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NUCLEAR REGULATORY COMMISSION

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CHARACTERIZATION PLAN FOR YUCCA MOUNTAIN

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PUBLIC MEETING

Nuclear Regulatory Commission  
One White Flint North  
Rockville, Maryland

Tuesday, July 11, 1989

The Commission met in open session, pursuant to notice, at 10:00 a.m., Kenneth M. Carr, Chairman, presiding.

COMMISSIONERS PRESENT:

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

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STAFF SEATED AT THE COMMISSION TABLE:

SAMUEL J. CHILK, Secretary

WILLIAM C. PARLER, General Counsel

HUGH THOMPSON, Deputy Executive Director for Nuclear  
Material Safety and Safeguards, and Operations  
Support

ROBERT BERNERO, NMSS

NEWTON STABLEIN, NMSS

DADE MOELLER, ACNW

ROBERT BROWNING, NMSS

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

10:03 a.m.

1  
2  
3 CHAIRMAN CARR: Good morning, ladies and  
4 gentlemen.

5 The purpose of today's meeting is to hear  
6 from the NRC staff, as well as the Advisory Committee  
7 on Nuclear Waste, regarding their review of the site  
8 characterization plan developed by the U.S. Department  
9 of Energy for the proposed high-level waste repository  
10 at the Yucca Mountain site in Nevada.

11 The Department of Energy is required by the  
12 Nuclear Waste Policy Act and Amendments Act, as well  
13 as Commission regulations, to prepare a site  
14 characterization plan to obtain information necessary  
15 to determine suitability of the Yucca Mountain site  
16 for a repository.

17 The Nuclear Regulatory Commission also has  
18 responsibilities under the Act and under Commission  
19 regulations to review DOE's site characterization plan  
20 which was issued in December 1988 and to provide its  
21 concerns to DOE in the form of a site characterization  
22 analysis. The NRC has previously transmitted to DOE  
23 its concerns regarding the consultation draft site  
24 characterization plan for the Yucca Mountain site.

25 We will hear from the NRC staff first,

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1 followed by the Chairman of the Advisory Committee on  
2 Nuclear Waste. Copies of the presentation slides of  
3 the NRC staff should be available at the entrance to  
4 the meeting room.

5 Do my fellow Commissioners have any opening  
6 comments?

7 Mr. Thompson, you may proceed.

8 MR. THOMPSON: Thank you, Mr. Chairman.

9 As you know, this has been a major effort on  
10 the Division of High-level Waste activity for some  
11 time. Today, with me, in addition to Mr. Bernero, who  
12 will do the primary briefing, is Mr. Bob Browning who  
13 is the Division Director and King Stablein and many  
14 members of the staff who play key roles in this review  
15 activity are in the audience today.

16 With that, I'd like to turn it over to Mr.  
17 Bernero to do the briefing. We'll shoot for about 40  
18 minutes and then give Doctor Moeller time for his  
19 remarks.

20 MR. BERNERO: (Slide.) May I have slide  
21 number one, please, Eileen?

22 Today's presentation, we're going to cover  
23 four basic items. The site characterization itself,  
24 our site characterization analysis and comments on it,  
25 identify some of the near term site characterization

1 milestones and, finally, say just a few words as a  
2 preamble to Doctor Moeller's presentation about the  
3 ACNW involvement with our review.

4 Before I proceed, I would like to take the  
5 opportunity to clarify some terminology and the  
6 current program status to some degree. In the first  
7 place, DOE is not yet an applicant. What they have  
8 submitted is a site characterization plan, the plan by  
9 which they would gather data to determine whether they  
10 should apply for a license for this site. As a  
11 result, we are commenting on a plan. We're not  
12 writing a safety evaluation report. It's a bit of a  
13 misnomer, but the regulations do call it that, to say  
14 the staff site characterization analysis. If you look  
15 at the regulation, it's really our analysis with  
16 respect to their plan. So, keep that in mind. We're  
17 commenting on a data gathering mechanism rather than  
18 evaluating the site specifically.

19 While we're --

20 COMMISSIONER ROBERTS: But if I may  
21 interrupt, if you look at the Department of Energy's  
22 letter of June 28th, I read, "First it appears to DOE  
23 that the NRC staff views the SCP and other DOE  
24 repository program submittals to the NRC essentially  
25 as licensing documents."

1 MR. BERNERO: No, we do not.

2 COMMISSIONER ROBERTS: Well, they're saying  
3 we do. We obviously have a disagreement.

4 MR. THOMPSON: Well, to a certain extent,  
5 they aren't licensing documents. But for the purpose  
6 of our review and our process and where they're open  
7 in our consultative activities, we do our reviews as  
8 we would do our review and our activity associated  
9 with any other major activity. But the findings, the  
10 bottom lines that we draw the conclusions we draw are  
11 not made in the licensing context of whether they meet  
12 our rules or regulations, which is the key element  
13 that we do in our licensing reviews.

14 MR. BERNERO: Keep in mind, the consultation  
15 required by the Act, and also fleshed out in our  
16 regulations, has a fairly ornate structure of the site  
17 characterization plan coming in, of being reviewed, of  
18 comments being made or objections being made and so  
19 forth. So, there is a structured mechanism for our  
20 comment. But we are not evaluating the site to say  
21 yea or nay, acceptable or unacceptable in these  
22 comments.

23 MR. THOMPSON: The bottom line on that is  
24 that DOE still maintains the responsibility to decide  
25 if that site is acceptable and in making the

1 determination of whether to make a submittal to NRC  
2 for an application. We are not the ones who call and  
3 make a statement whether that site is acceptable or  
4 not.

5 MR. BERNERO: And in that vein, there's  
6 another term in the regulations that has a little bit  
7 of confusion associated with it. I think it's also  
8 reflected in that same letter. If you go to the  
9 second page of the Commission paper we sent you, the  
10 regulations in 10 CFR 60.18 speak of the term  
11 "objection." Now, it doesn't mean, as a lay person  
12 might think, an objection to the plan overall or an  
13 objection to the site. It is, and I quote, "a matter  
14 of immediate seriousness to a particular area of the  
15 site characterization program that NRC would recommend  
16 DOE not start work in that area until it is  
17 satisfactorily resolved," and you see that in our  
18 discussion, that we're talking about specific areas of  
19 concern.

20 (Slide) So, with those, may I have slide  
21 two?

22 Basically, the site characterization plan is  
23 the plan for setting down -- its contents include the  
24 existing site data base, what is known about the site  
25 today, a tentative design for the waste form, the

1 waste package and the repository design itself and, of  
2 course, the key aspect is a plan for characterization  
3 activities, how does DOE intend to get the information  
4 they need in order to decide whether to apply for the  
5 license for this site and what are the arguments or  
6 the technical contents of the application.

7 They issued the site characterization plan  
8 just before the turn of the year, December 28th. It  
9 was supplemented with the design analysis document for  
10 the shaft in early '89. Our review is complete now  
11 and we're before you on the schedule we projected.

12 (Slide) May I have slide 3, please?

13 What is the overall impression? If you ask  
14 us that, as we say in the Commission paper and we also  
15 say in our draft cover letter attached to the  
16 Commission paper, it's an improved document. About  
17 two-thirds of the concerns identified in the CDSCP,  
18 the consultation draft of last year, about two-thirds  
19 of those concerns have been resolved. Many of the  
20 other remaining third of concerns have been partially  
21 resolved. There are some areas of the program where  
22 we don't have concerns. An example is the climate  
23 data gathering. So, basically, we see this as an  
24 improved document and a useful basis to proceed with  
25 site characterization as we resolve the comments that

1 we've made.

2 (Slide) May I have the next slide, please?

3 Our site characterization analysis, and I  
4 remind you again this is our analysis of the plan, is  
5 part of the hierarchy of comment. As we've said here  
6 in the Commission paper, we have a cover letter which  
7 includes some substantive comment. We have, as an  
8 attachment to it, the SCA or site characterization  
9 analysis which highlights all the principle issues.  
10 Then we have the very large attachment of detailed  
11 point papers and concerns.

12 The point papers and the overall balance, if  
13 you look at it, we list here, we have two that fall  
14 into the category of objections, 133 comments and 63  
15 questions. This is the hierarchy of comment and  
16 question that we have.

17 In our briefing today, I'm just going to  
18 touch on the two objections and the four top or most  
19 important comments.

20 COMMISSIONER CURTISS: Before you do that,  
21 could you explain what the distinction is? I read the  
22 explanation in the SECY paper, but in a little bit  
23 more detail, how you categorized issues into  
24 objections, comments and questions and what the line  
25 is between those three.

1 MR. BERNERO: Well, we said in the paper--  
2 now, the objection is one of these critical path  
3 items. Take the experimental shaft facility, that  
4 something irreversible might happen if you proceeded  
5 and then decided, "Oh, the hole is in the wrong  
6 place," or something. So, an objection is a  
7 potentially irreversible one. It was that definition  
8 I read. A comment is one where looking at the  
9 material, we basically have an opinion or a  
10 disagreement perhaps. A question is one where the  
11 basis is not clear.

12 COMMISSIONER CURTISS: In view of that,  
13 could a question be, at some future point, a  
14 significant objection if we gather the information  
15 necessary to evaluate it?

16 MR. BERNERO: Yes. That's theoretically  
17 true.

18 COMMISSIONER CURTISS: In some respect then,  
19 the question, depending on the information we get,  
20 might be as significant as the objections that we've  
21 got. The point that I'm getting at is while the  
22 objections go from five to two in this paper, I guess  
23 I'm puzzled that the comments go from 110 to 133 and  
24 the questions go from 52 to 63. You'd just think we'd  
25 be going in the opposite direction, that the numbers

1 of comments and questions would be going down.

2 MR. BERNERO: No. That would assume that  
3 the consultation draft and this site characterization  
4 plan had the same scope and content. This is a much  
5 bigger document. I think it's fair to say there's a  
6 lot of additional material in here that we didn't have  
7 before. So, that larger number of comments and  
8 questions isn't really reflective. We're not working  
9 the same database. I don't know that staff has  
10 identified any question that might fall into the  
11 category of a serious, possibly even an objection. I  
12 think it would have been singled out.

13 MR. THOMPSON: I just would reiterate though  
14 that this is an iterative process. We'll be going and  
15 looking at study plans. We'll be looking at revisions  
16 to the site characterization plans as it goes. In  
17 each of these areas, I would anticipate that we'll  
18 identify new questions and new comments as we go  
19 through the process. So I think this is something to  
20 be expected. As we get new material, we'll look at it  
21 and we'll provide our comments and questions to DOE in  
22 a consultative mode. Because we have new questions,  
23 it's typical because there's new information that's  
24 presented there for us to look at and review.

25 MR. BERNERO: (Slide) May I have slide 5,

1 please?

2           You referred to the objections. From the  
3 consultation draft site characterization plan, you  
4 look at five objections coming down to two. You can  
5 see at a glance that the previous objection number 2  
6 is objection number 1 now, virtually the same, the QA  
7 program qualification. Then previous objections 3, 4  
8 and 5 are really consolidated into one. The focus of  
9 it is the design control process for the experimental  
10 shaft facility. Please keep that in mind. It is the  
11 control process so that the design is properly placed,  
12 integrated and conducted.

13           We noted in our Commission paper that we had  
14 a major program meeting with DOE planned for last  
15 Thursday and Friday, the 6th and 7th of July. That  
16 meeting did take place. We covered the QA program  
17 status and the ESF design control process status and  
18 we also got started on some of the agenda for pursuit  
19 of tectonics issues.

20           We expect to modify and reflect the  
21 historical developments of that meeting in our  
22 submittal, as we indicated to you in the transmittal.  
23 I will address these two objections and speak to what  
24 has taken place on that.

25           CHAIRMAN CARR: The objection that you've

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1 really solved then is number one?

2 MR. BERNERO: Yes. They have the  
3 alternative conceptual models resolved.

4 MR. THOMPSON: But I do think that the  
5 specific objection as we articulated in previously  
6 with respect to the depth of the first shaft and some  
7 of the locations were resolved when we looked at those  
8 things in their totality. It focused us on -- and I  
9 guess what we said, we would refine our objections  
10 somewhat. So, I think some of the previous objections  
11 were resolved, but it kind of refocused the basic  
12 underlying concern that we have.

13 CHAIRMAN CARR: You just rewrote the  
14 objection?

15 MR. BERNERO: No, no. The shaft going below  
16 the Calico Hills deposit was a previous concern. That  
17 no longer goes below the Calico Hills deposit.

18 CHAIRMAN CARR: I guess what I meant was  
19 that you're a little more all inclusive in the  
20 objection number two now than you were specific in the  
21 earlier one.

22 MR. BERNERO: Yes.

23 MR. THOMPSON: Right. But some of those  
24 specifics have been resolved.

25 MR. BERNERO: Yes.

1                   (Slide) Now, if you turn to slide 6, the  
2 need for the qualified QA program, the essential  
3 element, and we've run across this in past regulatory  
4 operations, that the data and designs as they are  
5 developed should be usable in licensing, that it would  
6 be a terrible mistake to proceed for three, four  
7 years, whatever it takes for site characterization and  
8 then at the end, at the time of license application,  
9 have a whole QA program up in the air and real  
10 question about it.

11                   Now, NRC and DOE have agreed on this and we  
12 have agreed to continue implementation of agreed-upon  
13 approach for resolving it. In your slide package, it  
14 may not project very clearly. It's a status of the QA  
15 program implementation. You have a cross chart. You  
16 notice a lot of no, no, no, no, no. There are date  
17 blanks in there for further actions or further  
18 submittals. In the meeting last week in Las Vegas,  
19 the DOE gave us dates for most of those remaining  
20 actions. So, we have a schedule for that. So that's  
21 at least some evidence of progress.

22                   Also, I feel I should note, I believe you  
23 may have received it by now. We sent up an  
24 information note to you late yesterday. DOE just  
25 issued a stop work order associated with the QA

1 program at Sandia National Laboratory just yesterday.  
2 I don't have all of the facts or implications on that,  
3 but if nothing else it's evidence that the QA  
4 oversight is in place and functioning.

5 CHAIRMAN CARR: The qualification audits  
6 that were limited scope with the nos and the revision  
7 and NRC accepts, does that mean that we won't have to  
8 revise and accept those?

9 MR. BERNERO: Well, we're at the point, as  
10 you always get to in an implementation audit, of how  
11 much has to be audited before you can fully implement  
12 and how much can be implemented before you fully  
13 audit. We have reached the point where I think we  
14 will agree that the ones that have the black dot are  
15 sufficiently audited.

16 CHAIRMAN CARR: So, the plan didn't have to  
17 revised, I guess is what you're telling me. Or, if it  
18 did, you didn't have to relook at it because you've  
19 got two nos in the blanks in front of those.

20 MR. BERNERO: Yes, but --

21 CHAIRMAN CARR: It's not a progression  
22 across the page that's required?

23 MR. BERNERO: Yes. It's a progression  
24 across the page and then DOE has to -- if you look  
25 over in the qualified QA program where the black dots

1 are, we participate in a DOE audit and then DOE draws  
2 a conclusion based on their audit. Then, we fill in  
3 our blank.

4 CHAIRMAN CARR: The problem I've got is  
5 you've got two nos in front of an audit you've already  
6 started to run. In other words, you're auditing a  
7 plan that hasn't been revised and accepted yet, it  
8 looks like.

9 MR. BERNERO: I'm not sure that one needs  
10 it. Does it?

11 MR. BROWNING: I think in that case the  
12 comments that NRC made were clear enough and precise  
13 enough that the basis for the audit was well  
14 established. Two nos in "DOE revises" and "NRC  
15 accepts" are necessary but not necessarily a precursor  
16 to an audit for implementation.

17 CHAIRMAN CARR: Okay.

18 MR. BROWNING: I think one other thing I  
19 might point out is that the next to the last column is  
20 one of the most important ones. DOE has to accept the  
21 fact that they think the program is audited before we  
22 do. I think in that case we probably want to make  
23 sure that's clear. They ought to say on the basis of  
24 their audit that they think it's qualified before we  
25 take a position.

1 MR. BERNERO: (Slide) Could we go to slide  
2 8, please?

3 The essential issue with the experimental  
4 shaft facility is the fact that it will become part of  
5 the repository and therefore the design is part of the  
6 repository should meet the regulatory requirements.

7 Now, this was covered in the July 7th  
8 meeting and the staff has agreed with DOE that -- the  
9 word here "participate" is not an accurate way to  
10 depict it. We have agreed on a schedule for the  
11 process control and certain review milestones so that  
12 as DOE proceed with their final design, there is an  
13 iterative process where at certain milestones we'll be  
14 able to look at their design development and comment  
15 on it. Through that iterative process, they get our  
16 consultation in a timely way.

17 Now, they are already working, and the next  
18 figure, page 9, is a map that you may have seen before  
19 from the site characterization plan and from  
20 correspondence related to the case. DOE is already  
21 working at the site on the geologic anomaly or fault.  
22 If you look at the circle -- not a circle but sort of  
23 an ellipse of this site boundary and you see three  
24 vertical lines, the center line is what some people  
25 call the no name fault. It's a geological anomaly.

1 The experimental shaft facility locations sort of  
2 bracket the north end of that line. DOE is actively  
3 investigating the most recent data on that to  
4 determine whether or not it is a fault and, if so, how  
5 it would affect the experimental shaft facilities.

6 (Slide) Now, if I can turn to slide 10, I'd  
7 like to single out just some of the particularly  
8 important comments.

9 The cover letter and the site  
10 characterization analysis both cite 10 CFR 60.112 and  
11 122 on the need to demonstrate iterative system  
12 performance assessments. It's right in the  
13 regulations that one that DOE should be looking at  
14 potentially adverse conditions in a way to weigh their  
15 significance and, of course, to direct the gathering  
16 of data where necessary to deal with uncertainties or  
17 with difficulties.

18 Now, the principal focus of potentially  
19 adverse conditions -- remember, we're dealing here  
20 with a young, geologically complex site. The  
21 principal focus of that is our particularly important  
22 comment number two, the need for early investigation  
23 of tectonic phenomena. I just want to touch on a  
24 couple examples of that.

25 If you go to the next figure, figure 11, you

1 have a photocopy of it that's in black and white and  
2 perhaps not quite so legible, but we have a color  
3 version we can put on the screen. I passed out at  
4 your tables a figure. It's the overall geography of  
5 the site. Some of us who will get very close to this  
6 are able to look at it and remember what we're looking  
7 at.

8 If you look at the overall map of the site  
9 area, you find Yucca Mountain just to the left there,  
10 the lower left-hand corner. Visualize that you're on  
11 Yucca Mountain looking west and this is the view in  
12 the TV screen. This is looking west from the top of  
13 Yucca Mountain. You're looking out across what is  
14 called Crater Flat. You can see the evident volcano  
15 cones.

16 So, there are immediate geological issues  
17 raised. When you're in an area, you see the evidence  
18 of volcanism. Is the volcanic period over or are we  
19 merely in a recurring volcanic cycle? If Crater Flat  
20 is a volcanic zone, that valley out there, if Crater  
21 Flat is the volcanic zone, how far does it go? Is  
22 Yucca Mountain part of it? These are major surface-  
23 based investigation questions that have to be pursued.

24 Further, in pursuing the site  
25 characterization, there are difficult questions of how

1 does volcanic activity tie in with seismicity, because  
2 this is a fairly active site. It's a fairly young  
3 site, perhaps no more than about a million years old.

4 (Slide) If you go to the next slide, the  
5 slide 12, this is a photograph taken in trench 14 and  
6 if you refer again to the area map that was left at  
7 your place and look at the word "Yucca Mountain,"  
8 right above the U in Yucca is the approximate location  
9 of trench 14. And you look at this and the gentleman  
10 is looking at the -- it's faulting. You're looking at  
11 a cut of the rock that was excavated away. You're  
12 looking at faulting and you see mineral deposits in  
13 it. But, of course, there's serious question. Is  
14 that mineral deposit of upward welling water at some  
15 past time? You know, geothermal water coming up or  
16 are those mineral deposits of water coming down? Of  
17 course, that's very significant to site performance in  
18 modeling Yucca Mountain and how it will perform.

19 Now, if I could go back to slide --

20 CHAIRMAN CARR: But our responsibility in  
21 this is to comment that the plan should take care of  
22 finding out those answers, right?

23 MR. BERNERO: Yes, to gather sufficient data  
24 to deal with the questions. That's the whole purpose  
25 of the site characterization plan.

1           So, if we go back to slide 10, our two most  
2 important comments are to demonstrate by early and  
3 iterative analysis the potentially knotty problems of  
4 tectonic phenomena.

5           Now, we also have commented on the lapses in  
6 technical integration and coordination. It's not  
7 clear to us in the program that it is adequately  
8 integrated and issues are coordinated one to the  
9 other. Again, the tectonics are very complex and it  
10 makes it all the more difficult. This is not a simple  
11 site.

12           Our last comment is one that you have heard  
13 before. In fact, it appeared in our September 1988  
14 letter on the mission plan. For some time, the  
15 schedule for the repository has had an application  
16 date and a final operational date that hasn't changed.  
17 1995 application, 2003 operation as the years. What  
18 has happened is there has been substantial schedule  
19 slippage at the front end. We are expressing our  
20 concern that this compression can potentially affect  
21 the site characterization program and we feel the need  
22 to make that comment.

23           (Slide) If I may go to slide 13.

24           There was a Commission request to touch on  
25 those comments directly related to regulatory

1           uncertainties and we have added these and covered them  
2           in the transmittal to you.       Basically, in three  
3           categories, the methodologies to demonstrate  
4           compliance with EPA standard, we have two comments on  
5           that.    They're comments number 98 and 110 in the  
6           section 4 of the site characterization analysis. This  
7           is a concern that we will address with you in a later  
8           Commission paper.

9                        We've talked before about the use of  
10           performance assessment, the weaknesses, the strengths,  
11           the difficulties. And at the same time that we carry  
12           on with DOE commenting on the site characterization  
13           plan and the use of performance assessment, we are  
14           looking at rulemaking to clarify or to determine how  
15           to use it in the regulatory process and I would remind  
16           you that at the same time EPA is looking at their  
17           standard which was remanded by the courts in order to  
18           revise it appropriately and reissue it.

19                       So, we have two comments in that vein. The  
20           substantially complete containment issue was also  
21           discussed here at this table in the past. This is the  
22           part of the regulations that speaks of a 300 year to  
23           1,000 year package lifetime and so forth. We have two  
24           comments on that and that too is the subject of  
25           rulemaking by us in parallel with the pursuit along

1 with DOE.

2 Lastly, the disturbed zone boundary, that  
3 was comment 92. We have one comment in that too.  
4 These are all uncertainties that are covered in the  
5 rulemaking strategy of SECY-88-285 that we submitted  
6 to you last year and will update periodically as we  
7 proceed in the program.

8 (Slide) Well, if I can turn to slide 14,  
9 I'd just like to talk about the near-term milestones  
10 and just state where we expect to go from here.

11 First of all, we would need to resolve ACNW  
12 and Commission comments. You're going to hear from  
13 Doctor Moeller of the ACNW shortly and obviously your  
14 comments, we've asked for them in the next couple of  
15 weeks. Then, presuming that we have transmitted this  
16 by the end of July as we forecast, DOE will consider  
17 our concerns, resolve those objections consistent with  
18 the schedules we presume that were agreed upon last  
19 Thursday and Friday and they will proceed with site  
20 characterization.

21 I'd like to emphasize, as those last two  
22 bullets do, that we envision not a sequential but  
23 parallel pursuit of site characterization. They  
24 complete the ESF design and start construction. In  
25 other words, the underground search. And, in parallel

1 with that, completing key study plans and beginning  
2 surface based testing. It's very important that they  
3 are focusing on the highest priority issues and  
4 carrying forward site characterization in parallel.

5 (Slide) May I have slide 15, please?

6 Now, we have had intensive involvement with  
7 the ACNW during the staff development of comments and  
8 particularly in the last two months. You know, we  
9 furnished our earliest draft material to the ACNW.  
10 We've met with them, with their consultants and tried  
11 to expedite their review so that they could be  
12 prepared to sit here today with you.

13 Now, we recognize that they were working  
14 with draft material as we proceeded. When they  
15 generated their letter of July 3rd, we sort of brought  
16 it up to date with the latest version by preparing an  
17 annotation, item for item of their letter with our  
18 letter and I think your staff members have had access  
19 to that annotated version. We, of course, have given  
20 that to Doctor Moeller.

21 I believe that we are in essential agreement  
22 on all the major issues, but I defer to the ACNW  
23 briefing for their opinion.

24 (Slide) So, our conclusion, on slide 16, is  
25 basically that we intend to transmit the site

1 characterization analysis and comments by July 28th,  
2 unless you direct otherwise. You have our material.  
3 We will amend it in basically an editorial fashion to  
4 reflect the meeting of last Thursday and Friday and  
5 certain comments by ACNW that are evidently worth  
6 clarifying and we will transmit by the 28th.

7 Now I'd like to turn it over to Doctor  
8 Moeller, unless you have questions.

9 CHAIRMAN CARR: No, I think we can see if  
10 some of the questions are answered by Doctor Moeller  
11 en route. Then we can address questions at the end.

12 Go ahead.

13 DOCTOR MOELLER: Thank you, Mr. Chairman.

14 As Mr. Bernero has pointed out, the comments  
15 of the Advisory Committee on Nuclear Waste were  
16 transmitted to you in our letter of July 3rd, 1989.  
17 What I'd planned to do this morning was to comment on  
18 the three bullets or the three more important or most  
19 important items in terms of the Committee's  
20 deliberations.

21 Before I do that, I want to make two  
22 comments in terms of the approach that we use. One  
23 Mr. Bernero has already commented on and that is  
24 realizing that we as a Committee could in no way ever  
25 read the entire SCP, nor even become familiar in

1 detail with all the components of the SCA as it was  
2 being drafted. We appointed from our team of  
3 consultants individual members, individual consultants  
4 who then interacted one on one with the NRC staff and  
5 then brought back reports and reported to the full  
6 Committee and we deliberated on their reports on each  
7 of the key scientific areas.

8 I mention that because we found it to be a  
9 very efficient and an effective way to operate.  
10 Whether our final, bottom line proves that, I don't  
11 know, but at least we thought it was a very good way  
12 of doing things.

13 The second item I want to mention is to  
14 repeat what Mr. Bernero said, and that was it was an  
15 iterative process. We were dealing with drafts. We  
16 were dealing with predecisional documents. We were  
17 exchanging ideas as we went along. So, there was no  
18 way at the time that we wrote our letter to take each  
19 item and say, "This is resolved all except such and  
20 such parts." Rather, what we tried to do in the  
21 letter was to highlight what we considered to be the  
22 most important items and simply to set them down for  
23 your information.

24 Above all, we wanted to be supportive of the  
25 NRC staff. Obviously, if we have a point of

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1 disagreement, we'd want to bring it out. But  
2 certainly throughout this entire process, the NRC  
3 staff has always met our needs. They have been very  
4 cooperative in providing us drafts at the earliest  
5 possible moment. We, in turn -- they have attended  
6 our meetings and we've tried to make known to them our  
7 thinking as it evolved.

8 Also, the DOE staff has certainly been  
9 cooperative in that they were always willing to meet  
10 with us and to answer our questions and to help us  
11 move along with the process.

12 I believe, to give you a bottom line at this  
13 point, that I do not believe -- the Committee believes  
14 that the SCA in its present form is adequate for  
15 submission. We will, as you'll see in a few  
16 minutes -- we do desire that perhaps a look at the  
17 transmittal letter and make certain changes there to  
18 incorporate -- if they agree, to incorporate more of  
19 the comments which we shared with them.

20 Now, to look at our three bullets or more  
21 important items. The first one was our statement that  
22 "the absence in the SCP of statements addressing the  
23 systematic and early identification and evaluation of  
24 potentially disqualifying features at the Yucca  
25 Mountain site."

1           When we interacted with the DOE staff and  
2 when we questioned them on this, do you have an SCP  
3 that is designed to bring to your attention at the  
4 earliest possible moment any and all disqualifying  
5 features, there response was, "Really, the way we're  
6 operating, if a disqualifying feature is there, it  
7 will 'pop up.'" The Committee just was not of the  
8 opinion that that was adequate. You should not sit  
9 back, but we do not believe that DOE should sit back  
10 and expect the disqualifying features to pop up.  
11 Rather, we believe that they should aggressively seek  
12 them out and indeed have in their plan a method for  
13 aggressively seeking these out.

14           Now, the NRC staff, in their comments on  
15 this matter, did address it. In particular, they have  
16 addressed it in the transmittal letter. Let me quote  
17 some portions of that. This is found in item number  
18 two at the top of page 3 of the draft transmittal  
19 letter.

20           Now, in it they emphasize, as Mr. Bernero  
21 has pointed out this morning, that investigations  
22 associated with tectonic phenomena should receive  
23 early attention and they call for exploration of  
24 volcanism, faulting and seismicity to evaluate the  
25 site suitability in terms of potential adverse

1 conditions. Later on they say -- well, in the last  
2 sentence -- that such investigations need to be  
3 conducted early in the site characterization. So, in  
4 many ways, they have addressed our criticism.

5 In the next paragraph they say in line 3,  
6 this is still section 2, that the full spectrum of  
7 site characterization activities should proceed with  
8 proper coordination and integration. The reason I  
9 read that line or those lines to you is that we would  
10 have preferred -- and really I shouldn't say we. I,  
11 as Chairman of the Committee, I'm speaking really--  
12 trying to speak on behalf of the Committee, but  
13 recognizing full well that we as a Committee have not  
14 had time nor the opportunity to discuss these matters.

15 But in view of my understanding of what we  
16 as a Committee were seeking to do, I would have  
17 preferred that the second paragraph really be first.  
18 In other words, DOE seek out the full spectrum,  
19 investigate all possible processes and events, et  
20 cetera, and look for the early identification of these  
21 disqualifying features. And then, within this  
22 process, we would recommend that the tectonic  
23 phenomena be highlighted or be emphasized. In other  
24 words, reverse the sequence in which those two  
25 paragraphs are worded.

1           For example, another item to mention our  
2 concern is ground water travel time. Well, ground  
3 water travel time is a go/no go feature. It could be  
4 a disqualifying feature. Well, we want to be sure  
5 that somewhere along the line they are looking at that  
6 particular aspect of the proposed site.

7           Moving on now to our second bullet, it is on  
8 the apparent lack of sufficient attention to the  
9 limitations and uncertainty in the data bases and  
10 difficulties in proving or demonstrating the  
11 difficulties in demonstrating compliance with the EPA  
12 standard. Now, in terms of the response of the staff  
13 to that particular subject, let me offer a few  
14 comments.

15           In the proposed transmittal letter on page  
16 3, in the next to the last paragraph in line 7, it  
17 states, "Two concerns relate to methodologies DOE  
18 plans to use to demonstrate the total repository  
19 system compliance with EPA's standards."

20           Excuse me. That is not -- I'm misleading  
21 you. I made an error. That is not in the transmittal  
22 letter. That is in SECY-89-199, transmitting the  
23 package to you. So, it's on page 3 of SECY-89-199 and  
24 it's in the next to the last paragraph beginning about  
25 line 7.

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1 I want to emphasize this because here in the  
2 SECY it says, "To demonstrate total repository system  
3 compliance with the EPA's standard."

4 Now, if you go to the transmittal letter--  
5 and here I am back on track at this point and indeed  
6 it is the proposed draft transmittal letter. If you  
7 go to item one at the bottom of page 2 of the proposed  
8 draft transmittal letter, it says in about the eighth  
9 line -- it's five lines up from the bottom -- that  
10 they want performance assessments conducted to provide  
11 an early and ongoing evaluation of whether any of the  
12 potential adverse conditions significantly effect the  
13 ability of the site to meet 10 CFR 60 performance  
14 objectives.

15 We would have preferred for that to have  
16 said to meet EPA's standard. Now, I would leave it to  
17 the staff to tell you whether meeting 10 CFR 60 is  
18 equivalent to meeting the EPA standard, but we as a  
19 Committee believe that it would be better to  
20 demonstrate compliance with the EPA standard.

21 COMMISSIONER CURTISS: Does 10 CRF 60  
22 incorporate the EPA standard?

23 MR. BERNERO: It will. It doesn't yet.

24 MR. THOMPSON: That's one of the rulemakings  
25 that's kind of on hold right now, depending on --

1 MR. BERNERO: I think when we wrote this we  
2 had -- excuse me, Doctor Moeller. I think we had in  
3 mind the final version, which is both the segmented  
4 parts now in Part 60 and the integral part that's in  
5 the EPA standard.

6 COMMISSIONER CURTISS: Okay. Excuse me.

7 MR. PARLER: Mr. Chairman, our regulations  
8 do provide that the EPA standards have to be met. So,  
9 it's covered one way or the other.

10 DOCTOR MOELLER: And perhaps it is covered,  
11 as they say. But we thought that might be a key  
12 issue.

13 Now, as background on this matter, in  
14 discussing the procedures for demonstrating compliance  
15 with the EPA standard, of course the staff will be  
16 preparing the complementary cumulative distribution  
17 function. When we talk to some members of the  
18 staff -- well, all of the members of the staff said,  
19 "Yes, we can prepare a CCDF." However, some of the  
20 staff members left us with the implication that  
21 although they could prepare a CCDF, when you consider  
22 the adversarial nature under which demonstration of  
23 compliance will take place, several members of the  
24 staff shared with us, appeared to share with us the  
25 concern that they might not be able to reach that

1 objective.

2 Why are we bringing this up at this point?  
3 We're bringing it up because one of our consultants to  
4 the ACNW was a member of the EPA's Science Advisory  
5 Board Subcommittee, which five years, whatever it was,  
6 ago reviewed and commented on the EPA's proposed  
7 standard. And at the time they pointed out the  
8 problems, the Subcommittee pointed out to EPA the  
9 problems of demonstrating compliance. But their  
10 recommendations apparently were not accepted.

11 In view of the fact that the standard has  
12 been remanded by the courts, so I understand, and EPA  
13 is reconsidering the standard. Indeed, they may be  
14 reconsidering the entire standard and not certain  
15 components.

16 This may, in our opinion, offer a window of  
17 opportunity for the NRC to consult with EPA to see if  
18 some of the problem areas could be clarified and  
19 resolved. I say NRC because, again, by no means am I  
20 a lawyer nor do I understand all of these things, but  
21 we do not view this as DOE's task. We view it rather  
22 as an NRC/EPA task.

23 COMMISSIONER CURTISS: Let me ask just one  
24 question on that point because it wasn't clear to me  
25 from what you've said exactly what the concern is

1 here. There are maybe three separate concerns. I  
2 want to focus on exactly what the Committee is saying  
3 here.

4 At one point, as you pointed out, the letter  
5 itself and the SECY paper don't clearly state that the  
6 DOE repository has to meet 10 CFR Part 60 and that may  
7 be a matter of editorial word smithing to clarify that  
8 you either have to meet the EPA standard or 10 CRF  
9 Part 60 incorporates the EPA standard. It seems to me  
10 that's a fairly easy one to deal with.

11 The two other possible interpretations that  
12 I guess I'd like your thoughts on, one, the plan that  
13 DOE has put before us will not result in the gathering  
14 of sufficient information in order to determine  
15 whether the EPA standard is met with the uncertainties  
16 that are inherent in that, one possible interpretation  
17 or two; They're gathering sufficient data but there  
18 are problems of a fundamental nature with the EPA  
19 standard itself. Can you clarify which of those two  
20 it is that you're raising here?

21 DOCTOR MOELLER: I would say it's a  
22 combination, a little bit of both. We have problems  
23 with the standard and it could be reworded so that  
24 confirmation or demonstration of compliance would be  
25 more readily recognized. And, number two, the fact

1 that there are uncertainties in the data and  
2 uncertainties in the models and uncertainties in the  
3 scenarios and so forth. Because of this, the  
4 construction of the CCDF will be subject to criticism  
5 or comment and objections.

6 CHAIRMAN CARR: Bob?

7 MR. BERNERO: I wonder if I could interject  
8 once again. We, by the way, are planning a specific  
9 staff meeting with the ACNW consultant to follow up on  
10 this issue. That's a subject I was referring to about  
11 a forthcoming paper on the performance standard.

12 The essential issue is whether the  
13 quantitative standard can serve, as framed now, as a  
14 discipline for the thought process to consider  
15 seismicity, volcanism, ground water travel, whatever  
16 the technical issues are, or whether we would, in an  
17 adversarial process, bogged down with number  
18 crunching, that my number is lower and your number is  
19 higher. That's the essential issue.

20 This was argued a good deal some years back  
21 and it's up on the table again. That's the  
22 essential --

23 MR. THOMPSON: And there are clearly  
24 differing views in the staff as to the appropriate  
25 approach and that's why I think it's important for us

1 to have a Commission paper and a dialogue with the  
2 Commission on this issue.

3 CHAIRMAN CARR: Okay. Doctor Moeller?

4 DOCTOR MOELLER: We also, as part of this  
5 issue of the determining compliance or demonstrating  
6 compliance, we called for a scoping PRA or suggested  
7 that a scoping PRA be done. Let me clarify at this  
8 point or be sure to set down on the record that the  
9 total system performance assessments that the staff is  
10 calling for resolves, in my opinion, that issue. That  
11 is certainly equivalent or maybe even better than a  
12 scoping PRA. So, we have no concerns on that.

13 Moving to our third bullet, which is simply  
14 on the QA, we share the concern with the NRC staff on  
15 the delays by DOE on implementing satisfactory QA  
16 programs. Perhaps the Committee, if anything, would  
17 have been less patient with DOE than the NRC staff has  
18 been. I think with that, again because of time, those  
19 were the main features and main concerns of the ACNW.  
20 We had a number of additional comments, I believe they  
21 were on page 3 or so of our letter, mentioning  
22 individual points. These, I'm not in a position  
23 really to say whether they've been resolved, but  
24 certainly the staff has heard them and they have been  
25 very cooperative all along the way and I'm sure

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1 they'll consider them and use them where they can be  
2 used and reject them where they should be rejected.

3 Thank you, sir.

4 MR. THOMPSON: That completes our  
5 presentation. We'd be glad to respond to any  
6 questions you may have, sir.

7 CHAIRMAN CARR: Commissioner Roberts?

8 COMMISSIONER ROBERTS: No.

9 CHAIRMAN CARR: Commissioner Rogers?

10 COMMISSIONER ROGERS: Have you received the  
11 material requested to complete the review of the ESF  
12 related study plans? There was some missing material  
13 from DOE.

14 MR. THOMPSON: This is the DAA material that  
15 the time we looked at it?

16 COMMISSIONER ROGERS: Yes.

17 MR. BROWNING: I believe the answer to that  
18 is yes. They were supposed to provide an analysis of  
19 the process under which those plans were produced. I  
20 really think events are passing us by in some  
21 respects. The question of the electromagnetic anomaly  
22 or what some people are referring to as a potential  
23 fault near the site of the proposed location for the  
24 ESF has caused DOE to go back and relook in addition  
25 to whether they ought to be doing some things prior to

1 commitment to sink the shaft of that particular  
2 location. We have in hand a study plan related to  
3 that aspect.

4 So, I think the answer is yes, but it  
5 probably doesn't really have any real impact. We're  
6 going to have to take a fresh look at what it is they  
7 want to do at the engineering -- the proposed location  
8 of the engineering shaft facility.

9 COMMISSIONER ROGERS: Well, what does that  
10 mean, you need a new set of study plans for the ESF  
11 or --

12 MR. BROWNING: They need to size up exactly  
13 what they want us to look at and let us know. So, the  
14 ball is really in their court right now.

15 MR. THOMPSON: Remember, on the study plans,  
16 there were going to be more study plans than we could  
17 review in detail, but there were going to be key ones  
18 that we would review. I think this is one of the key  
19 ones that we wanted --

20 COMMISSIONER ROGERS: Well, I'm just talking  
21 about the ESF now.

22 MR. THOMPSON: That's right, and I believe  
23 there were some study plans associated with the ESF  
24 and I think, what, we had two on it, King?

25 MR. STABLEIN: Five.

1 MR. THOMPSON: But some of those, we were  
2 going to look in more detail than we would just  
3 normally looking at a fatal flaw type of approach.  
4 And I do believe they still owe us some of those study  
5 plans.

6 COMMISSIONER ROGERS: Well, that's really  
7 the question. There were some additional materials  
8 that you needed before you could complete your review  
9 of the ESF study plans. The question is, have you  
10 gotten that?

11 MR. STABLEIN: We got it last week.

12 COMMISSIONER ROGERS: Oh, okay. All right.  
13 So, you do have that.

14 DOCTOR MOELLER: Excuse me. On that aspect,  
15 one of the Committee's comments pertaining to the  
16 provision of details, the manner in which DOE would  
17 provide details on certain of their investigations,  
18 and we just wanted to be sure that these details  
19 didn't drop through the slats. Where they're not in  
20 the SCP, they're supposed to be in the study plans.  
21 If the staff can only review and detail 20 percent or  
22 so of the study plans, somebody should be sure that  
23 the details are where they're supposed to be.

24 MR. THOMPSON: And that's why we're putting  
25 so much emphasis on the QA program, because we can't

1 do DOE's QA job and that's the reason we're doing an  
2 audit of that aspect on our own. But it's DOE's  
3 responsibilities to do that and we want to have some  
4 confidence they're doing it.

5 CHAIRMAN CARR: And wherever they put those  
6 details, we're going to have a hard time looking at  
7 all the materials.

8 MR. THOMPSON: Right. I just cannot do it  
9 all.

10 COMMISSIONER ROGERS: When do you think that  
11 the ESF construction will begin? Is that now sliding?

12 MR. THOMPSON: I think DOE is obviously  
13 going to have to do two things. They're going to have  
14 to evaluate their program based on the comments that  
15 we have here and then I think they're having to look  
16 at their own program. Programmatically, I think  
17 Admiral Watkins has said he's going to take a fresh  
18 look at this area and I think that's an important  
19 thing. We have not had a meeting with DOE recently.

20 What I would recommend is that we may ask  
21 DOE to come over and give us the specifics once  
22 they've had a chance to digest these comments and  
23 either have identified a new director or at least some  
24 period of time and looked at the schedule. Right now  
25 they have not changed their schedule from their

1 previous estimate of a November time frame. But they  
2 may well and I think it depends on --

3 CHAIRMAN CARR: It's fair to say from what I  
4 see and from what I read that certainly the plan and  
5 our comments won't be the controlling factor on when  
6 they start.

7 MR. THOMPSON: Well, that's right. They're  
8 even having trouble just getting some activity started  
9 there off of the Yucca Mountain site. So, they're--

10 MR. BERNERO: Permitting is a real problem  
11 for them right now.

12 COMMISSIONER ROGERS: This June 28th letter  
13 has come up and I wonder if you could -- if you're  
14 prepared to say something about where you stand with  
15 respect to that letter. It's a little --

16 MR. THOMPSON: I basically responded on July  
17 7th to Mr. Rousso and indicated that -- his basic  
18 concerns, as I understood them, was he felt that if we  
19 used the words "objections," that they may send a  
20 wrong signal or send a wrong message out to the state  
21 and local individuals that NRC is objecting to site  
22 characterization activities.

23 I just indicated back to him in my answer  
24 that we were following our own regulations which had a  
25 fairly specific definition of what objections were.

1 It wasn't a situation where we did not have agreement  
2 on an approach to resolution. But if we had not  
3 reached agreement on the resolution and the issues  
4 were resolved, we would call them objections. That's  
5 just consistent with the way our program is in place.

6 We met last week to set out, and I'm sure we  
7 had for both objections, a program in place that we  
8 agreed to, that DOE agrees to and now it's a process  
9 of implementation. But that was the terminology and  
10 what Mr. Bernero is, by our regulations, required to  
11 identify in his letter back.

12 CHAIRMAN CARR: I read his letter as, "How  
13 do you expect me to get my work done if you guys keep  
14 asking me questions?" That's kind of like the staff  
15 says, "How do you guys expect us to get our work done  
16 if the Commission keeps asking us questions?"

17 MR. BERNERO: We never say that.

18 CHAIRMAN CARR: I take his letter for what  
19 it is. We can require him to answer so many questions  
20 in so much detail that we do divert them from their  
21 principle effort and that's not our intent. What  
22 we're trying to do is assist them by pointing out  
23 areas where we think they ought to focus more.

24 COMMISSIONER ROGERS: I wonder if we could  
25 get that message over though because it seems to me

1 that it's very important at this stage for them to  
2 understand what the nature of our question is. My  
3 impression is it's a helpful process that's going on  
4 here and that by settling some of these matters early  
5 on, we may avoid really serious problems later.

6 I'm a little uncomfortable with the view  
7 from DOE that we are frequently devoting time to  
8 repeatedly addressing matters that could be more  
9 productively evaluated by proceeding with the program  
10 and jointing monitoring treatment of the issues.

11 A couple of questions come to mind there as  
12 to roles of the different organizations. This isn't a  
13 joint project.

14 MR. THOMPSON: No.

15 COMMISSIONER ROGERS: And we are not  
16 partners in this. We're trying to be helpful and  
17 we're trying to bring up to the surface potential  
18 problems, but in the long run there is a somewhat  
19 adversarial relationship that's going to have to be  
20 recognized here. We're not starting off that way, but  
21 if we can get the issues cleared up to begin with that  
22 simply arise from a lack of understanding of what our  
23 requirements are and what our point of view is,  
24 everybody's going to be better off. I can understand  
25 the complaint that we don't have the time to do our

1 work because we're answering questions, but these are  
2 very important questions at this time.

3 MR. BERNERO: Excuse me, Commissioner  
4 Rogers. If I could add, that's one of the reasons I  
5 tried to emphasize at the beginning of the briefing  
6 that this is a review of a site characterization plan,  
7 a data gathering mechanism.

8 I would add that our regulations even  
9 include explicit recognition of the iterative process  
10 to follow, that periodically DOE will provide updated  
11 material basically saying, "Here's what we know now.  
12 Here's what it looks like now. What are your  
13 comments?" That iterative process, we expect to  
14 proceed on basically a semi-annual basis with new  
15 material and new commentary.

16 In the overall comments we're emphasizing,  
17 the ACNW is emphasizing and others whose comments have  
18 been made available to you, have emphasized the need  
19 to focus on high priority issues.

20 CHAIRMAN CARR: Well, in any effort like  
21 this where it has never been done before, there's no  
22 doubt in my mind we can always point out more problems  
23 than they can find answers for. So, we've got to make  
24 sure that we separate the trivial from the important  
25 and we think that's a message we need to remember.

1                   COMMISSIONER ROGERS:     Well, I guess I'm  
2 still very concerned about the question of quality  
3 assurance program that keeps coming up. It must have  
4 been a year ago we sat here with DOE people and they  
5 were working very hard on trying to solve that  
6 problem. It still seems to be an open issue. It's  
7 being approached, but it hasn't been met yet. I think  
8 we just have to keep hammering on that. I don't think  
9 it's improper for us to keep making noises that we're  
10 not happy with the lack of a QA program.

11                   CHAIRMAN CARR:     Well, it would certainly  
12 help if the Secretary could get his people in place  
13 over there.

14                   MR. THOMPSON:     That would help a great deal.

15                   COMMISSIONER ROGERS:     That's fundamental to  
16 our being able to go back later on and use the  
17 information that's being collected.

18                   MR. BERNERO:     And we treat it with very high  
19 priority and we will --

20                   COMMISSIONER ROGERS:     Well, I personally  
21 would urge you to just keep on it. It may be  
22 uncomfortable, but until it's resolved it's an open  
23 issue that has got to be recognized.

24                   MR. BROWNING:     In fact, it's probably the  
25 root cause of the very thing they complain about in

1 their letter. If you'll look at the case of the  
2 engineering shaft facility, if they could concentrate  
3 on that design rather than on the design plus a  
4 document rationalizing why it's okay even though it  
5 was produced under a non-QA base lined system, we  
6 would have at least one less document to look at. We  
7 could all concentrate on the design instead of a  
8 design and a rationalization as to why the design is  
9 okay even though it wasn't done under an approved  
10 program.

11 COMMISSIONER ROGERS: Just for Doctor  
12 Moeller. The alternative conceptual models question  
13 that you raised in your point F of your memo of July  
14 3rd, the staff has said that the conceptual model  
15 problem or objection has been resolved. Do you feel  
16 it's been resolved? Where does that stand? I feel a  
17 little uncomfortable about whether that has really  
18 moved to a state where ACNW will be satisfied.

19 DOCTOR MOELLER: On the basis of my  
20 understanding of the people or consultants who are  
21 knowledgeable in this area and the members of the  
22 Committee who are, they are still not satisfied.  
23 Particularly since, as we point out in our letter,  
24 that the models are essential to determining the  
25 performance of the repository. Again, you need

1 scenarios and you need models to construct the CCDF.  
2 This is still an area of concern to us.

3 MR. BERNERO: If I could clarify. When I  
4 said earlier, and I think I did use the phrase  
5 "resolved," it was resolved out of the objection  
6 category and now it is down in the iterative process  
7 where -- this is not to say that all conceptual models  
8 are there and it's a 100 percent complete matrix. We  
9 would agree with the characterization. You need  
10 scenarios, you --

11 CHAIRMAN CARR: I heard your comment to say  
12 it's sufficiently resolved that it's no longer an  
13 objection.

14 MR. BERNERO: Yes, because in the  
15 consultation draft there was a virtual absence of  
16 alternate models.

17 COMMISSIONER ROGERS: Well, the word that  
18 keeps coming up in concerns here is the integration of  
19 activities. That is difficult. It's not easy to do,  
20 but I think it's important to keep harping on it.

21 COMMISSIONER CURTISS: Yes.

22 COMMISSIONER ROGERS: Thank you.

23 CHAIRMAN CARR: Commissioner Curtiss?

24 COMMISSIONER CURTISS: Just picking up on  
25 Ken's point, it looked to me like the two issues that

1 were previously objections that have now dropped down  
2 a rung, the alternative conceptual models and the  
3 integration of the overall plan, from what the ACNW  
4 says and in looking at the SCP, may have been fairly  
5 close calls.

6 The objection that we had raised about the  
7 alternative conceptual models employing the most  
8 favorable model in most instances, I guess I still  
9 question whether there weren't some serious concerns  
10 there. I don't know whether you'd call them an  
11 objection or a comment or a question, but that was one  
12 area where it seemed to me that it was at least a  
13 close call. And by calling it something other than an  
14 objection, we wouldn't want to communicate the message  
15 to DOE that that's resolved, that we don't have any  
16 remaining concern.

17 On the question of integration, it looked to  
18 me like there were numerous instances where the  
19 coordination, the attempt to minimize bore holes and  
20 the number that you have and the drilling into the  
21 repository body still may not have come together.  
22 They've got tests that they're conducting in the same  
23 time and the same place that appear to raise the  
24 potential for conflict.

25 Now, I guess on those two questions or

1 comments as we call them, it looked to me like it was  
2 a much closer call.

3 I do want to comment about the letter  
4 because what I take it DOE is saying in their June  
5 28th letter is that we are casting our regulatory net  
6 too broadly here. We're getting into areas that  
7 really ought to be addressed at some point downstream,  
8 at the licensing phase when the formal application is  
9 submitted.

10 Because of the approach that we've used here  
11 in reducing from five to two the number of objections  
12 and classifying comments and questions separately, I  
13 guess I wouldn't want to create the impression with  
14 that classification and in the context of DOE's letter  
15 that addressing the two objections will put our minds  
16 at ease about proceeding with characterization, either  
17 at the surface or sinking the shaft, because it looks  
18 to me, particularly in those two areas, like there are  
19 still serious questions that they ought to come to  
20 grips with.

21 That's all I have.

22 COMMISSIONER ROGERS: Well, just if I could  
23 come back.

24 CHAIRMAN CARR: Sure.

25 COMMISSIONER ROGERS: I wonder if we really

1 feel that there is something being done to bring to  
2 the top of the priority list the really serious  
3 fundamental flaws that might cancel out this site.  
4 Everyone that's commenting on the program touches on  
5 that. The July response touches on it, ACNW. It's  
6 come up a number of times and yet somehow in the list  
7 of things to be done, it just seems to be one other  
8 item on the list. And yet it is so fundamental and  
9 one worries about whether the enormous inertia that  
10 starts to build up in momentum that develops when you  
11 get a project of this magnitude going, that the really  
12 fundamental question somehow or other gets lost in the  
13 dust.

14 I think we've got to keep that issue right  
15 up there because we have to be prepared to look at  
16 killer issues on this site very early on.

17 MR. THOMPSON: That was the intent of the  
18 focus when we identified what we felt were the  
19 important comments, to look as best as we could as to  
20 which of those need to be focused on early in the site  
21 characterization program. So, we certainly agree with  
22 you.

23 MR. BERNERO: Yes. But let me add to that.  
24 At the working level, last Friday's meeting, the  
25 meeting in Las Vegas with DOE and the State, of

1 course, participated in that, we gave them a tectonic  
2 models meeting proposed agenda. Now, that's not one  
3 meeting. That's going to be quite complex and a  
4 family of meetings. We're trying to pursue as early  
5 as possible with DOE technical meetings to get the  
6 spectrum of tectonics issues which we think will  
7 dominate the early issue priority and the performance  
8 models that are being conceived of or even applied on  
9 these. We're trying to get that sort of analysis in  
10 place early.

11 CHAIRMAN CARR: But our responsibility at  
12 this point is to make sure the plan includes the  
13 determination of those facts --

14 MR. BERNERO: Yes.

15 CHAIRMAN CARR: -- that would bring out the  
16 killer issues. The plan has got to include those.  
17 What we're trying to do is make sure they include them  
18 early on.

19 MR. BERNERO: Yes, right, and that they  
20 iterate that they --

21 COMMISSIONER ROGERS: Yes. But I just  
22 wonder if that's getting as much attention as it  
23 really should.

24 MR. BERNERO: Well, I've had verbal  
25 assurance that their performance assessment plan,

1 their overall plan, will be complete and given to us  
2 by the end of this year and that they should be able  
3 to support this activity or display this activity is  
4 perhaps a better word.

5 CHAIRMAN CARR: But it concerns me that the  
6 overall performance assessment is not going to be done  
7 until -- the whole thing isn't until '93.

8 MR. BERNERO: But individual issues can be  
9 put up to say, "How does one assess the significance  
10 of this seismic issue or this ground water travel or  
11 this volcanism." And take the issues at least one at  
12 a time and look for the key data that makes it or  
13 breaks it.

14 COMMISSIONER ROGERS: There's no reason why  
15 that should wait until the very end and be part of the  
16 final application.

17 CHAIRMAN CARR: I have a few questions and  
18 comments. You list four particularly significant  
19 programmatic concerns. One, performance assessment;  
20 early identification of potentially unacceptable  
21 adverse conditions; need for improved integration; and  
22 unrealistic schedule milestones. Do you really  
23 believe the site characterization program is improved  
24 with those major problems still sticking out there?

25 MR. BERNERO: Well, the term "improvement,"

1 it's a relative comparison. The consultation draft  
2 was seriously deficient, we thought. It certainly  
3 didn't appear to us as a suitable basis to proceed.

4 This one, with difficulties, we see as a  
5 basis to proceed. Obviously, you can't do anything  
6 without the QA program in place and the ESF design  
7 process requires that discipline that would reflect QA  
8 in place. And this early priority we just talked  
9 about clearly has to be there, but there's an awful  
10 lot of basic work covered in the plan that we're not  
11 talking about that really can proceed. So, basically,  
12 what we're saying is it's improved over the  
13 consultation draft and it is fundamentally a usable  
14 program to proceed with site characterization.

15 CHAIRMAN CARR: Okay. It looks like the  
16 regulatory uncertainties, the five concerns you've got  
17 there, have a potential rulemaking implication. Is  
18 the schedule for rulemaking on those going to have an  
19 adverse impact, assuming everybody else makes their  
20 dates?

21 MR. BERNERO: I don't think so, but I'm  
22 perhaps more sanguine about the outcome of some of the  
23 rulemakings than others might be. We have identified  
24 the rulemakings in these areas as matters of high  
25 priority. In that SECY paper of last year, SECY-88-

1 285, and all of the activity we're doing in staff  
2 related to it, we treat it as high priority matter.

3 I don't think it's going to end up on the  
4 critical path, but keep in mind when we make these  
5 comments, for instance on what constitutes  
6 substantially complete containment, DOE is forced to  
7 grope somewhat to determine what the real regulatory  
8 requirement will be. There is a potential for that  
9 basic comment.

10 Our comments -- we're basically trying to  
11 look ahead to what the outcome will be in performance  
12 assessment rulemaking, in substantially complete  
13 containment or in disturbed zone rulemaking, and see  
14 whether we can guide DOE fruitfully with our comments  
15 now while we proceed with priority on the rulemaking.

16 MR. THOMPSON: But I think I am correct.  
17 The current schedule right now is consistent with  
18 their application time. But what we're concerned  
19 about as these things keep slipping -- not just ours  
20 but even the site characterization activities -- the  
21 pressures are going to collapse on the application  
22 date for us and I think we're very mindful of that. I  
23 think though right now, we do have contemplation  
24 completing these rulemakings scheduled in a sufficient  
25 time to give DOE -- was it two years?

1           MR. BROWNING: Yes, we're shooting for 1992  
2 to give them sufficient guidance because that's when  
3 they'd need the guidance to submit a license  
4 application in 1995, which of course is the current  
5 schedule. It may slip, but --

6           MR. THOMPSON: But I agree with Mr. Bernero.  
7 Some of these rulemakings may be more difficult really  
8 to resolving the issue totally than we can project  
9 right now. But some of them, I think, we will clearly  
10 have success on.

11          CHAIRMAN CARR: Okay. And our objections  
12 and concerns and comments are still the priority. We  
13 expect DOE to work the problem in, huh?

14          MR. BERNERO: That's essentially it.

15          CHAIRMAN CARR: Take care of objections  
16 first and concerns second?

17          MR. BERNERO: Yes. That's a hierarchy of  
18 comment really.

19          MR. THOMPSON: Well, certainly those in the  
20 key technical issues that we've got. We've worked  
21 with some schedules for meeting schedules and I think  
22 there's some that we may even be able to meet some of  
23 the technical issues before you might do some  
24 resolution of the exploratory shaft activities. But I  
25 think we clearly identified the top activities that we

1 need to focus DOE and management's attention to.

2 COMMISSIONER CURTISS: Just so I understand  
3 that, if DOE addresses the two objections and their  
4 letter suggests that they may view their burden to be  
5 more narrow given what they perceive as our broader  
6 exercise of jurisdiction, but if they address the two  
7 objections that we have raised, are we saying that  
8 they're in the position to proceed with site  
9 characterization?

10 MR. THOMPSON: That's the basic issue, yes,  
11 that if they address those objections satisfactorily,  
12 then we would be able to proceed with site  
13 characterization. What I was trying to say is that we  
14 may be able to address some of the technical issues  
15 before they're able to actually complete and resolve  
16 some of the objections. You know, they've got QA  
17 programs that are going to have to be reviewed and in  
18 place. I think we can continue looking at some of the  
19 issues associated with volcanism and tectonics in  
20 parallel with the resolution of the quality assurance  
21 program, for example.

22 MR. BERNERO: I would suggest -- I don't  
23 think DOE is narrowly looking at just to take care of  
24 the two objections and soldier on. I think the  
25 dialogue we've had with them so far on the other

1 issues, like the tectonics, indicate they're intending  
2 to proceed on that front as well. It just wouldn't be  
3 prudent to do otherwise.

4 COMMISSIONER CURTISS: I agree with that.  
5 The tenor of the letter though suggested that they  
6 think we're getting into areas that ought to be  
7 addressed downstream or that really aren't part of the  
8 pre-licensing responsibility of the agency. To the  
9 extent that that reflects a concern on the part of DOE  
10 and, in turn, a more narrow focus, I guess we ought to  
11 disabuse them of that. That's why I think it's  
12 critical what you call an objection and what you call  
13 a concern if their focus is narrow here.

14 MR. BERNERO: Well, I think the context of  
15 that letter ought to be understood. As part of this  
16 process, you'll recall that the Commission, of course,  
17 wanted to review these comments. You wanted the  
18 benefit of the ACNW's advise and any activity whereby  
19 we collaborate with the ACNW as quasi-public as we go  
20 along and the meetings are open and so forth.

21 DOE had the overview or highlights of the  
22 principal comments and that's really the basis of that  
23 letter. They're probably a good deal of frustration.  
24 They've got a list of problems and none of the back-up  
25 analysis and none of the full flesh and a little bit

1 of frustration, I think, was displayed in that letter.

2 MR. BROWNING: One case example that seems  
3 to be a point of controversy between us, and I'm not  
4 sure has gone away based on that meeting we had, which  
5 is the way we're looking at the engineering shaft  
6 facility. As we try to highlight in the comments, the  
7 reason we're looking at it so closely is that if this  
8 site turns out to be satisfactory, that shaft will be  
9 part of the repository. Therefore we, in fact, are  
10 looking at it today as if we were going to eventually  
11 have to license that piece as piece of the repository.

12 There seems to be a rather fundamental  
13 disconnect there. They don't want to look at the--  
14 you know, the engineering shaft is an experimental  
15 thing which may or may not show that the site is okay.  
16 So, I think that seems to be the point at which we  
17 have a basic philosophical difference in the way we're  
18 looking at that particular aspect of this --

19 CHAIRMAN CARR: But it goes right back to  
20 the quality control problem.

21 MR. BROWNING: Exactly.

22 MR. THOMPSON: Right.

23 CHAIRMAN CARR: Well, I would like to thank  
24 the staff and Doctor Moeller, the Chairman of the  
25 Advisory Committee on Nuclear Waste, for the useful

1 briefing and discussion regarding the review of the  
2 Department of Energy's site characterization plan and  
3 the development of the Commission's site  
4 characterization analysis.

5 Certainly, all members of the NRC staff who  
6 participated in this review, and particularly Mr.  
7 Stablein, who coordinated the activity, are to be  
8 commended for the thoroughness of the review in light  
9 of the tight time schedule and early delay that you  
10 faced in completing the review. It's obvious a lot of  
11 extra hours went into the effort and I believe the  
12 product reflects that professional attitude.

13 Doctor Moeller, I also wish to thank the  
14 members of the ACNW and their consultants for their  
15 continuing interaction with the staff throughout the  
16 review in the development of the site characterization  
17 analysis to insure that any concerns could be factored  
18 in as early in the process as possible. I understand  
19 from the staff these interactions were most useful.

20 I can't emphasize enough the importance of  
21 this pre-licensing consultation period when the need  
22 for improvements to the site characterization program  
23 can be raised leading to the early identification of  
24 potential resolution of issues. I urge the staff to  
25 continue the dialogue with DOE to insure that our

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1 interactions during this period are as fruitful and  
2 constructive as possible.

3 These interactions, as well as those with  
4 the states and tribes are very important during our  
5 pre-licensing period. I am particularly concerned  
6 that DOE's schedule or objectives may be impacting the  
7 integration of necessary technical information  
8 gathering activities which are essential in developing  
9 a thorough understanding of the site as the basis for  
10 a high quality license application.

11 I believe it is important to emphasize these  
12 concerns to DOE and to continue our interaction to  
13 insure they understand our concerns.

14 The next action on this matter by the  
15 Commission is a notation vote on SECY-89-199, which I  
16 hope we complete as soon as possible so that we may  
17 transmit our comments to DOE.

18 I ask my fellow Commissioners to carefully  
19 consider the information before us in formulating  
20 their votes on the site characterization analysis and  
21 the transmittal letter proposed by the staff.

22 Are there any additional questions or  
23 comments from my fellow Commissioners?

24 COMMISSIONER ROGERS: Well, just to  
25 reinforce thanks to the staff for the enormous effort

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1 that I know was going on to clear this for our meeting  
2 today and to really get this job done. I think it's  
3 been first rate.

4 COMMISSIONER CURTISS: I'll add my voice to  
5 that too. I think it's an excellent piece of work.

6 CHAIRMAN CARR: If there are no further  
7 comments, we stand adjourned.

8 Thank you.

9 (Whereupon, at 11:22 p.m., the above-  
10 entitled matter was concluded.)  
11  
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CERTIFICATE OF TRANSCRIBER

This is to certify that the attached events of a meeting  
of the United States Nuclear Regulatory Commission entitled:

TITLE OF MEETING: BRIEFING ON STAFF COMMENTS ON DOE SITE  
CHARACTERIZATION PLAN FOR YUCCA MOUNTAIN

PLACE OF MEETING: ROCKVILLE, MARYLAND

DATE OF MEETING: JULY 11, 1989

were transcribed by me. I further certify that said transcription  
is accurate and complete, to the best of my ability, and that the  
transcript is a true and accurate record of the foregoing events.

Carol Lynch

Reporter's name: Peter Lynch

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COMMISSION BRIEFING  
ON THE  
NRC REVIEW OF  
THE DOE  
SITE CHARACTERIZATION PLAN  
FOR YUCCA MOUNTAIN  
NYE COUNTY, NEVADA  
JULY 11, 1989

CONTACT:  
Newton K. Stablein  
X20446

PRESENTATION OUTLINE

- SITE CHARACTERIZATION PLAN (SCP)
- NRC STAFF SITE CHARACTERIZATION ANALYSIS (SCA) AND COMMENTS
- NEAR-TERM SITE CHARACTERIZATION MILESTONES
- ADVISORY COMMITTEE ON NUCLEAR WASTE (ACNW) INVOLVEMENT WITH SCP

SITE CHARACTERIZATION PLAN

- PURPOSE
- CONTENTS
  - EXISTING SITE DATA BASE
  - DESCRIPTION OF WASTE FORM & PACKAGE
  - CONCEPTUAL DESIGN OF REPOSITORY
  - PLAN FOR CHARACTERIZATION ACTIVITIES
- DOE ISSUED SCP-12/28/88
- NRC REVIEW COMPLETED JULY 1989

OVERVIEW

- 105 OF 167 NRC CDSCP CONCERNS RESOLVED  
IN SCP
- MANY OF THE OTHER 62 CONCERNS  
PARTIALLY RESOLVED
- NRC STAFF HAS NO CONCERNS WITH A  
NUMBER OF PROGRAMS (E.G., CLIMATE)  
IN SCP

SITE CHARACTERIZATION ANALYSIS (SCA)

- DIRECTOR'S COMMENTS
- SUMMARY OF CONCERNS
- POINT PAPERS
  - OBJECTIONS (2)
  - COMMENTS (133)
  - QUESTIONS (63)

CDSCP OBJECTIONS

1. ALTERNATIVE CONCEPTUAL MODELS
2. QUALIFICATION OF QA PROGRAMS
3. DEPTH OF FIRST SHAFT
4. SHAFT CONCEPTUAL DESIGN INFORMATION
5. LOCATION OF SHAFTS

SCP OBJECTIONS

1. QUALIFICATION OF QA PROGRAMS
2. ESF DESIGN AND DESIGN CONTROL PROCESS

NEED FOR QUALIFIED QA  
PROGRAM

SIGNIFICANCE: DATA COLLECTED SHOULD BE  
USABLE IN LICENSING.

ACTION: NRC AND DOE TO CONTINUE  
IMPLEMENTATION OF AGREED-UPON APPROACH  
FOR RESOLVING THIS CONCERN. DOE AND NRC  
AUDITS IN PROGRESS.

# STATUS OF DOE QA PROGRAM IMPLEMENTATION (As of July 1, 1989)

QA PROGRAM PLAN					QUALIFIED QA PROGRAM		
Organization	DOE Submits	NRC Comments	DOE Revises	NRC Accepts	Qualifica- tion Audits	DOE Accepts	NRC Accepts
OCRWM <sup>1</sup> <sub>2</sub>	Aug 26, 1988 Sep 16, 1988	Sep 28, 1988 Nov 3, 1988	Nov 29, 1988 Dec 21, 1988	May 8, 1989 May 2, 1989	NO	NO	NO
YMP(88-9)	Aug 15, 1988	Oct 14, 1988	Dec 13, 1988	Dec 30, 1988	NA	NA	NA
YMPO	NO	NO	NO	NO	NO	NO	NO
F&S	Feb 21, 1989	Mar 22, 1989	NO	NO	● Apr 10-14, 1989	NO	NO
H&N	Mar 3, 1989	Apr 26, 1989	NO	NO	● Apr 24-28, 1989	NO	NO
SNL	Apr 14, 1989	NO	NO	NO	NO	NO	NO
USGS	Apr 14, 1989	Jun 20, 1989	NO	NO	NO	NO	NO
REE CO	Feb 21, 1989	May 5, 1989	NO	NO	NO	NO	NO
LLNL	Mar 3, 1989	Jun 19, 1989	NO	NO	● Jun 5-9, 1989	NO	NO
LANL	Mar 15, 1989	NO	NO	NO	NO	NO	NO

- ① QA RD  
② QA PD

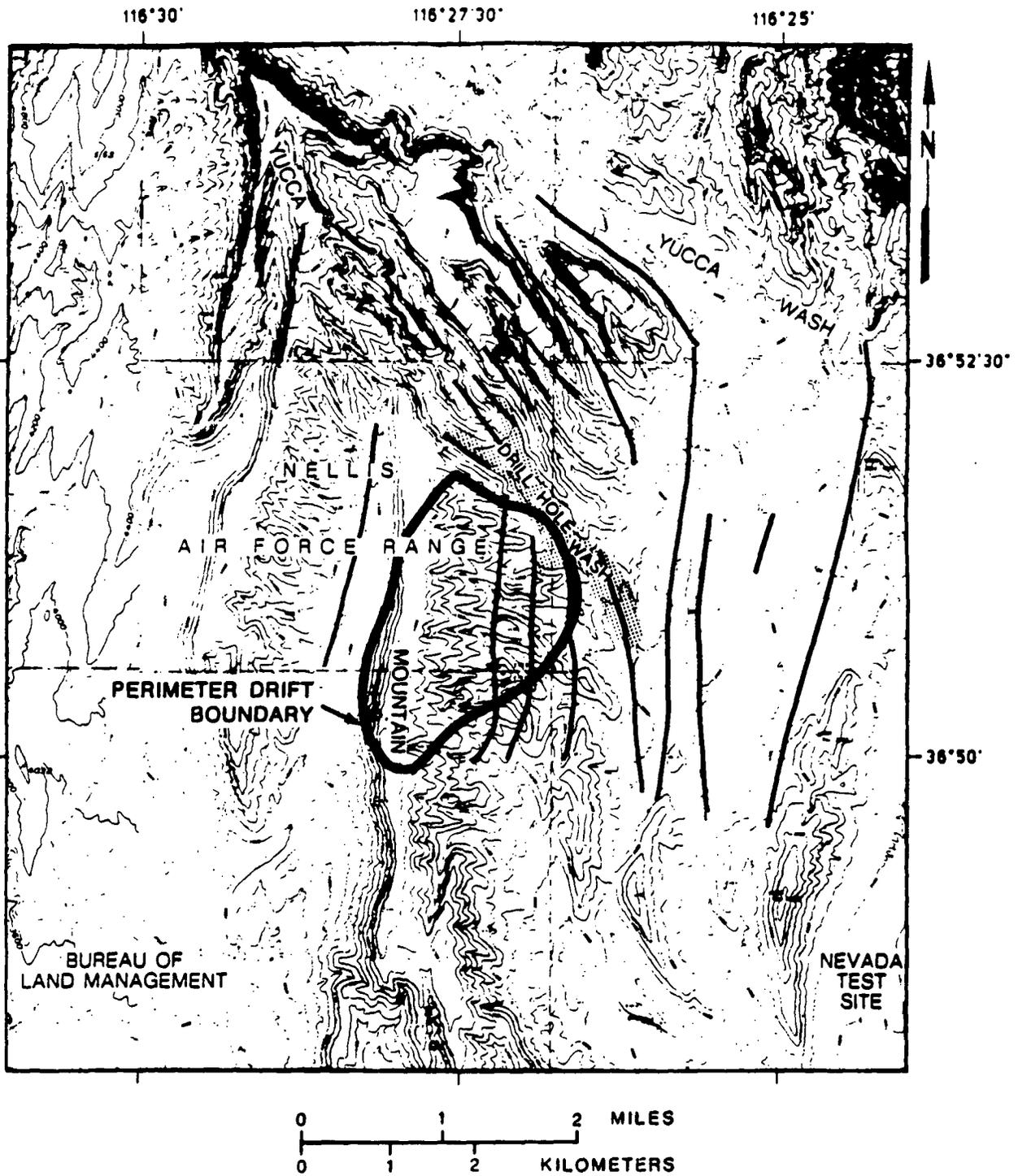
● Limited Scope Audit  
(Programmatic Audit  
Only)

ESF DESIGN AND DESIGN  
CONTROL PROCESS

SIGNIFICANCE: ESF WILL BECOME PART OF REPOSITORY. DESIGN SHOULD MEET REGULATORY REQUIREMENTS.

ACTION: MEETING IN NEVADA (JULY 7). NRC-DOE CONSULTATION DURING FINAL ESF DESIGN. NRC TO PARTICIPATE IN DOE'S DESIGN REVIEWS.

DECEMBER 1988



**Figure 1-40.** Faults and fractures at Yucca Mountain interpreted from electrical resistivity data. Stippling shows zone of inferred fracturing and faulting along Drill Hole Wash; fault trends appear to change abruptly across this zone. Modified from USGS (1984).

PARTICULARLY IMPORTANT COMMENTS

1. NEED TO DEMONSTRATE EARLY AND  
ITERATIVE TOTAL SYSTEM PERFORMANCE  
ASSESSMENTS
2. EARLY INVESTIGATIONS OF TECTONIC  
PHENOMENA
3. TECHNICAL INTEGRATION AND  
COORDINATION
4. PRESSURE TO MEET MILESTONES  
ADVERSELY AFFECTING THE SITE  
CHARACTERIZATION PROGRAM





COMMENTS RELATED TO REGULATORY  
UNCERTAINTIES

- METHODOLOGIES TO DEMONSTRATE  
COMPLIANCE WITH EPA  
STANDARD (TWO COMMENTS)
- SUBSTANTIALLY COMPLETE CONTAINMENT  
(TWO COMMENTS)
- DISTURBED ZONE BOUNDARY (ONE COMMENT)
- THESE UNCERTAINTIES ARE TO BE  
ADDRESSED IN THREE POTENTIAL  
RULEMAKINGS

NEAR-TERM SITE CHARACTERIZATION  
MILESTONES

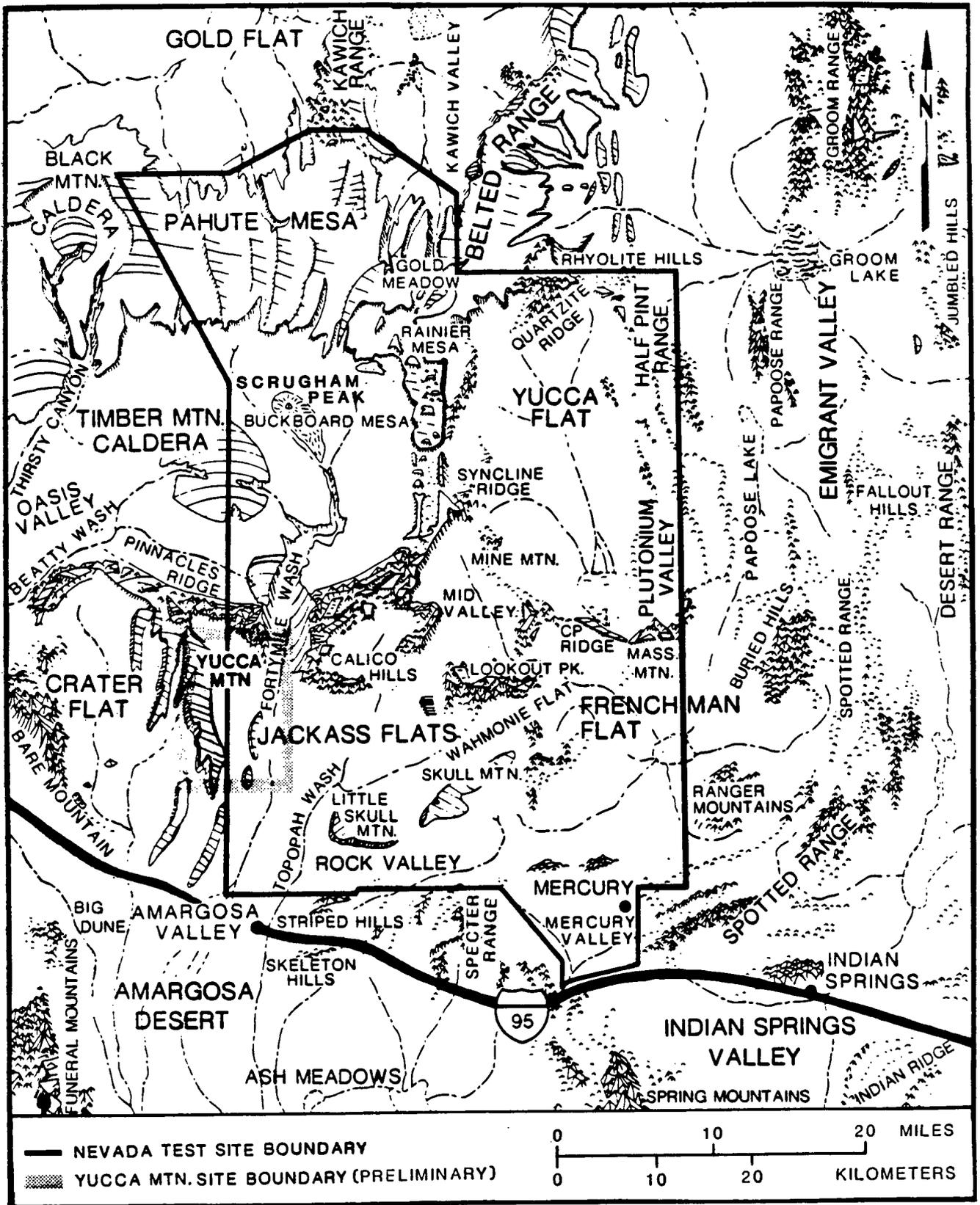
- RESOLVE ACNW AND COMMISSION COMMENTS
- ISSUE SCA BY END OF JULY
- DOE CONSIDERS NRC CONCERNS
- NRC AND DOE AGREE ON APPROACH TO  
RESOLVING OBJECTIONS
- DOE PROCEEDS WITH SCP
  - COMPLETES ESF DESIGN, AND STARTS  
CONSTRUCTION
  - COMPLETES KEY STUDY PLANS AND  
BEGINS SURFACE-BASED STUDIES

ACNW INVOLVEMENT WITH SCP

- INTENSIVE INVOLVEMENT DURING STAFF  
DEVELOPMENT OF COMMENTS (2/89-6/89)
- ACNW LETTER DATED 7/3/89

CONCLUSION

STAFF INTENDS TO TRANSMIT SCA TO DOE BY  
JULY 28, 1989 UNLESS THE COMMISSION  
DIRECTS OTHERWISE.



GOLD FLAT

BLACK MTN.

CALDERA

PAHUTE MESA

GOLD MEADOW

RAINIER MESA

SCRUGHAM PEAK

BUCKBOARD MESA

TIMBER MTN. CALDERA

OASIS VALLEY

BEATTY WASH

PINNACLES RIDGE

CRATER FLAT

BARE MOUNTAIN

YUCCA MTN.

JACKASS FLATS

CALICO HILLS

LITTLE SKULL MTN.

ROCK VALLEY

BIG DUNE

AMARGOSA VALLEY

AMARGOSA DESERT

STRIPED HILLS

SKELETON HILLS

ASH MEADOWS

WAHMONE FLAT

LOOKOUT PK.

SKULL MTN.

MERCURY

MERCURY VALLEY

INDIAN SPRINGS VALLEY

SPRING MOUNTAINS

BELTED RANGE

QUARTZITE RIDGE

YUCCA FLAT

SYNCLINE RIDGE

MINE MTN.

MID VALLEY

CP RIDGE

MASS. MTN.

FRENCH MAN FLAT

BURIED HILLS

SPOTTED RANGE

RANGER MOUNTAINS

SPOTTED RANGE

INDIAN RIDGE

RYHOLITE HILLS

HALF PINT RANGE

PLUTONIUM VALLEY

PAPOOSE LAKE

PAPOOSE RANGE

EMIGRANT VALLEY

FALLOUT HILLS

DESERT RANGE

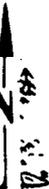
JUMBLED HILLS

GROOM RANGE

GROOM LAKE

INDIAN SPRINGS

INDIAN RIDGE



JUMBLED HILLS

DESERT RANGE

FALLOUT HILLS

EMIGRANT VALLEY

PAPOOSE LAKE

PAPOOSE RANGE

GROOM RANGE

GROOM LAKE

INDIAN SPRINGS

INDIAN RIDGE