 (Laughter.)

11 MR. DIRCKS: You are on that track.

12 CHAIRMAN PALLADINO: Which track?

13 MR. DIRCKS: I think publish the rule. On 3.

14 CHAIRMAN PALLADINO: Which you haven't gotten
15 to yet.

16 MR. DIRCKS: No.

17 MR. DAVIS: Option 3 is to publish the rule as
18 it now exists, and it does have existing numerical
19 performance objectives in it.

20 COMMISSIONER GILINSKY: We would have to say
21 that those are provisional and subject to change upon
22 obtaining the EPA's final numbers.

23 MR. DIRCKS: Yes, and we would condition it on
24 that it would be revised in case the EPA came out with
25 numbers substantially different from their standard.

1 MR. DAVIS: Then options 4 and 5 is to go into
2 limbo and wait until the EPA standard comes out.

3 (Laughter.)

4 MR. DAVIS: Then option 5 is to renote the
5 whole rule as it is now and perhaps get additional
6 public comment. I think the primary point against that
7 is most of the rule is not a matter of contention at all
8 and we would urge that you move forward with at least
9 finalizing those parts of the rule which are not in
10 contention.

11 COMMISSIONER AHEARNE: John, could you explain
12 to me why the following description of the difference
13 between 1 and 2 is not correct. No. 2 is the same as
14 No. 1 except it says for years we have been frustrated
15 with trying to get EPA to act. The Congress has been
16 frustrated with trying to get EPA to act. Option 2 says
17 we are asking the public can you tell us how to get the
18 EPA to act.

19 (Laughter.)

20 COMMISSIONER AHEARNE: This is a
21 semi-facetious way of saying I didn't see what option
22 was buying for you.

23 MR. DAVIS: It would highlight certain aspects
24 of our current situation.

25 MR. DIRCKS: It is asking for a little help.

1 That completes our portion of the program.

2 MR. DAVIS: Again, what we came down for is
3 some guidance so we can move along with putting it into
4 final form.

5 CHAIRMAN PALLADINO: Let's see, under No. 1
6 you would issue the final rule highlighting that one
7 little part of it that is not final and has to have some
8 comment.

9 MR. DAVIS: Right, and we would subtract out
10 the two numbers.

11 CHAIRMAN PALLADINO: Then you would also
12 subtract the two numbers.

13 MR. DIRCKS: Yes.

14 MR. DAVIS: Right.

15 CHAIRMAN PALLADINO: But you would have to get
16 some input on this unsaturated material.

17 MR. DAVIS: That is true in all options.

18 CHAIRMAN PALLADINO: Now I can understand
19 that, but I am having trouble with understanding why you
20 think No. 2 is an improvement over No. 1.

21 MR. DAVIS: Because we would get public input.

22 COMMISSIONER AHEARNE: I just described it.

23 (Laughter.)

24 CHAIRMAN PALLADINO: I understand your
25 version. I want to hear his version.

1 (Laughter.)

2 MR. DAVIS: Because we would get public input
3 into the Commission decision and hopefully develop a
4 stronger position for their decision, whatever it may be.

5 MR. DIRCKS: I think it is just another signal
6 and we talked about it. 1 and 2 are about equal and 2
7 says we just get a little more public input into whether
8 this is the right course or not to take.

9 CHAIRMAN PALLADINO: But it wouldn't get
10 public input on the substance of the rule.

11 MR. DIRCKS: That is right.

12 MR. DAVIS: Just on how to handle the EPA.

13 (Laughter.)

14 MR. DIRCKS: Comments may come back to go
15 ahead with Option 3 and move ahead and finalize the
16 thing and revise it later on.

17 COMMISSIONER ASSELSTINE: The public could
18 well provide a rationale for what is the best approach
19 to take.

20 MR. DIRCKS: Yes.

21 CHAIRMAN PALLADINO: Okay. Any further
22 questions?

23 (No response.)

24 CHAIRMAN PALLADINO: Well, both 1 and 2 would
25 permit DOE to proceed, except insofar as those numbers

1 might apply.

2 MR. DAVIS: That is right.

3 COMMISSIONER AHEARNE: All of them would. The
4 absence of a rule also allows DOE to proceed. The
5 question is what kind of constraints are placed on that
6 procedure.

7 COMMISSIONER ASSELSTINE: But 1 or 2 would
8 principally affect the question of packaging and the
9 design of the facility.

10 MR. DIRCKS: I think the ground water
11 movement, I think that part would enable them to move
12 along with a little more security in their site
13 selection.

14 COMMISSIONER ASSELSTINE: That is right, but
15 to the extent that exploration or investigative work on
16 packaging form and the engineered aspects of the
17 facility were intended to go along at the same time that
18 site characterization work was going along, then that
19 would be new uncertainty or continuing uncertainty in
20 those areas.

21 CHAIRMAN PALLADINO: Do you have any reaction
22 to Commissioner Ahearne's suggestion using, what is it,
23 a NUREG?

24 COMMISSIONER AHEARNE: A reg. guide.

25 MR. DAVIS: Was the suggestion to combine that

1 with No. 2 or No. 1 or No. 3?

2 COMMISSIONER AHEARNE: No. 1.

3 MR. DAVIS: No. 1?

4 COMMISSIONER AHEARNE: Yes.

5 MR. DAVIS: Well, the only thing you would
6 give up in it is of course the Commission would give up
7 the opportunity to have public comment on proposals.
8 Now let me make certain I understand it, Commissioner
9 Ahearne. You are saying No. 1 as it is written with
10 subtraction of the two numbers, the placement of those
11 two numbers in a reg. guide which would be published
12 simultaneously with the rule?

13 COMMISSIONER AHEARNE: Yes.

14 MR. DAVIS: I don't see anything wrong with
15 that. I can think of nothing right now to argue against
16 that.

17 MR. DIRCKS: I think it is consistent with 1,
18 but it gives a little more guidance.

19 CHAIRMAN PALLADINO: Any other questions of
20 the Commissioners?

21 (No response.)

22 CHAIRMAN PALLADINO: Okay, thank you.

23 (At this point in the proceedings Ms. Comella
24 and Messrs. Cunningham, Dircks, Davis and Bell left the
25 Commissioners' table and Messrs. Hewett, Coffman, Brewer

1 and DeJu joined the Commissioners at the table.)

2 COMMISSIONER ASSELSTINE: John, it does strike
3 me that that is a somewhat unusual use of a reg. guide
4 because it is not the normal situation where you are
5 saying this is one approach to satisfying the
6 requirements of the regulation that the staff finds
7 acceptable. This would be an area where we are taking
8 the requirements out of the regulation altogether.

9 COMMISSIONER AHEARNE: Except that we would be
10 having barriers. The regulation talks about barriers.

11 COMMISSIONER ASSELSTINE: Yes, that is true.

12 COMMISSIONER AHEARNE: And of course what it
13 is an attempt to get at is EPA eventually in theory will
14 have some limit and this is now how. At that stage our
15 regulations have to be constructed in such a way to make
16 sure that limit is met.

17 COMMISSIONER ASSELSTINE: That is right.

18 CHAIRMAN PALLADINO: We are prepared to listen
19 to DOE's comments.

20 MR. BREWER: Thank you, Mr. Chairman.

21 We are very grateful for the opportunity to
22 appear before you this afternoon. I think you
23 understand the urgency the President has propelled us
24 with toward a swift, careful solution to the high-level
25 waste management system.

1 I have with me Frank Coffman, who is the
2 Deputy Assistant Secretary for Waste, Raul DeJu from
3 Rockwell and Mr. Hewett from Battelle.

4 In general we strongly support the current
5 version of 10 CFR 60. As you know, we do have some
6 reservations about the quantitative guides placed on
7 individual subsystems and it is about that central
8 concern that we will brief you this afternoon on a very
9 technical basis. I would like to have Mr. Coffman
10 proceed with that at this time.

11 MR. COFFMAN: Thank you also for the
12 opportunity to comment.

13 Before I get into the presentation let me say
14 that the rule has gone through three rounds of comment
15 and the specific area, Section 113, was called out
16 specifically for comment the last time around.

17 Secondly, we fully agree with the combination
18 of multi-barrier approaches, including engineered
19 barriers and natural geologic barriers. The question is
20 one of course of applying a general and ad hoc barrier
21 and the impacts of that which I want to describe today.

22 Your staff today presented to the Commission
23 options with respect to finalization of the technical
24 criteria. The Department of Energy, which is the future
25 applicant, does not believe that any of these options

1 properly addresses the Department's concerns.

2 To do that we recommend that the Commission
3 modify Sections 112 and 113 before publication perhaps
4 using the results of a searching peer review if the
5 Commission needs additional technical evaluation beyond
6 that already available to them in our and other
7 participants' comments.

8 Before elaborating on this recommendation let
9 me affirm the Department of Energy's support for the
10 Nuclear Regulatory Commission in the matter of 10 CFR
11 60. As the Department testified in the oversight
12 hearing on nuclear waste programs before the House
13 Interior Subcommittee, we saw the need for Commission
14 involvement early in the Department's site exploration
15 and characterization activities. I should note the
16 effective ongoing interactions between the Department
17 and the Commission's staff as evidenced by our last
18 eight workshops at Hanford. The same might also be said
19 for TMI.

20 (Slide presentation.)

21 MR. COFFMAN: If I could have the first
22 viewgraph.

23 In addition, we do feel that the draft final
24 rule as presented in the public meeting at Germantown on
25 July 29th has many positive features which deserve

1 publication. Without enumerating them in detail, the
2 draft rule provides for public health and safety, it
3 also supports an overall system performance objective
4 upon which we have taken a strong supportive position
5 and provides guidance in many key areas. Resolution of
6 these key areas are a result of NRC staff work in
7 response to the comments provided by the Department and
8 other participants.

9 However, the Department continues to disagree
10 with portions of 10 CFR 60 technical criteria as we
11 discussed in our letters to the Commission of November
12 5th, 1981 and October 29th, 1982. The concerns center
13 on the lack of technical justification for numerical
14 subsystem requirements, the probable complications and
15 delays in the licensing process that would occur in
16 demonstrating compliance and the probable cost of
17 developing components that would be required.

18 COMMISSIONER GILINSKY: You are not, I take
19 it, objecting to a particular number, but to having the
20 numbers there at all?

21 MR. COFFMAN: That is correct. We believe, if
22 I can get ahead of myself, that we need a broad,
23 flexible rule on which we can build a comprehensive set
24 of standards and NUREGs. We do not believe that an ad
25 hoc generic standard in the rule is the proper

1 approach. If there was a NUREG guide on basalt issued
2 in the future based on this rule, I would understand
3 that and we would support that. The answer is we are
4 not objecting to numeric engineered numbers. We are
5 objecting to an ad hoc number which calls into
6 fundamental question the licensability on a site
7 specific basis.

8 CHAIRMAN PALLADINO: You used the word "ad
9 hoc." Would not the future ones be ad hoc also? I
10 don't know what you imply by ad hoc. Do you mean
11 arbitrary?

12 MR. COFFMAN: by that I mean that when you
13 license a repository there will be a series of systems,
14 ground water travel time, absorption, solubility and
15 engineered requirements as you have here which in
16 consort must show that you are a small fraction of the
17 EPA standard.

18 If you are in a media such as salt where we
19 believe it might be impossible to demonstrate a waste
20 package that we could ever afford to pay for, we might
21 rely on other parameters or we might disavow that site.

22 COMMISSIONER GILINSKY: Well, I will tell you,
23 you really want total flexibility in meeting the EPA
24 standard. Is that a mischaracterization?

25 MR. COFFMAN: It is in that we would be

1 receptive to site specific reg. guides. In other words,
2 if there was a reg. guide that talked to waste package
3 life and engineering system performance, if you want to
4 specify a subcomponent we would be receptive to that.

5 COMMISSIONER GILINSKY: But that could only
6 after a site has been picked and you know the
7 characteristics and then you started developing a reg.
8 guide, but that is likely to come too late, don't you
9 think?

10 COMMISSIONER ASSELSTINE: And even then it is
11 not a requirement.

12 COMMISSIONER GILINSKY: Yes, and even then it
13 is not a requirement. But in any case ---

14 MR. COFFMAN: We will come back to that. It
15 is a valid point, but I would hope we could come back to
16 it in future viewgraphs.

17 If I can skip forward, I am going to go to
18 viewgraph No. 2.

19 The second viewgraph, please.

20 Our comments center on the content, as I said,
21 of Section 112 and 113, that is specifically we feel
22 that the requirement to meet generic levels of
23 performance on site specific subsystems is
24 inappropriate. We also believe that there is a
25 significant degree of uncertainty and inconsistency in

1 the two sections.

2 If I can have the next viewgraph.

3 In summary what we are recommending is that
4 Section 113 be eliminated and that Section 112 be
5 redrafted to emphasize systems analysis procedures and
6 that consultation between the NRC and DOE staffs and
7 other appropriate participants take place to resolve
8 other concerns such as definitions, proofs of compliance
9 and proposed reg. guides.

10 On the other hand, the Commission may feel
11 that it is preferable to turn to a technically competent
12 peer group for analysis of NRC staff's and our positions
13 on these two issues. In that case we suggest that the
14 Commission may wish to consider requesting the ACRS
15 Subcommittee on Waste Management or the National Academy
16 of Sciences to comment or appoint a Hearing Board.
17 Either of these actions should be followed by specific
18 recommendations, including a draft of the final rule to
19 the Commission by the peer group or Hearing Board.

20 COMMISSIONER GILINSKY: Isn't this all going
21 to set the program back I would think at least a year
22 and perhaps more?

23 MR. COFFMAN: Our understanding until a week
24 ago was that neither of those paragraphs were in the
25 final version and we had deeply hoped that this rule

1 would be going to final without further comment in two
2 weeks.

3 COMMISSIONER AHEARNE: And neither with 60.113
4 or 60.112?

5 MR. COFFMAN: The new paragraphs in Section
6 113.

7 COMMISSIONER ROBERTS: Say that again, as of
8 two weeks ago you what?

9 MR. COFFMAN: Our understanding was as of two
10 weeks ago that these two paragraphs were being
11 considered for deletion in response to the comments from
12 the National Academy of Sciences and the ACRS, the EPA
13 and other commenters, including ourselves. Then we
14 learned of this option meeting and found that, indeed,
15 that was not the case which is why we requested the
16 opportunity to brief you directly.

17 COMMISSIONER GILINSKY: Let me ask you, does
18 this material you are presenting contain new data or new
19 arguments or is this sort of a reformulation of
20 arguments and data you have presented before?

21 MR. COFFMAN: It is a reformulation of the
22 arguments in the November letter and again as late as
23 our October letter.

24 COMMISSIONER GILINSKY: But both letters come
25 after the comment period. Did those letters, do you

1 feel, contain new material?

2 MR. COFFMAN: I don't believe they do. We
3 have material here by example which shows what the
4 positions taken mean, but in terms of the position they
5 are essentially identical.

6 COMMISSICNER AHEARNE: Specifically, Frank,
7 you mentioned the two paragraphs. These were the two
8 with respect to the numerical criteria for the barrier
9 package?

10 MR. COFFMAN: The package and the ten to the
11 minus five ---

12 COMMISSICNER AHEARNE: Now you also say there
13 is an inconsistency between 112 and 113.

14 MR. COFFMAN: Section 112 basically supports
15 the need to perform a systems approach to licensing the
16 repository where you identify all of the barriers in
17 sequence and assign to them what you think is licensable
18 and defensible barrier characteristics and those would
19 be assembled and provided as a package for licensing.

20 What Section 113 does is it says independent
21 of whether it is Hanford basalt where you have ground
22 water or whether it basalt where there is no ground
23 water flow and where you probably don't need a thousand
24 year package at all. Independent of all those you have
25 to meet these criteria and if you don't meet them then

1 both the Department and the Commission must entertain an
2 exception to a design objective in the rule. That is
3 where the fundamental difficulty arises.

4 MR. BREWER: Section 113, Commissioner,
5 effectively eliminates the degrees of freedom that the
6 Department would have. For example, to give a very
7 simple, crude example, a thousand year package should be
8 compared, for example, to the ground water transport
9 time in basalt, which I believe is some 30,000 years.
10 So the 1,000 year package would just make it 31,000
11 rather than 30,000.

12 COMMISSIONER GILINSKY: If you have complete
13 confidence in both of them.

14 MR. COFFMAN: Yes.

15 MR. BREWER: Yes.

16 CHAIRMAN PALLADINO: What does 112 have that
17 you want to modify?

18 MR. COFFMAN: Do you want to comment on that?

19 MR. HEWETT: The basic disagreement we have
20 with 112 is the last sentence which stipulates that we
21 have to assume the repository would be saturated with
22 water. In the case of a salt repository, one chooses a
23 salt repository because of an absence of water and the
24 staff has preassumed without basis that the repository
25 would fill with water, which is contrary to what our

1 studies show.

2 MR. COFFMAN: Likewise with tuff.

3 COMMISSIONER GILINSKY: Could I ask you where
4 you got the impression that these were going to be
5 dropped?

6 MR. COFFMAN: Well we, as a result of the July
7 29th meeting where we were briefed on that, we had a
8 series of discussions ---

9 COMMISSIONER GILINSKY: This was what meeting?

10 MR. COFFMAN: This was a public meeting that
11 Jack Martin had to describe the rationale document which
12 is the new document. In those series of discussions we
13 came to the understanding that those paragraphs were
14 probably going to be deleted.

15 COMMISSIONER GILINSKY: From Jack Martin?

16 MR. COFFMAN: Yes.

17 CHAIRMAN PALLADINO: What is that last
18 sentence? Do you have the version of the sentence that
19 you want to get rid of?

20 MR. HEWETT: I don't have the draft with me.

21 CHAIRMAN PALLADINO: I have a draft here that
22 is a comparative draft.

23 MR. HEWETT: Is this the one with lines
24 through it?

25 CHAIRMAN PALLADINO: Yes.

1 MR. HEWETT: In that particular draft they
2 moved the sentence to 113. If we had that draft we
3 could narrow our comments to 113.

4 MR. COFFMAN: In two viewgraphs down the road
5 I would like to show some examples of how engineered and
6 natural barriers interact to show compliance with the
7 EPA standard.

8 If I could summarize briefly, the two
9 fundamental differences between NRC and DOE is
10 summarized in these two points. Our interpretation of
11 the staff position is that they believe that man can
12 build a repository with less uncertainty in its
13 performance by depending on engineered systems rather
14 than relying on the performance of natural barriers.

15 COMMISSIONER ASSELSTINE: Let me stop you
16 right there, Frank. Is it rather than or in addition to?

17 MR. COFFMAN: Well, it provides a rule and
18 standard which has its focus on engineered system.
19 Whereas the bulk of the retardation, the factor of ten
20 to the eighth that you need in retardation comes
21 basically from natural barriers that you get from
22 picking the site.

23 COMMISSIONER GILINSKY: Well, it is fair to
24 say it weights things in the direction of engineered
25 systems.

1 MR. COFFMAN: Yes, that is correct.

2 COMMISSIONER ASSELSTINE: But it has an
3 additional degree of providing assurance.

4 MR. COFFMAN: And that is the point I hope to
5 show in the next viewgraph.

6 CHAIRMAN PALLADINO: I don't follow that. I
7 thought part of the issue in packaging was to keep it
8 intact during a period when the heating and therefore
9 the temperature reached a peak and get it over that peak
10 so then you can rely on the natural geologic situation.
11 The reason they picked a thousand years was because it
12 peaked somewhere maybe as late as 500 years and you just
13 added some for assurance.

14 So I am not sure that is a true statement that
15 they think they can build something. Well, it depends
16 on how you want to describe it. I was trying to follow
17 it as you were paraphrasing it and I see it is stated
18 differently here. It says "The dependence upon
19 engineered systems rather than a natural barrier system
20 will result in a repository with less uncertainty in its
21 overall performance." Now the way you say it here I
22 would say that is true. Now tell me why it isn't.

23 MR. COFFMAN: The point of fact is that the
24 issue at heart is the presence of radioactivity in the
25 accessible environment. That is the slant of the EPA

1 standard and the systems approach is what they use to
2 derive it.

3 As I will show on future viewgraphs, the
4 presence or absence of either the waste form requirement
5 or the package requirement makes a negligible impact on
6 that standard and that result which is what you are
7 there to meet.

8 Now, indeed, you can focus on a sort of
9 generic argument that there will be a thermal plume
10 there for the first 200 years and would it not be nice
11 to have it canned during that time.

12 CHAIRMAN PALLADINO: I understood from the
13 staff it was necessary to keep the leaching rate down.

14 MR. COFFMAN: Maybe then I should skip this
15 viewgraph and go to the next one.

16 CHAIRMAN PALLADINO: No, I am just trying to
17 understand. I am not unwilling to accept your point of
18 view.

19 MR. HEWETT: I think the point should be made
20 that it may be necessary, but that is highly site
21 specific. In certain sites, in hard rock sites where
22 you have water that goes through the rock at a low rate,
23 leaching could occur there fairly soon. In a salt site
24 there isn't any ground water flowing through and you
25 have excellent containment provided by the salt itself.

1 COMMISSIONER GILINSKY: Does this pose
2 problems for sites other than salt? I mean you keep
3 returning to salt and I wonder whether that is the
4 problem?

5 MR. HEWETT: That is because there is a great
6 difference between a salt site and a hard rock site
7 because the salt is plastic and flows and it is free
8 from ground water.

9 COMMISSIONER GILINSKY: Is that where the
10 principal problems lie with the application of this rule?

11 MR. HEWETT: That is why we would prefer to
12 see a guide issued for a particular medium. If you are
13 going to have a guide with numbers, there should be a
14 guide for salt and a guide for basalt.

15 COMMISSIONER ASSELSTINE: Are you saying
16 basically that you recognize that there is a need for
17 these kinds of requirements for sites other than salt,
18 but you are not prepared to recognize that there is a
19 need for these kinds of requirements for salt since you
20 don't expect them?

21 MR. COFFMAN: I think that what we are trying
22 to say is that we acknowledge that we would want to take
23 some credit for waste form and package life depending
24 upon the site. If you have a site where the water is
25 flowing fast through it and you are up against a

1 thousand year ground water travel time, you are probably
2 going to want an elaborate package.

3 On the other hand, if you have got a site
4 where the ground water travel time is zero, then there
5 is no mechanism to mobilize that waste for the first
6 thousand years. So why do you have a can to mobilize a
7 waste that is not moving. It is that kind of systems
8 tradeoff that we would like to have.

9 COMMISSICNER GILINSKY: Well, isn't there in
10 here implicit the notion that you may have made a
11 mistake about the geologic setting and you may have
12 taken a number of measurements and concluded something
13 about the water travel time but you may have missed
14 something else?

15 CHAIRMAN PALLADINO: Or something happens that
16 changes it.

17 COMMISSIONER GILINSKY: It is really that
18 drives one in the direction of something that you can
19 design and test.

20 MR. HEWETT: But it can't change that much.
21 There are too many natural barriers in there.

22 COMMISSICNER GILINSKY: I guess it is a matter
23 of opinion.

24 MR. COFFMAN: Of all of the models that we
25 have put together we have been unable to model a

1 situation with zero package and in zero waste form we
2 would exceed the EPA standard. The next viewgraph
3 starts getting at the reasons why. If we could take
4 just ten more minutes and then come back. Your points
5 are important, but I also want to make a couple of
6 technical points.

7 If I could have the next viewgraph.

8 The EPA standard is a 10,000 year standard.
9 The first point I want to make is the predominant
10 importance of ground water travel time. We are going to
11 pick sites that have ground water travel times of tens
12 of thousands of years. The net result of that will be
13 that by the time any radioactivity which is leached gets
14 to the site boundary or to the accessible environment it
15 will have decayed for 35 to 100 thousand years and the
16 only residual nuclide will be Iodine 129 which a half
17 life of 16 million years.

18 COMMISSIONER AHEARNE: Frank, your assumption
19 here is that everything starts when you first ---

20 MR. HEWETT: Immediately.

21 MR. COFFMAN: Immediately, and that is exactly
22 the point. A thousand year waste package will change
23 that 35,000 year number by 1,000 years.

24 COMMISSIONER GILINSKY: Assuming you have got
25 those numbers right and you haven't made any mistakes.

1 MR. COFFMAN: We have a viewgraph for that one
2 as well.

3 (Laughter.)

4 COMMISSIONER AHEARNE: These are generic
5 materials? The general site, for example, the tuff site
6 would have this range of characteristics?

7 MR. COFFMAN: Yes.

8 MR. HEWETT: These are actual sites. These
9 aren't generic.

10 MR. COFFMAN: These are our three sites.

11 MR. DeJU: There are actual data to support
12 each of these measurements.

13 COMMISSIONER AHEARNE: The basalt is Hanford?

14 MR. COFFMAN: Yes.

15 MR. DeJU: The basalt is Hanford and that is a
16 composite of over 200 measurements.

17 COMMISSIONER ASSELSTINE: Which are the two
18 salt sites?

19 MR. DeJU: The Paradox Basin in Utah and the
20 Permian Basin in Texas and there are on the order of a
21 hundred measurements for each of them.

22 COMMISSIONER AHEARNE: And the tuff is the
23 bottom?

24 MR. DeJU: Right.

25 MR. COFFMAN: May I have the next viewgraph,

1 please.

2 Now hopefully this will give you a feeling of
3 the importance of engineered systems relative to natural
4 geologic systems. On the left you see the draft EPA
5 limit. If you assume a site with a thousand year ground
6 water travel time, a thousand year waste package and a
7 ten to the minus five leach rate and ignore the natural
8 absorption and the natural solubility, which is an
9 absorptive assumption, but if you only rely on your
10 engineered systems, within about 3,000 years you will
11 exceed the EPA standard by a factor of three or four
12 thousand and it will for thousands of years into the
13 future.

14 CHAIRMAN PALLADINO: Where do I see that?

15 MR. COFFMAN: This red curve going up right
16 here.

17 CHAIRMAN PALLADINO: Now what is it that this
18 curve is telling me?

19 COMMISSIONER ASSELSTINE: That is only if you
20 rely on engineered barriers, right?

21 MR. COFFMAN: Right.

22 MR. HEWETT: What we did was use exactly what
23 the staff asked for, you know, 60.113. We said if we
24 meet those requirements this will be the result and we
25 assumed a hypothetical site exactly as the staff did in

1 their rationale.

2 MR. COFFMAN: This is a rationale document
3 assumption.

4 MR. DeJU: That ignores absorption and
5 solubility.

6 MR. COFFMAN: Right.

7 If I can go to the extreme right-hand side, I
8 took as an example and it is even better for salt, but
9 if I take the Hanford site and I take the ground water
10 travel time, absorption, solubility and natural decay
11 with zero waste package and zero waste form, I will be
12 at 11 percent of the EPA standard after 35,000 years.

13 Now if I put in addition to that, and this is
14 your question, Jim, if I put a thousand year waste
15 package and ten to the minus five leach rate, I would
16 reduce at Hanford for this conservative, realistic case
17 my exposure to man from about 11 percent of the standard
18 to about 7 percent of the standard.

19 Now that would occur 1,000 years later because
20 it had a waste package. This is for all time. This is
21 not for 10,000 years. This is exposure to mankind for
22 all time and it would be 11 percent of the standard.
23 That incremental that I would buy with the waste package
24 represents 40 health effects in basalt for all mankind
25 for all time.

1 COMMISSICNER ROBERTS: Have you made this
2 presentation to the NRC staff?

3 MR. COFFMAN: This one I have not. We have
4 made the arguments in more detail but not this briefing.

5 COMMISSICNER AHEARNE: Frank, on your
6 left-hand side the difference between that and the
7 right-hand side, and you have the natural barriers on
8 the right-hand side ---

9 MR. COFFMAN: That is correct.

10 COMMISSICNER AHEARNE: ---you did include
11 absorption ---

12 MR. DeJU: Absorption and there is some
13 solubility constraints for basalt.

14 COMMISSICNER AHEARNE: And decay?

15 MR. DeJU: That is right, and that is 99
16 percent of Iodine 129.

17 MR. COFFMAN: That is another point, that
18 after 35,000 years for any of these sites the isotope
19 which gives you dose is 99 percent Iodine 129. It has a
20 16 million year half life. Unless you have a waste form
21 that can do ten to the minus six or ten to the minus
22 seven, the ultimate dose to mankind is identical. I
23 don't know of any engineered system that can hold it
24 back 16 million years nor do I think I care.

25 If I could have the next viewgraph.

1 CHAIRMAN PALLADINO: No, don't go too fast.
2 You haven't brought me along yet.

3 MR. COFFMAN: Sorry.

4 CHAIRMAN PALLADINO: Is this only for Hanford
5 basalt, this 11 to 7 percent?

6 MR. COFFMAN: Yes.

7 CHAIRMAN PALLADINO: What is for other
8 situations?

9 MR. COFFMAN: It is better.

10 Can I have the viewgraph after this one.

11 COMMISSIONER GILINSKY: May I ask you why have
12 you not take this up with our staff?

13 MR. COFFMAN: We have. This discussion has
14 been going on for three years.

15 COMMISSIONER GILINSKY: But I thought your
16 response to ---

17 MR. HEWETT: We haven't shown them this
18 presentation.

19 MR. COFFMAN: I haven't shown them this set of
20 viewgraphs.

21 MR. DeJU: Commissioner Gilinsky, at the
22 workshops that we had at Hanford with the staff we
23 discussed in much more detail the subject that we are
24 talking about here in terms of waste package life and
25 what it represents and performance for a repository in

1 basalt.

2 MR. COFFMAN: Mr. Chairman, you asked the
3 question what about salt.

4 CHAIRMAN PALLADINO: And what about the
5 others, the tuff and what-not, are they better than this
6 11 to 7?

7 MR. COFFMAN: Yes. This is salt. If you read
8 the middle headline, for embedded salt we predict for
9 all models zero release of the radioactivity from that
10 embedded salt for all time.

11 COMMISSIONER AHEARNE: That is because there
12 is no ground water.

13 MR. COFFMAN: That is because there is no
14 ground water. So the number is zero for salt.

15 CHAIRMAN PALLADINO: This assumes that what
16 has been will stay and you will have no ground water and
17 it will be stable.

18 MR. COFFMAN: Yes. Then the question comes of
19 intrusion. Here we have modeled an eight-inch bore hole
20 drilling within 20 feet of a waste package going through
21 the above aquifer, through the repository and into the
22 bottom aquifer, which is the direction that water would
23 move because of hydrologic head.

24 What would happen there is we assumed the
25 worst case that the salt would not extrude the thing off

1 within a thousand years, the models show about 200, and
2 that there would be some leaching out. The net result
3 of that would be that some 50,000 years after that hole
4 was bored, which would be the year after you close the
5 repository, that 50,000 years later there would be a
6 blip in the accessible environment 10 miles away which
7 could represent 5/10,000th; of the EPA standard under an
8 intrusion with a drill hole.

9 MR. DeJU: That is about a half a health
10 effect.

11 MR. COFFMAN: And it is one-half of one health
12 effect.

13 MR. BREWER: Over all time.

14 MR. COFFMAN: We cannot see any impact of
15 waste form or waste package on that number. It is all
16 Iodine 129.

17 COMMISSIONER AHEARNE: Correct me if I am
18 wrong, but I doubt whether the staff would have said we
19 agree that there is no water flowthrough and never any
20 chance but we still believe there could be a significant
21 health effect. That is not their position I would
22 imagine. It is a good argument, but it is not clear to
23 me it is addressing their argument. I recognize this is
24 the DCE argument and we have to judge which side ---

25 MR. COFFMAN: If I can back up one viewgraph.

1 CHAIRMAN PALLADINO: Why is it that you didn't
2 convince the staff or what is it that they are holding
3 on to that you are not recognizing?

4 MR. HEWETT: The dialogue with the staff was
5 always directed at us asking them the basis for the
6 numbers and for a very long time no basis ever
7 appeared. Then we started to hear about what some of
8 the bases were. As a matter of fact, in the case of the
9 waste package even the staff's contractors didn't agree
10 with it. There was a paper given this year by the
11 Sandia contractor that showed that you didn't need a
12 waste package as long as you had 500 years ground water
13 travel. We never really tried to provide a technical
14 basis for the staff. We came to the staff to find out
15 what their basis was and we finally saw what they were
16 using in the rationale document and on that basis they
17 don't look at anything beyond 10,000 years.

18 Well, you can use that argument and show that
19 we need nothing because all of the ground water travel
20 time is far in excess of 10,000 years. So if we use
21 their basis that would knock down all those numbers.

22 COMMISSIONER AHEARNE: Would it be correct
23 just for argument purposes that then you would be
24 satisfied with a licensing criteria that would say that
25 it can only be located in a location where the ground

1 water travel time can be proven to be at least 35,000
2 years?

3 MR. HEWETT: I don't believe it is necessary
4 to be that strict.

5 CHAIRMAN PALLADINO: How strict would you feel
6 it necessary to be?

7 MR. COFFMAN: I think that is the whole point
8 of the EPA's standard making and the systems approach to
9 it. The objective is not to pick a number which is
10 close to the best that anybody can meet. The objective
11 is to pick a series of subcomponents, engineered and
12 natural, at a specific site which guarantees that the
13 public health and safety is protected, and it is that
14 systems approach that is getting lost in a discussion
15 about an ad hoc package lifetime.

16 COMMISSICNER GILINSKY: But suppose we follow
17 up this point about the travel time, would you then
18 propose to put the waste away without any package or any
19 facility, and then why not if it meets the ---

20 MR. COFFMAN: As a matter of fact, and I
21 understand that question, the package discussions and
22 the waste form discussions came up when we talked about
23 shipping the waste from a reprocessing plant to the
24 repository and everyone agreed that you cannot ship
25 liquid high-level waste. So we got into discussions of

1 calcines and then we got into borasilica glass and the
2 Department is selecting borasilica glass as a waste form
3 for shipping and it has to be put into a can and put in
4 the repository. I think it is important that during the
5 repository operation and during shipment that it is safe
6 from the environment.

7 COMMISSIONER GILINSKY: So this is a
8 transportation casket.

9 MR. COFFMAN: I think technically in terms of
10 the public health and safety the concerns are during
11 transportation and during the period when the repository
12 is open.

13 COMMISSIONER GILINSKY: Do you see any need to
14 put standards on the repository itself given that the
15 water travel time would meet the EPA 10,000 year
16 requirement?

17 MR. HEWETT: Well, we think that you should
18 look on a site specific basis to see if there are
19 engineering enhancements that can help.

20 COMMISSIONER GILINSKY: But if you have a site
21 where the water travel time is well over 10,000 years ---

22 MR. COFFMAN: Independent of that, the place
23 where you can have potential water in leakage and you
24 may want to recover or whatever, I think you have to
25 have a package in a stable waste form during the 50 to

1 100 years that the facility is operational and that
2 provides I think the kind of assurance ---

3 COMMISSIONER GILINSKY: So those are the kinds
4 of times you are thinking about?

5 MR. COFFMAN: Yes.

6 COMMISSIONER GILINSKY: Let me ask you one
7 more question. You mentioned the output of a
8 reprocessing plant. What is it that you see going to a
9 repository and ---

10 CHAIRMAN PALLADINO: In what form? Are you
11 thinking of just pouring water down there?

12 MR. COFFMAN: The defense waste treatment
13 facility is selecting borasilica glass in a steel can
14 which has a lifetime probably of two to three hundred
15 years in borasilica glass. We at West Valley are
16 proceeding with a waste form which we are staffing to be
17 borasilica glass in a steel can which is a two or three
18 hundred year waste package.

19 COMMISSIONER GILINSKY: When are those going
20 to be available?

21 MR. COFFMAN: You mean the waste?

22 COMMISSIONER GILINSKY: Yes.

23 MR. COFFMAN: In about 1990 for DWPF and in
24 about 1992, '91 or '92 for West Valley.

25 COMMISSIONER GILINSKY: DWPF is what?

1 MR. BREWER: The DWTF if the proposed Defense
2 Waste Solidification Plant at Savannah River to work off
3 the tanked waste, liquid waste.

4 COMMISSIONER GILINSKY: And what do you see
5 happening with the commercial fuel?

6 MR. COFFMAN: I would hope that there is some
7 institutional mechanism found by which a commercial
8 venture at Barnwell will proceed by 1990. If not, then
9 other ---

10 MR. BREWER: We are making our repository
11 designs in planning to be satisfactory for either spent
12 fuel or solidified high-level reprocessed waste.

13 COMMISSIONER GILINSKY: It wouldn't then be
14 sensitive to that choice?

15 MR. BREWER: No, sir.

16 CHAIRMAN PALLADINO: Frank, you are talking
17 about borasilica glass in a steel liner and you say it
18 is 200 years. Why do you say 200 years, because you
19 made the liner thin and it is going to corrode or there
20 is going to be interaction between it and something
21 else? What more do you have to do to go to a thousand
22 years, for example? To me now you just admitted that we
23 are not talking about whether we should package it or
24 not, but we are talking about the price of the packing,
25 so to speak. So it isn't whether you package or not.

1 It is that you want to package and do you want it to
2 last for 200 years or 1,000. That is the where you have
3 led me to right now.

4 MR. COFFMAN: I am talking about the site
5 specific aspects of it. I am thinking about getting a
6 license is what I am really thinking about. If I have
7 to come to you and get a license and I have got a
8 stainless steel package in salt and the standard says
9 that you have to assume that it is saturated with ground
10 water, then the corrosivity of salt makes it extremely
11 difficult for me to show you based on 10 years of
12 engineering data that this thing will last with
13 "reasonable assurance" for a thousand years.

14 CHAIRMAN PALLADINO: So you are saying that
15 the price or the degree of difficulty should be related
16 to the site?

17 MR. COFFMAN: I think it will be, yes.

18 CHAIRMAN PALLADINO: Those are the major
19 points I am getting out of the discussion so far.

20 MR. BREWER: Mr. Chairman, if I could explain
21 it another way. There are sort of four degrees of
22 freedom that the waste form, be it borasilica glass or
23 whatever, the liner and its design and thickness and
24 material, and the geology, that is the water transport
25 time, et cetera, and the fourth is economics. The way

1 the rule now reads that we are opposed to is that three
2 of those four degrees of freedom are nailed down. We
3 are overconstrained. So that we cannot optimize the
4 repository, the entire system.

5 CHAIRMAN PALLADINO: There is one other
6 argument that I think has to be addressed. One might
7 say well here is a packaging form I am going to use for
8 this particular material salt. You say great and we
9 package it and all of the sudden for some reason you
10 can't put it there and you have to go put it in another
11 place where the characteristics are different. I
12 thought part of the staff philosophy was let's make it
13 good enough so you don't have to worry about whether it
14 is site specific.

15 MR. HEWETT: But you probably would change the
16 package in going from a site of salt.

17 CHAIRMAN PALLADINO: If you make it so it
18 meets the requirements for any of your sites, then you
19 don't into that problem that you package it for one and
20 now it is no good for the other.

21 MR. DeJU: Mr. Chairman, the problem that you
22 have with that option, and the Department looked at that
23 option earlier, is that when you have a generic waste
24 package you have a very expensive waste package. You
25 have overdesigned the waste package in order to be

1 generic.

2 CHAIRMAN PALLADINO: Oh, sure, if you are
3 going to make it adaptable to every site.

4 MR. DeJU: In terms of optimizing the waste
5 package design, it is more important to go to a site
6 specific ---

7 COMMISSIONER GILINSKY: What sort of
8 differences are you talking about?

9 MR. DeJU: Well, you are talking some
10 sizeable, in the millions of dollars or hundreds of
11 millions of dollars to billions of dollars difference.

12 COMMISSIONER GILINSKY: Well, per package what
13 is the difference that you are talking about?

14 MR. DeJU: The various waste package costs
15 range from \$10,000-plus a package to hundreds of
16 thousands of dollars a package. It depends upon whether
17 you put a titanium overpack or whether you don't have an
18 overpack or what how much metal you are going to bury in
19 a repository.

20 COMMISSIONER AHEARNE: You are saying that you
21 already have a fairly good sense of what type of design
22 would be required to the level of detail to enable you
23 to do a cost estimate?

24 MR. DeJU: There are conceptual designs and
25 preliminary designs for the various sites that have

1 incorporated some cost estimating.

2 MR. COFFMAN: Ralph, can I back up one
3 viewgraph.

4 COMMISSICNER ASSELSTINE: Let me go back to
5 one quick point you made, Frank, earlier just a few
6 minutes ago. Were you saying that for salt it may not
7 only be an economic problem, but it may be a technical
8 feasibility problem?

9 MR. COFFMAN: I am sorry.

10 COMMISSIONER ASSELSTINE: Were you saying that
11 for salt it may not only be an economic problem, but
12 that it also may be a technical feasibility problem in
13 being able because of the corrosiveness to design a cask
14 that would satisfy the numerical requirement for the
15 container?

16 MR. COFFMAN: That is right.

17 CHAIRMAN PALLADINO: I don't follow that one
18 because then if you are going to put anything in salt,
19 then you are going to have corrosion problems and you
20 have got to make it thicker.

21 COMMISSIONER ASSELSTINE: That is the
22 assumption that it is full of water, right?

23 MR. COFFMAN: That is part of it, yes.

24 CHAIRMAN PALLADINO: Well, you are going on
25 the basis that things are as they have been, and I am

1 t sure that is what we ---

2 MR. COFFMAN: And that there are intrusions.

3 COMMISSIONER AHEARNE: I think as you put it
4 there, Joe, I would guess that is one of the fundamental
5 differences between the staff approach and the DOE's
6 position.

7 COMMISSIONER GILINSKY: Let me ask you
8 something as a general question, you are troubled by
9 having to come back on a case-by-case basis for an
10 exemption for some particular either package requirement
11 or repository requirement, but yet you are asking for an
12 approach that would have us treat the whole question on
13 a case-by-case basis and somehow you feel it is going to
14 be easier for you that way. It would be harder to do it
15 on one little piece of the license.

16 MR. BREWER: In the first case, Commissioner,
17 it would be of the nature of applying for an exemption
18 of an existing quantitative rule, and that has less
19 appetite ---

20 COMMISSIONER GILINSKY: You just got an
21 exemption from the rule.

22 MR. BREWER: We have less appetite for that
23 than asking for ad hoc repository-by-repository
24 rulemaking.

25 COMMISSIONER GILINSKY: Well, I think it may

1 be unfamiliarity with our system that leads you to think
2 that one is simpler than the other.

3 (Laughter.)

4 MR. BREWER: Well, one has public optics which
5 are not there in the other.

6 MR. COFFMAN: Here is an example of another
7 approach at this. If we apply for a license the first
8 thing that we are going to go for and make an argument
9 to you on is the ground water travel time. This is
10 Hanford basalt. You see that by getting credit for the
11 ground water travel time and the natural decay of
12 radioactivity before it leaves the site we drop this by
13 a factor of ten to the third.

14 CHAIRMAN PALLADINO: Could you explain what is
15 on here. I am sorry, that is where I lose you.

16 MR. COFFMAN: The first hatched bar is the
17 repository inventory in curies, and if that were
18 released over a 10,000 year period you would be at about
19 a million times the EPA curie limit.

20 CHAIRMAN PALLADINO: If released over what
21 period of time?

22 MR. COFFMAN: About 10,000 years, which is the
23 period the standard applies. If you take all the curies
24 of the repository and release them over 10,000 years you
25 would exceed the EPA standard by a million.

1 COMMISSIONER AHEARNE: By released you mean ---

2 MR. HEWETT: Without any credit for decay.

3 MR. COFFMAN: You release it to the accessible
4 environment.

5 Then if you on the other hand take the entire
6 inventory and release it, and a complete solubility, no
7 absorption and let it transport through ground water, it
8 will naturally decay down to about a thousand times. So
9 35,000 years from now you would exceed the EPA standard
10 by about a factor of a thousand.

11 CHAIRMAN PALLADINO: And that is because of
12 the 35,000 year ground water travel time?

13 MR. COFFMAN: Exactly, the ground water travel
14 time and the natural decay.

15 CHAIRMAN PALLADINO: You seem to have as an
16 assumption all the way along the 35,000 year travel time.

17 MR. DeJU: 35,000 is a very conservative
18 number for Hanford and it is a result of a lot of work
19 that has gone on there and it is the same number that is
20 reported in the site characterization report that has
21 gone to the Commission.

22 MR. COFFMAN: Then if you assume that while it
23 is being transported along that there are realistic
24 solubility limits on nuclides, you get down and meet the
25 EPA standard. Then if you assume the absorptivity

1 limits that are in Hanford basalt, you drop down to
2 about 11 percent of the EPA limit. Then if you put on a
3 thousand year waste package there is no change. This is
4 for Hanford basalt.

5 CHAIRMAN PALLADINO: Wait a minute, why is
6 there no change?

7 MR. COFFMAN: Because, one, it takes it 35,000
8 years to get there, it is delayed for 1,000 years, but
9 the curies are of Iodine 129, which is so long half
10 lived that the dose to man over all time is identical.

11 COMMISSIONER AHEARNE: What you really mean is
12 that there is no visible change in this scale.

13 CHAIRMAN PALLADINO: What did you do with the
14 rod there, you just put it in the package?

15 MR. COFFMAN: Then I assumed that the package
16 was added in.

17 CHAIRMAN PALLADINO: And then what did you
18 assume?

19 MR. COFFMAN: In the last one I assumed that I
20 had to meet a ten to the minus five ---

21 CHAIRMAN PALLADINO: You added the package
22 into what?

23 MR. HEWETT: These accumulative effects of
24 barriers.

25 MR. COFFMAN: To being with I assume the waste

1 was in there and it was completely soluble and
2 completely liquid and it could immediately go to ground
3 water. Then I assumed that some of it had solubility
4 limits as a liquid like cesium has a solubility limit.
5 Then I assumed that Hanford basalt has K-effective
6 absorption rates. Then lastly I assumed that it was
7 bottled up in a thousand year can. That is the first
8 red block which has no impact. Last of all I assumed
9 not only that, but I had a ten to the minus five waste
10 form.

11 COMMISSIONER AHEARNE: I assume what you mean
12 is that you had someone go back and redo the
13 calculations.

14 MR. COFFMAN: Exactly.

15 CHAIRMAN PALLADINO: I was going to ask you in
16 the can, while it is spending a thousand years in the
17 can you are not getting the absorption or you not
18 getting the solubility.

19 MR. HEWETT: That is correct.

20 CHAIRMAN PALLADINO: So that is where I am
21 having trouble understanding what you are talking about.

22 MR. HEWETT: We are just trying to find a way
23 to show you the effect of adding barrier after barrier.
24 The blue barrier is an natural and we showed those first
25 because they are a part of the site and we really don't

1 have much choice there once we have chosen the site.

2 MR. COFFMAN: The red ones you have to buy and
3 pay for and select. That is fine if they add in terms
4 of health effects or dose to man.

5 CHAIRMAN PALLADINO: But you are going to put
6 it in a package for some reason anyhow.

7 MR. COFFMAN: Right.

8 CHAIRMAN PALLADINO: And you are saying those
9 reasons are? Why do you put it in a package at all?

10 MR. COFFMAN: To transport it to the
11 repository and to keep it stable and retrievable for the
12 first hundred years.

13 CHAIRMAN PALLADINO: And this applies to any
14 particular site?

15 MR. COFFMAN: Any of them, yes.

16 COMMISSIONER AHEARNE: This particular chart
17 is Hanford?

18 MR. COFFMAN: This one is Hanford.

19 MR. DeJU: By the way, that particular chart
20 is very, very conservative in that it doesn't take
21 credit for a lot of barriers and it assumes a very large
22 flow rate through the repository. So a lot of those
23 conservative assumptions have been taken into account.

24 MR. COFFMAN: Ralph, if I can proceed through
25 two viewgraphs.

1 CHAIRMAN PALLADINO: Just one more question
2 and then I won't bother you any more for a while. In
3 all these processes you must be making some assumption
4 about temperatures and how those temperatures influence
5 interaction. If you don't have it packaged as opposed
6 to having it packaged, don't you change these rates
7 considerably?

8 MR. HEWETT: It is all lost in the ground
9 water travel. We assumed in the case of this Hanford
10 example that the waste was released immediately over a
11 one-year period. We looked at it over a ten year period
12 and over a hundred year period and over a thousand year
13 period and it didn't make any difference at all in the
14 release.

15 MR. COFFMAN: The real reason is because if it
16 is sitting here and you dump it in, the ground water
17 travel time is about an inch a year. Now, you know,
18 during the first five inches or five years all the
19 cobalt decays. During the next 30 inches all the cesium
20 and strontium is decaying. The point is that by the
21 time you get to any accessible environment everything
22 has decayed except Iodine 129. Iodine 129 has a 16
23 million half life and the waste form is not going to
24 have any impact on that.

25 CHAIRMAN PALLADINO: See, but I picture things

1 having cracks and not everything goes exactly the way
2 you say.

3 MR. HEWETT: These numbers are very
4 conservative, as Raul indicated in our estimation.

5 CHAIRMAN PALLADINO: Well, okay. Why don't
6 you go on.

7 MR. COFFMAN: This is another approach just to
8 show what we are talking about when we say there are
9 natural defense in depth barriers. You have the
10 vertical separation from aquifers, you have low host
11 rock permeability, you have the question of solubility,
12 you have the question of ground water travel times, you
13 can pick media which are absorptive and of course if you
14 have an aquifer which is penetrated you have the
15 dilution potential there in that situation.

16 So not only are we supportive of engineered
17 barriers which are specified on a site specific basis,
18 but there is defense in depth through these systems
19 which have been stable for geologic time.

20 If I can have the next view graph.

21 This is the time to get at Jim's question. We
22 will have about five or ten years of data base when you
23 give us our construction authorization and we have to
24 make a reasonable extrapolation for a thousand year
25 waste package as a result of this rule.

1 At the time we seal it up, which is 40 or 50
2 years after we have our construction authorization, we
3 will have 50 years of data assuming we have run an
4 aggressive R&D program. Even then there are questions
5 about whether you can make reasonable assurance
6 arguments under the current licensing environment that
7 this number can be met. In lieu of making that argument
8 we have to come back on an exception basis so that both
9 the Commission and the Department has to make the
10 arguments about why this thousand year number is
11 accepted.

12 If I can have the next viewgraph.

13 This shows you the kind of time extrapolation
14 arguments that we have to make for natural barriers. We
15 are trying to pick sites which have been completely
16 stable over the quaternary period which is the last
17 million years approximately.

18 We are trying to extrapolate that data for the
19 EPA standard of 10,000. We believe that convincing
20 arguments can be made that ground water travel times,
21 basic rock solubilities, basic rock absorptivities,
22 those quantities and those arguments can be made
23 convincingly before a licensing committee.

24 I don't think that the same is true in a
25 near-field environment where you have a three or four

1 hundred year waste package which is varying with time,
2 where you have ground water intrusion at temperatures
3 comparable to the heat exchanger environments and where
4 you have a changing environment.

5 To make that argument and to model that in the
6 near field is much more difficult than making a
7 licensing argument in the far field where you are saying
8 that ground water has traveled at this speed for the
9 last hundred thousand years and we are reasonably
10 convinced it will continue along at that speed for
11 another 10,000 years.

12 COMMISSIONER AHEARNE: Frank, is it correct
13 that your argument, and let me characterize it and see
14 if you disagree. I had thought originally when you
15 first started speaking that you were talking about the
16 systems approach which the IRG had talked a lot about.
17 My sense is that that is really not what you are
18 advocating. What you are really advocating is site
19 protection rather than the system, but it is really the
20 specific characteristics of the specific site because as
21 far as I can tell your argument really is being based
22 upon the properties of that site, either the absence of
23 water such as salt or the very slow water travel time.
24 Is that correct?

25 MR. COFFMAN: That is partially correct, yes.

1 All the way back to the 1957 National Academy of
2 Sciences there was a basic push that man cannot design
3 an engineered system to store his waste into the
4 indefinite future. The only thing that is stable for
5 geologic time is stable geology. So the whole purpose
6 of a national screening and siting program is to find a
7 site which has a set of natural features and
8 characteristics that will protect mankind for all time.

9 Now we want to get a license for that and we
10 want to protect during the operational phases. That is
11 where the package and waste form question crept in.
12 Now we agree that there should be site specific waste
13 package lifetime requirements and waste form
14 requirements. That is not the problem. The problem is
15 that they should be tailored to the specific sites ---

16 COMMISSICNER GILINSKY: But aren't you going
17 to come in here and argue when you have got a site that
18 you estimate to have a water travel time of say 35,000
19 years that you don't need a waste package and you don't
20 need an engineered facility because you have made it?

21 MR. COFFMAN: The waste form and waste package
22 will be required in part because of the retrievability
23 requirement in the standard and because of the
24 transportation laws. I can't ship liquid high-level
25 waste on the highway.

1 COMMISSIONER GILINSKY: I understand and we
2 talked about that.

3 CHAIRMAN PALLADINO: But that wouldn't be site
4 specific. The transportation requirement wouldn't be
5 different for one site from another.

6 COMMISSIONER GILINSKY: But as far as the site
7 goes you are really laying it all on geology and the
8 purpose of having requirements on the package and the
9 facility and so on is to compensate for mistakes in
10 analyzing the geology.

11 CHAIRMAN PALLADINO: At least in the first
12 thousand years.

13 MR. COFFMAN: Let me say it one other way.
14 What we are saying is that all the comments by competent
15 others and ourselves have suggested that you should put
16 in place a broad flexible rule and that as we gather
17 physical data during the next two or three years that
18 that should be supplemented with NUREGS or licensing
19 guides as with the case with reactors which are tailored
20 to the specific reality that we are going to be
21 operating in and a thousand year waste package for salt
22 poses a real technical and logical difficulty.

23 COMMISSIONER AHEARNE: As you may have
24 gathered from my earlier comments in the previous
25 section of the meeting, I am not in favor of putting

1 that into the rule. So putting it in some separate
2 document is the way I was pushing. I am just trying to
3 understand though. It really seems to me that at least
4 your current thinking would, however, end up putting all
5 of that protection on the geologic setting and the only
6 thing I have to mull over, and I recognize your argument
7 that we have all this past historical data, it
8 nevertheless still is the argument that the uncertainty
9 is sufficiently small that therefore one doesn't have to
10 be concerned about the reliability of that estimate.

11 MR. HEWETT: Let me just bring out one point
12 on that. All of the studies that have been done to date
13 indicate that it isn't a matter of choice that we are
14 saying put the reliance on the natural system. It is a
15 matter of fact that with any reasonable natural system
16 you simply can't design anything good enough to have
17 much effect, and an example is this ten to the minus
18 fifth.

19 COMMISSIONER AHEARNE: Of course and I
20 wouldn't argue that. The reason that one looks at
21 uncertainty and then says in the regulatory world let me
22 look at, say, a worst case is you ask yourself what if
23 the predictions you are making fail. If your geological
24 estimates are correct, they aren't going to argue with
25 your case, well then this waste form engineered barrier

1 just doesn't make any difference. That is absolutely
2 true. The issue is what if because of some element of
3 uncertainty you may be sufficiently far out on the
4 fringe and you haven't looked at that. What if the
5 estimate was completely wrong and it doesn't work that
6 way?

7 MR. HEWETT: And that is why we chose numbers
8 for this analysis that were way down on the conservative
9 end of the range we have.

10 MR. COFFMAN: Let me give an example of the
11 difficulty. Can I go four viewgraphs forward.

12 CHAIRMAN PALLADINO: You are ignoring this
13 temperature problem during the early period of life.
14 That is one of the major reasons I believe you have this
15 engineered package so that you can cope with that and
16 not somehow invalidate what is going to take place later
17 on. That is one of the arguments I remember hearing.

18 MR. COFFMAN: Would you move forward four
19 viewgraphs.

20 These are the kinds of problems we see coming
21 into play. What is substantial containment and how do
22 you prove it for a thousand years? Do all of the
23 packages have to survive and, if not, how many are you
24 talking about here? Can statistically significant
25 thousand year accelerated tests be performed, radiation

1 on the waste package, brine on package components,
2 radiation on brine and package component interactions
3 with each other which was raised as an issue with the
4 DWPF waste form decision? Do the standards apply to
5 worst case or to the average package? Where is the
6 compliance boundaries for then to the minus five? How
7 can licensing credit be determined for engineered system
8 components, by long-term proof testing, long-term
9 materials properties, the basis for intra-repository
10 flow calculations, the basis for engineered component
11 long-term radionuclide retention? For soluble host
12 rocks like salt how can flow be shown to be affected by
13 the engineered barriers? These are the kinds of ---

14 COMMISSIONER GILINSKY: But you can ask
15 questions like that for your approach, too, which seems
16 to me to be much mushier and more difficult to justify
17 in a legal proceeding.

18 MR. COFFMAN: These arguments are made in the
19 near field to meet a standard which in some cases is
20 against the edge of what we think we might be able to
21 meet in a dynamic thermal environment in the presence of
22 high heat load and high radioactivity loads to meet an
23 ad hoc number as opposed to meeting something in the
24 ground water at the ambient temperature.

25 COMMISSIONER GILINSKY: Well, you are going to

1 have to convince someone that the standard is met. This
2 is a way of doing it. You raise these questions and
3 they are good questions, but that is why the law has
4 words like "reasonable assurance" and so on.

5 CHAIRMAN PALLADINO: I think we could sit down
6 and agree to answer many of them.

7 Excuse me, I am sorry. Go ahead.

8 MR. COFFMAN: I have one viewgraph which
9 summarizes I guess the issues all in one.

10 If I can have the slide A-1.

11 (Laughter.)

12 MR. COFFMAN: What we are saying here is that
13 if those numbers go in, those two paragraphs go into
14 this rule, then we have to do two things. To avoid a
15 delay from not meeting the ad hoc number we have to run
16 about a \$40 or \$50 million a year R&D program as an
17 insurance that we are going to deliver this repository
18 regardless.

19 Secondly, we have to come in with rather
20 elaborate documentation of proof of compliance with an
21 exception to that and both the Commission and the
22 Department are going to have to deal with that as an
23 exception and the public perception of requesting this
24 exception is going to be that we requested something
25 more relaxed and something less restrictive and it is

1 going to create a lot of extra licensing issues.

2 COMMISSIONER GILINSKY: But what is the public
3 perception of us relaxing entirely right now if you are
4 going to talk about public perception?

5 MR. COFFMAN: The last time that this rule
6 went out for comment the Commission explicitly requested
7 that this section be commented on and the ACRS and the
8 National Academy of Sciences, DOE and EPA recommended
9 that you proceed toward a broad, flexible rule. That
10 has been the comment for the last three years.

11 COMMISSIONER GILINSKY: I am not deciding this
12 on the basis of public perception but on the basis of
13 what I think is a reasonable rule. What I am suggesting
14 to you is that the public perceptions may not be
15 favorable to the approach that you are suggesting.

16 MR. HEWETT: I see one big difference and the
17 big difference is that right now we are saying that the
18 numbers in that regulation really don't buy you anything
19 as far as the public health and safety is concerned.
20 Now presumably if the Commission puts out the regulation
21 with those numbers, the Commission has made a finding
22 that those numbers do indeed buy you something for
23 public health and safety and we would be coming in for
24 an exemption against something which the Commission has
25 found to be necessary. But right now that is still an

1 open question we believe.

2 COMMISSIONER ASSELSTINE: On that point you
3 have mentioned the comments from a number of other
4 commenters. I looked at the comments from the
5 Department of Interior and the Department of Interior
6 seems to take just the opposite view from just your past
7 statement, and that is that there is a significant
8 advantage to redundancy among barriers during that
9 initial period when short-lived fission products
10 dominate the hazard and heat generation is greatest. I
11 guess the Chairman raised that a little while ago and I
12 would like you all to address that specifically because
13 it does seem to me that one of the advantages to the
14 staff's approach is that you get redundancy during that
15 earlier period. It is not just a thousand years tacked
16 on the end. It is a thousand years up front.

17 COMMISSIONER GILINSKY: You didn't include EPA
18 in that group, did you?

19 MR. HEWETT: Yes, we did.

20 MR. COFFMAN: Yes.

21 COMMISSIONER GILINSKY: Their comment to us
22 here seems to say the opposite and I suppose we will
23 have an opportunity to find out.

24 MR. HEWETT: The comment to the regulation and
25 what is in this presentation appear to be a bit

1 different. But getting to the Department of the
2 Interior, we met with them two weeks ago Wednesday to
3 ask them about their comment. The reason for the
4 comment was they were under the impression from talking
5 with the staff that it was a very easy matter to have a
6 thousand year package and to have a one in ten to the
7 minus fifth release rate and that this was something you
8 could buy off the shelf, and if you could do that, well
9 then why not?

10 When we tried to explain some of the
11 difficulties we saw, their reply was well, would you
12 like us to write a letter in and clarify our comment.

13 COMMISSIONER GILINSKY: And?

14 MR. HEWETT: We suggested they wait until
15 after this meeting.

16 (Laughter.)

17 COMMISSIONER ASSELSTINE: Well, I guess what
18 you are saying is they see a substantial advantage in a
19 redundancy of barriers, but if it is impossible to have
20 a redundancy in barriers, then all right, they are
21 willing to live with the situation without them.

22 MR. HEWETT: They weren't aware that we
23 thought that that would muddy the waters. They thought
24 it would clear them up.

25 CHAIRMAN PALLADINO: If there is no water

1 there you can't muddy it.

2 (Laughter.)

3 COMMISSIONER ASSELSTINE: I guess the other
4 thing I saw in their comments in particular was a
5 considerably greater degree of uncertainty in their
6 minds about the performance of a geologic environment
7 over substantial periods of time.

8 MR. HEWETT: And if you look at our ground
9 water travel time for the permian basin, it could vary
10 from a hundred thousand years to a million years and
11 that is a lot, but it is still ten times more than you
12 need for the EPA standard.

13 MR. DeJU: That is why you would use very
14 conservative numbers in doing these calculations. There
15 is of course some uncertainty in all those numbers, but
16 the more experimentation we do the more reliability we
17 are getting into that. But you have to remember that in
18 order to ascertain the value of the engineered barriers
19 you also have to get some side data and you have to get
20 some side geochemistry which a lot of times is more
21 difficult to get than the overall far-field data that
22 you need for the overall side assessment.

23 MR. COFFMAN: Again, I think it is important
24 to recognize when you talked about disagreements, I
25 think it is important to recognize, one, that we support

1 the promulgation of the rule and that it has many
2 features to it from land ownership to QA, et cetera, and
3 that we consider those desirable features and we
4 consider that the staff activities on that have been
5 very constructive and will be very helpful.

6 On this particular one we also agree on a
7 multi-barrier approach using a combination of engineered
8 and natural barriers. The disconnect comes from how
9 that is done and we believe that specific inflexible
10 numbers at this time could create licensing difficulties
11 and time delays for both the Commission and the
12 Department in seeking a license.

13 We do not object to subsequent regulatory
14 guides as we get some at-depth data. To date nobody
15 bigger than eight inches in diameter have been at depth
16 at any of these sites. Regulatory guides which contain
17 numerical or more specific guidance on the issue of
18 engineered systems and definitions associated with them
19 to avoid this other morass of things associated with
20 broad definitions we would support and I think that is
21 the option we would like to suggest to you.

22 COMMISSIONER GILINSKY: But what we are
23 talking about are the guts of the rule. These numbers
24 really are, whether you agree with them or not or
25 whether they are right or not, that is really the core

1 of the rule.

2 MR. COFFMAN: If that is the case, why does
3 the rule not have a minimum absorption number or a
4 minimum solubility number? Why does the rule not have
5 specific numbers for all of the barriers in the natural
6 system? In other words, two numbers were picked out
7 that came from a history of shipping waste and got out
8 into place and the comments have gone around those
9 things for three years, but basically it has been
10 ignored on the technical merits and that is our
11 fundamental problem.

12 CHAIRMAN PALLADINO: Let me make proposal. We
13 have been here two hours. I am going to suggest, if our
14 guests can spare the time, I am going to suggest a
15 ten-minute break and then we will have EPA and the A&S
16 representatives speak, and I might want the staff to
17 comment on some of the points you have made. I think it
18 is worth our spending some time on it. I don't see us
19 taking any vote today. I think we are still in the
20 learning process.

21 COMMISSIONER ROBERTS: Mr. Chairman, I will
22 not be here when you reconvene. I am going out of
23 that. That does not indicate any lack of interest at
24 all and I will familiarize myself of what the remaining
25 speakers say.

1 CHAIRMAN PALLADINO: Okay, thank you.

2 COMMISSIONER ASSELSTINE: Just before we let
3 the DOE people go let me ask just one question, if I
4 could, on the EPA standard. Based upon your whole
5 presentation it really comes through to me how critical
6 the EPS standard is as an element. Virtually all the
7 assumptions you have made so far are based upon having
8 an EPA standard and having one along the lines of the
9 draft that has been bottled up for so long.

10 Would you agree that it is just absolutely
11 critical that we get that standard out as just as soon
12 as possible?

13 MR. COFFMAN: Yes.

14 COMMISSIONER GILINSKY: Do you have any
15 difficulty with the EPA standard?

16 CHAIRMAN PALLADINO: I don't know what they
17 are.

18 COMMISSIONER GILINSKY: Assuming that it ends
19 up being 10,000 years.

20 COMMISSIONER ASSELSTINE: Draft 21.

21 MR. COFFMAN: There are some technical
22 definitions which both NRC and we have commented on.
23 There is one issue regarding definition of accessible
24 environment, but that to us is a technicality. I think
25 both to NRC staff and to DOE there are a couple of other

1 examples and we have recommended that the rule be
2 promulgated for comment and that these minor things
3 could be worked out in the public comment period. We
4 have sent a letter to the OMB recommending that it be
5 sent out for public comment.

6 CHAIRMAN PALLADINO: Well, thank you very much.
7 Do you have more?

8 COMMISSIONER ASSELSTINE: No.

9 CHAIRMAN PALLADINO: Will you be able to
10 remain in case we want to get back to you.

11 MR. BREWER: Dr. Coffman can remain.
12 Thank you, Mr. Chairman.

13 CHAIRMAN PALLADINO: Thank you for coming.
14 We will recess for 10 minutes.

15 (Whereupon a short recess was taken.)

16 CHAIRMAN PALLADINO: Would you please take you
17 seats so that we can get started.

18 The next speaker will be Mr. Dan Egan of the
19 Waste Management Branch of EPA.

20 Dan.

21 MR. EGAN: Thank you.

22 Glen Sjoblom sends his regrets that he
23 couldn't be here this afternoon. He has been called
24 away on business. I am the Project Leader for the
25 oft-mentioned EPA standards and he felt there is some

1 justice in my coming to speak to you this afternoon
2 about our program.

3 COMMISSIONER AHEARNE: I thought it was to
4 convince us there really was someone.

5 (Laughter.)

6 MR. EGAN: Yes, he has allowed you to stick
7 pinpricks in my hand to see if I really do bleed.

8 (Laughter.)

9 COMMISSIONER ASSELSTINE: The problem may not
10 be with you.

11 COMMISSIONER AHEARNE: We recognize that.

12 (Laughter.)

13 MR. EGAN: I was hooing somebody else but he
14 might make that point.

15 COMMISSIONER AHEARNE: I was, too.

16 (Laughter.)

17 MR. EGAN: What I have brought with me is a
18 couple minutes of comments that really address perhaps
19 your second meeting today, the question of whether it is
20 appropriate to assess specific numerical requirements
21 for the individual barriers.

22 Then perhaps after I read that what I would
23 like to do is turn it over to questions both about those
24 comments and about anything you might want to ask about
25 the status of our standards.

1 Our environmental standards, part of that
2 package would establish overall performance requirements
3 for high-level waste disposal systems in terms of limits
4 on releases of radioactivity to the environment for
5 10,000 years after disposal.

6 We believe that these limits should provide
7 very good long-term protection for disposal of
8 high-level waste and they should keep risk to future
9 generations to a level no greater than the risk from the
10 equivalent amounts of unmined uranium ore.

11 COMMISSIONER AHEARNE: That is the comparison
12 criteria.

13 MR. EGAN: It is a comparison we use. It is
14 not that we are saying that that is the basis for the
15 standards. However, we picked a level that we think is
16 reasonably achievable for an overall system performance,
17 indeed reasonably achievable with a considerable margin,
18 and we picked a level that both captures that and also
19 captures a level we think should be low enough to be
20 acceptable to the community and hopefully the public at
21 large.

22 COMMISSIONER AHEARNE: The acceptability is
23 based on ---

24 MR. EGAN: It is one of the comparisons we
25 made. There is certainly no way that we or anybody else

1 has come up with a single valued approach to say this is
2 an acceptable risk for an activity independent of
3 circumstances. There is always a balancing of
4 achievability and the acceptability involved.

5 COMMISSIONER GILINSKY: I am sorry I missed
6 your first remarks and if you covered it I apologize,
7 but in your prepared remarks you do say you expect to be
8 able to propose them for public review in the near
9 future.

10 COMMISSIONER AHEARNE: I think you skipped
11 that initially.

12 (Laughter.)

13 MR. EGAN: I was expecting that we would
14 probably get to questions on that topic after I finished
15 my comments on the question of individual barriers. I
16 had no doubt that that would escape your attention.

17 (Laughter.)

18 MR. EGAN: The comment I made in response to
19 Commissioner Ahearne's question is certainly those are
20 judgment calls we had to make in balancing those two.
21 In fact, the comments we get in our public proceeding
22 will certainly be a test of whether we have done that
23 correctly.

24 However, in talking about the overall
25 performance standards, we very clearly do not believe

1 that these release limits provide an adequate regulatory
2 framework by themselves. Disposal systems that meet our
3 overall performance requirements will need to isolate
4 high-level waste for many thousands of years in spite of
5 unplanned events and in spite of unplanned potential
6 failures of parts of the disposal system.

7 Compliance with these requirements will have
8 to be judged through analytic projections of disposal
9 system performance over a period far longer than any
10 that has previously been considered in government
11 regulations.

12 Because of the uncertainties inherent in
13 applying these overall requirements, our package also
14 contains seven criteria that should be met to assure the
15 needed confidence that our long term release limits will
16 be complied with.

17 COMMISSIONER AHEARNE: Is that for certain?

18 MR. EGAN: That is currently our position and
19 we have not at the agency changed from that. As I am
20 sure you are probably aware, we have represented that
21 very strongly in various dialogues with other agencies.

22 COMMISSIONER AHEARNE: Yes.

23 COMMISSIONER GILINSKY: Are those public,
24 those criteria?

25 MR. EGAN: We haven't made them public.

1 However, certainly they are part of Draft 19, and as I
2 understand it, Draft 19 is now understandably in your
3 Public Document Room such that in that sense you have
4 done that for us.

5 (Laughter.)

6 COMMISSIONER GILINSKY: We do that sometimes.

7 (Laughter.)

8 MR. EGAN: These criteria call for a cautious
9 and common-sense approach to disposal that encourages
10 use of disposal systems that are tolerant of potential
11 mistakes and unknowns.

12 One of these criteria calls for use of
13 multiple barriers in disposal systems with each barrier
14 separately designed to provide substantial protection.
15 This criterion is intended to compensate for unexpected
16 failures of one or more of the barriers of a disposal
17 system. Thus, the performance goals for each barrier
18 should not merely be optimized within the context of a
19 properly functioning system to meet our overall
20 performance requirements. Instead, each barrier should
21 be designed to provide as much protection as reasonably
22 achievable for that barrier taking into account economic
23 and social and other considerations and also allowing
24 for possible failures of other barriers.

25 COMMISSIONER GILINSKY: Now does this

1 represent the change from previous ---

2 MR. EGAN: No, this criterion has not changed
3 in its wording for some time.

4 COMMISSIONER GILINSKY: I mean, DCE
5 represented ---

6 MR. EGAN: Let me touch upon that a little bit
7 as we go through the letter. We did not use the words
8 "as reasonably achievable" for each barrier in the
9 criterion because we are not sure how you judge that,
10 but the idea is that you do indeed design each barrier
11 to a large extent independently and not counting on each
12 and every other barrier to back up that particular
13 barrier. It is a concept we are all familiar with here,
14 one of redundancy and defense in depth and there is
15 nothing particularly conceptually new to any of us.

16 We reiterate, and this gets to your question,
17 that we strongly support the approach taken in proposed
18 Part 60 to select specific performance requirements for
19 the individual barriers of a geologic repository. We
20 believe this is the best way to achieve the cautious
21 strategy for disposal that we believe is essential and
22 it should prevent shortsighted designs for barriers that
23 do not appear critical in the context of an analytical
24 overall system analysis. In fact, we have consistently
25 urged the Commission to extend the approach to include

1 specific performance requirements for site, geochemistry
2 and hydrology.

3 At the same time, selection of the performance
4 requirements for individual barriers must include
5 judgments about cost and feasibility. For instance, our
6 comments on your proposed technical criteria questions
7 the appropriateness of the specific number of a thousand
8 year requirement for containment within the waste
9 package.

10 Our assessments and the data that we have
11 available to us indicate that a thousand year waste
12 package might cost a great deal without offering the
13 extra long-term protection that enhanced performance of
14 other barriers could provide even when it is assumed
15 that some of the repository's components do not perform
16 as expected.

17 Perhaps most importantly we are concerned that
18 the apparent severity, again from our perspective, of
19 that particular requirement may encourage not merely
20 attack of that requirement, but attack of the whole
21 approach, essentially throwing the baby out with the
22 bath water, as it were.

23 COMMISSIONER GILINSKY: Did you suggest any
24 other time for that ---

25 MR. EGAN: No. In our rule and our comments

1 we did not make any specific suggestions.

2 CHAIRMAN PALLADINO: Are you saying that the
3 number here is not long enough?

4 MR. EGAN: Let me get to my second question.
5 We are seeing again our data and cost and the like. We
6 certainly don't believe they are by any means the final
7 word. In fact, when we discussed this with DCE, because
8 we had to prepare a regulatory impact assessment for our
9 standards, the data was clearly quite uncertain at that
10 time and I suspect it still is. In fact, cost data is
11 something that will come along fairly slowly as it
12 typically does in a process such as this.

13 It is our judgment, just based on what we have
14 seen, that the thousand year requirement may in fact
15 have significant cost implications. On the other hand,
16 it is also our judgment that the ten to the minus five
17 waste form does not seem to have the same severity of
18 cost implications as we understand it, but we certainly
19 don't claim to be the ultimate experts on that, but that
20 is the information we have.

21 To reiterate this, we support a specific
22 numerical requirement for waste package lifetime, but a
23 value other than a thousand years a thousand years may
24 be appropriate.

25 COMMISSIONER HEARNE: Since you have reached

1 the conclusion that a thousand may be inappropriate,
2 would you have a number which you feel might be
3 appropriate?

4 MR. EGAN: Yes. From my own personal
5 judgment, I will be glad to give you what I have seen,
6 numbers like two or three or four hundred years, in that
7 range, a few hundreds of years to get you past the very
8 intense heat problem with the 30 year half life fission
9 products. That seems to be perhaps more defensible and
10 perhaps more achievable with the technologies we have
11 seen, but again I hesitate, you know, to pass that on as
12 the findings of an expert.

13 CHAIRMAN PALLADINO: Are there uncertainties
14 in the length of time over this heat has to be handled,
15 in other words, two or three hundred years might be a
16 calculation? Is there something that you might say
17 would be longer or shorter or different?

18 MR. EGAN: Well, when you get into the heat
19 generation of the waste of course, the waste itself, you
20 know pretty well that heat removal of course is a much
21 more site specific thing and we have not studied that
22 extensively. My picking of two or three hundred years
23 is more based on the argument than the facts staff made
24 to you that it was the decay of the radioisotopes that
25 was perhaps the most important. Again, we have seen

1 numbers that stretch into a thousand and it may drive
2 you into materials that you might not have to go to if
3 you cut that by a factor of three or four.

4 I am struck by the argument, particularly in a
5 very high heat period that in fact you may have things
6 going on that you can't model very well and there is
7 some reason to have a redundant, or an extra redundant
8 barrier in the system at that time.

9 COMMISSIONER ASSELSTINE: But your comment is
10 based more upon the difficulty in meeting the thousand
11 year requirement and the incremental protection that you
12 see might be gained from that rather than anything, for
13 example, in your standards that would drive it one way
14 or the other?

15 MR. EGAN: That is correct. Let me finish
16 this and comment on that in a minute.

17 To reiterate our position, we do support a
18 specific numerical requirement and a value other than a
19 thousand may be appropriate. We are encouraged that the
20 revisions that we have seen in the proposed Part 60
21 would allow the Commission to pick a different
22 requirement when more information, particularly
23 information such as cost data, becomes available. We
24 also wish to point out that the other specific
25 requirements in the proposed Part 60, particularly the

1 requirement on waste form release rate, appear to be
2 both appropriate and we believe are also more important
3 than the waste package requirement.

4 The approach of setting such specific
5 numerical requirements on individual barriers, which is
6 clearly not within our authority, is an appropriate way
7 for the Commission to implement our environmental
8 standards. Furthermore, we believe this approach is
9 essential for developing the confidence that will be
10 needed in disposal systems that must work for so long,
11 and we believe the Commission should continue on this
12 course.

13 I will get back to the question Commissioner
14 Asselstine raised. In the comment letter we sent you
15 all and which DCI has correctly quoted in their
16 submission to you we did of course question the thousand
17 year requirement and we are also fairly careful both in
18 that paragraph and elsewhere in the letter to say we did
19 support the approach you were taking.

20 We did not, as I go back and remember the
21 letter, say exactly the words we said here such as you
22 might consider this to be a clarification of our
23 previous comments. But we have consistently felt you
24 should set not only the requirements, specific numeric
25 requirements that you have set, but we have also argued

1 quite often that you could extend that to the geology as
2 well and the geochemistry because it is clear.

3 COMMISSIONER AHEARNE: You said "We urge the
4 Commission to extend the multiple barrier approach to
5 the geology and geochemistry at the disposal site."

6 MR. EGAN: The analyses the DCE showed do
7 reflect the fact that the geology does provide
8 substantial protection and we are concerned that that
9 should be focused on as well.

10 That completes I guess my formal comments or
11 comments on your second part of the meeting and I guess
12 I will go back to Commissioner Gilinsky's question as to
13 where we stand on the package.

14 Of course I don't have a particularly firm
15 answer as always.

16 (Laughter.)

17 MR. EGAN: The Administrator has been pushing,
18 as Chairman Palladino well knows, very hard in the last
19 several weeks to get the package out. We are not
20 preparing internally a package so that everything is
21 ready to go for her signature, and I am hoping that that
22 road block can be cleared up and I think a feasible date
23 would be by the end of the year, by mid or late
24 December. My predictions here have not been terribly
25 reliable before so I offer that with some salt, but I do

1 get indications that there may be some resolutions of
2 that coming along.

3 As you know, we have been over at CMB now
4 since Christmas Eve of last year in the formal 12291
5 review.

6 CHAIRMAN PALLADINO: Do you think you are
7 making progress?

8 MR. EGAN: Yes, I do in fact, but then I have
9 thought that for a while.

10 (Laughter.)

11 COMMISSIONER GILINSKY: But the reports we
12 have gotten back from meetings that I gather were held
13 with you were that things seemed to be pretty much at an
14 impasse.

15 MR. EGAN: Yes. Certainly the meeting the
16 Chairman was at did not end with any agreement in sight,
17 but it did end with the Administrator being very firmly
18 committed to solve that particular problem at whatever
19 level is appropriate.

20 COMMISSIONER ASSELSTINE: Is it fair to say
21 that as far as you all are concerned and our staff is
22 concerned and the DDE people are concerned that there is
23 agreement there?

24 MR. EGAN: Yes.

25 CHAIRMAN PALLADINO: That there is agreement

1 where?

2 COMMISSIONER ASSELSTINE: That there is
3 agreement between our staff and the EPA and the DOE
4 people.

5 MR. EGAN: We have letters on the record since
6 June this summer from both DOE and NRC saying, you know,
7 we agree that the standards are fine for public
8 comment.

9 COMMISSIONER ASSELSTINE: So the hold is
10 coming from OMB.

11 MR. EGAN: Oh, there is no question about
12 that, and there has been that particular point for some
13 time.

14 COMMISSIONER GILINSKY: Can I ask you what we
15 are talking about here is putting the EPA standard out
16 for comment. How long a period do you envisage for a
17 standard to become effective?

18 MR. EGAN: I anticipated you might ask that,
19 too. We do envision certainly initially allowing
20 180-day comment period, which is perhaps somewhat longer
21 than the minimum required, but again because of the
22 tremendous interest in this issue and also the
23 complexity of the issue I feel it would be wrong to try
24 to cut short a comment period any more quickly than
25 that. We will hold public hearings at the end of that

1 comment period.

2 We are forecasting that one year after the day
3 of proposal we plan to promulgate the standard.

4 COMMISSIONER GILINSKY: Do you think you can
5 do that even with public hearings at the end of the
6 180-day period because after that you have to prepare
7 for those hearings?

8 MR. EGAN: Well, we will hold the hearings
9 within the comment period, within the 180 days, and
10 probably near the end of that period and then close the
11 comment record both from written comments and from
12 public hearing in approximately six months after we
13 propose. That will give us about six months to organize
14 the comments and deal with whatever we have to deal with
15 as far as revising the rule if that is appropriate. My
16 personal judgment is that it will come out, you know, on
17 schedule within one year afterwards, you know, Murphy's
18 Law being I think very valuable here, because I expect
19 we will get a very wide range of comments. There are a
20 lot of social issues besides technical issues that are
21 involved here.

22 We do have a technical review panel that we
23 are setting up through our Science Advisory Board to
24 conduct a technical peer review at the same time as the
25 public comment period. Essentially we have a number of

1 things going on during that period of time.

2 COMMISSIONER GILINSKY: So really the earliest
3 that one could have a final EPA standard is early 1984.

4 MR. EGAN: I think that is certainly a fair
5 assessment. That would be my personal call from the way
6 this has proceeded to date.

7 COMMISSIONER GILINSKY: That assumes that you
8 in fact resolve your problems by the end of the year.

9 MR. EGAN: Not knowing what they are, that
10 assumes that we do, yes. You know, your judgment, I
11 would say at this point, is as good as mine on how much
12 that is going to take you down through a similar type of
13 rulemaking on yours.

14 CHAIRMAN PALLADINO: Any other questions?

15 COMMISSIONER AHEARNE: No. I thank Mr. Egan
16 for his presentation.

17 COMMISSIONER GILINSKY: Thank you very much.

18 CHAIRMAN PALLADINO: Thank you both for your
19 presentation and for your forthright answers to
20 questions.

21 Now we have Dr. Krauskopf.

22 (At this point in the proceedings Mr. Egan
23 left the Commissioners' table and Messrs. Krauskopf and
24 Meyers joined the Commissioners at the table.)

25 CHAIRMAN PALLADINO: It is nice to have you

1 with us.

2 MR. KRAUSKOPF: I am very glad of the
3 opportunity to be with you.

4 I am the Chairman of the Board on Radioactive
5 Waste Management of the National Academy, and I have
6 with me Dr. Peter Meyers who is the Executive Office of
7 that Board.

8 About a year ago the National Academy sent to
9 you some comments that had been prepared by the Board on
10 Radioactive Waste Management regarding an earlier issue
11 of 10 CFR 60. Much of what I have to say will be a
12 little dated because the Board has not considered 10 CFR
13 60 since that time. So some of the comments that were
14 made in that letter would undoubtedly have to be revised
15 today.

16 I will try to distinguish between what the
17 Board said in that letter and what my guesses would be
18 about what its opinions would be today.

19 COMMISSIONER GILINSKY: I wonder if you could
20 say a word about the Board, the composition of the Board.

21 MR. KRAUSKOPF: The Board is made up of people
22 from a number of different disciplines, from nuclear
23 energy through chemistry, geology, hydrology to
24 economics, materials science and even political
25 science. It has been functioning for oh in one form or

1 another for the last couple of decades, and it has tried
2 to provide the answers to questions posed to it by
3 government agencies, the Department of Energy, NRC and
4 EPA. This report that I am speaking of was in answer to
5 a request for comments by the NRC.

6 The Board was complimentary about the proposed
7 rule in general. We were much impressed with the work
8 that had gone into it and the care with which its
9 recommendations had been prepared.

10 The letter was rather critical in some
11 respects. We thought for one thing that the rule should
12 not be issued until EPA had set its standards, that the
13 rule should be left in a proposed form at present or
14 otherwise the rule should carefully justify why it was
15 being promulgated before the EPA standard had been set.

16 Regarding the numbers that have been talked
17 about so much this afternoon, the general feel of the
18 Board was that the numbers for subsystems did not belong
19 in the rule, that if numbers were to be used they should
20 appear in regulatory guides rather than in the rule.

21 We felt that the evidence supporting the
22 numbers was not really very convincing, that no evidence
23 was given, that the numbers would really support a
24 finding of no unreasonable risk to the health and safety
25 of the public. We thought that it had not been shown

1 adequately that the numbers were either necessary or
2 sufficient to meet the standard that EPA had apparently
3 adopted, that is we did find a tentative standard at
4 that time in I believe it was EPA's 19th version of
5 their standard and we didn't feel that the numbers were
6 demonstrated to be either necessary or sufficient to
7 meet that standard.

8 We did not think that it had been adequately
9 shown that the numbers would aid the licensing process,
10 that the numbers were technically valid or that the
11 numbers could be verified. We felt also that there was
12 no real proof that the numbers were actually achievable
13 at any reasonable cost.

14 We thought that concentration on these numbers
15 would deflect the Department of Energy from work on an
16 overall performance standard which we thought should be
17 the object of the rule. A single overall performance
18 standard was one of the alternatives in the rule at that
19 time and we thought that that was a preferable approach
20 rather than trying to set numbers for some systems.

21 We thought that the rule should contain a
22 qualitative analysis of the factors which the numbers
23 were attached to, that is, there should certainly be
24 discussion of the lifetime of a canister, of the amount
25 of radioactive material that could be permissible after

1 the first few hundred or thousand years and there should
2 be a discussion of geological factors like the motion of
3 ground water.

4 But there should not be fixed numbers because
5 each repository site is going to be different from
6 others in many respects and that it is more important
7 that each site be evaluated on its own and that the
8 repository system should be investigated as a system and
9 that there should be an opportunity for balancing say
10 deficiency in one respect against advantages in another
11 respect.

12 Also, we thought that the numbers, if they
13 were set, will undoubtedly be changed in the future as
14 we learn more about repository sites and as we learn
15 more about the effects of radioactivity on organisms,
16 and if the numbers are frozen in the rule they will be
17 difficult to change in the future.

18 As Dr. Coffman has so eloquently explained,
19 the numbers will be different from one site to another,
20 that is for example, if you contrast a repository in
21 salt with a repository in silicate rock the requirement
22 for the life of the canister would necessarily be quite
23 different and it would be awkward to have a specific
24 number in the rule itself.

25 well, these are some of the statements in that

1 letter of last year. It seems to me that if the Board
2 were to consider the latest version that probably some
3 of those statements would be modified. Now I am
4 speaking now as an individual and I am really making
5 guesses as to what the Board would say.

6 It seems to me that the rationale that is
7 attached to the final rule or document answers a number
8 of our objections, that is, it does provide considerable
9 evidence that the numbers suggested in the rule might be
10 sufficient to satisfy the requirements of EPA.

11 Now I make that statement with some
12 trepidation because I have not gone through the analysis
13 and I do not know. It just seems to me that a real
14 effort has been made in that direction and it looks to
15 me as if there is much more evidence that there was
16 originally. I am not sure that the evidence is so good
17 that these numbers are necessary. In fact, I would
18 think myself as an individual that some of them are more
19 restrictive than necessary as a general rule.

20 Also it seems to me, and again this is an
21 individual opinion, that part of this discussion ought
22 to keep in the background that there will be only one or
23 two repositories commissioned in the next say 40 years.
24 So it seems to me that there isn't very much gained by
25 making generic rules that would apply to many

1 repositories. There simply won't be many repositories.
2 So I should think each one would be better handled on a
3 case-by-case basis considering the peculiarities of the
4 particular sites.

5 It seems to me that flexibility is
6 particularly important so that DOE can carry out its
7 function of building a repository that will have minimum
8 risk to health and safety.

9 I think that is about all I have to say.

10 CHAIRMAN PALLADINO: Okay. Thank you very
11 much.

12 Any questions?

13 (No response.)

14 CHAIRMAN PALLADINO: I wonder if I might ask
15 you a question. You said that you don't anticipate many
16 repositories will be established and yet I have heard
17 discussions of having established one can we keep up
18 with the rates at which spent fuel or waste would be
19 generated. From that I get the impression there might
20 be several and they might be for purposes of
21 experimentation or mainly for diversity, and it may be
22 that we have different sites in different geologic
23 formation.

24 If you have everything being site specific you
25 are faced with having to predict which site it is going

1 into. Do you have any thoughts on overcoming that
2 problem?

3 MR. KRAUSKOPF: Possibly my guess about the
4 number of repositories was pessimistic. I am afraid tht
5 I have been conditioned by say 12 years or so in this
6 game when originally a repository was supposed to be
7 built in the middle 1930's and now it has been pushed up
8 toward the end of the century.

9 CHAIRMAN PALLADINO: I wasn't thinking when
10 these repositories ---

11 (Laughter.)

12 CHAIRMAN PALLADINO: Go ahead. I am sorry.

13 MR. KRAUSKOPF: Well, it simply seems to me
14 that the rule should have an analysis of the important
15 factors to consider in a repository, the geologic
16 factors and the engineering factors. There is no
17 argument on our side about the necessity for a
18 multi-barrier approach, and this should be spelled out
19 in qualitative terms in the rule and then for each
20 repository there should be guidelines established for
21 that particular kind of a geologic environment.

22 CHAIRMAN PALLADINO: If you found something
23 wrong in the one and you wanted to transfer material
24 over to the other ---

25 MR. KRAUSKOPF: That could well be a

1 difficulty, but to fashion a waste package that would be
2 suitable both for putting in salt and for putting in a
3 rock like basalt or granite or tuff, that would be
4 pretty difficult and I think would be needlessly
5 expensive.

6 COMMISSIONER GILINSKY: Let's see, you would
7 see a process in which DOE would pick a site, inform us
8 and we would then develop standards for that site before
9 they designed a repository?

10 MR. KRAUSKOPF: You would develop regulations
11 for that site, yes.

12 COMMISSIONER GILINSKY: Before they designed
13 the repository presumably.

14 MR. KRAUSKOPF: I don't know about the
15 sequence of events here. They would certainly have at
16 least rough plans for the design of the repository.

17 COMMISSIONER GILINSKY: The way we were trying
18 to work it was to, on our staff was at any rate, was to
19 develop rules now that would be turned over to DOE and
20 DOE would then pick a site on the basis of this and
21 design a repository, packages and so on and submit an
22 application. But if one goes with the site specific
23 approach, then what we need to have is for DOE to pick a
24 repository, come back and tell us about it and for us
25 then to develop standards for that particular geology.

1 You are shaking your head. So how do you see
2 it differently?

3 MR. MEYERS: Isn't it for DCE to make its
4 proposal for that specific site as to the particular
5 tradeoffs which it would feel adequately protected
6 health and safety in line with the EPA's ---

7 COMMISSIONER GILINSKY: So there would simply
8 be no standards. We would simply see what they have
9 done and see if it meets the EPA standard? You talked
10 to us earlier about regulatory guides.

11 MR. KRAUSKOPF: Yes.

12 COMMISSIONER GILINSKY: When will these come
13 in the process? That is what I was trying to get at.
14 If you are talking about a regulatory guide, which is
15 site specific, that can only come after we know which
16 site we are talking about. So there would be a period
17 of time during we are preparing regulatory guides after
18 a site has been picked and before one can design a
19 repository.

20 MR. MEYERS: There is no reason you could not
21 start a generic set of guides for salt and another
22 generic set of guides for basalt. Much of the work can
23 be done while the site selection and qualification is
24 going on because it is medium specific rather than ---

25 COMMISSIONER GILINSKY: Well, but the way DCE

1 was approaching it there is more to it than that. It is
2 really knowing all the various other barriers and their
3 performances that allows you to pick, say, the package
4 standard.

5 MR. KRAUSKOPF: Of course I don't know the
6 procedure of establishing these regulatory guides. I
7 should think, as Peter has just pointed out, that it
8 would be possible to develop a series of guides for the
9 different possible geologic media and then those could
10 be rather quickly modified for particular sites. I
11 would not want to introduce long delays in the process.

12 COMMISSIONER GILINSKY: It seemed to me that
13 we were taking a simpler approach which does involve
14 possibly an increase in cost in the package over what
15 you might arrive at if you had a very site specific
16 approach, but it is one that applies to all sites and
17 doesn't then require us to develop a regulatory
18 framework for each one of those sites.

19 MR. KRAUSKOPF: Well, the difficulty is of
20 course that it is impossible to set actual numbers that
21 will be suitable for all sites.

22 COMMISSIONER GILINSKY: Well, you pay a
23 penalty at some sites certainly. The alternative though
24 is it seems to me a rather lengthier process. In other
25 words, if one wants to optimize further I think we would

1 be getting into a rather longer process which is going
2 to have to take a look at individual sites and set up a
3 framework for those.

4 MR. KRAUSKOPF: Well, I wish I knew more about
5 the process of establishing regulations and guidelines.

6 CHAIRMAN PALLADINO: I think Commissioner
7 Ahearne has a question.

8 COMMISSIONER AHEARNE: A couple of questions,
9 if I could. Reading your letter is it fair for me to
10 assume that underlying it was the report that was
11 prepared by Tom Pickford?

12 MR. KRAUSKOPF: Oh, yes, very much so.

13 COMMISSIONER AHEARNE: He sent that into us
14 and he said that your Board have given him permission to
15 send that in as his individual comments.

16 MR. KRAUSKOPF: That is correct.

17 COMMISSIONER AHEARNE: Based on that then let
18 me see if I understand correctly. It seems that you
19 were raising in your letter two types of concerns. The
20 first was there was no technical justification developed
21 for the criteria, and I believe that to some extent the
22 staff has attempted to address, as you had mentioned.

23 MR. KRAUSKOPF: That is correct, yes.

24 COMMISSIONER AHEARNE: The second, and now I
25 refer more to Pickford's paper, is a question that the

1 numbers themselves weren't correct, not so much that
2 there was no justification, but then going through his
3 own analysis he was reaching the conclusion that those
4 were wrong numbers. I wondered whether that second
5 piece in your sense would still be the flavor of your
6 board's position if they were to review it again?

7 MR. KRAUSKOPF: I would only be guessing as to
8 what Dr. Pickford would say to a question like that. I
9 would think that we would still object to the particular
10 numbers. We would think I believe that the numbers are
11 too restrictive.

12 COMMISSIONER AHEARNE: That is the site
13 specific issue that is being debated.

14 MR. KRAUSKOPF: Yes.

15 COMMISSIONER AHEARNE: A final question
16 speaking specifically to one of the comments in your
17 letter. You say, and then I want to ask the implication
18 of what DOE's position is, "The criterion of water
19 transport time may not be verifiable and is probably not
20 verifiable in some geologic media. Because the flow of
21 water in some media is complex and poorly understood,
22 the transport time may be verifiable only within broad
23 limits."

24 DOE is making a great part of their argument,
25 at least it seemed to be this afternoon, based upon very

1 large travel times. How should I interpret your
2 comments? Should I interpret them as saying that we
3 ought to be cautious on accepting the complete reliance
4 upon estimated large travel time?

5 MR. KRAUSKOPF: This is a technical matter of
6 how you determine how fast ground water is moving. I
7 suppose the question really hinges on what is meant by
8 the broad limits.

9 COMMISSIONER AHEARNE: Yes.

10 MR. KRAUSKOPF: When ground water moves
11 through rock it doesn't just move as a body but there
12 will be stringers that will move faster than the rest of
13 it and of course it will disperse in all directions and
14 that sort of thing.

15 In the presentation by DOE this afternoon they
16 were careful to point out repeatedly that they were
17 using conservative numbers. They were using small
18 numbers which would be on the low side of this broad
19 limitation. So I don't think there is anything
20 necessarily inconsistent there with their position.

21 COMMISSIONER AHEARNE: Thank you.

22 CHAIRMAN PALLADINO: All right. Thank you
23 very much, Dr. Krauskopf and Dr. Meyers.

24 I was going to ask Mr. Dircks if he had any
25 comment that he would feel appropriate to make based on

1 what he has heard here and the staff.

2 MR. DIRCKS: Well, as we mentioned earlier, we
3 didn't want to get into a point-by-point technical
4 rebuttal of what DOE had to say. I think though you
5 picked up where we do have a basic fundamental
6 variance. It is that they are putting much more weight
7 on the certainty of geology than the staff did and still
8 does, and we are particularly concerned I think about
9 the first several hundred to a thousand year limit when
10 we believe that the material is at its most hazardous
11 state.

12 I think the arguments were the temperature and
13 particularly the fission product decay were two elements
14 that we were particularly concerned about in our
15 discussion of the thousand year period.

16 There are in addition to the DOE comments of
17 course and the other comments you have heard today,
18 there are many other commenters on this subject, and
19 rather than for us to deal only with DOE today, you do I
20 think owe it to yourself, if you want to get into this
21 more deeply, to hear the comments of the Department of
22 Interior, the Geologic Survey and of course the outside
23 groups such as the Natural Resources Defense Council
24 which has been quite active in commenting on the rule.

25 I do think that is the basic underlying

1 difference. It is that thousand year period, up to the
2 thousand year period where we are a little bit less sure
3 of the geology than DOE seems to be.

4 COMMISSIONER GILINSKY: Where does the rule
5 stand geographically? Is it in Bethesda or is it here?

6 (Laughter.)

7 COMMISSIONER GILINSKY: I mean have you sent
8 it to us to deal with?

9 MR. DIRCKS: No, not the full package.

10 COMMISSIONER GILINSKY: That is what I meant.

11 MR. DIRCKS: We sent you the rule itself, but
12 I have the rule and if you ask me where it is --

13 COMMISSIONER GILINSKY: No, no, no, I meant
14 the package from you.

15 MR. DAVIS: Once we get the guidance we have
16 requested today we can finalize the rule and bring it
17 down fairly promptly and then go through all the
18 technical briefings that the staff would be prepared to
19 do. We were holding it back.

20 COMMISSIONER GILINSKY: I would very much like
21 for you to send us the package. I don't know that we
22 have to decide on the precise option for you to do that.

23 CHAIRMAN PALLADINO: I have something here
24 that maybe is not the latest but it is dated November
25 5th. It says a proposed Part 60 criteria per your

1 request at the agenda planning session.

2 MR. DAVIS: That is not the whole package.

3 MR. DIRCKS: That is not including all the
4 comments.

5 CHAIRMAN PALLADINO: The rule but not the
6 entire package.

7 COMMISSIONER GILINSKY: When I said rule I
8 meant package.

9 COMMISSIONER ASSELSTINE: We have the rule but
10 not the package.

11 MR. DIRCKS: We can send that down.

12 COMMISSIONER GILINSKY: I think it would be
13 useful for you to send that forward and then we can
14 deliberate on just exactly how we want to deal with it.

15 MR. DIRCKS: Fine.

16 CHAIRMAN PALLADINO: Okay. Any other comments?

17 (No response.)

18 CHAIRMAN PALLADINO: Well, thank you very much.

19 Now before we adjourn I would like to make a
20 request of the whole audience. This may take an
21 investment of two minutes of your time, but it could
22 save us considerable more. I am going to adjourn this
23 meeting and I am going to reconvene in affirmation
24 session which is a ritual whereby we affirm notation
25 votes and it takes a very short period of time unless

1 somebody has a question on them and I don't anticipate
2 any today. So if you would bear with us, I will ask you
3 to stay seated and I will adjourn this meeting and start
4 the other.

5 This meeting will stand adjourned.
6 (Whereupon, at 5:00 p.m., the meeting
7 adjourned.)

8 * * *

9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

NUCLEAR REGULATORY COMMISSION

This is to certify that the attached proceedings before the
COMMISSION MEETING

In the matter of: PUBLIC MEETING - Options Regarding High-Level Waste
Rule Technical Criteria (Part 60)

Date of Proceeding: November 18, 1982

Docket Number: _____

Place of Proceeding: Washington, D. C.

were held as herein appears, and that this is the original transcript
thereof for the file of the Commission.

Mary C. Simons

Official Reporter (Typed)

Mary C Simons

Official Reporter (Signature)

United States Department of Energy

**Presentation Before the
United States Nuclear Regulatory Commission
on the Matter of
Draft 10 CFR Part 60**

November 18, 1982

**F. D. Coffman
Acting Director
Office of Terminal Waste Disposal
and Remedial Action
Office of Nuclear Energy
U.S. Department of Energy**

**DRAFT 10 CFR 60.1128 MAIN PROPOSED
FEATURES WHICH SHOULD BE INCLUDED
IN THE REGULATIONS.**

- PROVIDES FOR THE EXAMINATION OF THE PLANS, HEALTH AND SAFETY WHILE FULFILLING DUTIES AS DURING FLEXIBILITY
- PROVIDES OVERALL SYSTEM EFFICIENCY AND OBJECTIVE (60.112)
- PROVIDES GUIDANCE IN KEY AREAS:
 - LAND OWNERSHIP AND CONTROL (60.121)
 - Siting REQUIREMENTS (60.121)
 - DESIGN REQUIREMENTS (60.130)
 - PERFORMANCE DURING OPERATION (SUBPART D)
 - QUALITY ASSURANCE (SUBPART G)
 - PERSONNEL TRAINING AND CERTIFICATION (SUBPART H)

**DOE CONCERNS WITH 10 CFR 60
CENTERS ON 60.112 AND 60.113**

- 1. REQUIREMENTS TO MEET GENERIC LEVELS OF
PERFORMANCE ON A SITE-SPECIFIC BASIS**
- 2. INCONSISTENCY BETWEEN 60.112 AND 60.113**
- 3. IMPOSITION OF GENERIC ASSUMPTIONS ON
SPECIFIC ROCK TYPES**

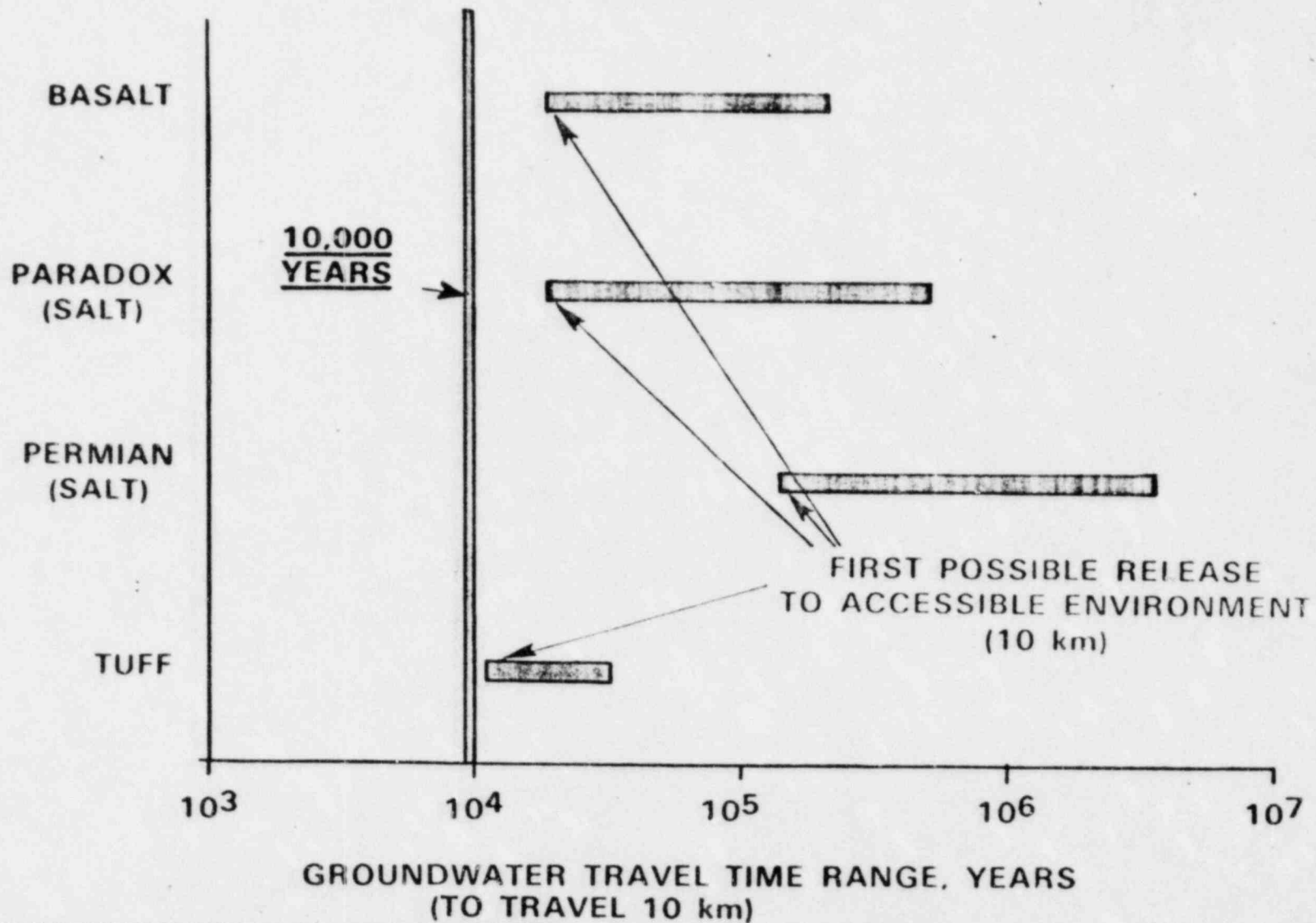
DOE RECOMMENDS:

1. ELIMINATION OF 60.113
2. REDRAFTING OF 60.112
3. CONSULTATION BETWEEN NRC/DOE STAFFS
TO RESOLVE OTHER CONCERNS
4. PUBLISH FINAL RULE

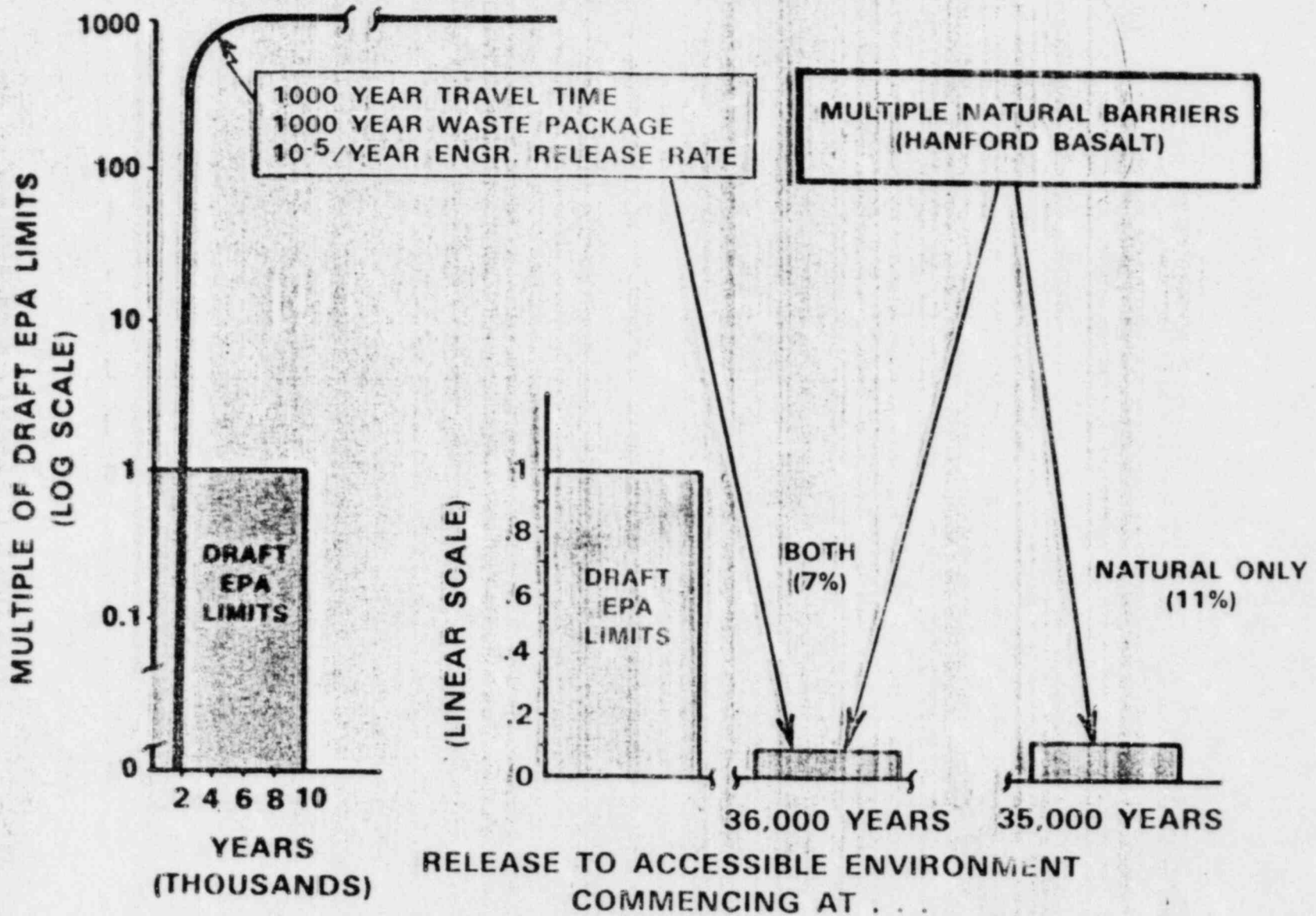
FUNDAMENTAL DIFFERENCES BETWEEN NRC STAFF AND DOE ARE:

1. NRC STAFF STATES THAT DEPENDENCE UPON ENGINEERED SYSTEMS RATHER THAN NATURAL BARRIER SYSTEMS WILL RESULT IN A REPOSITORY WITH LESS UNCERTAINTY IN ITS OVERALL PERFORMANCE.
2. NRC STAFF STATES THAT BY SPECIFYING ENGINEERED PERFORMANCE YOU CAN REDUCE THE UNCERTAINTY IN TOTAL SYSTEM PERFORMANCE. [EVEN WHEN THE SUM OF THE SUBSYSTEMS PERFORMANCES DOES NOT ENSURE OVERALL (EPA STANDARD) COMPLIANCE.]

THE PROPOSED 10,000 YEAR EPA LIMIT WOULD BE MET ON THE BASIS OF GROUND-WATER TRAVEL TIME ALONE

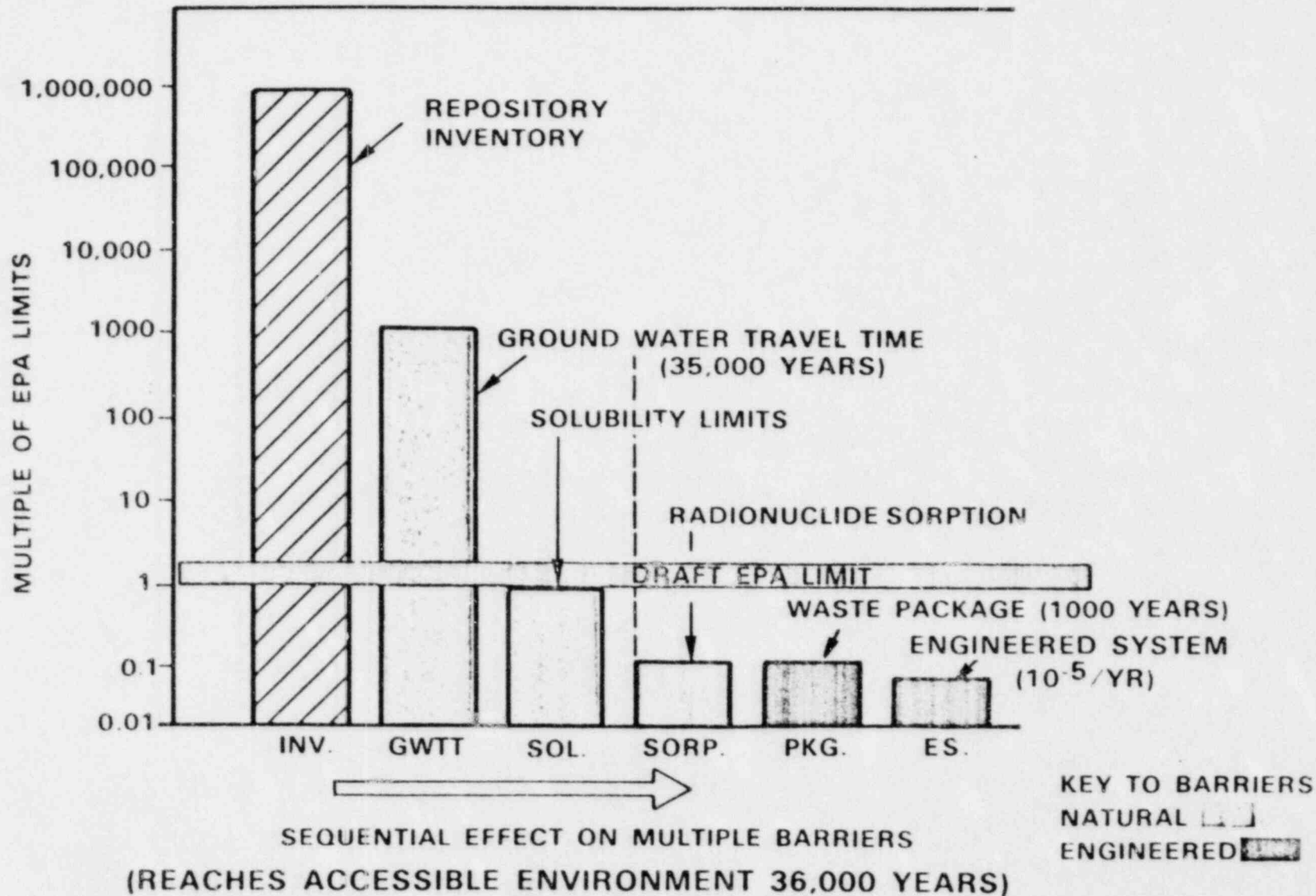


ALTHOUGH THE 60.113 REQUIREMENTS ARE INTENDED TO PROVIDE CONFIDENCE IN COMPLIANCE WITH THE EPA SYSTEM STANDARD, NATURAL BARRIERS DOMINATE SYSTEM PERFORMANCE

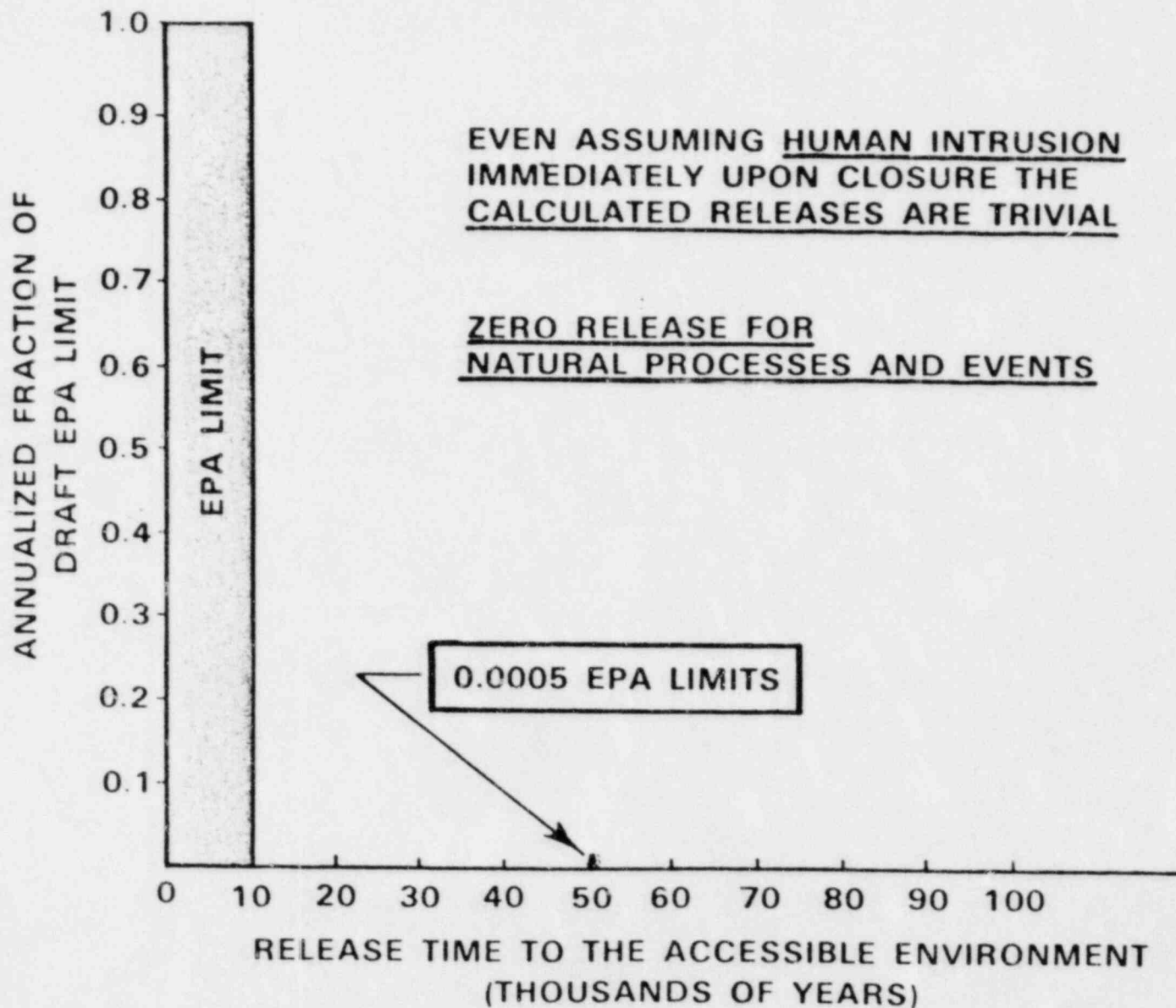


(HANFORD BASALT: RELEASE INTEGRATED OVER ALL TIME)

LOW INTEGRATED RELEASE DUE TO MULTIPLE NATURAL BARRIERS
(SHOWN IN BLUE). ENGINEERED BARRIERS HAVE LITTLE OR NO
EFFECT ON MAGNITUDE OF RELEASE

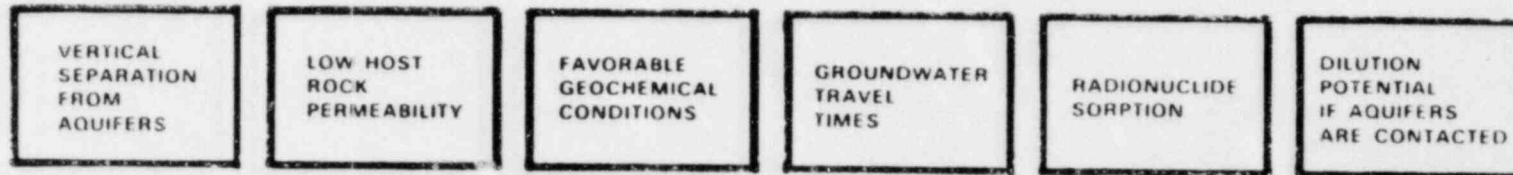


PARADOX BEDDED SALT

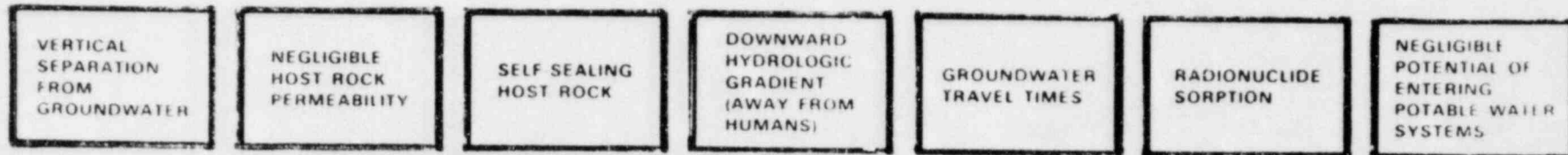


DEFENSE-IN-DEPTH IS PROVIDED BY THE
MULTIPLE NATURAL BARRIERS

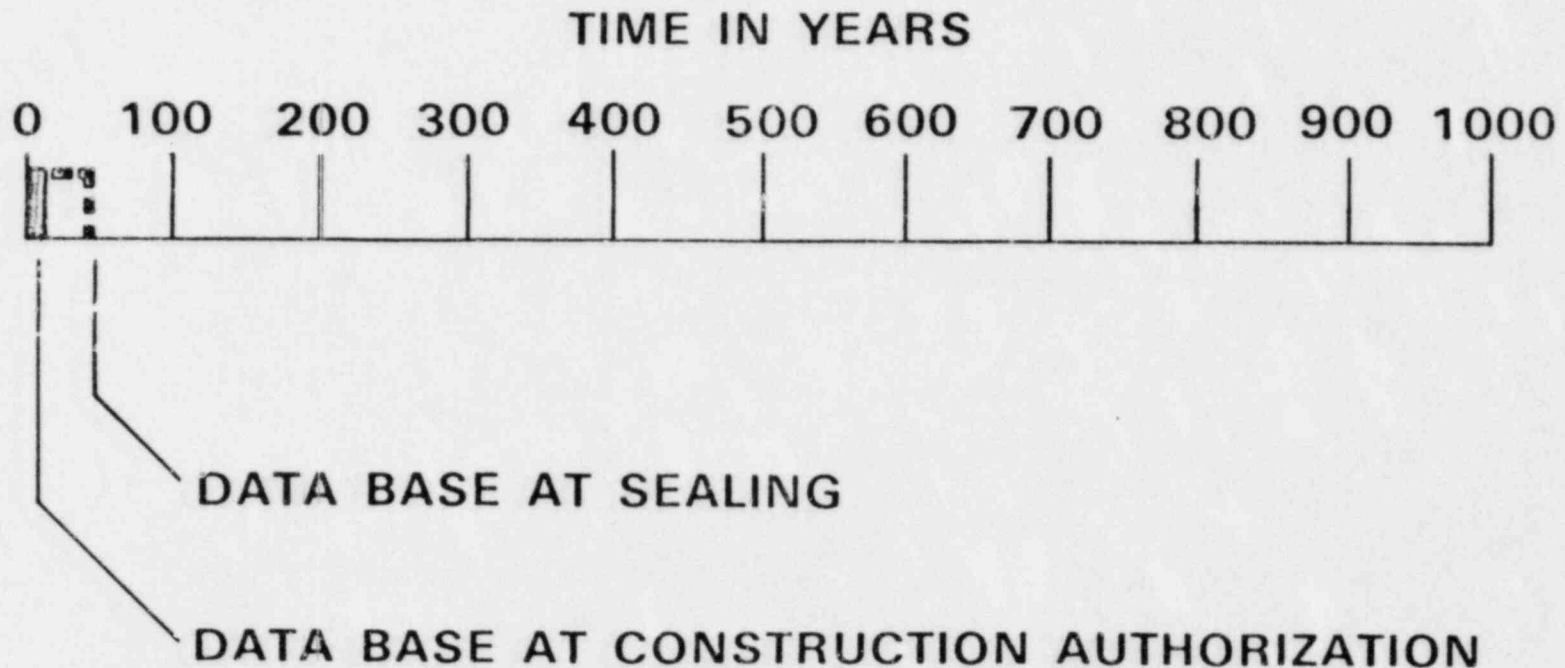
BASALT



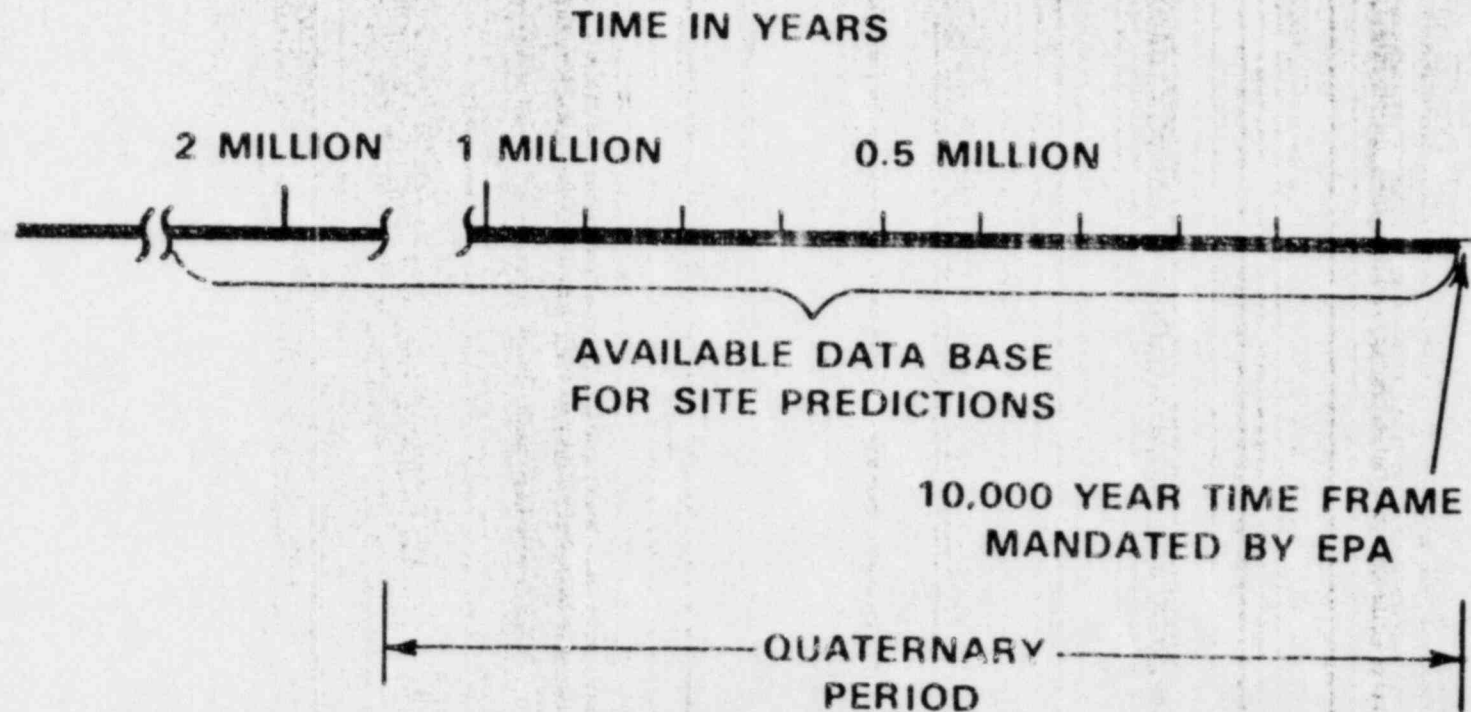
BEDDED SALT



**PROVING COMPLIANCE WITH 60.113
REQUIREMENTS (E.G., 1000 YEAR WASTE
PACKAGE) REQUIRES EXTRAPOLATIONS
THAT ARE VERY LARGE RELATIVE
TO THE ENGINEERING DATA BASE**



CONVERSELY, THE DATA BASE FOR SITE PREDICTIONS
EXTENDS MILLIONS OF YEARS BACK IN TIME MAKING
THE FORWARD EXTRAPOLATION VERY MINOR.



**ALTHOUGH TECHNICALLY FEASIBLE,
PROOF OF COMPLIANCE WILL BE
EXTREMELY DIFFICULT DUE TO:**

- **VERY LARGE ENGINEERED
DATA EXTRAPOLATIONS
REQUIRED**
- **UNCERTAINTY REGARDING
NATURE AND EXTENT OF
PROOF REQUIRED BY NRC**

191.14 IMPLEMENTATION

COMPLIANCE WITH 191.13 SHALL BE DETERMINED THROUGH ANALYTICAL PROJECTIONS OF POTENTIAL RELEASES OF WASTE TO THE ACCESSIBLE ENVIRONMENT. THESE PROJECTIONS SHOULD BE MADE IN ACCORDANCE WITH THE FOLLOWING PROVISIONS:

(A) PERFORMANCE ASSESSMENTS USED TO DETERMINE COMPLIANCE WITH THE PROJECTED PERFORMANCE REQUIREMENTS SHOULD CONSIDER REALISTIC PROJECTIONS OF THE PROTECTION PROVIDED BY ALL OF THE ENGINEERED AND NATURAL BARRIERS OF A DISPOSAL SYSTEM.

**THE ADOPTION OF 60.113 WILL RESULT
IN SIGNIFICANT R&D AND SYSTEM
DESIGN CONTINGENCY COSTS DUE TO:**

- **TIMING AND UNCERTAINTY IN
OBTAINING A 60.113(B)
COMMISSION APPROVAL**
- **UNCERTAINTY REGARDING
REQUIREMENTS FOR COM-
PLIANCE WITH 60.113**

**THE CASE-BY-CASE COMMISSION
APPROVAL PROVISIONS IN 60.113(B)
REQUIRE LARGE AND TIME CONSUMING
EFFORTS BY DOE & NRC.**

- DETAILED TECHNICAL ANALYSIS AND PETITION BY DOE (ACCOMPANIES PSAR)
- STAFF ANALYSIS AND RECOMMENDATION
- BOARD* REVIEW AND RECOMMENDATION TO COMMISSION
- COMMISSION FINDING

THE PROCESS COULD TAKE SEVERAL YEARS CONSIDERING FIRST-OF-A-KIND PROBLEMS, TYPICAL STAFF/APPLICANT QUESTION-RESPONSE-ANALYSIS CYCLES, POTENTIAL FOR PUBLIC INTERVENTION, AND THE COMPLEXITY OF SITE SPECIFIC TECHNICAL ISSUES.

*ASLB, ACRS SUBCOMMITTEE, AD HOC PANEL

THE PROPOSED 60.113 REQUIREMENTS ADD NUMEROUS COMPLEX ISSUES TO THE LICENSING PROCESS BY FOCUSING ATTENTION ON NEAR-FIELD AND VERY-NEAR-FIELD PHENOMENA THAT DO NOT STRONGLY AFFECT SYSTEM PERFORMANCE.

- HOW CAN SUBSTANTIAL CONTAINMENT FOR 1000 YEARS BE PROVEN?
- MUST ALL PACKAGES SURVIVE? IF NOT, HOW MANY?
- CAN STATISTICALLY SIGNIFICANT 1000 YEAR ACCELERATED TESTS BE PERFORMED?
 - RADIATION ON PACKAGE COMPONENTS?
 - BRINE ON PACKAGE COMPONENTS?
 - RADIATION ON BRINE?
 - PACKAGE COMPONENT INTERACTIONS WITH EACH OTHER?
- DO STANDARDS APPLY TO WORST-CASE OR AVERAGE PACKAGE?
- WHERE IS THE COMPLIANCE BOUNDARY FOR THE 10^{-5} CRITERION?
- HOW CAN LICENSING CREDIT BE DETERMINED FOR ENGINEERED SYSTEM COMPONENTS?
 - LONG-TERM PROOF TESTING?
 - LONG-TERM MATERIALS PROPERTIES
 - BASIS FOR DETAILED INTRA-REPOSITORY FLOW CALCULATIONS
 - BASIS FOR ENGINEERED COMPONENT LONG-TERM RADIONUCLIDE RETENTION
- FOR SOLUBLE HOST ROCKS (E.G., SALT) HOW CAN FLOW BE SHOWN TO BE AFFECTED BY THE ENGINEERED BARRIERS?

DOE CONCERNS WITH 10 CFR 60 CENTERS ON 60.112 AND 60.113

- 1. REQUIREMENTS TO MEET GENERIC LEVELS OF PERFORMANCE ON A SITE-SPECIFIC BASIS**
- 2. INCONSISTENCY BETWEEN 60.112 AND 60.113**
- 3. IMPOSITION OF GENERIC ASSUMPTIONS ON SPECIFIC ROCK TYPES**

DOE RECOMMENDS:

- 1. ELIMINATION OF 60.113**
- 2. REDRAFTING OF 60.112**
- 3. CONSULTATION BETWEEN NRC/DOE STAFFS
TO RESOLVE OTHER CONCERNS**
- 4. PUBLISH FINAL RULE**

BRIEFING ON OPTIONS FOR FINAL 10 CFR PART 60
TECHNICAL CRITERIA

W. J. DIRCKS, ET. AL.

NOVEMBER 18, 1982

TECHNICAL CRITERIA: BACKGROUND ON PUBLIC COMMENTS

- PROPOSED TECHNICAL CRITERIA PUBLISHED FOR COMMENT JULY 8, 1981
- PUBLIC COMMENT PERIOD CLOSED NOVEMBER 5, 1981
- SEVERAL HUNDRED INDIVIDUAL COMMENTS IN 91 LETTERS
- EVERY ISSUE ON WHICH COMMISSION SOUGHT COMMENT/EVERY ASPECT OF
RULE ADDRESSED

BACKGROUND ON PUBLIC COMMENTS CONT'D

- SUMMARY OF PUBLIC COMMENTS RECEIVED
 - GENERAL SUPPORT FOR MULTI-BARRIER APPROACH
 - CONCERN EXPRESSED OVER:
 - . NUMERICAL PERFORMANCE REQUIREMENTS
 - . LACK OF EPA STANDARD
 - . MEANING OF REASONABLE ASSURANCE
 - . LENGTH OF RETRIEVABILITY REQUIREMENT
 - . LEVEL OF DETAIL
 - . TRU REQUIREMENTS
 - . DISPOSAL IN UNSATURATED ZONE

STAFF ANALYSIS OF PUBLIC COMMENTS

OBJECTIVE: , SYSTEMATIC AND DOCUMENTED IDENTIFICATION AND CONSIDERATION
OF ALL ISSUES AND TOPICS RAISED IN THE PUBLIC COMMENTS TO
SHOW WHAT WAS DONE IN THE FINAL RULE IN LIGHT OF COMMENTS
RECEIVED AND WHY

STAFF ANALYSIS CONT'D.

- LETTERS EXAMINED TO IDENTIFY TOPICS ADDRESSED IN PUBLIC COMMENT
- LETTERS SECTIONED INTO INDIVIDUAL VERBATIM CONTEXTED COMMENTS ACCORDING TO TOPIC
- INDIVIDUAL COMMENTS COMPILED BY TOPIC
- PROPOSED RULEMAKING PACKAGE ANALYZED TOPICALLY BY TEAMS OF COGNIZANT TECHNICAL STAFF IN LIGHT OF COMPILED COMMENTS
- ONGOING MANAGEMENT REVIEW OF DRAFT RESPONSES AND RECOMMENDED CHANGES FOR ADEQUACY OF ANALYSIS, COHERENCY, INTERNAL CONSISTENCY, ETC.
- INDIVIDUAL COMMENTS AND RESPONSES PRESENTED IN 500-PAGE STAFF ANALYSIS
- SYNTHESIS OF INDIVIDUAL COMMENTS AND RESPONSES PRESENTED IN 70 PAGE POLICY OVERVIEW AND SECTION-BY-SECTION ANALYSIS OF CHANGES FROM PROPOSED RULE
- CRITICAL TECHNICAL ISSUES TREATED IN RATIONALE DOCUMENT

ILLUSTRATIVE EXAMPLE-1

DOE LETTER OF NOVEMBER 5, 1981

DOCKET NO. 48

"WE HAVE LONG RECOGNIZED THE NEED FOR A MULTIBARRIER APPROACH AND THE OBJECTIVES WHICH THE COMMISSION IS SEEKING TO ACHIEVE."

STAFF RESPONSE:

MULTIBARRIER APPROACH RETAINED (§60.112 & §60.113(A)(1)(1))

INDIVIDUAL REPOSITORY SUBSYSTEMS IDENTIFIED:

- CONTAINMENT WITHIN WASTE PACKAGES
- CONTROLLED RELEASE FROM UNDERGROUND FACILITY
- MINIMUM GROUNDWATER TRAVEL TIME TO ACCESSIBLE ENVIRONMENT

ILLUSTRATIVE EXAMPLE-2

DOE LETTER OF NOVEMBER 5, 1981:

DOCKET NO. 48

". . . THE DEPARTMENT CONSIDERS THAT A MORE APPROPRIATE WAY OF ACCOMPLISHING THE OBJECTIVES EXPRESSED BY THE COMMISSION WOULD BE TO PROVIDE SPECIFIC SUBSYSTEM PERFORMANCE GOALS . . . BY PROVIDING THE FLEXIBILITY TO SELECT NUMERICAL SUBSYSTEM CRITERIA ON A CASE-BY-CASE BASIS."

STAFF RESPONSE:

NUMERICAL PERFORMANCE OBJECTIVES FOR INDIVIDUAL SUBSYSTEMS (§60.113(A)(1) (11) & (2)) WITH FLEXIBILITY TO PROPOSE ALTERNATIVE NUMBERS (§60.113(B))

ILLUSTRATIVE EXAMPLE-3

DOE LETTER OF NOVEMBER 5, 1981

DOCKET NO. 48

". . . IT IS NOT CLEAR HOW THE INDIVIDUAL PERFORMANCE OBJECTIVES ARE RELATED TO THE EPA RELEASE LIMITS USING THE TECHNIQUES OF PERFORMANCE ANALYSIS AND AN UNDERSTANDING OF THE GEOLOGIC AND HYDROLOGIC ENVIRONMENTS."

STAFF RESPONSE:

RELATIONSHIP BETWEEN ASSUMED EPA STANDARD (DRAFT NO. 19) AND NUMERICAL PERFORMANCE OBJECTIVES SHOWN IN RATIONALE DOCUMENT. SANDIA PERFORMANCE ASSESSMENT MODELS USED IN ANALYSIS. UNCERTAINTIES ASSOCIATED WITH GEOLOGIC AND HYDROLOGIC ENVIRONMENTS DISCUSSED EXTENSIVELY.

ILLUSTRATIVE EXAMPLE-4

DOE LETTER OF OCTOBER 29, 1982

DOCKET NO. 91

"WE ARE SERIOUSLY CONCERNED OVER THE NUMERICAL REQUIREMENTS. . . FOR COMPONENTS. . . WE BELIEVE THAT THE NEED TO DEMONSTRATE COMPLIANCE WILL UNNECESSARILY COMPLICATE AND PROLONG THE LICENSING PROCESS."

STAFF RESPONSE:

- LICENSING PROCESS REQUIRES IDENTIFICATION AND ASSESSMENT AGAINST NUMERICAL CRITERIA OF CONTRIBUTIONS TO OVERALL SYSTEM PERFORMANCE OF ALL INDIVIDUAL SUBSYSTEMS OF DOE DESIGN FOR WHICH DOE WANTS CREDIT.
- ABSENCE OF NUMERICAL CRITERIA IN RULE DOES NOT CHANGE NEED FOR DOE TO IDENTIFY AND DEMONSTRATE INDIVIDUAL SUBSYSTEM PERFORMANCE.
- POTENTIAL FOR LITIGATION INVOLVING COMPLIANCE DEMONSTRATION IN LICENSING PROCESS REGARDING PERFORMANCE OF INDIVIDUAL SUBSYSTEMS EXISTS REGARDLESS.
- COMMISSION JUDGMENT THAT IDENTIFICATION OF INDIVIDUAL SUBSYSTEM NUMERICAL CRITERIA IN RULE ADDS TO CONFIDENCE (LEADS TO REASONABLE ASSURANCE) AND MORE CLEARLY DEFINES HEARING ISSUES FOR INDIVIDUAL SUBSYSTEM ASSESSMENT.
- ABSENCE OF NUMERICAL CRITERIA IN RULE BROADENS SCOPE OF ISSUES TO BE LITIGATED.
- BROADENED SCOPE HAS POTENTIAL FOR NEEDLESS EXPENSE AND DELAY IN DISPOSAL OF NATION'S WASTE.