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1 UNITED STATES OF AMERICA

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2 NUCLEAR REGULATORY COMMISSION

3 ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

4 SUBCOMMITTEE ON REACTOR SAFETY RESEARCH

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6 Nuclear Regulatory Commission  
7 Room 1046  
8 1717 H Street, N.W.  
9 Washington, D.C.

10 Tuesday, July 8, 1980

11 The Subcommittee met, pursuant to notice, at 8:30 a.m.

12 BEFORE:

13 C. P. SIESS, Chairman

14 J. CARSON MARK

15 WILLIAM W. MATHIS

16 W. KERR

17 S. LAWROSKI

18 D. W. MOELLER

19 P. G. SHEWMON

20 NRC STAFF PRESENT:

21 SAM DURAISWAMY

22 THOMAS G. MC CRELESS

23 THIS DOCUMENT CONTAINS  
24 POOR QUALITY PAGES  
25

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P R O C E E D I N G S

1  
2 MR. SIESS: The meeting will come to order. This is  
3 a meeting of the Advisory Committee on Reactor Safeguards,  
4 Subcommittee on Reactor Safety Research. I am Chester Siess,  
5 Subcommittee Chairman. The other members present today are  
6 Carson Mark, William Mathis just stepped out, Steve Lawroski,  
7 Dade Moeller, Paul Shewmon, and William Kerr is here.

8 I see his briefcase, he will be back shortly. The purpose of this  
9 meeting is to continue the review of pertinent portions of the  
10 NRC research program to get information for the annual ACRS to  
11 the Commission. Later on, the report to the Congress on the  
12 research program.

13 The Subcommittee will also discuss, as they are  
14 available, draft reports -- draft sections of the report to the  
15 Commission. The meeting is being conducted in accordance with  
16 the provisions of the Federal Advisory Committee Act, and the  
17 government in the Sunshine Act.

18 All of the meeting will be open. A transcript will be  
19 kept. The designated federal employee for the meeting is Mr.  
20 Sam Duraiswamy on my right. Participation in today's meeting  
21 has been announced as part of the notice previously published in  
22 the Federal Register.

23 We have received no comments or requests to make oral  
24 statements from members of the public. A transcript of the  
25 meeting is being kept. It will be made available as stated in

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1 the Federal register; keepin gin mind that there is a transcript,  
2 all speakers except those at the table who have name tags are  
3 requested to first identify themselves for the benefit of the  
4 reporter and to use a microphone if possible. If not, speak with  
5 sufficient clarity so that the reporter can hear you.

6 We have a tentative presentation schedule which calls  
7 for presentations by research. Of course, we expect them to be  
8 here through the day as various items come up.

9 The presentation by the acting executive director for  
10 operations. Then, we will hear from NRR. I do not see any of  
11 the other user-offices here. At a fairly early stage, I would  
12 like to run through a roll call to see where we stand on draft  
13 chapters. Before I get into that, we have had a request from  
14 the EDO office to put them on first.

15 Does anybody have any objection to that?

16 (No response.)

17 I would hope they would be round during the meeting  
18 as items are discussed in more depth to explain or to argue on  
19 EDOs mark .

20 MR. KERR: Mr. Chairman, does this require unanimous  
21 consent?

22 MR. SIESS: No, just no loud yells. I will move on.  
23 If you object to anything I propose, speak up and speak up fast.  
24 Does everybody on the subcommittee that is here have a copy of  
25 the EDO mark ?

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1 MR. KERR: Do we have a copy of what?

2 MR. SIESS: The budget with the EDO mark .

3 MR. KERR: Is that this fat thing?

4 MR. SIESS: Right. I assure most of you just got it  
5 today. Is that right? You did not get it at the hotel last  
6 night?

7 I would suggest that as soon as you can, you look at  
8 your portion that you are responsible for. What you have there  
9 is essentially the budget format that you saw before. Then the  
10 right-hand side of it will be the EDO's mark . It takes a  
11 little while to understand the arrangement.

12 There is a horizontal line of FY '80, '81, '82, '83,  
13 '84, and '85 that precedes the subelement. The subelement on  
14 that is called planned accomplishment. They are using numbers  
15 where we were using letters.

16 We will worry about the details on that, but the  
17 right-hand margin essentially is the EDO mark and the reasons  
18 therefore. So, as you find time while you are listening, try to  
19 locate your particular areas and see what was done to it.

20 The schedule that we will be following between now  
21 and Saturday goes something like this. We will have some drafts  
22 of chapters today, although obviously specific recommendations  
23 in terms of budget levels may not be arrived at. Final recommen-  
24 dations will not be arrived at until the full Committee has a  
25 chance to look at it.

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1 On Thursday, we have almost all of the morning and  
2 an hour -- part of the afternoon devoted to this for the full  
3 Committee. I would hope that by Thursday we will have draft  
4 chapters from everybody for the full Committee to look at and  
5 preliminary recommendations for consideration by the full  
6 Committee on what we want to say about budget levels.

7 We also have some time scheduled Friday, if minor  
8 changes need to be made from what we have Thursday. We can  
9 get at them by Friday afternoon. We can do that.

10 MR. SHEWMON: I will not be later this week. I have  
11 drafts in for the part I am responsible for. In so far as time  
12 in the agenda permits, I would like to go over those to reach some  
13 consensus.

14 MR. SIESS: Can you designate somebody from your  
15 subcommittee to present that to the full Committee and make the  
16 final changes in it?

17 MR. SHEWMON: I suppose so. Somebody is responsible  
18 for each of the chapters. Chuck has one of them. Who has  
19 chapter one? Who has chapter three?

20 MR. SIESS: Yours are all inputs to other chapters,  
21 aren't they?

22 MR. SHEWMON: Yes.

23 MR. SIESS: We will do it that way. They will take the  
24 responsibility for the chapters. We have some time scheduled  
25 Friday in which we will try to clean up as much as we can. We

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1 have some time scheduled Saturday.

2 Now, of course, what I expect is by Saturday, there  
3 will be essentially a final draft of the report for the  
4 Committee to look at. Decisions will have been made on Thursday  
5 or Friday. All we will have to do Saturday is run through a  
6 final fairly complete draft, because when I leave here Saturday,  
7 this thing has to be finished.

8 I do not intend to stay over Monday if I can help it.  
9 The weather does not look too good Sunday.

10 (Laughter.)

11 So, that is the way we are going. The object today for  
12 the subcommittee members is to get the information you need to  
13 be able to prepare recommendations to the full Committee for  
14 Thursday morning. It means you have all day tomorrow to work on  
15 that.

16 MR. MATHIS: We have nothing else to do.

17 MR. SIESS: There are some other subcommittee meetings,  
18 but they are not very important.

19 (Laughter.)

20 Okay. With that introduction -- I will hold the formal  
21 roll call on the chapters until later -- we will now hear from the  
22 Office of the Executive Director for Operations. Who is  
23 representing them?

24 MR. CORNELL: I am, sir.

25 MR. SIESS: Kevin Cornell.

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1 MR. CORNELL: Where you would like me?

2 MR. SIESS: Wherever there is a mike. There is one  
3 up here. If you have some vu-graphs, it would probably be best  
4 to be up there.

5 MR. CORNELL: I don't have any. I just have a state-  
6 ment.

7 MR. SIESS: If you don't have any vu-graphs, you can  
8 leave the lectern where it is.

9 MR. CORNELL: I appreciate the opportunity to describe  
10 to you our budget mark. I would like to point out, you catch us  
11 in the middle of our deliberations. We have only had about one  
12 week of discussion at the EDO level, perhaps two.

13 We are right in the middle of coming up with our mark.  
14 What we have already provided you with is a preliminary mark,  
15 which we have sent out to the offices. We expect to be meeting  
16 with the Office of Research on Wednesday to listen to their  
17 reaction to that. I suspect there will be substantial changes  
18 by the end of the week.

19 We hope to send out final mark down to the Commission  
20 early next week. Any views we can get from the ACRS concerning  
21 areas that they think should be modified, we would welcome the  
22 opportunity here, and factor in what we send down to the Commis-  
23 sion.

24 I would like to stress we are still in the middle of  
25 this process.

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MR. SIESS: I might mention, I think we were at about the same stage last year. We were between the EDO -- it was in the budget review group, preliminary mark and the research. Last year there was an EDO mark after the BRG.

That step has been combined. When will the Commissioners see this?

MR. CORNELL: We expect to get it down to the Commission by the middle of next week.

MR. SIESS: They ought to get our report then.

MR. CORNELL: Then about a week after they get it, they will start their discussions. So, they will start their discussions in about two weeks.

MR. SIESS: Our timing will be to get a report to them by about the middle of the week.

MR. CORNELL: The only disadvantage is you will be reacting, as far as our marks goes, to something which may change. You are shooting at a moving target.

MR. SIESS: The target is basically in between what I call the PPPG mark and the reserach request.

MR. CORNELL: In terms of the total dollar figure.

MR. SIESS: In terms of the total dollar figures, and basically right down to the subelements. It is almost in between.

MR. BUDNITZ: I just want to repeat. You intend to get a letter to the Commission by the middle of next week.

MR. SIESS: It will be final by Saturday. It will be



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1 just then a question of when it is typed up and what form they  
2 get it in.

3 MR. BUDNITZ: Okay.

4 MR. SIESS: It would be --

5 MR. BUDNITZ: It would be useful if it is final by  
6 Saturday. If you could arrange it, to have something around  
7 for the key people early Monday or Tuesday, even before the thing  
8 has been printed in large numbers of copies. Key people like  
9 ourselves and EDO.

10 MR. SIESS: I do not see why we can't. This is going to  
11 be NUREG-0699. There is no reason it has to be printed before  
12 it goes to the Commission. Printing is presumably for the benefit  
13 of the public.

14 That is a mechanical detail. The Committee will have  
15 signed off in it by Saturday. The rest of that is just getting  
16 the copies available.

17 MR. BUDNITZ: It will not only be valuable, but it is  
18 almost crucial in giving us the extra days to react to it as we  
19 prepare for what we say to the Commission the follow week.

20 MR. SIESS: Anybody who was here during our meetings  
21 will know what is in it. They will all be open, according to  
22 the latest ruling. There has not been any change in that, has  
23 there?

24 MR. MC CRELESS: No.

25 MR. SIESS: Okay. Go ahead.

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1 MR. CORNELL: I would like to point out before we get  
2 into any specific discussions, that you might be interested in the  
3 particulars of our mark. A couple of general comments about the  
4 process we have gone through, this year, is significantly different  
5 than what we have done in the past.

6 In the first case, we are -- have been subjected to  
7 very detailed mission guidance on what type of budget they want  
8 us to submit to them. In some cases, the guidance has been  
9 very general, such as go out and have greater NRC presence in  
10 the reactors.

11 In other cases, Commission guidance has been quite spe-  
12 cific. In the case of reactor safeguards, they directed the EDO  
13 to come down with a budget that does not exceed \$1+ million in  
14 reactor safeguards across the agency.

15 That has put us under a significant constraint. We  
16 have not been under that before in coming up with a budget. The  
17 second factor that has played a role in our decision, at least  
18 in terms of total dollars, is what we view as a significant  
19 change in attitude on the part of the Congress towards NRC's  
20 budget.

21 You only have to look at what is happening in the  
22 current FY '81 budget process, where, for example, the research  
23 budget has been cut almost 20 percent from the program requests  
24 that they originally submitted.

25 They agency, as a whole, has been cut on the order of

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1 10 percent. You get the view that the attitude of the Congress  
2 towards our budget is significantly different than what it used  
3 to be.

4 With that in mind, at some point, we have made a  
5 tactical judgment as to what level of budget is a credible budget  
6 for us to go to OMB and to the Congress to. It is clear that  
7 more research dollars would clearly be better. We could do more  
8 research if you have more funding.

9 Then, there is a tactical judgment as to what kind of  
10 a budget we think we can support in the Congress, given what  
11 has happened over the past year. I think our view is that the  
12 climate certainly has changed from what it has been in the past  
13 years.

14 MR. MARK: Could I ask a question on that point?

15 MR. CORNELL: Yes.

16 MR. MARK: I thought Congress only carried, so far as  
17 decreeing a 10 percent reduction in the agency -- the 20 percent  
18 reserach was an internal response.

19 MR. CONRELL: You are partially correct. The  
20 authorizing committee -- I am speaking of the center authorizing  
21 committee -- cut the agency 10 percent. They specifically,  
22 though directed specific cuts in the research program. In addi-  
23 tion to that, they directed the Office of Research to spend  
24 certain monies for breeders and gas reactors, and did not provide  
25 those additional monies. So, the 20 percent figure is a combina-

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1 tion of the reduction in the total figure, plus telling research  
2 to take money out of programs they had planned to spend them in  
3 and put them in to gas and fast reactors, which one view of it  
4 is a cut in the program request -- I think the exact figure is  
5 closer to 18 percent.

6 MR. FERR: It is not as if one has not been spending  
7 money on gas reactors in the previous year.

8 MR. CORNELL: I'm talking about what research requested.  
9 It amounts to a cut on the order of 18 percent. That, coupled  
10 with -- this is the first time that this agency has been cut  
11 by authorizing committees.

12 In past years, the authorizing committees have  
13 generally added money to our budget. This is the first time  
14 this has happened, to my knowledge. Within these general  
15 constraints, there are a number of other factors that strongly  
16 influenced the EDO initial mark.

17 The first of those was that the Office of Research  
18 submitted to us along with their budget, a list, a prioritized  
19 list of those items they would cut if they were forced to live  
20 within the Commission's PPPG fiscal guidance.

21 We tried to, as much as possible, take cognizance of  
22 what those priorities were and what those items were. In  
23 addition to that, the Commission has directed us and the staff  
24 to go through a new user office procedure, which had all of the  
25 user offices look at the budget and analyze it and determine

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1 which parts of it they would endorse and at what levels.

2 We got very specific endorsement numbers and comments  
3 from the Office of NRR and NMSS primarily. We tried to take those  
4 into account. We did not always find that the user endorsement  
5 priorities and the Office of Research priorities -- they were  
6 not always congruent.

7 Where they were, we tried to follow those fairly expli-  
8 citly. Where they diverged, we made some judgment. In addition  
9 to that, there were some areas where we made some preliminary  
10 judgements based on the overall growth of programs. How much  
11 growth we thought they could sustain.

12 I would like to emphasize during our process, we tried  
13 to minimize our technical judgment over what programs were good  
14 and what programs were not good and tried to rely very heavily on  
15 the priorities served up by the Office of Research and those by  
16 the endorsement offices.

17 Another point I would like to make is, as I said before,  
18 our mark is not final. We are still in the process of resolving  
19 a number of issues. I suspect our mark will change substantially.  
20 We have not reached any decision on LOFT.

21 There is still disagreement between the Office of  
22 NRR, which is suggesting a lower level of funding for LOFT; and  
23 the Office of Research, which would like to have a LOFT budget  
24 on the order of \$48 million.

25 We had some discussion yesterday with NRR and with

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1 Research, and have not reached any final decision on that.

2 We are also trying to assess what the impact of the  
3 initial budget mark would be on up-coming citing rulemaking and  
4 degraded core cooling rulemaking.

5 Those are issues which we are still concerned with, and  
6 are still very much -- have an open view as to changing the marks  
7 that may affect those particular items. Those are just examples  
8 of areas where we are still in the midst of our deliberations.

9 In addition to that, the mark you have before you  
10 does not factor into a memorandum. I recently received from  
11 NRR at the end of last week, which said if Research were given a  
12 budget over and above the PPPG mark, these are the items they  
13 would suggest be increased.

14 There was a memorandum which I do not have with me  
15 right now but goes into detail. That has not been factored into  
16 our mark.

17 By the time we get to our final mark, those kinds of  
18 issues will be factored in. Secondly, as I mentioned before,  
19 we are going to be meeting with the Office of Research on  
20 Wednesday. That will undoubtedly affect our final position.

21 Finally, any views that we can get from the ACRS, we  
22 certainly would welcome. That is all the initial remarks I  
23 have. If you have any questions, I would be glad to get into  
24 any specifics.

25 MR. SIESS: I have one comment. I think it would be

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1 very helpful if you could make a similar set of comments before  
2 the full Committee when they consider this on Thursday.

3 MR. CORNELL: I would be glad to.

4 MR. SIESS: I think this background would be very  
5 helpful and might engender some questions. One question I have  
6 relates to this very significant weight that has been given to  
7 the user office endorsements and priorities.

8 MR. CORNELL: Yes.

9 MR. SIESS: Including some that you have not considered.  
10 Incidentally, I would like very much to see a copy of that. I  
11 think it would be very helpful to us.

12 MR. CORNELL: I think we have one here.

13 MR. SIESS: If we could get copies of that, but with  
14 this weight given to the user office endorsements and with cuts  
15 in the budget level of the kind that are being made -- I am  
16 talking about cuts from requests.

17 Although increases from FY '81 are not very great,  
18 what does this do to the scheme that has been proposed whereby  
19 up to 10 percent of the budget can be used for research origina-  
20 ting in the Office of Nuclear Regulatory Research?

21 MR. CORNELL: My recollection -- I will have to defer  
22 to Jim Blaha, but my recollection is the mark you have before you  
23 has an 87 percent endorsement, 13 percent is not endorsed.

24 That is my recollection as to what those numbers are.  
25 They may be slightly different.

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1 MR. SIESS: We will expect to hear from Research on  
2 that more.

3 MR. CORNELL: I think the other point I would like to  
4 make about the user endorsement is it was our view that in making  
5 an initial cut, that is where we should start; by taking into  
6 account what the user offices want.

7 Then, in looking at Research's priorities, that's  
8 where things should go out. It is clear from here on the mark  
9 will probably increase. This issue is by how much. Our view  
10 was to start out with the level user offices are interested in,  
11 then listen to what research has to say.

12 MR. SIESS: You try to make any distinction between  
13 what the user offices want and what the user offices need.

14 MR. CORNELL: We minimize our interjection of those  
15 views in the process. Though there were some cases where we  
16 did make some cuts because, for example, we found some, what  
17 looked to be, a fair amount of duplication.

18 Risk assessment, I believe, is one area where we made  
19 a cut because our initial was there may be some duplication.  
20 We have not threshed all that out, yet, but there was a signifi-  
21 cant increase in both NRR and Research.

22 The view was that there may be some duplication there.  
23 In that case, there was a question of cutting either NRR or  
24 research.

25 MR. SIESS: Dr. Kerr?



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1 MR. KERR: Mr. Chairman, the material just received has  
2 a hand-written column. Is that FY '82, the hand-written column?

3 MR. BLAHA: The hand-written column shows the additional  
4 placement of \$25 million that NRR -- where they would put an  
5 additional \$25 million.

6 MR. SIESS: Above the PPPG level.

7 MR. KERR: Is it for FY '82?

8 MR. ARSENAULT: That is right.

9 MR. KERR: All right. That's what I wanted.

10 MR. SIESS: Everything on that sheet is FY '82 except  
11 the column headed FY '81. Okay.

12 MR. LAWROSKI: There is no information on waste mana-  
13 gement on those two sheets.

14 MR. SIESS: No, because this came from NRR. Waste  
15 management is NMSS.

16 MR. LAWROSKI: So, is safeguards and fuel cycle. That  
17 is here.

18 MR. SIESS: Safeguards is --

19 MR. LAWROSKI: It is the last one.

20 MR. CORNELL: I think what you have is the decision  
21 unit of safeguards and fuel cycle. NRR addressed the fuel cycle  
22 aspects of that. Most of the safeguards endorsement came from  
23 NMSS, which is on a different document.

24 MR. LAWROSKI: Okay. Will we get the other stuff?

25 MR. SIESS: Apparently, NMSS did not do this. Was

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1 this similar information requested from other user offices, or  
2 was this something that --

3 MR. CORNELL: Yes, we did get user endorsement infor-  
4 mation from other offices. NRR gave more explicit numerical  
5 details. There is a document that was provided by NMSS. A lot  
6 of the numbers that we came up with reflect discussions that we  
7 had with the various program directors in NMSS.

8 It is not clear that we got a list of what the  
9 dollar figure is. Is that right, Jim?

10 MR. BLAHA: That's right. I think NMSS's responses  
11 was more subjective. In our follow-on discussions, they did  
12 indicate specific funding levels. They did not create the for-  
13 mat that NRR did. Our discussions supplemented that.

14 MR. ARSENAULT: In briefings before the Subcommittee,  
15 the Division of Waste Management provided information concerning  
16 their interest in the waste management program. That was provided  
17 to the subcommittee.

18 The fuel cycle division has endorsed all of the programs  
19 in that decision unit, except for a few that have been endorsed  
20 by NRR. In addition, the Fuel Cycle Division has indicated that  
21 we feel they have not requested sufficient funds to cover all of  
22 their needs for fiscal '82.

23 In the Division of Safeguards, this position is less  
24 clear with respect to levels and prioritization.

25 MR. SIESS: Kevin, will there be someone from EDO

bfmt19 1 around during the rest of the day that might wanswer specific  
2 questions as they come up?

3 MR. CORNELL: Sure, we can have somebody here.

4 MR. SIESS: I noted a couple as we went through. I  
5 believe the other people should have a chance to look at this.  
6 They may have specific ones.

7 MR. CORNELL: I would be glad to.

8 MR. SIESS: I noted, for example, that in the waste  
9 management area where there was a request for people, as opposed  
10 to dollars, and where the --

11 MR. CORNELL: This is a research request?

12 MR. SIESS: Yes. Page RES-44, the only page numbers  
13 that you can use are the ones at the bottom right-hand corner.  
14 Those up at the top don't help. They had asked for an increase  
15 from FY '81, 17 people; in FY'82, 24. That was cut back as near  
16 as I can tell. It is a little hard to find out where.

17 MR. CORNELL: Let me mention --

18 MR. SIESS: I just wanted to point out that in the  
19 report last year to the Congress, and I believe to the Commis-  
20 sion, the ACRS made the point that t'ey thought that the man-  
21 power increase in the waste management area was badly needed.

22 That was partly in response to an ACRS request.

23 MR. CORNELL: In regard to manpower, let me make one  
24 general comment, and then one specific one about waste. The  
25 mark you have before you, we did not get into specific discus-

bfm20 1 sions of do we believe that NRR's request in waste for people is  
2 appropriate versus some other?

3 We did not get into the specifics of that. We relied  
4 primarily on the comptroller's office, using a model which they  
5 have developed, tracking the number of people that are generally  
6 associated with certain dollar amounts.

7 We expect to get in specific discussions with the  
8 Office of Research as to whether or not the results of that model  
9 -- how they impact their office.

10 We have not had detailed discussions at all in the  
11 EDO office about the specifics of various manpower requests.

12 MR. SIESS: The point I wanted to make was we devoted  
13 most of our attention to the programs and to the budgets. Our  
14 first report to Congress, we did have some comments about people.  
15 We have made, since then, very few specific comments about  
16 manpower.

17 We realize the budget for people on the budget for  
18 dollars are not related in any way.

19 MR. CORNELL: The other comment I wanted to make about  
20 waste is the Congressional attitude towards waste management is  
21 -- creates some problems.

22 What is going on in the Congress right now is cutting  
23 and complete redirection of what the President's policy was and  
24 what the NRC policy was as reflected in their budget request.

25 The Appropriations Committee significantly cut waste

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1 management staff in NMSS and elsewhere. So, we feel very  
2 tenuous about how we're going to approach the waste management  
3 issue in our budget request because it appears that Congress may  
4 be sending down directors for a complete redirection of the  
5 whole policy.

6 MR. SIESS: The redirection is a de-emphasis?

7 MR. CORNELL: The redirection is a de-emphasis in  
8 spending both dollars and devoting staff.

9 MR. SIESS: In NRC or other areas as well?

10 MR. CORNELL: It is my understanding that this cuts  
11 across both DOE and NRC.

12 MR. SIESS: Is there any logical explanation for that  
13 in terms of the public's attitude toward nuclear waste?

14 MR. CORNELL: I am not sure I would direct those  
15 questions to the Congress.

16 MR. SIESS: Do you think I would get any better answer?

17 MR. CORNELL: I am not sure.

18 (Laughter.)

19 MR. LAWROSKI: Aren't they listening to the public?

20 MR. CORNELL: I don't know. I assume they are.

21 MR. SIESS: Not the same public we are listening to,  
22 probably. Dade?

23 MR. MOELLER: This is a basic question. I find these  
24 issues hard to follow. On page RES-44, which we are looking at,  
25 you go down halfway on the page and you have a line that gives

bfm22

1 budget numbers. Now, do those budget numbers --

2 MR. SIESS: It applies to the item that follows it.

3 MR. MOELLER: Why don't they put a line or something  
4 so you know which money goes with which item?

5 MR. CORNELL: I asked the same question.

6 MR. MOELLER: To me, it is logical to read the  
7 description, then look at the budget.

8 MR. SIESS: Yes. Logic will not help you on this.

9 MR. KERR: If you will just stand on your head, then  
10 you will be okay.

11 MR. SIESS: Paul?

12 MR. SHEWMON: In a different vein, I notice the NRC  
13 went in --

14 MR. SIESS: What page? Look in the bottom right-hand  
15 corner.

16 MR. SHEWMON: I'm on a different sheet. It is not ger-  
17 mane. You don't have to see that for the question. Basically,  
18 fast reactors and advanced converters is another area where the  
19 Administration went in for zero.

20 From what I have heard, Congress is putting money in  
21 at the -- at the authorization and appropriation level.

22 MR. CORNELL: That is correct. I think they have  
23 upped the ante, by about \$17 million in '81 for fast and gas.

24 MR. SHEWMON: At what point does the NRC start planning  
25 to use some of that?

bfm23

1 MR. BUDNITZ: We have contingencies to spend money in  
2 fast reactor safety at a series of levels from \$5 million, which  
3 is a phase-out to the full \$22 million, which would be the  
4 highest number under consideration on the Hill, and levels in  
5 between.

6 We are not going to spend any of the new money until we  
7 see it. We are working hard to try to keep a stable program so  
8 that if we get it we will not have too much disruption. We  
9 have our foot in the bucket in case we get clobbered and are  
10 told to phase it out.

11 That turns out to be a non-trivial exercise in mana-  
12 gement, which Tom Reilly and Charlie Kilbert are exercising  
13 to their great credit.

14 MR. SHEWMON: The '81 budget is not approved, yet. Is  
15 that correct?

16 MR. CORNELL: That is correct. There has been an  
17 authorization mark on both sides. The Appropriations Committee  
18 has acted on the House side. Have we gotten the Senate marked  
19 yet?

20 VOICE: No, we will not have the Senate mark until  
21 after the Congress re-convenes.

22 MR. CORNELL: It is this uncertainty as well as the  
23 waste management area where we are faced with directives coming  
24 from Congress to re-orient our thinking.

25 MR. SIESS: Dr. Kerr?

bfm24

1 MR. KERR: On page RES-32, the statement is made  
2 concerning the fast reactor part of the requested budget. It  
3 is recommended by EDO that this program not be funded since it  
4 would be contrary to current Commission policy. What is the  
5 current Commission policy?

6 MR. CORNELL: What we were reflecting in that state-  
7 ment is the fiscal -- the guidance given and the PPPG which says  
8 that fast and gas reactor effort will be phased out in '82.

9 MR. KERR: That is Commission policy, not somebody  
10 else's policy.

11 MR. CORNELL: That is Commission's policy. That is  
12 correct.

13 MR. SIESS: Congress has had the practice of saying  
14 you should do something about fast and gas, but not providing  
15 money for it.

16 MR. CORNELL: Which is what happened in '81.

17 MR. SIESS: I noticed that the EDO is emulating that  
18 somewhat doubtful policy by eliminating funds for gas, but  
19 saying that Reserach should identify sufficient resources to  
20 support NRC's Fort St. Vrain responsibilities.

21 MR. CORNELL: Let me tell you the rationale behind  
22 that. They have not identified to us what level was needed to  
23 support Fort St. Vrain. What we are stressing is that -- in  
24 discussions with research, they will identify wht they need.

25 Our expectation will be to increase that mark based



bfm25

1 on what they tell us.

2 MR. SIESS: I see. That is helpful. Any other ques-  
3 tions?

4 (No response.)

5 Thank you very much. Does that cover everything from  
6 the EDO's office? Carson?

7 MR. MARK: I thought Kevin would be going through  
8 something in more detail. It is true that the Administration,  
9 the OMB, and the Commission write down zero for advanced reactors  
10 at every opportunity. Congress says no, that should be \$15  
11 million.

12 Why would it not -- why would it not, from the EDO's  
13 point of view, be better to put in \$15 million for advanced  
14 reactors so you don't have to subtract it from an otherwise  
15 cut total by the time --

16 MR. SIESS: OMB will take it out.

17 MR. MARK: One should not, in my view, concur in a wrong  
18 decision, even if it is going to be made that way.

19 MR. CORNELL: In this particular issue, we took the  
20 position -- this was a Commission position. We were not making  
21 a judgment one way or the the other, whether fast and gas reactors  
22 should be spent.

23 MR. MARK: This has resulted in part in this 20 percent  
24 shift in an otherwise well-considered, let us say, total  
25 research budget through no fault of its own.

bfm26

1 MR. CORNELL: Correct. I still repeat that we did  
2 not make a policy judgment as to whether or not fast and gas  
3 were -- we were merely responding to the Commission directive  
4 that it be phased out in '82.

5 It is a policy level, which is appropriate for the  
6 Commission to address.

7 MR. MARK: So, complaints about this belong to the  
8 Commission?

9 MR. CORNELL: That is correct.

10 MR. SIESS: Last year, that was handled as a set-aside.  
11 I did not see any set-asides in here. Has that procedure sort  
12 of been dropped?

13 MR. CORNELL: Yes. We have made a conscious decision  
14 to try to at least make judgments where we could. I think the  
15 process was easier in this instance, because we did have fiscal  
16 guidance.

17 For example, in the fast reactor area, we did not have  
18 to make a judgment. We had guidance before us.

19 MR. SIESS: From the PPPG?

20 MR. CORNELL: That is correct. There may be areas  
21 where there are some set-asides. Right now, LOFT is a set-aside  
22 because we have not reached a decision. Our view was to minimize  
23 the number of set-asides and at least make a tentative decision  
24 on our part as to what we recommend to the Commission.

25 In the case of gas and fast reactors, we were following

bfm27

1 what the policy directives were from the Commission.

2 MR. KERR: On page RES-29, having to do with fuel  
3 melt behavior. The statement is made that the staff recommends  
4 a 3000 k reduction, since program requests are larger than the  
5 original estimate of task action plan 2-B-5. A copy of that  
6 task action plan that I was able to get seems to have numbers  
7 for FY '81. I do not see numbers for FY '82. What am I  
8 missing?

9 MR. CORNELL: What you are missing, as I understand it,  
10 is the original draft, the earlier draft of the original task  
11 action plan and budget figures for FY '81, '82, and into the  
12 out years.

13 In the later versions of the draft, the out year  
14 estimates were dropped. So, in the final version of the task  
15 action plan, there are not any out year numbers, but looking  
16 back over what the task action steering group decided was an  
17 appropriate level of funding, we took that as our initial mark.

18 We are hoping to hear from the Office of Research  
19 whether or not that mark was reasonable or not. That is where  
20 we left the burden of proof.

21 MR. KERR: Thank you.

22 MR. LAWROSKI: May I ask Mr. Arsenault whether the  
23 numbers we got at the Subcommittee meeting on waste management  
24 dated June 23rd still hold, including what was added by you at  
25 the end of the meeting in terms of NMSS support -- the NMSS

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bfm28

1 priority. Have there been any changes since June 27, the time  
2 of the meeting?

3 MR. ARSENAULT: The numbers still hold with regard to  
4 the planning document, the BRG mark -- the EDO mark is at a  
5 level that corresponds to that level endorsed by the Division  
6 of Waste Management and the Division of Fuel Cycle Licensing.

7 We are reclaiming only a small portion of the  
8 increment between that level of endorsement and the full level  
9 originally requested prior to the coordination exercise that  
10 accompanied the endorsement procedure.

11 MR. MOELLER: In your opening remarks, you refer to  
12 the funding for plant safeguards.

13 MR. CORNELL: Yes.

14 MR. MOELLER: What are those?

15 MR. CORNELL: The PPPG guidance sent down a fiscal  
16 constraint on all monies used for program support for plant  
17 safeguards -- that that should not exceed \$14 million. I believe  
18 that actually applied to fuel cycle as well as plant. They put  
19 a ceiling, essentially, on the total budget within the -- across  
20 the agency, both research and NMSS for safeguards program support.

21 The budget you have before you exceeds that \$14 million  
22 by about \$700,000.

23 MR. SHEWMON: Safeguards means security and sabotage  
24 prevention?

25 MR. CORNELL: Yes.

bfm29

1 MR. SIESS: Any other questions?

2 (No response.)

3 Thank you very much, Kevin. Bob, you are down here for  
4 an hour. What I think we would like is pretty much of an over  
5 view of the major problems of the EDO mark as you see them.

6 Kevin has raised some points. I think you have some  
7 stuff on your reclamer already. Then, what I would like to do  
8 is to go through -- well, we will hear from NRR, I believe.

9 Then, I would like to go through essentially item by  
10 item. I would like to remind the subcommittee members that I  
11 propose that we have a very general statement at the beginning  
12 of this report. I think I called it introduction.

13 Dade drafted something up on that. You should have  
14 it in your material by now. It's -- let me identify it. It is  
15 marked Part I, General Comments. It is headed draft II, DOCPS.  
16 Does everyone have that?

17 MR. SHEWMON: I don't find it. Can somebody hold it  
18 up? The only thing I have has LOCA and Transient Research on  
19 the top of it.

20 MR. SIESS: Just keep looking. Anybody who has found  
21 it, please raise their hand.

22 MR. SHEWMON: That puts me in good company, anyway.

23 MR. MC CRELESS: I do not have one either.

24 MR. SIESS: It was passed out. It looks like this.

25 (Indicating.)

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bfm30

1 MR. MC CRELESS: I do not have one, either.

2 MR. SIESS: The thing is, the reason it said Part I  
3 is I am trying to divide this report up into two parts. General  
4 Comments and Specific Comments, so that the specific comments  
5 can be numbered in accordance with decision units to keep us  
6 from getting all fouled up.

7 MR. SHEWMON: What did you call it?

8 MR. SIESS: It is headed Part I, General Comments. These  
9 are some general comments that were prepared by Dave. I will  
10 want to discuss those with the Committee to see how many we  
11 agree with, or disagree with.

12 MR. LAWROSKI: Is this it?

13 MR. SIESS: You do not have it. Does everybody under-  
14 stand that? You do not have it.

15 MR. LAWROSKI: A moment ago, we really had it.

16 MR. SIESS: Well, there was confusion. We will discuss  
17 that first; the very general comments about what the Committee  
18 would like to say.

19 If we agree with them, fine. We will see that the  
20 remaining chapters agree. If we do not agree, we will change  
21 it. Then, we will go through item by item.

22 So, with that introduction, Bob, do you know what  
23 you want to say?

24 MR. BUDNITZ: Yes.

25 MR. SIESS: All right.

bfm31

1 MR. BUDNITZ. Thanks, Chet. You have me down for  
2 an hour, but I think I can cover the key points in about 15  
3 minutes.

4 MR. SIESS: You'll have a lot more than an hour before  
5 you get through.

6 MR. BUDNITZ: I know, but I want to try to talk about  
7 some of the overview issues quickly. Then, when we get into the  
8 specific details program by program, why we can take as much  
9 time as you need.

10 So, let me start by describing the philosophy of our  
11 budget preparation, and where we differ in our budget prepara-  
12 tion philosophy from the philosophy that Kevin talked about  
13 in their mark.

14 I have to apologize to Kevin and Len Barry and the  
15 people who are working with the Executive Director on the mark,  
16 because they have not heard some of the stuff that I will say  
17 to you. That is for tomorrow. That is a timing problem that  
18 is just an unfortunate glitch in schedules.

19 Secondly, I have to apologize because we are still in  
20 the process of thinking through some of these things ourselves  
21 with the user offices. That does not mean that we have no views  
22 of our own, but interacting with them, we have learned some  
23 things.

24 That is going on every day. However, you have to  
25 appreciate that I see the Office of Research's role in this

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bfm32 1 whole thing as that of a protagonist. I will explain what I mean  
2 by that.

3 You see, Kevin started by saying that they began with  
4 the Commissioner's PPPG guidance because, to them, that is  
5 Commission policy. I think that is great and admirable.

6 I happen not to agree with some of the PPPG guidance.  
7 My goal in this budget exercise is to convince the Commission  
8 where we do not agree that our view is the proper one.

9 MR. SIESS: I might add that the ACRS has not been  
10 asked to comment on the PPPG guidance. Therefore, has not, so  
11 far as I know, any official position on it.

12 MR. BUDNITZ: On the other hand, some of you may recall  
13 conversation with me standing here, perhaps, a month ago in which  
14 some of my views on the PPPG guidance emerged.

15 It is in the record for those that want to go and  
16 see it. I will say a little more about it here. You see, the  
17 PPPG guidance developed in February, but actually a process that  
18 began in the fall, contains numerical limits, ceilings and floors  
19 of certain kinds that are intended to govern the budget prepara-  
20 tion.

21 While that guidance has been useful, because it tells  
22 me where the Commissioners, at that time, thought the thing  
23 should come out, I believe that I have a statutory obligation  
24 which I have exercised to recommend to the Commissioners the  
25 research that I believe the agency must do to satisfy its over-



bfm33

1 all mission.

2 That is what we have done. If those numbers are  
3 higher than the PPPG, that is a statement that I believe exerci-  
4 sing that statutory responsibility that the numbers they gave  
5 us are not high enough to satisfy the agency's mission.

6 That is a fundamental philosophical difference which  
7 you must understand and which I will explain tomorrow to the  
8 EDO and to the Commission later this month.

9 Secondly, we feel terribly disturbed by the Congres-  
10 sional constraints that Kevin talked about. We are glum, but  
11 trying to be realistic. The question that confronts us is  
12 whether in the face of Congressional cuts for the first time in  
13 the authorization committee and of sepcific area and program  
14 guidance in Congressional numerical budget that we have received  
15 -- the question is whether in the face of that we should  
16 realistically tone our request down to something we can sell,  
17 or whether we should attempt to fight it.

18 Fight it means to fight for what we think is right.  
19 My specific attitude has been the latter. Although it could be  
20 argued that that is politically unrealistic, I would like to  
21 make a point, which is that in some areas it may be politically  
22 exactly right; while in others we may just get clobbered. It  
23 may, in fact, hurt us overall.

24 In talking about this, we have not been ignorant of  
25 Congressional attitudes, and the sort of change that we see in

bfm34 1 the Congressional deliberations in the last six or nine months.

2 I will come to that specifically about fast reactors.  
3 It is true of other things too. I will come back to that.

4 The next point has to do with the question of priorities.  
5 We did submit to the budget review people a prioritized list  
6 of important items. We began by saying that the budget we would  
7 prepare was what we thought the agency needed. It turned out to  
8 be \$283 million or some number like that -- that is just right,  
9 \$283.6.

10 We prepared for them a priority list of where we  
11 would take cuts if we were forced to take cuts to some numerical  
12 limit. A numerical limit determined not on the basis in our  
13 view of program content, but on the basis of some other political  
14 reason. I fome guy says you cannot get 283, you can only get  
15 271, we submitted what we would do with that \$12 million.

16 The philosophy there was that if somebody has a number  
17 in their head or pulled one out, or it is dictated, then that  
18 is where we would do it. I think we submitted to the ACRS  
19 Subcommittee that list.

20 In any event, I have it here. You can have it. It  
21 shows, for example, that if we could get only a small amount  
22 above the PPPG, the first thing we would fund was LOFT, if we  
23 were doing it.

24 It also shows the first things we would give up if  
25 we were to be reduced below our 283. You can see all that. Now,

bfm35

1 I think that is important for you to recognize because it shows  
2 that while we have submitted a budget that we think is what  
3 we need, we are realistic enough to know we are probably not  
4 going to get 283.6.

5 If we are going to take \$2 million less than that, it  
6 tells you what the first thing is to take off and so on.

7 The next point to discuss is the whole question about  
8 the user endorsement office procedure. Here we have sort of a  
9 difficult time working through a procedure for the first time.  
10 YOU see, this is the first time that we have ever been asked by  
11 process to obtain an endorsement of the budget at this stage.

12 Previously, there was no endorsement at this stage.  
13 Endorsement came on a project by project procedure at the imple-  
14 mentation stage. When we were ready to implement something, we  
15 obtained their endorsement.

16 Often, that endorsement process began much earlier  
17 with requests and with iteration. In any event, endorsement  
18 was never sought or obtained at this stage in such a systematic  
19 way.

20 What we have found that is in the process of obtaining  
21 these endorsement, we have learned a lot more about the user  
22 offices needs, and their view of our budget than we had if it had  
23 not been there. That is great.

24 In fact, it is one of the healthiest things that has  
25 gone on because we have obtained the sort of feedback that was

bfm36

1 never possible without it, because we could not get their atten-  
2 tion. Frankly, we did not ask for their attention.

3 You have to appreciate that both are important issues.  
4 Now, if I have a regret, it is that I have no direct way of  
5 commenting on their budget. That strikes me as a kind of  
6 curious anomaly, but it is true. The excuse for that is "Well,  
7 we really do not compete with each other. We are after dollars,  
8 they are after people. We are supposed to support them and  
9 all that stuff."

10 I do not want to get into a long discussion here about  
11 what is wrong with what I just said. I think it should be trans-  
12 parently obvious. Not only that their perusal and scrutiny and  
13 comments on our budget are vital to its development -- of course,  
14 they are -- but the whole of the agency ought to look at the  
15 whole budget and talk about it goether.

16 MR. MOELLER: Can you give a few examples of other  
17 budget areas, or budget areas of other groups that you would --  
18 could offer comment on?

19 MR. BUDNITZ: Yes. The first that comes to mind is  
20 the one area in the budget where substantial research is going  
21 on in another office. That is the NMSS waste management program.

22 MR. MOELLER: Thank you.

23 MR. BUDNITZ: I can give other examples in the  
24 regulatory area that are just as important. For example, the  
25 AOD operation has substantial potential overlap with the sorts

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1 of activities we carry on.

2 MR. KERR: What is that?

3 MR. BUDNITZ: Analysis of operational data Carl  
4 Michaelson's new group. SEcondly, NRR is beginning, than God,  
5 a major effort in risk assessment. There, we have substantial  
6 inputs. So, the situation is not in bad shape. In fact, in the  
7 kind of cross-cut approach to budget preparation, Bob Bernero  
8 has played the lead for the agency there. So, we are cognizant  
9 of it.

10 Let's go into the things that might seem quite far  
11 afield, like inspection. They say, "Why should research comment  
12 on Vic Stello's budget?"

13 I might pose to you that we might have some insight  
14 from the activities we carry on in a whole long list of things  
15 ranging from soup to nuts that might provide the sort of in-  
16 sight on whether the inspectorate is too large or too small, or  
17 putting its eggs in the wrong basket.

18 I must say that although I have had nuemerous conversa-  
19 tions with those people informally, there is no formal budget  
20 mechanism for doing that. I am going to complain about that  
21 to the Commission because I think that is kind of a bad way to  
22 do business.

23 I complained about it last year in trying to convince  
24 them that the correct way to review the budget was to have the  
25 office directors do that themselves. It has not happened. It

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is still a mistake. It remains a mistake.

1           And I hope and pray the 1983 budget is put  
2 together differently. The correct way to do that is to have  
3 the office directors chosen and appointed to bear the  
4 responsibility to run the agency and put the budget --  
5 themselves.

6           All right. Now, that is nobody's fault that is  
7 doing this, but it is a problem at the top, the top meaning,  
8 of course, the Commissioners, and which I have discussed  
9 informally from time to time. Maybe it will get fixed up  
10 next year. However, I am grateful for the fact that the  
11 people in the group who looked at this budget this time -- I  
12 mean, Kevin and Len Barry and Jim Blaha and a whole range of  
13 people we have been working with, have been as clear, you  
14 know, now, about how the process works.

15           We wished we understood it before, but everybody  
16 is kind of feeling their way through this, and I guess now  
17 in what is the second week -- I guess the second week in  
18 July, we understand just what went into it, and we know just  
19 exactly then how to formulate the thoughts about the way we  
20 want to proceed.

21           You see, it is perfectly valid for someone who is  
22 trying to figure out what to do to ask NRR. In fact, if  
23 they did not ask NRR, they would be making a bad mistake. I  
24 think that is great.

25           So, with those general thoughts, I think what I

1 would like to do is talk about a few key issues -- a few key  
2 budgetary issues, and then we can get into them one by one.  
3 However, I just have to get back and reiterate, I think  
4 through no fault of anybody's that is in this room, the  
5 process is fundamentally flawed, because the office  
6 directors are not putting it together themselves.

7           It is also fundamentally flawed because the  
8 interaction between us and the other offices was  
9 insufficient. Now, that second flaw will be cured next  
10 year, because the budget process next year will begin  
11 earlier. We are bound by our promise to do so, to submit a  
12 long-range plan early enough each year, beginning next year,  
13 so that the long-range plan and the budget preparation  
14 become an integral part of the same procedure.

15           If that occurs properly, that second criticism of  
16 the 1972 budget preparation we are in the middle of now will  
17 be obviated. I think that is great. The first thing is  
18 still not right.

19           Okay. Now, let me then talk about the issues -- a  
20 few of them, and we will --

21           MR. CORNELL: One thing you ought to realize, what  
22 you have before you is a two-year budget. We will not go  
23 through the same budget process next year, because Congress  
24 has directed us to, as well as OMB, put together a two-year  
25 agency budget.



1           The process next year, we will be looking at  
2 making modifications to what we have decided this year. It  
3 will not be a complete redo.

4           MR. SIESS: I think the ACRS has been informed of  
5 that, and there has been no plan -- I suspect it may be too  
6 late to change -- to comment on this as a two-year budget.

7           MR. BUDNITZ: Chet, I do not think we have behaved  
8 this year in a way that is very much different from whether  
9 or not that is a two-year budget or one-year budget. Next  
10 year, it will be different. This year, we have been trying  
11 to get the 1982. We have been trying to make 1983 fit 1982,  
12 by noticing trends and making sure the trends are all  
13 pointing in the right direction, but it is clear to me that  
14 our behavior has not been affected very much by what Kevin  
15 said, and I think that what that means is that even though,  
16 yes, this is a two-year budget, next year you will be back  
17 here looking at a 1983 budget that will be thought of  
18 perhaps as different, but you know, it is only the  
19 differences we are talking about anyway, as you see when we  
20 come to the issues.

21           MR. SIESS: We have enough trouble looking two  
22 years ahead. I think looking three is going to be --

23           MR. BUDNITZ: Yes, of course. Authorizations may  
24 be two years, but appropriations are going to be annual in  
25 any event. At least that is my understanding.

1 Appropriations must be annual by the Constitution, in fact,  
2 except for ships. Do you people remember that?

3 MR. SIESS: We are still committed to commenting  
4 to the Congress on an annual basis.

5 MR. BUDNITZ: Okay, let me talk about issues. I  
6 can start --

7 MR. MOELLER: That is the example of the floating  
8 nuclear plan.

9 (General laughter.)

10 MR. BUDNITZ: I do not know where to start, but I  
11 guess I will start with people. You see, the mark we've got  
12 on people is kind of curious to us, because it clearly just  
13 gave us the number we had in 1981. Obviously, there is no  
14 other way they would hit the number 178 on the head. That  
15 would be a low probability event by doing it that way, and I  
16 believe that our needs in the area of people are different  
17 than the mark they gave, and I will just point out two or  
18 three areas where this is clear to us.

19 The first and most obvious is in systems  
20 reliability analysis, our risk assessment work, our  
21 reliability studies, and so on. Where the 1981 budget --  
22 1981 President's budget has 29 people and the mark has 27,  
23 in the face of what they give us, there is a substantial  
24 increase from \$11 to \$12 million, and we want 24 and some  
25 change.

1           It is my view, and a view shared by essentially  
2 the whole Office of Research unanimously that that whole  
3 staff there is dramatically increased in its  
4 responsibilities, and the complexity of its operation and  
5 needs more people, and that mark is inevitable. The people  
6 are needed to manage substantial research funds that are  
7 increasing. People are needed to carry out in-house  
8 analysis, and they are most importantly needed to do what  
9 Bob Bernero calls spreading the gospel. That is, turning  
10 the skills of systems reliability analysis from skills  
11 maintained and developed substantially within our office to  
12 skills used everywhere in the agency.

13           Taking skills that we have and making sure that  
14 NRR and NMSS and IEE and Standards possess those skills, and  
15 in our view the responsibilities are growing enough so that  
16 our budget increases is, in my view, completely, obviously,  
17 justified.

18           I do not want to argue about whether 37 is the  
19 right number or 36, but the point is that going from 29 to  
20 27 is exactly wrong.

21           The second place where we need people -- the mark  
22 -- plant operational safety, where we are undertaking a  
23 number of activities that are different in kind from  
24 activities now carried out. For example, we are developing  
25 new programs in instrumentation, electrical systems,

1 controls, power systems, and so on, programs where we have  
2 no or insufficient expertise to carry them out. We need  
3 people to do that. We are beginning new programs in human  
4 factors, man-machine interface, other operational safety  
5 questions where we do not have a single soul in the whole  
6 office that has any of this expertise.

7 MR. KERR: If I wanted to follow the numbers that  
8 you are quoting, is there some document I should be looking  
9 at?

10 MR. SIESS: The second page of the handout.

11 MR. BUDNITZ: The second page of the handout. We  
12 just believe, again, responsibilities are growing. We need  
13 more people.

14 Ron Scroggins is trying to tell me something.

15 MR. SCROGGINS: The vu-graph.

16 (Slide.)

17 MR. BUDNITZ: Now, those are the two areas I just  
18 talked about. There is that ten and there is that plant  
19 operational safety. The five there is fast reactors. I  
20 will come to that in the context of fast reactors in a  
21 minute, and then, if you notice, safeguards and fuel cycle  
22 safety, we are trying to go from 14 -- well, we started with  
23 16, but if they want to cut the budget a little bit, we will  
24 take 14, and they want us to go from 14 to 10, and again, we  
25 just cannot see how we can go from 14 to 10 in an area of

1 safeguards and fuel cycle safety that is growing in effort  
2 several percent.

3           And then finally in LOCA and transient research,  
4 where you see the 29, and the mark is 23, and we backed off  
5 to 27, that is coming down quite a bit, and if you remember,  
6 the trends over a multi-year period, the LOCA and transient  
7 research is going to come down more the following year, but  
8 the fact is, we really need the people in that area to  
9 continue to do the work.

10           The fact that the budget is coming down is  
11 different from saying that our work is coming down.  
12 Especially in the next year or two we need people in LOCA  
13 and transient decision unit to tie together the things that  
14 we are learning in the program, not just to write the rules  
15 and see that the stuff is implemented, but to tie together  
16 the technical information we are gathering.

17           The budget shows a turnover, but the fact is that  
18 this year and next year and last year are the most fruitful  
19 years we have ever had or will have in this whole program.  
20 It is the time when we are finally picking the peaches off  
21 the peach tree, and that metaphor is about right. It has  
22 taken nearly a decade, and we need the people to do that  
23 analysis, and so that is that point. The other things are  
24 smaller, except for fast reactors, which I will come to.

25           Now, I suppose what I would like you to understand

1 here is that you notice the total is 178 and that is the  
2 same number as before, and anything you could do to  
3 understand with us area by area the technical reasons why we  
4 need the people, and then with that understanding give us  
5 any advice, that is great.

6           You may conclude, for example, that we probably do  
7 not need as many people -- you may; I hope not -- in that  
8 first one, in which case you can say, if someone will listen  
9 -- make them pay attention.

10           I want to finish the conversation about the  
11 people, I want to get on to some issues on the next slide.  
12 I want to finish the conversation about the people, with the  
13 reiteration of a frustration which I feel, which I told you  
14 about last month.

15           That is, the whole agency has too many people. I  
16 do not know whether it is off by a factor of two, but it is  
17 certainly off by some nice factor compared to what it would  
18 have if any one of us by himself could run the agency  
19 without the Mickey Mouse the agency engages in. We all know  
20 that is not realistic. It is like shouting into the wind on  
21 a beach. You cannot even hear it yourself. Right?

22           The fact is, it is true. The other fact is that  
23 while those with a 10 or 20-year experience in the  
24 government have a complaint where they say, gee, it ain't  
25 like it used to be, and they know that, and everybody in the

1 room knows that.

2           You may know I am going home after two years. I  
3 want to tell you, in the two years I have been a substantial  
4 and noticeable increase to me, and that means the effect is  
5 real over a very short time span in the context of a  
6 lifetime of a civil servant. It is going to get worse next  
7 year. It is going to get worse the year after, because of  
8 things that are going on that have been begun, and my view  
9 is that another part of the single most important things  
10 that the agency ought to do at the top in planning its  
11 budget is to try to figure out what the budgetary impacts  
12 are of the Mickey Mouse they are still continuing to impose  
13 or that is still continuing to be imposed on the Hill,  
14 because those budgetary impacts are only a few percent every  
15 time, but there are three or four every year, or whatever.  
16 I don't know what they are. The 10 percents add up.

17           Just to tell you about the impacts in the Office  
18 of Research, because the other guys have to talk to you if  
19 they want to about their own, in talking to my own people  
20 within the office -- there are 160 or so of us -- I am  
21 continually impressed by the fact that technical people,  
22 engineers and scientists mostly, find themselves demoralized  
23 and deprived of their ability to do technical work by  
24 demands on their time that seem to them -- and I reiterate  
25 -- seem to me unproductive.

1 I will not go into that any more. As I said,  
2 shouting into the wind on a beach. But anything that the  
3 ACRS could do to identify such areas with us and then write  
4 anything about it would be of great use, because I cannot do  
5 it myself.

6 Let me get on to the program. By the way, a lot  
7 of that increase, you know, I could run that Office of  
8 Research if I had my own way. I won't say with half the  
9 people, because we need technical disciplines, but it is  
10 unbelievable. Enough said.

11 MR. MOELLER: What does the heading in the next to  
12 the last column mean?

13 MR. BUDNITZ: The "reclama?"

14 MR. MOELLER: Yes. What does that mean?

15 MR. BUDNITZ: This is the mark that we got the  
16 other day from Kevin and the people with whom he worked,  
17 that is, the reclama, which is how much we want back, which  
18 means we scaled our request down from this to that  
19 (indicating). That is also true on the first slide.

20 (Slide.)

21 MR. BUDNITZ: Let me put up the major issues one  
22 after another, and then we will get to them later, but here  
23 are the major issues. The major issues are that in systems  
24 and reliability analysis, we have more to do in specific  
25 things than we have been allocated budget to do. You can



1 read what they are. We will get into them.

2 Fast and gas reactors, we feel we must maintain a  
3 base program, and that is not just \$10 million, but it is  
4 five people and \$800,000 in equipment. The program is  
5 either going to be whole or it is not. It is a Commission  
6 decision in which you people have generally supported our  
7 view that it ought to be done and it ought to be done right,  
8 and that will emerge as we talk.

9 I can only guess again that your attitude will not  
10 be very different than it was before, and Charlie is saying  
11 something --

12 MR. KILBERT: I don't believe that the statement  
13 made to you earlier was correct, that PPPG represents  
14 Commission policy. Policy was expressed in their testimony  
15 to Congress.

16 MR. BUDNITZ: On the other hand, Commission policy  
17 within the PPPG itself said zero.

18 MR. KILBERT: That was because of a very naive  
19 view of what was characterized by people who draft such  
20 documents. I prefer to go on what the Commissioners said  
21 rather than what some naive person wrote in a document. I  
22 must say I question whether any of us who came down here to  
23 do a job, to support the licensing of reactors, has any real  
24 future with this agency. If the PPPG actually represents  
25 policy, I wonder whether the reactors should continue to be

1 licensed.

2 MR. BUDNITZ: I have my doubts about whether we  
3 can satisfy the agency's mission in 217, which is where they  
4 came out. That is the first thing I said. I believe I had  
5 a statutory obligation. It is not just 217 is too low by  
6 itself. In detail it is wrong. That is what a lot of this  
7 is.

8 Now, besides which, the fact that the PPPG was  
9 adopted in February does not mean that the Commission will  
10 not again endorse fast reactors in August. I hope they  
11 will. In fact, I will be blunt. I assume they will. I had  
12 just as soon they will, as they did last year.

13 Plant operational safety, the budget mark would  
14 eliminate for us some very important tests. We believe in  
15 high pressure thermal shock, and primary system integrity  
16 issues that NRR did not endorse and which mystify us.  
17 Seismology and geology, the budget mark so far would  
18 substantially reduce our ability to continue with our  
19 ability --

20 MR. KERR: Excuse me --

21 MR. BUDNITZ: We think that is an important part  
22 of our seismic understanding.

23 MR. KERR: You said NRR did not endorse, and that  
24 mystifies you. I assume you do not know why they did not  
25 endorse it.

1           MR. BUDNITZ: We talked to them, but we are  
2           mystified by the basis for their decision. I understand  
3           it. I would not have done it myself. Obviously, we are  
4           going to try to convince people that it is not appropriate.  
5           The decrease from 53 to 35 in the seismology and geology  
6           area would reduce our capability to do this sort of work. I  
7           said that Jerry Harper has, I know, described to you, we  
8           have these networks all over the east, and we are not going  
9           to be able to do that properly, and that is a real problem  
10          for us which I hope we can get into in detail.

11          The fuel melt behavior, we believe that we are  
12          going to in any event have a difficult time supporting that  
13          rulemaking, the degraded core rulemaking. Even with the  
14          budget numbers we have requested, we are going to have a  
15          difficult time supporting it, because there is not enough  
16          time, and we don't have the technical basis to put together  
17          the sort of program that we would have if we had begun this  
18          work earlier, and if it had a long history of a lot of  
19          workers in the field. There are not many workers in this  
20          field.

21          The notion of cutting that budget below even what  
22          we have requested, which is going to be hard to put together  
23          to support that rulemaking just strikes us as being a  
24          significant compromise on an important issue.

25          Finally, in LOCA and transient research --

1           MR. KERR: Are you going to make a comment on the  
2 apparent reason for dropping it, which was that it did not  
3 appear in the task action plan at the level --

4           MR. BUDNITZ: I said on all these we can come  
5 back. We have the rest of the day to cover these, one at a  
6 time. In LOCA and transient research, we show a substantial  
7 decrease from 71 and something to 59 and something. We  
8 think that decrease is a clear indication of the Office of  
9 Research's policy that this work, while important, does not  
10 require the sort of major expenditures it has in the past.

11           Large LOCA work is coming all the way down. It  
12 has been replaced in important ways by small break studies,  
13 operational transient studies, but these are thermal  
14 hydraulics and related work, fuel behavior and so on. We  
15 believe cutting it from 71 to 52 is too fast a drop, that it  
16 will compromise significant programs that we have to do, and  
17 we will tell you about that, and it is just not orderly  
18 enough, despite the fact that it is now suddenly quite  
19 unpopular.

20           By quite unpopular, I mean that when NRR -- you  
21 have the memo -- when NRR was providing priorities for all  
22 the different areas that they oversee that are only part of  
23 our budget, but the major part, they put LOCA and transient  
24 research last, sixth out of six. Of course, they put siting  
25 fifth out of six, despite the fact that we are trying to do

1 a siting rulemaking next year, and we are trying to tie the  
2 rulemakings on siting and degraded core and Class 9 and all  
3 that stuff together. They put it fifth out of six again. I  
4 guess something has to be fifth out of six, but I kind of  
5 think it is important.

6 So, the basic notion here which I want to try to  
7 cover for you is that for each of these we have technical  
8 discussions which I would go into at your leisure. I have  
9 to come back to LOFT before I am done. I won't forget  
10 LOFT. It is real important. It is not on this list. Their  
11 mark was the 48 -- Their tentative mark was the 48 we asked  
12 for, but I believe LOFT is still in jeopardy before we are  
13 done with this, and I want you people to understand that I  
14 think LOFT is important.

15 MR. SIESS: Bob, just let me interject one  
16 question. You mentioned rulemaking in connection with the  
17 research, the degraded core rulemaking that is proposed, the  
18 siting rulemaking, and the idea seems to be that the  
19 research will or could or should be done before the  
20 rulemaking, and this seems historically backwards.

21 I am thinking about the emergency core cooling  
22 rulemaking,

23 MR. BUDNITZ: Part 100.

24 MR. SIESS: A tremendous amount of research which  
25 is now being phased out, so would you care to comment on the

1 role of research in relation to rulemaking.

2 MR. BUDNITZ: Yes, yes. Mr. Chairman, there are  
3 three different rulemaking activities at least that are  
4 interlinked. There may be more, but for sure there is this  
5 degraded core rulemaking whose advanced notice is now in  
6 preparation. There is the siting rulemaking, whose advance  
7 notice has come out. There is the Class 9 NEPA rulemaking,  
8 which may not go to the full hearing thing like the others,  
9 but it may, and then there is the emergency preparedness  
10 rulemaking, which is well along, but is clearly linked with  
11 the others somehow.

12 MR. SIESS: Inextricably linked.

13 MR. BUDNITZ: Of course. And for each of these,  
14 we have a vital role. I must say there is none in which we  
15 have a central role. The central role is not ours. The  
16 central role is the people who are making the rule, who have  
17 to do the regulating, who have to decide how you go about  
18 regulating to assure adequate protection.

19 Our role is to provide the technical information  
20 so that those decisions can be made properly, so that the  
21 insights needed are present when they are discussing a  
22 trade-off between a rule formulated in a certain way and a  
23 rule formulated in a different way.

24 Now, I do not think there is any one of those  
25 rulemakings for which we really have right now in the summer

1 of 1980 an adequate technical basis. The siting and the  
2 emergency preparedness rulemaking are in better shape in the  
3 sense we know more about them. The uncertainties, while  
4 important, are not so crucial as to make it almost  
5 impossible to do a rulemaking. That is my view. But in the  
6 degraded core area, I do not know how in the world we are  
7 going to undertake that rulemaking without the sort of  
8 research we are starting.

9 MR. SIESS: You are assuming that rulemaking, like  
10 legislation, should be based on scientific evidence or sound  
11 scientific bases.

12 MR. BUDNITE: No. I think you may have put words  
13 in my mouth I did not mean, Chet, as in the area of human  
14 factors, where Steve Hanauer is wrestling with a difficult  
15 problem.

16 Also, in the degraded core area, the agency is  
17 going to go ahead and make rules and Reg. Guides and  
18 standards and branch technical positions and the whole  
19 hierarchy of regulatory things, in the absence of complete  
20 understanding. It has to. It will. There is no way on  
21 earth that the agency can stand still. I think it would be  
22 irresponsible in the area of human factors to stand still  
23 until we have done all the research to make the whole thing  
24 absolutely pat.

25 So, poor Steve Hanauer -- I say that knowing full

1 well he would agree -- is out there trying to work on human  
2 factors, and he does not have the technical basis, and we  
3 know that he knows it.

4 Steve said when he got the job, he said, "Two  
5 weeks ago, I could not spell 'human factors.' Now I is  
6 one." Steve has probably told you that.

7 The fact is, in the degraded core area as well,  
8 the agency is, in my view, unfortunately, going ahead  
9 without a technical basis, not only with an inadequate  
10 technical basis, but practically without a start on one.

11 MR. KERR: I agree with just about everything you  
12 said except the statement that it would be irresponsible not  
13 to do something. It seems to me it is irresponsible  
14 sometimes to do something if you have no idea whether what  
15 you do will improve things.

16 MR. BUDNITZ: Which means that the rulemaking has  
17 to be done in a careful way so as to make sure you do not  
18 pre-empt things that might fool you. Now, if we had more  
19 time by definition we could do a better job. More time  
20 could have been purchased if this program had begun in  
21 1975. I cannot look back. That is obvious. It is not  
22 useful. So what we are trying to do is, we are trying to do  
23 all the work we can as soon as we can, to support it as well  
24 as we can.

25 That sounds like, again, motherhood, but I am



1 personally pessimistic that we will have enough to do it so  
2 that rulemaking can be even moderately successful, and by  
3 moderately successful, I mean that several years afterwards  
4 you will look back and say, yes, gee, they made some pretty  
5 good guesses.

6 I think there is some reasonable chance that our  
7 technical information will be sufficiently poor that  
8 mistakes will be made which will be substantial regrets  
9 later unless in the middle of it this is realized and they  
10 kind of back off. I hope they do.

11 MR. SHEWMON: You are all doing what you believe  
12 in. That is your job here. At this point, you lose a  
13 little bit of credibility because it seems to me in that  
14 area you have to say, hey, stop the world for two years, we  
15 want to do research. Politically, the time has come for  
16 those kind of rulemakings.

17 MR. BUDNITZ: Yes, that is what I am saying.

18 MR. SHEWMON: The best you can do is argue for a  
19 program to go on with it. I don't really think your  
20 argument is too strong that you know double our budget and  
21 you will have better rulemaking because the time constants  
22 for research are not that way.

23 MR. BUDNITZ: I don't think I was saying that. I  
24 think there is no way even with the biggest budget we could  
25 get that we could support it adequately if it is going on on

1 this schedule.

2 MR. SIESS: If you look at history, you would say  
3 double the budget for 1982 and 1983, because if we get  
4 rulemakings started in 1981, we are going to need all the  
5 money we can get to answer the questions that come up in the  
6 rulemaking while it is still going on or after it is over.  
7 That is just historical fact, right. You look at past  
8 rulemaking and it generated tremendous volumes of research  
9 which maybe could have been anticipated. So, I guess I  
10 could argue that we just ought to arbitrarily double the  
11 budget to take care of all the research that is going to  
12 have to be done when people get through rulemaking.

13 MR. SUDNITZ: We have tried not to do that. What  
14 we have tried to do is, we have tried to give our best  
15 judgment as to which programs and in what order and with  
16 what relative rating are the best to undertake.

17 Now, undertaking some of them is limited by the  
18 fact that some you cannot do until you have done others.  
19 There is sort of a phasing, some by the fact that we don't  
20 have the staff to even think about some of the issues yet or  
21 the same staff is thinking about several issues and they  
22 cannot think about them all at once. It is a very complex  
23 thing. I don't know what else to say.

24 MR. SHEWON: In a different vein, thermal shock  
25 to pressure vessels is the only -- certainly the most

1 credible concern with regard to a rupture of our incredible  
2 defense system there. I would like to hear about that some  
3 time today. Just when I will leave to you.

4 MR. SIESS: I think Bob would like to address each  
5 of these items in a little more depth.

6 MR. BUDNITZ: As we go through. I will sit down.

7 MR. SIESS: What you have done here, those are the  
8 major areas where you have cuts.

9 MR. BUDNITZ: Plus LOFT, which I do not want to  
10 leave out.

11 MR. SIESS: Don't leave LOFT out.

12 MR. BUDNITZ: The \$48 million EDO staff mark on  
13 your sheet, while it is numerically equal to our request, is  
14 still in jeopardy, and what I mean by that is, whether we  
15 will get \$48 million out of the Congressional appropriation,  
16 six steps down this torturous path is of great concern to  
17 us, and we would like to make sure you understand our view.

18 If you share it, fine. If you do not, we want to  
19 know why, because I want to insist that I personally believe  
20 that prematurely -- you know -- closing down the whole LOFT  
21 program will substantially compromise the whole research  
22 program in reactor safety. We can come back to that later.

23 So, let me just close by saying that we have a  
24 list of issues here. There are not many, but they are  
25 important. For each, we have a technical argument which I

1 can give you, or sometimes it is a non-technical but  
2 administrative or managerial argument, and we will talk  
3 about the technical issues.

4 I think that is really where it is at. There is  
5 one other issue I need to talk about. That has to do with  
6 endorsement. The way this funny endorsement process has  
7 worked has disturbed me a good deal. You see, in the best of  
8 all worlds, the new endorsement policy would result in  
9 programs of two different kinds.

10 There would be programs that we and the user  
11 offices had worked out together as being satisfactory for us  
12 to do to satisfy their needs. They would endorse those, and  
13 whether or not we had initiated them or they had initiated  
14 them is not necessarily the point.

15 The fact is that whoever got them up, both parties  
16 agreed that the programs are required to support the  
17 regulatory mission, and it would be our hope that almost  
18 everything we would think of would be of that kind.  
19 Everything they think up ought to be by definition -- If  
20 they are thinking it up, they need it. We say, hey, you  
21 guys, do you need this? They say, yes, gee, you are right.  
22 This should comprise the majority, indeed, almost all of the  
23 budget.

24 The second part should be programs that we have  
25 thought up ourselves that do not have endorsement for one of

1 two reasons. Either they do not have endorsement because we  
2 have not set endorsement for them. Fast reactors is an  
3 example of that. There is no user office for fast  
4 reactors. We do not seek anybody's endorsement for that.  
5 That is something which is by its nature a Commission sort  
6 of program, Commission level program.

7 And things -- the second group like that, where we  
8 do not seek endorsement because we ourselves have serious  
9 doubts that it will be of sufficient use to the obvious  
10 office that would use it, that we are running out on a  
11 gamble. For example, suppose we undertake a program that  
12 has only a small probability of success, that would be of  
13 clear use to one group.

14 There is the ABC branch in standards. It is a  
15 gamble. It is the kind of gamble we think we should take  
16 from time to time. We might undertake that and seek their  
17 endorsement, but why put them out on a limb? It is our  
18 limb. That is one sort of program that we would undertake  
19 and which we now have the freedom to undertake without  
20 endorsement.

21 A second sort is the sort of program where we  
22 develop it thinking they need it, but by hook or by crook we  
23 cannot get them to endorse it, even though we believe they  
24 should. I have to insist there is a difference between that  
25 kind and the kind where we really do not think they should.

1 Now, what we have here, and you will see in the details that  
2 you have in front of you is a little over 10 percent of the  
3 budget we seek is of that last kind.

4 It is the kind where we believe they should have  
5 endorsed it and they have not. Now, I do not think when we  
6 were proposing the procedure last year to the Commission,  
7 and we discussed it at great length, I do not think we  
8 thought that the flexibility would be used predominantly for  
9 that last kind. I do not think we considered that we would  
10 be going ahead with 10 percent of the budget, a cut like  
11 that for programs we all thought they should endorse, and  
12 they are not endorsing.

13 I thought the flexibility would be predominantly  
14 used for programs of that other kind where we did not think  
15 it was appropriate to get their endorsement for one or  
16 another reason. Either it is like fast reactors, or it is a  
17 gamble. We do not think we should hang them on as having  
18 requested it, but as you will see in this process -- and you  
19 have in front of you -- 10 percent or more of the budget is  
20 of that other kind, and I think that is an artifact of the  
21 timing and the character of this year's budget endorsement  
22 procedure.

23 I said that before. I had to repeat it. Then I  
24 will sit down. The fact is, if we had begun the interaction  
25 with them in the context of budget preparation back in the

1 winter, there would be some stuff now in our budget that  
2 might not be in there because they would have talked us out  
3 of it. There would have been some stuff in there that had  
4 been endorsed because we talked them into it. That  
5 interaction has not had enough time to mature in some cases,  
6 and that is reflected in these endorsement and  
7 non-endorsement columns, in my view, as a matter of  
8 insufficient timing and insufficient interaction.

9 MR. SIESS: Bob, I gather that there are some  
10 areas where you think they should have endorsed it and they  
11 have not.

12 MR. BUDNITZ: Yes, like pressurized thermal shock.

13 MR. SIESS: Have you looked to see what position  
14 the ACES has taken in the past on those particular items?

15 MR. BUDNITZ: I guess we are about as cognizant of  
16 your position as we can be in most of these things, because  
17 we study your stuff a lot.

18 MR. SIESS: I was wondering if there were any  
19 specific instances you can cite now or later where you have  
20 not gotten formal user endorsement, but where you could  
21 point to an ACES endorsement. In the past -- I am not  
22 talking about what we might do in the future. We have never  
23 been officially recognized as a user office, and we  
24 certainly have not been consulted as a user office.

25 MR. BUDNITZ: I am not sure that you should be.

1 MR. SIESS: Research continues to say we are part  
2 of their constituency.

3 MR. BUDNITZ: You should be, too.

4 MR. SIESS: We suggested once to the Commission  
5 that we might be considered a user in the sense of  
6 endorsing. You might look and see if in some of those areas  
7 the ACRS has taken a position.

8 MR. BUDNITZ: I can cite some clearly right here.  
9 Obviously, in the fast reactor and gas reactor area, your  
10 strong support has been continuing, and we are not only  
11 cognizant of that, but we rely on it. I am not sure whether  
12 you formally endorsed in the past this whole idea about  
13 pressurized thermal shock studies in the primary system, but  
14 based on what Paul said here a few minutes ago, I would be  
15 surprised if you don't.

16 I look forward to your support.

17 MR. SIESS: It is one of our generic items, I  
18 believe, which indicates some concern by the ACRS.

19 MR. BUDNITZ: Did we get endorsement from  
20 Standards?

21 MR. SHAO: The recommendation did not come from  
22 the technical staff.

23 MR. BUDNITZ: The endorsement --

24 MR. SHAO: We are working on the subject.

25 MR. KERR: When you talk about systems and



1 reliability analysis, the need for some missionary work, it  
2 may sound trivial, but the more I see of this, the more I  
3 think some serious effort is needed. Everybody endorses  
4 probabilistic analysis, and yet I could cite two or three  
5 occasions recently in which people outside the staff in  
6 effect said, we believe in this stuff, but it is no good.

7 MR. BUDNITZ: People within our staff?

8 MR. KEER: Outside of your staff. And I will not  
9 go into detail, but it is happening often enough that I  
10 think it is a very serious problem. You guys are developing  
11 this. It is applicable. It needs to be used. The rest of  
12 the NRC staff does not really believe it deep down in their  
13 gut. This must be true --

14 MR. BUDNITZ: That is an overstatement. Some of  
15 the rest of the staff believe it, and some do not.

16 MR. SIESS: Whoever is making the decisions do not.

17 MR. BUDNITZ: Well, let me point out that the  
18 statement that you made about their views also is our view.  
19 We believe in it even though it is no good.

20 (General laughter.)

21 MR. BUDNITZ: And you know what I mean by that.  
22 There are major uncertainties which must be taken into  
23 account whenever you are using this for decision-making, but  
24 we believe in it anyway, because it is the best of what we  
25 have.

1           Part of the difficulty we continue to face is the  
2 question about whether -- you know. The classic is the  
3 glass half full or half empty.

4           MR. LAWROSKI: As large as that list is, it still  
5 does not include anything outside the reactor. Am I not  
6 correct?

7           MR. BUDNITZ: These are the major issues. The  
8 issues in the area where Frank Arsenault has primary  
9 responsibility, waste management, safeguards, fuel cycle --

10          MR. LAWROSKI: Are not in here.

11          MR. BUDNITZ: Are not in here. They are not only  
12 numerically but conceptually quite a bit less important to  
13 us, although in one area in safeguards -- in one area, in  
14 waste management, there is the issue that the mark  
15 specifically excludes just those projects which we would  
16 initiate, self-endorsed. It only includes those endorsed.  
17 We will come to that tomorrow and see if we can have a small  
18 increase to take that into account.

19          Basically, the endorsement of our program plans by  
20 NYSR was pretty good, pretty uniform, and with a good deal  
21 of study. They did not agree with us in everything, of  
22 course.

23          MR. LAWROSKI: Why do you not include those?

24          MR. BUDNITZ: Well, I do not think any of those --  
25 I don't think any of those is the sort of major issue that

1 these are. That is, for example, in waste management, they  
2 have endorsed all but half a million dollars, or whatever --  
3 the \$25 million program, and the philosophical congruence is  
4 pretty good, not perfect, but pretty good. Congruence that  
5 has been achieved only over the last year by some tremendous  
6 and hardworking staff members on both sides, which I must  
7 say everybody that works in recognizes.

8           Safeguards we have a little bit of a discord which  
9 we will get into, but it is not the biggest deal on earth.

10           MR. LAWROSKI: Okay.

11           MR. BUDNITZ: In the fuel cycle area, Cunningham,  
12 I believe, endorsed everything, unless I mistake what  
13 happened. There is one little thing, but he more or less  
14 endorsed everything. Is that right, Paul Baker? Did he  
15 endorse everything?

16           MR. BAKER: I am not sure.

17           MR. BUDNITZ: Frank, did Cunningham endorse  
18 everything?

19           MR. ARSENAULT: Yes. The fuel cycle division  
20 endorsed projects in both the siting and environmental  
21 decision unit as well as the safeguards and fuel cycle  
22 decision unit. The fuel cycle decision has endorsed all of  
23 the projects which we have indicated as relevant to their  
24 needs.

25           MR. BUDNITZ: So Steve, the answer there is, those

1 are issues, but they are not the sort of issues we face  
2 here. I am at your pleasure, Mr. Chairman, as to whether  
3 you want to ask some of the other officers for their  
4 comments first and come back, or whatever you want to do.

5 MR. SIESS: I think I would like to get into some  
6 item by item type stuff. I think your people can be with us  
7 most of the day, can they not?

8 MR. BUDNITZ: At your pleasure, yes.

9 MR. SIESS: Okay. I would like to follow the  
10 following procedure. I would like to take a break shortly,  
11 then review briefly the status of chapters, just to find out  
12 where people are, and then review briefly some general  
13 comments that Dave Okrent has prepared, since Dave cannot be  
14 here, and then start in item by item. Those preliminaries  
15 will not take more than a half an hour, I think.

16 MR. BUDNITZ: You are the chairman.

17 MR. SIESS: We will take a ten-minute break.

18 (Whereupon, a brief recess was taken.)  
19  
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1 MR. SIESS: The meeting will reconvene. I would like  
2 to handle a little internal business under the first item here  
3 and see where we stand on drafts in decision unit one, plus it  
4 is the leadoff.

5 Do we have a draft from Plesset?

6 MR. MC CRELESS: Yes, we do.

7 MR. SIESS: Including items F, G, and H from Shewmon.

8 MR. MC CRELESS: Those are separate, but we do have  
9 them.

10 MR. SIESS: And we have something from Plesset on LOFT?

11 MR. MC CRELESS: Yes.

12 MR. SIESS: Charlie on chapter three.

13 MR. MATHIS: I have some inputs fresh today. I hope  
14 by the end of the day we will have at least a cut.

15 MR. SIESS: Do you have Carl's input?

16 MR. MATHIS: Yes.

17 MR. SIESS: You have mine. It is being reproduced.

18 Okay. Bill, on chapter four have you got Dave's?

19 MR. KERR: I do not have Dave's input. At least I do  
20 not think I do. I have the input from Max, and I have a draft  
21 of what I was supposed to write.

22 MR. SIESS: Have you got something from Carbon on both  
23 fast and gas? I saw something on fast, a Telex. Does it have  
24 gas in it?

25 MR. KERR: I do not see anything in it on gas.

1 MR. SIESS: Okay. So we have only part of it.

2 Have we got anything from Okrent?

3 MR. MC CRELESS: Not on 5-A.

4 MR. SIESS: 4-C.

5 MR. MC CRELESS: No, sir.

6 MR. KERR: I have something on 4-C which will serve.

7 MR. SIESS: Dade, do we have all of your chapter?

8 MR. MOELLER: Yes.

9 MR. SIESS: Including the part from Okrent?

10 MR. MOELLER: Oh, yes. Okrent has given me his section.

11 MR. SIESS: Has that been distributed yet?

12 MR. MOELLER: Okrent's thing I had two or three weeks

13 ago.

14 MR. SIESS: Has somebody got -- I have -- your draft

15 is here, but I do not see if Okrent's has been incorporated.

16 MR. MOELLER: Yes. Okrent's is geology and seismology.

17 MR. SIESS: It's all here.

18 Steve.

19 MR. LAWROSKI: I gave to Dorothy for typing this morning

20 the first cut of chapter six.

21 MR. SIESS: We do not have copies of it yet, though

22 we should have them before the day is out.

23 Carson, do you have chapter seven?

24 MR. MARK: I have turned it into Tom, which has gone

25 on to be typed.

1 MR. MC CRELESS: Yes.

2 MR. MARK: The first sections of seven Steve, I think,  
3 has a text somewhere -- a good part of the next one. I am not  
4 sure.

5 MR. LAWROSKI: That is correct. I gave it to Dorothy --  
6 through Dorothy, D, E. F. I still have G to do.

7 MR. SISS: Okay.

8 MR. MARK: I have something from Dade, the section  
9 already on the table.

10 MR. SISS: And you have done -- what about the first  
11 three?

12 MR. MARK: I have turned in something on the first three.

13 MR. SISS: Okay.

14 MR. MARK: If you're happy with it, it is fine. I am  
15 not.

16 (Laughter.)

17 MR. SISS: We have something from Okrent on chapter  
18 eight, Dade at 8-D. Do we have something on that?

19 MR. MOELLER: Yes.

20 MR. SISS: Okay. We are in pretty good shape. By the  
21 end of the day we will have drafts on everything, right?

22 MR. MC CRELESS: Yes.

23 \* MR. SISS: Gentlemen, NRR is prepared to make a presenta-  
24 tion which comes under the heading of user endorsement, which we  
25 have heard a lot about this morning. I think it would probably be

1 best to hear that now so we can get the whole thing in perspective.  
2 We heard from Budnitz on the major areas, and I think you can  
3 identify those from looking at the budget figures.

4 And so Roger Mattson is here. He will talk about the  
5 ONR -- NRR endorsement of the program.

6 Roger.

7 MR. MATTSON: We have some handouts going around.

8 MR. SIESS: They're being passed out now.

9 MR. MATTSON: I do not know whether we are the first  
10 office to tell you how this endorsement process is working or not,  
11 but if we are not, I will not worry about whether we say the same  
12 things. I do not think it is a very good process, frankly.

13 First of all, they throw you into it and tell you you  
14 cannot have any details, but you have to endorse these multi-  
15 million dollar programs or come up with a reason why not. And  
16 as soon as you do not -- then they bury you in details. So that  
17 is the process we have been through in the last few weeks; that  
18 is, trying to understand the details that came back to us in  
19 response to saying some very general things about the research  
20 program overall.

21 I do not know if you have a copy or not, but the office  
22 director -- that is, the director of Nuclear Reactor Regulation --  
23 comments to the office director of Research on the '82 budget --  
24 that is contained in a one and a half page memorandum dated  
25 June 23, 1980.



1 MR. LAWROSKI: Did we get that?

2 MR. SIESS: No.

3 MR. MATTSON: I am not sure that it is necessary for  
4 you to because I am going to repeat most of it here at the start,  
5 but should you want to have, your staff might want to sort out a  
6 copy. I will summarize the principal points there.

7 The main thing to be said at this time is what the  
8 office director said was fairly general, and since that time in  
9 response to these details that we have been forced to deal with  
10 below the program endorsement level, we have generated more informa-  
11 tion on a subelement or subunit basis, and I will try to get  
12 into some of that today to explain what we mean by some of our  
13 general comments.

14 (Slide.)

15 First of all, we started with what we understood to  
16 be the goals and objectives of the research program as reflected  
17 in various places. Listed here under this item one, PPPG you  
18 have heard a lot about already today. I don't need to explain  
19 about that.

20 The action plan has been discussed at length. I don't  
21 need to explain that.

22 Licensing needs, we went back and took a look at all of  
23 the old user need letters that had come from -- gone from NRR to  
24 RES, and we looked generally at research in progress in order to  
25 formulate the comments I'm about to describe.

1 You ought to recognize, I guess, in addition that NRR  
2 went about this process with a new organization, and in that  
3 organization a new entity to be responsible for research coordina-  
4 tion, namely the Research and Standards Coordination Branch of  
5 the Division of Safety Technology.

6 George Knighton is here today, the chief of that branch.

7 Someone else we talked to in this process was our office  
8 director and division directors; and point two is a very important  
9 point in understanding the NRR views of the research budget. It  
10 is a policy point. It is a decision made at the front end of this  
11 process, and a decision made by Mr. Denton and Mr. Case and myself,  
12 that the PPPG level of spending -- that is, the target given to  
13 the Office of Nuclear Reactor Regulation and to the Office of  
14 Research, and indeed other offices, although we did not look at  
15 them in any detail, were adequate to do the job that we saw  
16 before the agency in fiscal 82.

17 I am sure that the reasons for reaching that judgment  
18 vary a little bit from person to person, and each person would  
19 say them a little bit differently; but they have to do with an  
20 understanding of the mood of the Congress who are giving you  
21 monies. They have to do with an understanding of increases re-  
22 ceived in the past several years by NRC in response to requests  
23 for increases, especially those most directly tied to the accident  
24 at Three Mile Island, that occurred in the '80 supplement and the  
25 '81 budget.

1           They have to do with the general understanding of the  
2 pool of available nuclear engineering resources in the United  
3 States to do work for the NRC or for the nuclear industry that we  
4 regulate. And as I said, varying people put varying weights on  
5 those elements, and a decision was made at the highest levels of  
6 NRR that the \$207 million mark given by the Commission to the  
7 Office of Research was about right.

8           We went on -- have gone on to say in summary form what  
9 is written in item number three. I will not repeat it. It is  
10 essentially what I just said.

11           (Slide.)

12           Well, in the letter to Mr. Budnitz, Denton made some  
13 comments, the first of which was that there was an underlying  
14 assumption in our review of the '82 budget request by RES that  
15 the sorts of things that had been requested of DOE would get  
16 done.

17           That is a faulty assumption in our view today. We have  
18 for review at this time DOE's proposed '82 work. If I understand  
19 it correctly, there is nothing in that work having to do with  
20 vented filter containments, hydrogen control systems, or alternative  
21 heat decay systems.

22           Bob.

23           MR. BUDNITZ: Roger, the DOE nuclear reactor programs  
24 have recently been reorganized, as I may you know, and I'm not  
25 sure whether the ACRS is aware of that or has seen it. And that

1 reorganization places most or almost all of the stuff that NRC  
2 is interested in under a new division headed by Jerry Griffith.  
3 And we are interacting with them a little already, and there will  
4 be more to come, and we are pretty confident that they will be  
5 more responsive in those areas than they have been to date.

6 MR. MATTSON: We are going to say some harsh things  
7 about some elements of the tried and true research program this  
8 morning. You are not going to like them, I suspect, in some  
9 areas.

10 One of the reasons we have had to say some harsh things,  
11 we want money put into core melt-related things, three of which  
12 I just listed, that DOE has been asked to do; and I know of no  
13 concrete evidence existing today that DOE is going to do any of  
14 it.

15 MR. BUDNITZ: That is right.

16 MR. ATTSON: It is a big uncertainty, and DOE is either  
17 going to do approved reactor safety research, or they are not going  
18 to do it. Somebody ought to say in unequivocal terms for them  
19 to get on with it.

20 The assumption in what I am about to do this morning  
21 is that they will get on with it.

22 The second point made by the Office of Nuclear Reactor  
23 Regulation was that that office does not support any funding of  
24 fast reactor and advanced converter reactor research programs at  
25 this time, fiscal 82.

1           If you take the premise that I gave that the conclusion  
2 that \$207 million was about right, that is part of the reason --  
3 part of the reason is that you take what you can get, and you use  
4 the resources you reasonably believe you can command to do some-  
5 thing productive.

6           This country cannot afford at this time to be spending,  
7 in our judgment, millions of dollars in fast reactor safety re-  
8 search and advance converter reactor safety research that comes  
9 out of the NRC pot.

10           The third area -- at the time we wrote to Mr. Budnitz,  
11 the systems analysis program -- probabilistic risk assessment is  
12 the name I know it better by -- we said we endorsed but we thought  
13 there was some overlap in Research and NRR budgets. We think we  
14 have ironed that out at this point.

15           MR. KERR: What is HREP or NREP?

16           MR. MATTSON: Somebody said we'd probably better define  
17 that term. NREP is jargon that has grown up in connection with  
18 the TMI action plan. Remember, we had an IREP program there that  
19 was a six-plant study over the next year, and then a decision  
20 as to how to get the industry to do the others.

21           MR. KERR: You are going to tell me it is not that.

22           MR. MATTSON: NREP stands for National Reliability  
23 Evaluation Program. It is meant to be the step after the Interim  
24 Reliability Evaluation Program, and one of us know exactly how  
25 to do it yet. That is, as the action plan conveys, there are

1 decisions to be made on what share the industry has and what share  
2 the government has.

3 We know we are all going to do it. We would like to  
4 start in '82, and we are going to develop some methodologies and  
5 some other agreements on how to do it between now and then. And  
6 it is going to cost some money to do it. It is probably better  
7 described than that in documents that we can give to you, but it  
8 stands for the step after IREP, building on IREP. It is really --  
9 we had -- 2-C-1 was the IREP in the action plan. This is 2-C-2.  
10 It is jargon for referring to that item in the action plan.

11 Well, Bernero and his fellows, and Mr. Ernst and my  
12 fellows have discussed this business of overlap, and where manage-  
13 ment resides for NREP, and what the money in the research budget  
14 stands for, and what our money in the NRR budget stands for.  
15 Those monies have changed slightly since this letter was written.  
16 NRR has been cut back some by EDO's people. Research, I believe,  
17 is proposing to add on to their monies.

18 At this point we have reached agreement as to who is  
19 going to do what, and the dollar amounts required to do the various  
20 pieces are pretty much up to the individual offices to estimate;  
21 that is, I do not try to tell Bob how much it costs to do what  
22 he has to do, and we think that the overlap is removed.

23 We had a memo yesterday from BAS which I think removes  
24 most of that uncertainty.

25 LOFT is an area that we touched on in the letter from

1 Denton to Budnitz. Basically we said that LOFT ought to be  
2 funded at the PPPG level, said level having been estimated by the  
3 Office of Research for the Commission's PPPG mark. Research has  
4 said that the \$35 million would be just about enough to phase  
5 LOFT out in fiscal 82 and little else.

6 That is not what we intended by marking LOFT at the  
7 PPPG level, and subsequent to the Denton letter we have tried to  
8 find a middle ground between what we think is an unnecessary  
9 increase of the LOFT program and an unintentional shutting down  
10 of the LOFT program. And I suspect this is the major point of  
11 difference between us and the Office of Research at this point.

12 MR. KERR: What numbers are we talking about? Are we  
13 talking about the numbers --

14 MR. MATTSON: I will get to that later. If I can delay  
15 it just a little bit, Bill, I will try to show you the numbers  
16 on LOFT. Basically the PPPG mark is \$35 million. \$43 million  
17 can probably be bled out of this budget, and \$48 million I think  
18 the Office of Research would like to put into the program.

19 Is that right, Don?

20 Those are basically the three numbers that describe  
21 the various positions.

22 MR. MARK: How many experiments on LOFT are NRR inter-  
23 ested in? Any at all?

24 MR. MATTSON: Oh, yes. Let me try to explain. Let me  
25 tell you the kinds of experiments we want. I am not going to give

1 you a specific list or number for how many, so the little bullets  
2 under item four, we think the program should continue in '82, not  
3 shut down.

4 We think the small break LOCA program that is envisioned  
5 by Research is about right and ought to be finished. We think  
6 the augmented program for enhanced reactor operations information  
7 ought to be pushed.

8 Hanauer and us have agreed that there is merit in such  
9 work at LOFT. I do not think anybody has a very good definition  
10 today of exactly what can be gained, and there needs to be some  
11 work on that definition probably -- especially before we get down  
12 to the Hill. But we see some things that can be gotten from that  
13 augmentation of the LOFT program, and they are basically the same  
14 things that the Research people seek.

15 And we think that the sort of code of the Hill's of  
16 LOFT is correct, that LOFT testing can be completed in FY 84,  
17 subject to us learning something that is unanticipated in FY 83,  
18 or finding out something between now and then, another accident  
19 or another close call or some new licensing insight that would  
20 cause us to want to add on to the program.

21 To say it another way, we do not see LOFT continuing at  
22 some low level of effort year after year after year beyond '84  
23 based on current knowledge. Knowledge may change, and that may  
24 be what happens. But based on current knowledge, we see it phasing  
25 down in '84.



1           There were some other general points in the Denton  
2 letter. I will just list them. We gave them some new words on  
3 the emergency preparedness program. We told them that they ought  
4 to improve their writeups by taking advantage of the number of  
5 places that human factors and operational safety were in fact  
6 being treated in a program but not very well described at the  
7 program level of definition.

8           And we, as I said before, gave them an endorsement of  
9 the overall research program in those areas affecting NRR at the  
10 PPPG level.

11           If you want to see the detailed words, I will get you  
12 a copy of the letter.

13           One thing worth mentioning before I move on to some  
14 more details, we did in the back of that letter attempt the first  
15 NRR overall prioritization of the Research decision units and  
16 subunits that I have ever seen. There may have been some informal  
17 ones, but this is the first formal one.

18           What we did is try to say at the PPPG level marked  
19 by research -- that is, for each of the subunits that we think  
20 their marks were high, low, or about right, given our sense of  
21 priorities, for the various decision units and subunits. So for  
22 that reason you may want to look at it. It is your choice.

23           Well, having done that, that got us into a little bit  
24 of hot water. People wanted to know more about what we thought  
25 about priorities, and we -- I think this is the first time anybody

1 has seen this particular slide presented in this way.

2 (Slide.)

3 Bob and fellows, you might want to look at it. We are  
4 trying to home in on what NRR priority levels are.

5 MR. KERR: The reference here is the PPPG level when  
6 you say increase or decrease?

7 MR. MATTSON: Right, but not on the slide. I am sorry.  
8 In the memo that was the reference level.

9 MR. KERR: What is the reference level on this slide?

10 MR. MATTSON: It says in the slide relative to fiscal  
11 '81. Let me try to explain the slide. We tried to use this last  
12 week and earlier this week as a simple listing of our pecking  
13 order for changes in FY 82.

14 The difficulty is that items five and six we have  
15 recommended decreases relative to '81, so it is a little bit  
16 different than a pecking order. These are the six decision units  
17 in Research that apply to NRR, and they contain a mix of things.

18 If you have gotten deep into the Research budget, you  
19 know it is a little complicated. If you are looking, for example,  
20 for core melt, you will find some in several decision units.

21 Ron is shaking his head. I will try to show you later  
22 why I think it will, Ron.

23 In any event, at the PPPG level, which is the same  
24 level as the fiscal 81 budget for Research, we would in FY 82  
25 increase the three decision units at the top of the slide and

1 decrease the two decision units at the bottom of this slide.  
 2 And LOFT is the contentious point in between.

3 Now, if you take their PPPG mark for LOFT, \$35 million,  
 4 and leave it at that level, then as the managers of the program  
 5 they tell you -- that means they shut LOFT down -- then we do not  
 6 want it kept at the PPPG level. It has to be increased. We want  
 7 LOFT to continue to run for another three and a half years.

end  
to 5

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2 If on the other hand you decide that more money than  
3 the PPPG level is going to into LOFT, then you could use this  
4 slide to say -- I'm sorry.

5 More than the PPPG level is going to go into the  
6 Office of Research. Then, NRR would read this slide to say that  
7 the highest priority place for putting that money above the PPPG  
8 mark is in LOFT to get it up to about the \$24 million mark.

9 Now, it may be that research and you all and ut could  
10 agree to some internal changes within the \$207 million. That  
11 is, within the PPPG mark to raise LOFT from \$35 million to  
12 \$43 million.

13 As you will see later, when you start to look at these  
14 numbers, because those numbers are so large as compared to other  
15 programs, that will severely cut into some other programs. Well,  
16 I don't know if this slide does it any better, but at the PPPG  
17 level, relative to '81, we would increase the top three, we  
18 would decrease the bottom two. We would leave LOFT about the  
19 same. If that means \$35 million, that is inadequate.

20 Juggling the numbers between programs is what the  
21 rest of my presentation is about.

22 MR. KERR: Are you going to give some additional  
23 guidance? For example, on one which I have more than passing  
24 interest, if I look at fiscal '81, I see 8.6. Now, all the other  
25 numbers are an increase, but the increase varies from 30.2 to  
11.5. So, I do not know which of these you endorse.

bfm2

1 I'm sorry, it varies from 30.2 to 17.2.

2 MR. MATTSON: Are you reading my charts from up ahead,  
3 Bill?

4 MR. KERR: No.

5 MR. MATTSON: Which charts are you reading?

6 MR. KERR: You are going to be more specific about  
7 what increase you endorse, is that right?

8 MR. MATTSON: Oh, yes. Don't try to read numbers  
9 at this point. Research has changed the numbers so many times  
10 since I commented on them that I have not the foggiest idea what  
11 the numbers mean anymore. That is between you and them.

12 I will give you the numbers I am commenting on. At  
13 this point, you should only pay attention to \$207 million, as  
14 far as I am concerned, and \$35 million, \$43 million, and \$48  
15 million.

16 Don't try to make sense between what I am saying --  
17 what I am saying. I think you can understand without knowing  
18 those numbers. I have just been handed them.

19 MR. KERR: Okay.

20 (Slide.)

21 MR. MATTSON: You have to bear in mind that NRR does  
22 not make decisions on the reserach budget in the context of  
23 user endorsement. We offer comments, we tell you where our  
24 sense of priorities are. You have to think of what I am giving  
25 you as a data point. I will try to mark it for you, relative to

1 key numbers that should be in there, current budget numbers.  
2 You will have to ask them to help you interpolate.

3 Well, they have given a bunch of -- research has  
4 written down implications of what various funding levels would  
5 mean for their program. We thought it would be useful and we  
6 tried to do so in these slides to state what we think the impli-  
7 cations are of funding at the PPPG level.

8 By stating them, NRR is saying they accept these impli-  
9 cations. That is, if it means you drop ESSOR as decreasing  
10 LOCA and transient research money would do. NRR knows that,  
11 understands that, isn't too upset about it. If it means phase  
12 out most heat transfer experiments under accident and transient  
13 conditions, we know that.

14 On it goes. LOFT, I have already summarized. Plant  
15 operational safety we have given pretty high priority to that  
16 area, as you can expect from NRR's participation in the Action  
17 Plan and the things we have said there.

18 One area that is a little controversial is down at  
19 the bottom, this dropping of the high pressure thermal shock test.  
20 We got a "nasty-gram" from Bernero's people that wondered how  
21 in the world we could possibly do that. We have looked at it  
22 again to make sure that we did not miss something.

23 We stick by our guns. Basically, the story there is  
24 it is about \$1.5 million. Because in brittle vessels will be  
25 a problem, but not yet. It is more of a deferral from '82 that

1 we see happening here; not a total for ever cancellation of  
2 high pressure thermal shock testing. Unless somebody has some-  
3 thing in particular that catches their eye --

4 MR. SHEWMON: You think thermal shock is probably the  
5 highest risk to the pressure vessel, but not this year, two  
6 years later down the pike.

7 MR. MATTSON: Later, yes. It is not going to limit  
8 the operation of plants in '82 in our judgment. We don't need  
9 an answer in '82. We can wait until later.

10 MR. SHEWMON: Thermal shock -- well.

11 MR. MATTSON: It is cold water on an embrittled vessel.

12 MR. SHEWMON: I am intrigued by the reasoning.

13 MR. MATTONS: Let me try to get through it for you,  
14 Paul. The basis for sticking with 207 have several reasons.  
15 One, available national talent. Two, a sense of needing to  
16 prioritize the safety interest in a research program. That is,  
17 you cannot get in our national climate -- you cannot pick money  
18 off trees. So, for reasons like this particular one, can you  
19 do it later? Yes.

20 We have deferred that kind of program, so we can make  
21 up millions here and there, like not shut down the LOFT test.  
22 There are some tough choices. You may not agree with them.

23 MR. MARK: As I understand it, the PPPG level that  
24 you are using as a base here for some of these statements is  
25 \$207 million, which is the same as, I believe, I see for '81.

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MR. MATTSON: That is right.

MR. MARK: Your comment about the national talken, you expect it to drop by 10 percent in the year since the dollars have got to change in value.

MR. MATTSON: Carson, I am not the comptroller. I am not the director of the Office of Research. I do not have any comments on inflation, whether it is right to fund inflation or not fund inflation. You will have to sort that out for yourself. That is the level of details that we are not prepared to go into.

MR. MARK: If you wish to keep the same manpower, you would have to have a number larger than \$207 in '82.

MR. MATTONS: One could draw that conclusion from what I have said. If that is the right conclusion and the comptroller and the professional budget people agree with that.

MR. MARK: The national level of talent --

MR. MATTSON: I have to believe that the Commission, in its wisdom, knew what it was doing when it took the PPPG mark for the various offices, and understood the general inflationary trends of our economy.

We are agreeing for a variety of reasons, as I said, with the PPPG mark.

MR. SIESS: You said you have to believe. I can take that various ways. Could you elaborate?

MR. MATTSON: The comptroller of NRC is sitting in the audience. Was the Commission informed of the inflationary

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pressures of the United States in deciding what to do with the PPPG mark?

MR. SIESS: That was not the question, Roger. Do you feel compelled to believe because of faith, or because of direction from above --

MR. MATTONS: Faith on my part. The gentleman with the responsibility -- Len?

MR. BARRY: Maybe I should have stood up earlier today to give you fellows -- maybe I should have stood up a little earlier today, along with Kevin and give you a little more perspective on the PPPG. Every year, we go in with what we think is an adequate research budget with quite a bit of review before it leaves the Commission.

Every year, it gets marked down by both OMB and the Congress. Then, what we are faced with is the prioritization that goes into the original budget. It gets all messed up again because you determine a program and the priorities on that program at a certain level that never comes to pass.

So, we get each year --we, in effect, almost have to redo our research budget after the fact. I think this year, the purpose of the PPPG mark was to start -- not just for research, for everyone -- is to try to get the staff to start thinking in terms of limitation and realistic budget approvals and to start prioritizing their work in anticipation that that is all you are going to get when it finally is approved.

1 Not to be spending so much of our time and energy  
2 in coming up with what we consider a panacea program with  
3 relatively unlimited resources, then have to go through a whole  
4 exercise again when it doesn't happen, and have to restructure  
5 our program.

6 I think in research it is more apparent than anyplace,  
7 because you gentlemen know as well as I it constitutes at least  
8 half of our budget. It has a great number of line items in  
9 comparison to our technical assistance program. It has some big  
10 money items and it has some small money items.

11 SO, it is not that easy sometimes to start all over  
12 and have to wonder what you are going to do when you get a  
13 \$10 million or a \$20 million cut. So, one of the things that  
14 I think would certainly be in the best interest of the agency  
15 from your standpoint is to think very hard about priorities.

16 Regardless of the mark you come to, or your  
17 recommendation for funding level, think very hard about priorities  
18 and let the Commissioners know what your priorities are, because,  
19 you know, here we are. We are using a base-line of fiscal year  
20 '81, which in a sense shows about the same level of resources  
21 that the PPPG showed in '82.

22 One of you gentlemen just made a comment: "How about  
23 inflation?" Each year, we have cranked into our budget in the  
24 contractual area which is research and technical assistance about  
25 9 percent.

1 We cranked in about a 9 percent factor into the PPPG  
2 level. Obviously, there were some thoughts about some of the  
3 programs coming down. In fact, in '81 in our base-line as of  
4 this date, it is not \$207 million in research. It is more like  
5 \$100 million -- \$24 million less than that. If you have to  
6 swallow some of the breeder money, about \$6.1 million. We have  
7 to do more gas than we are programmed to do; there is another  
8 \$.9 million.

9 We are not going to get the \$207 million in '81. We  
10 have appealed to the Senate for \$10 million in the light  
11 water area. We have appealed for \$6.1 million in the breeder on  
12 the basis that the Congress is going to insist that we go for-  
13 ward with the breeder program, which I think many of us, myself  
14 in particular, completely agree with.

15 We have also appealed that if they are going to make  
16 us do \$4.9 in gas, \$3.9 in research, and \$1 million in NRR, we  
17 have asked for the money there. I guarantee we will not get all  
18 of that.

19 We have asked for people, too. Maybe that would give  
20 you a little bit better perspective as to how the PPPG was toget-  
21 her, also in the dilemma that we found ourselves at the EDO level  
22 and the staff trying to come up with a mark.

23 You will note that we exceeded the mark. We felt we  
24 could not get there, particularly in research. We have been  
25 talking this morning about reductions. If you will look at your

1 decision units carefully in reserach, you will see, except for the  
2 first decision unit, every one of them increases. Many of them  
3 increase very substantially in terms of percents.

4 You know, I think if we went on with this mark that  
5 we are discussing today, if it were to go, we all know that  
6 that is not what is going to come out the other end by the  
7 time we get it through the Congress.

8 Once again, my last statement is I think that one  
9 of the greatest services this Committee can do is to really let  
10 the Commission know what your priorities are.

11 MR. SIESS: Thank you. This basic strategy coming  
12 up with what what I call a Spartan budget, do you really think  
13 that that budget will not still be cut by OMB and Congress,  
14 just like the previous ones have been?

15 MR. BAKER: Definitely. What you are leading up to --  
16 you may recall, if you saw the copy of the letter that the  
17 Chairman sent to Senator Hart on the five percent reduction,  
18 the essence of that letter was, you know, here we do what we  
19 consider an extremely honest job in our budget scrub and to no  
20 avail.

21 In the situation that you gentlemen on the Hill face,  
22 you cut us just like anyone else. I think what John was implying  
23 there was maybe we ought to be like a few of the other agencies.  
24 If the OMB is going to cut five percent, we will stuff five per-  
25 cent back in there.

1 If you are people of integrity, that is not the way  
2 to submit a budget.

3 MR. SIESS: No, but it puts you at a disadvantage  
4 among people who do not have integrity.

5 MR. BAKER: You are right.

6 MR. SIESS: I am not sure Congress believe you have  
7 any more than anybody else.

8 MR. BAKER: Right. I think all of us in this room are  
9 going to say when the office directors come in with their budgets,  
10 not just research, but everybody; it is hard to prove or disprove.  
11 Some of us that watch the budgets, there is a little bit of  
12 slack in there on occasion, both in people an dollars.

13 MR. SIESS: Well, let me -- thank you very much. You  
14 made a point that I think is important. I mentioned this last  
15 month when we talked about the budget. There is a tendency to  
16 look at the research requests, the PPPG, th EDO mark.

17 We need to start by looking at, say, the FY '81  
18 budget, whether or not we think it is adequate. We have com-  
19 mented on that. We need to look at where we stand in relation  
20 to that, because as was indicated there have been significant  
21 increases in most areas over the \$207 FY '81 budget, which is  
22 not necessarily what research is going to get.

23 Bob has given us a figure, but I have some figures  
24 last time. I still hve them. I will give you some others.  
25 We can look at FY '82 in relation to where we think we might be

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1 in FY '81. We could also look at where we know we are in FY '80,  
2 because that is practically over. I will have a handout for you  
3 later that will help you look at that.

4 Now, Roger, one question. Everything you are saying,  
5 as you made quite clear, is starting at -- is working at the  
6 PPPG level, right?

7 MR.MATTSON: Yes.

8 MR. SIESS: The decreases in some areas, the increases  
9 in others are implied by staying at that level. Now, we have seen  
10 an EDO mark that is, you know, \$20 million plus above the PPPG  
11 level.

12 MR. MATTSON: I can help you with that. I am going to  
13 give you a slide towards the end that says, "Where would we  
14 put \$25 million more than the PPPG level?"

15 That was a request made of us made by the EDO people  
16 reviewing the budget prior to their making the mark. I guess  
17 with some fore-knowledge of where the mark was going to be.

18 MR. SIESS: We have the handout. I just wanted to  
19 let you know where we were going to be.

20 MR. MATTSON: Let me touch on a couple of in-depth  
21 statements. One of them up here reduced the code improvement  
22 and amintenance effort and shift toward simulator development  
23 and other uses of relaistic analyses.

24 We think we are doing something that you all in the  
25 ACRS agree with. Remember the discussion we've had in the course

1 of the 15 months or so since Three Mile Island, where we have  
2 talked about the need to move from code development to code  
3 application.

4 Again, so, we understand how these machines behave  
5 with complex, but generally less severe thermal hydraulic  
6 conditions than the large break LOCAs that our code development  
7 has been chasing for lo these many years.

8 We think that's what we have done by decreasing  
9 the emphasis or the priority or the dollars in code development  
10 and code maintenance and increase the dollars in code applications.  
11 One such application being realistic analysis for use in the  
12 simulator.

13 MR. SHAO: Are we to understand the --

14 MR. SIESS: Larry, get a mike.

15 MR. SHAO: I don't understand the technical reasons.  
16 As far as I'm concerned, the reactor vessel is the most important  
17 item, and pressurized thermal shock is the most important  
18 loading.

19 Many of the old operating pressure vessels were not  
20 built properly. They have high copper content. Because of  
21 irradiation, they have lost toughness. Most vessels have  
22 toughness less than specified in regulations. They approach --  
23 they are less than 50-goo pound.

24 They are in bad shape. In addition to that, a lot of  
25 reactor vessels cannot be inspected. They may have a lot of

1 flaws. We don't know. A combination of shock and with certain  
2 processes it can be a very dangerous loading. So, I do not  
3 quite understand why you want to drop this test.

4 MR. MATTSON: I do not quarrel with anything you said,  
5 except that I am told by people who I trust to be as expert as  
6 you in these fields that the safety problem can be handled for  
7 the next several years, and this item can be deferred beyond  
8 Fiscal '82.

9 I do not claim to be the expert in this field.

10 MR. SHAO: I have been working in this for many years.

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1 MR. MATTSON: I do not know how to sort that out. If  
2 the committee wants to sort it out, I guess what you need to do  
3 is request NRR and Research to send down the various experts,  
4 and you can hear both sides of the question.

5 George.

6 MR. KNIGHTON: I think one point would be -- one comment  
7 I would like to make, as we have read the impact statement -- as  
8 we have addressed the impact which was presented by Research in  
9 various areas, we presume that as they went over the various pro-  
10 grams in a given decision unit, they have made certain judgments  
11 as to the priority of these various programs. And if, as an  
12 example, they drop high pressure thermal shock tests, if that is  
13 in fact a lower priority compared to other tasks they have in that  
14 same area, then we tend to agree with it. We can accept it.

15 MR. MATTSON: What I would try to say -- let me try to  
16 say in simpler terms what George is trying to say nicely.

17 MR. KERR: I want to know which "we" George represents.  
18 That is all.

19 MR. MATTSON: NRR. When we review a program level  
20 budget there is not sufficient information for us to judge that  
21 in a given subunit, Research has picked the lowest priority element  
22 to kill in going from one funding level to another funding level.  
23 In other words, the only information we have to go by is what  
24 they tell us should be cut.

25 They told us that in going from their request level to

1 their PPPG level in this subunit would mean cutting this program.  
2 George is cautioning that if we are going to go into a lot of  
3 detail on whether this is the right decision to make for this  
4 subunit, then you really ought to get more information than we  
5 had to make the choice to pay this penalty.

6 We have gone to our people who are responsible for  
7 making safety decisions in this area on each licensing case on  
8 operating reactors, and they are willing to say it is not as  
9 important to do this as to do some other things you could with  
10 that \$1.5 million because we can defer it for several years. Other  
11 things we cannot defer, for instance, the core melt experimentation  
12 necessary to complete a rulemaking that is going to go forward  
13 rapidly.

14 MR. BUDNITZ: Mr. Chairman. if I can just comment on  
15 that, this is intended to be a p strong comment, so I will  
16 preface it by saying that that is exactly the attitude which his  
17 led us to 1980 without a significant program in severe accident  
18 phenomena, because in 1978 it was something that could be deferred.  
19 In 1976 it was something that could be deferred. And now we are  
20 undertaking a rulemaking in 1981 and 1982 without the information.

21 The fact is that the licensing staff tend, as a matter  
22 of standard operating procedure and as a matter of philosophy  
23 because of the nature of their work, to think about things that  
24 are useful in the next year or two, and to think that something  
25 that is needed in 1985 can be deferred until 1983. And this would

1 defer it until 1983, which means that they will not have information  
2 until 1985.

3 And that short-range view that 1983 is soon enough to  
4 start a program is -- and I am saying this in the strongest possible  
5 language -- it is exactly the problem with NRR, which is why you  
6 need RES there, too, which is why the statute, in its infinite  
7 wisdom, set us up.

8 We have the obligation, gentlemen, to worry about 1985  
9 by starting in '82 or even in '81 and not starting in '83 for  
10 '85.

11 But I guess you and I do agree on that. I'm not attack-  
12 ing you directly here, but that general philosophical view that  
13 '83 is soon enough to start something because we do not need it  
14 until '85 is exactly the view that is the inherent tension between  
15 their offices -- and I mean all of them -- and our office and  
16 is exactly the reason why Congress in its wisdom set us up.

17 I insist that the correct thing to do here is to listen  
18 to the Office of Research, whose director who is speaking has a  
19 statutory obligation to tell you what he thinks the agency needs  
20 in 1982. Although the Commission will inevitably reject some  
21 of our comments and some of our pleas -- they inevitably do and  
22 the Congress after them, too -- I think the statement on its face  
23 does not hold water.

24 MR. KERR: Bob, suppose that one has a finite number of  
25 resources available, and one has to discard something. It seems

1 to me that what I am hearing from Roger and what I am hearing  
2 from you are both logical conclusions, but they are based on  
3 different assumptions. His assumption seems to be that he has  
4 a finite number of resources, and given that situation he has to  
5 take the things that he needs immediately.

6 Your assumption seems to be that given some forward  
7 thinking, the resources -- this is implicit, it seems to me -- the  
8 resources are not sufficient to do what you are convinced needs  
9 to be done. Therefore, we ought to ask for more resources.

10 MR. BUDNITZ: By definition, if the money is cut, we  
11 are going to have to cut some stuff we think is important because  
12 what we have in our budget request is what we think is important.  
13 The question that has to be asked is whether or not those things  
14 that are cut are deferrable, or if not deferrable then maybe  
15 we ought to do something about the plants because you cannot have  
16 it both ways.

17 Either you defer them because they are really deferrable,  
18 that is, operating plants and plants under construction, under  
19 licensing or review; those actions can be continued in the interim  
20 or they cannot be. You cannot have both ways.

21 One of the things I think we learned from Three Mile  
22 Island is that such continuing shortsightedness is exactly what  
23 is getting us into the trouble we are getting into. What I am  
24 basically saying is the PPPG level is not enough.

25 MR. KERR: Okay. The resources simply are not sufficient.

1 MR. BUDNITZ: The conclusion might be one of two.  
2 That is, if we are stuck with the PPPG level, you're right, we  
3 are going to drop this. We think that is a shame. Somebody else  
4 is going to have to come back later and decide whether they have  
5 to close the plants down, some of them with a high copper content  
6 running below 50-foot pounds. It is a vital point. You know,  
7 50-foot pounds is below the safety margin.

8 That is the level, right?

9 MR. SHAO: Yes. The regulations --

10 MR. BUDNITZ: If we are going to get in trouble on this,  
11 somebody is going to have to bite a hard bullet. I don't think  
12 starting in '83 is right there.

13 MR. MATTSON: I do not disagree with much of what you  
14 said except to call it an attitudinal problem. Bob, I think is  
15 unfair.

16 MR. SHEWMON: In Roger's defense, though, I don't  
17 particularly care for his position.

18 (Laughter.)

19 Let me point out that 50-foot pounds is the trip point  
20 where you have to start justifying continued operation. It is not  
21 really defined as a dangerous position.

22 MR. MATTSON: And in Roger's defense also, it is not  
23 that I am picking on Larry or that I am picking on metallurgy, it  
24 is that I am picking between things. When I saw what the PPPG  
25 level impact was in LOFT, I said wait a minute, I cannot stand that.

1 I backed off from it slightly. When I saw what the PPPG impact  
2 was on this program, I double checked and I have to stand by  
3 this one, at least so far.

4 I do not have any specific --

5 MR. KERR: I don't understand why the scientists can't  
6 get together and reach the same conclusion.

7 (Laughter.)

8 (Slide.)

9 MR. MATTSON: I don't have any specific comments on that  
10 page. In glancing ahead --

11 MR. MC CRELESS: Does NRR feel as though all the planned  
12 experiments in LOFT, those in the steam generator tubes and  
13 alternate ECCs should be conducted? I realize they are not  
14 scheduled for FY 82.

15 MR. MATTSON: Let me see.

16 MR. MC CRELESS: It would make a difference as to when  
17 LOFT will be shut down.

18 MR. MATTSON: I think what we are saying is we want  
19 the small break tests. We think there is information to be gained  
20 on the steam generator tube failure test. There is enough uncer-  
21 tainty in what other tests ought to be run between now and '84  
22 that we can pick and choose between some alternatives. Remember,  
23 you are going to do some operational safety things with whatever  
24 tests you run. I do not think the operational safety things that  
25 you learn in the control room change much, depending on what kind

1 of tests you conduct in the plant to take data on.

2 And it is my understanding that having said run the  
3 small break LOCAs and try to get a couple of steam generator tube  
4 failures at large breaks, that that leaves them a couple of tests  
5 to play with. And we can talk back and forth about what the  
6 precise definition ought to be. That is my understanding of it.  
7 Finish it in '84. We cannot afford to keep testing given today's  
8 knowledge beyond '84.

9 MR. MC CRELESS: Thank you.

10 MR. SHEWMON: Roger, one item on there, item four, I  
11 was not here during the ECCS rule making, but I understand the  
12 Commission had a position or some positions evolved before they  
13 went into that for suggestions.

14 In the subcommittee meetings one could almost get the  
15 impression that they are looking for Moses to come down with  
16 stone tablets, and once we started rulemakings, maybe somebody  
17 would come in with this stuff.

18 Now, delete that part, but there is a question. The  
19 criteria and the evolution of these criteria on the part of  
20 staff, outside of Research, have not been very clear to us. Is  
21 that happening in your part of this reorganized forest or some  
22 place else?

23 MR. MATTSON: I have heard that, and I think that is  
24 a rewriting of history. People don't understand what happened  
25 in the ECCS hearings. It is much different than what is going

1 on with core melt. There are similarities, but the point you  
2 bring up is different.

3 In the case of ECCS we had required plants be designed  
4 for loss of coolant accidents to supply abundant cooling, as  
5 criterion 35 says. Through a number of licensing cases it became  
6 clear we did not have a unanimous or accepted agreement on what  
7 abundant cooling meant. We were interpreting it differently from  
8 case to case depending on intervention. Research was going on  
9 on the general manager's side of AEC, and the intervention movement  
10 in the United States was really in its infancy, and licensing  
11 cases could not go forward. There was complete disarray.

12 The Commission said well, what we need to do is have  
13 some generally accepted statement of criteria that we could use  
14 in all of these hearings, and since it is so controversial, we  
15 will call it interim and conduct the first national rulemaking  
16 hearing to sort out over a longer period of time how it ought to  
17 be changed before it is put in final form. That is ECCS. Core  
18 melt is a little different.

19 Never before have we required plants to be designed  
20 for core melt. We have a few things in our requirements that  
21 treat TID releases. We talk about beyond design basis accidents,  
22 but we have not required people to design their plants for core  
23 melt. The question in a core melt rulemaking is should we, and  
24 if so, to what extent.

25 Now, the lessons from Three Mile Island said we ought



1 to do a little bit more in the interim while we are deciding the  
2 final question, because whether or not you get a core melt, we  
3 found out that with a fairly high likelihood you can get into  
4 situations that cause conditions very much like core melt; that  
5 is, they put a lot of fission products outside of containment.  
6 They can generate a fair amount of hydrogen and still not melt  
7 the core.

8 A lot of interim things are being discussed and were in  
9 fact required pursuant to the short-term lessons learned. Probably  
10 what confuses people, we are also going to put out an interim  
11 rule just as we did in the case of ECCS, just about for the same  
12 reasons; that is, to give guidance to Hearing Boards and to the  
13 staff as to how far the Commission wants to go in the interim  
14 while it is making the longterm considerations.

15 The criteria do not have to be thought out as well  
16 because you have not made a decision yet to design completely  
17 for core melt accidents or even partially for core melt accidents  
18 as you had in the case of ECCS where the general design criteria  
19 were beginning to be implemented in the late '60s, and the rule-  
20 making did not begin until the early '70s.

21 MR. SHEWMON: When do you expect to see these interim  
22 criteria on paper?

23 MR. MATTSON: They are on paper. They are due to  
24 reach the Commission this month, and basically what they are is  
25 pulling together the degraded core steps that were taken in the

1 Short Term Lessons Learned against operating plants and in the  
2 requirements for near-term OLS, plus Commission decisions being  
3 made in the course of this month and last and next probably on  
4 hydrogen control for Sequoyah and for the boilers, in language  
5 appropriate for the regulations; that is, not quite as specific  
6 and prescriptive as some of the licensing documents that were  
7 issued last fall treating these subjects. And that is about the  
8 content of the interim rule.

9 MR. KERR: Roger, I want to applaud that explanation  
10 that you just gave for the difference in those two. If I had  
11 not been listening very carefully and had not been to the subcom-  
12 mittee meetings, I would almost be willing to accept it because  
13 it sounded so good.

14 But I really believe that if the NRC does not go into  
15 rulemaking with some tentative positions that the whole thing  
16 will be chaos. There may exist some interim positions, but I have  
17 been probing at subcommittee meetings now for a significant amount  
18 of time, and I have not discovered even very much activity going  
19 into formulating the interim positions.

20 I am glad to hear that they do exist, and I will be eager  
21 to see them on paper somewhere.

22 MR. MATTSON: You are talking, Bill, about a proposed  
23 rule, and no work is going on on a proposed final rule which is  
24 what the interim requirements were in the case of ECCS.

25 MR. KERR: I had not heard of it until this morning.

1 MR. MATTSON: Don't mix them up. They are different  
2 criteria.

3 MR. KERR: I am not talking about ECCS, Roger. I am  
4 talking about rulemaking having to do with degraded core --

5 MR. MATTSON: The final rulemaking has no --

6 MR. KERR: I cannot imagine going into rulemaking without  
7 some proposed position, at least on the part of the Commission.  
8 My imagination is limited, I must admit, but I just -- it seems  
9 to me that for the very reasons you gave, which is this is an  
10 extremely complex and difficult situation, the Commission ought  
11 to have -- the staff ought to have a significant effort in trying  
12 to determine what staff believes at least is some sort of a  
13 reasonable position to take.

14 It certainly may change in the course of rulemaking.  
15 It may be approved. It may be extended. But I cannot imagine  
16 what I seem to be hearing, which is somehow if you go into the  
17 rulemaking process, out of it will come some sort of a workable  
18 rule without any particular --

19 MR. MATTSON: The Commission's approach to these rule-  
20 makings has changed a lot. Maybe you have not noticed how it  
21 has changed.

22 MR. KERR: I have noticed how it has changed, and I am  
23 distressed -- that is not strong enough.

24 (Laughter.)

25 Flabbergasted. I do not know how to best express it.

1 MR. MATTSON: Well, they are following II.B.8 of the  
2 TMI action plan, which says issue advance notice of rulemaking.  
3 That advance notice will be issued this month also.

4 MR. KERR: Somewhere in this whole process there ought  
5 to be some scientific engineering logic somehow involved, not  
6 just adherence to an action plan that I am suddenly discovering  
7 has become one of the tablets of stone.

8 MR. MATTSON: I understand that.

9 MR. KERR: I cannot believe this about a -- well --

10 (Laughter.)

11 MR. SIESS: He is speechless.

12 (Laughter.)

13 MR. MATTSON: What can I say? We have talked about it  
14 before.

15 (Slide.)

16 The tables at the tail-end of this package, I do not  
17 want to go through each number, but let me explain the columns.  
18 These are the decision units and subunits and the research programs  
19 that apply to NRR.

20 The first two columns are how NRR in the first column  
21 would divvy up the PPPG mark among the various subunits. The  
22 second column labeled "expanded" is if \$25 million were added to  
23 the PPPG mark, this is where NRR would spend it; that is, the  
24 differences between column 1 and column 2 when added up after the  
25 next three pages should add up to \$25 million.

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The third column is where Research -- is the way Research said they would divvy up the \$207 million PPPG mark. And just for a frame of reference, the fourth column is FY 81 research budget.

I guess in broad brush what we would do is stick some money -- the second column is the one of interest, I think -- we would stick some money into LOFT so as to keep it going until '84. Research does not like that \$43 million number, and I think they would put more in there to bring it up higher. Maybe that is because they know more about what it costs, but it almost might be because of the difference in priorities. They will have to speak to that, and you will have to make your own judgment.

On page 7, if you'll flip ahead to the next one, I call your attention to the severe accident phenomena and mitigation decision unit.

(Slide.)

end to  
7  
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1           Those columns add up in the PPPG, Column 2, \$16.2  
2 million. In the NRR expanded, it looks like about another  
3 \$2.5 million, \$18.7, I believe, in research PPPG. They said  
4 15.7, and in FY 81 it is 8.6.

5           My point in mentioning it is, even after spending  
6 some time with the research budget -- and this is the point  
7 Ron grimaced at -- when I turn back to the previous page,  
8 when I look at LOCA and transients, core damage, this you  
9 must add to the core melt mitigation research, and --

10           MR. LAWROSKI: Where do you get that?

11           MR. BUDNITZ: That is still small break LOCA.

12           MR. MATTSON: How much should you subtract? That  
13 is the question I do not know an answer to. What is the  
14 total amount going into core melt? That is the question I  
15 am asking, and we cannot make such a cross-cut.

16           MR. SCROGGINS: We are talking, Roger, a little  
17 bit of semantics here. What we define as core melt is  
18 indeed fully contained in the severe accident phenomena  
19 mitigation.

20           MR. MATTSON: That is not fair.

21           MR. SCROGGINS: In the action plan, it is degraded  
22 core and core melt. The degraded core is where we have put  
23 it. It is purely a matter of, I believe --

24           MR. MATTSON: That is not my problem. My problem  
25 is, I am being asked the question, and I am trying to

1 anticipate it from the Committee. Is the total amount of  
2 money going to core melt research adequate? I do not care  
3 what the action plan says. I care what the budget says. In  
4 trying to answer that question, and I think it is somewhere  
5 between the 16.2 or 18.7, whichever column you want to add  
6 here, and that amount added to 17.9, but I am not sure what  
7 it is.

8 MR. SCROGGINS: It depends on what you define as  
9 core melt. If you want to use the definitions used in the  
10 action plan 2B5, which included degraded core as well as  
11 core melt, then indeed you must add some of these -- the  
12 damage beyond LOCA, if you want to talk fuel melting, that  
13 is all under the fuel melt.

14 MR. MATTSON: We have more than \$20 million in the  
15 1982 budget for the degraded core rulemaking.

16 MR. SHEWMON: I don't think the fuel has melted in  
17 their parlance until it has come through the bottom of the  
18 pressure vessel.

19 MR. MATTSON: In order to do the rulemaking, which  
20 is the point I am really interested. In from NRR's point of  
21 view, is the amount of money in this budget about right to  
22 do something of that scale? I think something on the order  
23 of \$16 million is a little short. Something on the order of  
24 \$20 million gives me a more comfortable feel, and I think it  
25 is in here, but it is the way that you define core melt, and

1 by my definition, for the rulemaking, I think I have to  
2 include the creeping up on core melt, the getting to that  
3 point, the degradation of the core, the specification of the  
4 initial conditions, and those are up under LOCA and  
5 transients.

6 MR. SCROGGINS: There is money up there define it  
7 that way.

8 MR. KERR: What level are you endorsing in the  
9 severe accident phenomena and mitigation?

10 MR. MATTSON: 16.2.

11 MR. KERR: If I want to find it on the chart, is  
12 it there or is there another --

13 MR. MATTSON: First column.

14 MR. LAWROSKI: That is 17.2.

15 MR. MOELLER: Once again, the expanded column is  
16 simply the receivers of the extra funds.

17 MR. MATTSON: Right.

18 MR. MOELLER: I guess in looking at this, one of  
19 the problems I have is that I do not follow it in terms of  
20 your overall remarks. For example, in one of the first  
21 charts, you told us what you would decrease and what you  
22 would increase, and so forth. Take siting and  
23 environmental. I don't know what the column totals, but you  
24 had listed that you would decrease it below, I gather, what  
25 RES had proposed.



4  
1 MR. MATTSON: No. It was relative to the 1981  
2 budget. Frank, does our PPPG come up -- It comes up below,  
3 right?

4 MR. MOELLER: It was relative to FY 1981.

5 MR. MATTSON: Do you know the sums right off the  
6 top of your head? I did not add those.

7 MR. SIESS: 13.9.

8 MR. MATTSON: A slight decrease.

9 The third point I wanted to make --

10 MR. MOELLER: I gather that you cannot -- I mean,  
11 it is a moving target, and things are changing,  
12 recommendations are changing, so we cannot hold you down to  
13 every number, but take siting alternatives, Item 7 under  
14 Siting and Environmental. You have listed two-tenths --  
15 200,000, I presume -- under the PPPG, and RES has listed  
16 nothing. So, you are actually recommending more.

17 MR. MATTSON: In fiscal 1981 there was nothing.  
18 RES and its PPPG level says it would spend \$300,000. Their  
19 request level was quite a bit higher than that, I think.  
20 Does somebody have that number?

21 MR. BUDNITZ: Which one?

22 MR. MATTSON: Siting alternatives.

23 MR. SCROGGINS: Our request level was \$400,000.

24 MR. MATTSON: \$400,000. Okay. And so we say that  
25 if you have \$25 million above the PPPG level, we would go

5

1 with their request level there. One thing that would  
2 probably help was to put what research came in with. The  
3 trouble is that they now have lists of what the EDO mark and  
4 what the reclama is, so you have lots of columns to add.

5 MR. MOELLER: I am looking at what EDO recommended.

6 MR. KERR: Don't feel bad. It is confusing to us,  
7 too.

8 (General laughter.)

9 MR. MATTSON: The last page, 6, this again is -- I  
10 said we sorted out the seeming overlap between NRR and  
11 research in the area of probabilistic risk assessment.

12 (Slide.)

13 MR. MATTSON: I point out, rather, that there are  
14 some problems in this area that we both are going to have to  
15 contend with. You notice that Bob's program grows from  
16 fiscal 1981 to the PPPG mark of research from \$11.6 to \$17.8  
17 million.

18 Well, we say -- let's see. That is if you add  
19 this column and this column (indicating). We say we want  
20 more than PPPG in this area. This column, as to \$21.8  
21 million. And we keep that the same, even if we got the  
22 add-on of \$25 million.

23 I understand research is reclaiming in that area to  
24 increase it to \$24 million, which is the request level --  
25 roughly \$24 million. Remember that NRR is increasing in

1 that area to run this NREP that we discussed earlier. That  
2 makes \$28 million -- \$27 million roughly, \$27 million as  
3 opposed to \$11.6 million in 1981.

4 I don't know the number for 1980, but it is less  
5 than \$11.6 million -- eight to eleven to twenty-seven  
6 potentially in one year. It may be a bit steep. And I do  
7 not know how we come to grips with that for sure. It is in  
8 this area of, are there resources available to do what you  
9 want them to do.

10 One way to look at it is to say, well, by sticking  
11 to these PPPG numbers you have killed some important  
12 programs in order to accelerate some others, so what you  
13 have done is to move people from one area of technology to  
14 another area. Hence you will be able to sustain such a  
15 rapid growth rate. That is about the only argument I have  
16 come up with so far.

17 I encourage you in your deliberations to think a  
18 little bit about that -- that amount of growth in that  
19 area. That is all I have to say about the research budget.

20 MR. SIESS: Your expanded column was how much over  
21 PPPG?

22 MR. HATTSON: Twenty-five. Is that what it adds  
23 up to?

24 MR. SIESS: Well, the EDC mark was about \$23  
25 million over, and I still cannot reconcile -- I was trying

1 to count up. You recommended \$13.4 million in increases  
 2 beyond what the EDO mark was, and \$6 million in decreases.  
 3 It seems to me it should balance out better than that.

4 MR. MATTSON: I am not seeing the EDO mark, so I  
 5 cannot help you.

6 MR. SIESS: In their area, they have added --  
 7 Well, it can be accounted for. I will have to check, Mark.  
 8 I don't know that it does.

9 MR. MATTSON: I don't even know if the \$25 million  
 10 or the \$23 million applies across the board to research or  
 11 reactor safety research. We are only commenting on spending  
 12 \$25 million in reactor safety research, not fuel cycle or  
 13 other things.

14 MR. BARRY: It is everything.

15 MR. MATTSON: We are entirely parochial in our  
 16 outlook.

17 Well, in the lull, I will say that office  
 18 endorsements of the program are not pleasant things to do,  
 19 and I do not think it worked very well. We are here talking  
 20 about dollar details only where people screamed, and we only  
 21 knew where to attack based on where they told us they had  
 22 cut. It took less time than a full review, but I am not  
 23 sure that it is altogether satisfactory. Maybe by this time  
 24 next year, when NRR has devoted the resources to trying to  
 25 do this kind of function -- perform this kind of function,

1 we will be better able to follow this endorsement process.

2 At this point, I think it is not very satisfactory.

3 MR. KERR: In principle, practice, or both?

4 MR. MATTSON: In principle, I think it is good.

5 NRR should have to stand back and talk about the programs in  
6 research rather than just say, well, we have given them our  
7 users need letters and then completely ignore programs like  
8 LOFT. The difficulty is trying to do it at this high level  
9 of detail, and to do what you think is right based on  
10 priorities across the agency.

11 This ends up in causing specific things to be cut,  
12 specific things to be counterargued, and you do not know  
13 whether you are dealing with the right specific things or  
14 not, because you have not been given the specific  
15 information to analyze.

16 MR. KERR: Have you thought about the possibility  
17 -- and this is not meant to be a didactic question at all --  
18 that more involvement by NRR in the process of formulating  
19 and perhaps budgeting is more likely to make the final  
20 result used by NRR or is there some correlation that one  
21 might expect between -- sort of ongoing participation in the  
22 research and its ultimate use by NRR?

23 MR. MATTSON: I think the staff has got to come to  
24 feel a part of the research program before they will use  
25 it. The traditional historic view has been one of

1 competition rather than working together to achieve some  
2 common end. This kind of thing has to be done in  
3 principle. I am talking about the practicalities of how it  
4 worked the first time through. We have to make it work  
5 better.

6 Bob, you had something you wanted to say?

7 MR. BUDNITZ: Mr. Chairman, Frank Arsenault just  
8 mentioned something to me which I think should have been  
9 mentioned when I was standing up there, so I will mention it  
10 here.

11 That is, in the course of looking at the entire  
12 agency budget, all of the people who look at it, beginning  
13 with the BRG and ending with the Congress, have access at as  
14 great a level of detail as they wish to the sort of  
15 technical discussion and issues within the research program  
16 that you have heard here.

17 For example, we discussed here, although only  
18 briefly, a question about pressurized thermal shock. Now,  
19 there is in way that access at that level of detail can be  
20 had to the NRC program in any other office. For example,  
21 whether NRR is devoting more resources to something like  
22 pressurized thermal shock is not either apparent or possible  
23 to become apparent by examining their budget.

24 Their budget is put together in gross units like,  
25 you know, we are going to -- we are looking at some new

1 plants, and we are looking at some operating plants, and we  
2 are worrying about idolizing operating data. So, you have to  
3 absorb that difference.

4 Now, secondly, then, you have to ask whether that  
5 is right. You see, what we are trying to do is, we are  
6 trying by knowing more about their needs than is apparent in  
7 their budget presentation -- we are trying to write explicit  
8 research program plans to address needs that they are not  
9 addressing in their budget, except in some aggregate, and  
10 then when we write pressurized thermal shock, they say, we  
11 don't need that until 1983.

12 My point is that we are put in the anomalous  
13 position of having to kind of psych out in many cases needs,  
14 write them down, put them up on the board, and then, like a  
15 carnival, you put a quarter in and you get six shots.  
16 Somebody goes bang, bang, bang, and they knock one of them  
17 over. They took four shots. Why should the discussion of  
18 the agency's technical needs be focused on the research  
19 program which is itself only supporting the agency's  
20 technical needs, and not central to it.

21 That is an anomaly. We all know the answer. It  
22 is an anomaly of the budget planning process which I think  
23 is kind of oddball.

24 MR. MATISON: We don't all know the same answer.  
25 I disagree with what you are saying. The function of the

1 Office of Research is to manage a program of research, and  
2 the scrutiny of the management of that program is about  
3 equal -- probably not yet there -- to the scrutiny of the  
4 Office of Nuclear Reactor Regulations function, namely, to  
5 license nuclear power plants, such scrutiny occurring by  
6 this Committee, by the Commission, by the Courts.

7 We have a different function. We serve a  
8 different role. Yours is to manage the agency's research  
9 budget. Mine is to manage the agency's licensing program.

10 MR. BUDNITZ: No, ours is to formulate and manage  
11 the research budget, and I think that that is a vital  
12 difference. In fact, it is more than to formulate, it is to  
13 formulate it, to recommend it, to obtain support for it, and  
14 then to manage it. And it is those early stages that I was  
15 addressing.

16 Unfortunately, the process of formulating it,  
17 recommending it, and obtaining support for it results in the  
18 sort of scrutiny at a level of detail that I do not object  
19 to, which is a far finer level of detail than anything else  
20 that is scrutinized in the budget process. That does not  
21 mean the ACES does not scrutinize various issues. Of course  
22 they do. But in the budget process, only we are subjected  
23 to the level of detail here under discussion.

24 MR. XERR: The implication of what you are saying  
25 is that the very high quality of your program results from



12  
1 this careful consideration.

2 (General laughter.)

3 MR. BUDNITZ: I would like to leave that as  
4 further than an implication. I think that our program is  
5 not uniformly perfect. It has never been. It cannot be.  
6 But I think our program is in detail far more defensible as  
7 it emerges from this long and complex process item by item,  
8 including details within subelements than the detailed  
9 operating plan in the rest of the agency.

10 The reason is, it is getting that sort of detail.  
11 Everyone is looking at it. I think that is great. But the  
12 other elements of the agency are not examined in that  
13 detail, either in the budget process or in their operating  
14 plan, except internally. That is the branch chief of the  
15 XYZ branch in Standards. And presumably, Bob Minogue is  
16 looking after it just the way I look after things, but I  
17 don't think anybody else in the agency is worrying whether  
18 that guy is putting more money on this or that, yet within  
19 the details of our branches, everybody in the agency is  
20 looking.

21 I am not sure what I am pleading for, but I am  
22 pointing out an asymmetry which puts much greater burden on  
23 us to demonstrate a certain level of technical competence at  
24 the project level in some cases and at the program level in  
25 all others than anybody else is ever asked to defend, and

1 two years in advance.

2 MR. ARSENAULT: If I might add a brief comment,  
3 Bob said he was not sure what he was pleading. It seems to  
4 me difficult to be able to evaluate priorities within the  
5 research program at the level of detail that we are getting  
6 to without knowing what the technical requirements of the  
7 operating office are at a similar level of detail.

8 I think that is the difficulty that I would have  
9 with that phenomenon.

10 MR. BUDNITZ: I guess just in 20 words my point is  
11 that the forum for examination of the NRR program is not the  
12 budget process. It is the case by case licensing or generic  
13 issues, or something happens in a reactor, or something.  
14 Our forum is intrinsically tied up in the budget process.

15 MR. SIESS: Any other questions for Dr. Mattson?

16 (No response.)

17 MR. SIESS: Any other comment to address to him?  
18 Advice to give him?

19 (General laughter.)

20 MR. SIESS: Thank you, Roger.

21 Has the Office of Nuclear Materials Safety and  
22 Safeguards gone through a similar process of reviewing the  
23 portions of the research budget that address their problems?

24 Is there anybody here from that office?

25 VOICE: There is no one spokesman for the office.

1 We have representatives from the three divisions.

2 MR. SIESS: Is there anyone who can answer my  
3 question?

4 MR. BARRY: I can. They did not do it on quite  
5 the sophisticated basis that Roger did for us when they went  
6 before us, but they did come in by program, fuel cycle,  
7 safeguards, and so on, and reviewed their budget, and made  
8 comments, and influenced our judgment heavily in terms of  
9 how much money they felt was about right for research. They  
10 also did it from a programmatic standpoint, the 19 programs.

11 As an example, you will -- you probably have not  
12 seen them, but we have programs like safeguards across the  
13 staff, waste management. They also did it in that context  
14 with us. They did not have quite the formality and the  
15 level of detail that NRR provided us.

16 MR. SIESS: Thank you.

17 MR. ARSENAULT: I understand the process that was  
18 followed by the controller and the reviewers of the budget  
19 along the lines that he just described. The various members  
20 of the subcommittee are familiar, I think, with the level of  
21 detail that the division presented its program in. The  
22 spread sheets which got down to individual project levels.

23 I would like to point out that with the staff of  
24 each of the three divisions of the Office of Nuclear  
25 Material Safety and Safeguards, we went over our program at

1 that level of detail and received endorsement for project  
2 levels of effort and in some cases got an indication of  
3 priorities, so that our own programming and our reclama is  
4 guided by that endorsement process at that level of detail.

5 MR. SIESS: Thank you.

6 Now, the committee has heard some interesting  
7 presentations for each area. We have a lot of numbers. Of  
8 course, we cannot think just in terms of numbers. We have  
9 to think in terms of programs, what is being done. But the  
10 numbers you have -- you have what FY 1981 might be. You  
11 have an overall figure that breaks down to something less  
12 than \$207 million. How it breaks down for the individual  
13 areas, I do not know. I do not think I have seen the staff  
14 -- research staff distribution of what they would do with  
15 the 1981 money if it came in at \$180 million instead of \$207  
16 million.

17 Some of it is obvious. It is mandated. Fast and  
18 gas. We have a 1981 figure, and we have a whole series of  
19 1982 type figures, the lowest of which overall is the PPPG  
20 number; the highest of which overall is the original  
21 research request. In between we have an EDO mark tentative  
22 and an NRR expanded figure which comes out total about the  
23 same as the EDO mark.

24 Now, what else we have that is of interest is two  
25 figures from NRR. I am not covering all the items, but

1 those items pertinent to their activities. One is, we have  
2 their idea of how they would distribute the PPPG numbers  
3 which would not be the same way that research proposed to  
4 distribute them, and the other is how they would distribute  
5 the expanded figure, which would be the line of numbers  
6 corresponding to the EDO mark, where they would put the  
7 additional \$25 million.

8 I have been looking at that a little bit, and it  
9 is interesting. They did not put it in the same place as  
10 EDO did. In fact, I do not quite understand a couple of  
11 items. One was the seismology and geology, which was cut by  
12 EDO because it was not user endorsed, and yet NRR would  
13 restore that if they had the money that EDO added back in.

14 So, I do not think EDO had the benefit of NRR's  
15 priorities when they made their mark. I don't quite know  
16 what went on there, but I assume the reclama will straighten  
17 some of that out.

18 In the time that remains today and the time we  
19 have to think about it before Thursday, you can look at some  
20 of those numbers in your particular areas, and see what the  
21 consistencies are between the staff's perception of  
22 priorities, NRR's perception of priorities, and I guess the  
23 EDO's perceptions of the other two's perceptions.

24 (General laughter.)

25 MR. SIESS: In some cases, I think research and

1 NRR agree on priorities, and in some cases they do not  
2 agree. I think the advice we got from Mr. Barry is  
3 extremely important. We can recommend numbers if we want.  
4 We can say the budget ought to be \$230 million for research  
5 and \$240 million or \$240 million, and the Commission might  
6 take that advice, but that does not help them very much when  
7 OMB cuts it \$10 million or \$20 million, or Congress cuts it  
8 \$10 million or \$20 million, or somebody says, do the fast  
9 and gas, but find the money somewhere else.

10 We have tried to do priorities ever since we  
11 started this job. Our first report to the Congress was  
12 related pretty much to the nature of the program, the  
13 quality of the program. It did not address the budget too  
14 much. Then they said they wanted more in the budget. Then  
15 they said they wanted more on priorities, and we can do  
16 pretty good on priorities when it gets down to the project  
17 level, but it is a little hard for us when we are working at  
18 the highest levels.

19 We have heard some better discussion of priorities  
20 at some pretty good levels today than I think we have heard  
21 in some of the other meetings. I suspect that if we are  
22 looking ahead two years, I think in terms of priorities they  
23 ought to be somewhat broader than individual projects. I  
24 think in most cases it should be broader than subelements  
25 but maybe not quite as broad as decision units.

1 I do not think in spite of a lot of things I have  
2 heard that we know exactly what we are going to be doing in  
3 1982.

4 (General laughter.)

5 MR. SIESS: About all we can be sure of is, it is  
6 going to be too late, no matter what it is. You have all  
7 sorts of figures, and I do not know how much good they will  
8 do you. I am going to pass out something that I worked up,  
9 a rather crude table, to give some brief comparisons. Just  
10 looking down the line, the changes in priorities at the  
11 decision unit level, there are some fairly obvious ones.

12 Unit 1 LOCA and transient analysis is clearly  
13 going down. That is somewhere around \$70 million for 1981,  
14 \$75 million for 1980, the highest figure. Even the research  
15 request was down to about \$60 million. PPPG was below  
16 that. EDO is at the PPPG level. LOFT is -- whether it is  
17 going down or going up, it is a little hard to tell right  
18 now. The \$48 million, of course, is higher than the \$42  
19 million for the 1980-81 period, but that is really not much  
20 of an increase in view of inflation.

21 The plant operational safety item is up by any  
22 standards. It is up in 1981, and it will certainly be up in  
23 1981, even if they do not get the full \$207 million.

24 There is a pretty big chunk in there, and it is up  
25 from 1981 by any of the figures that you see there. Severe

1 accident mitigation and prevention -- I cannot remember all  
2 the full names of these -- it is up by any standard,  
3 compared to 1981. Why it is not up higher in 1981, I am not  
4 so sure, and I have separated out fast and gas from severe  
5 accidents. I cannot think of those two things together.  
6 Nobody else is thinking about them together, so I will just  
7 put them on a separate line there.

8 That is a separate item the committee will have to  
9 address, and it will probably have to -- that is a good  
10 place to decide on a priority. If we are going to recommend  
11 something be done on fast and gas as we have in each of the  
12 last three years, I think the committee ought to come to  
13 grips with what it wants to say that should replace, if  
14 anything, in the rest of the budget.

15 MR. KERR: I agree with that.

16 MR. SIESS: That is a simple decision, and I think  
17 we can say something about it.

18 MR. MARK: The number 2.2 for 1981 is not what is  
19 going to apply, is it?

20 MR. SIESS: That is what is appropriated, I think,  
21 and if they do what the Congress says, do up to so much,  
22 then they have to get it out of somewhere else.

23 MR. MARK: There is another number there.

24 MR. SIESS: That was the number that went to the  
25 Congress. Nobody knows what it is in 1981. We do not have



1 a 1981 budget. The 2.2 is comparable to the zero. It was,  
2 do nothing, close out.

3 MR. BUDNITZ: The OMB sent forth \$5 million; \$2.8  
4 million of that is work that is both LWR and fast.

5 MR. SIESS: The core melt.

6 MR. BUDNITZ: The 2.2 is stuff that is only fast.

7 MR. SIESS: The rest of it is up in the 6.4.

8 MR. BUDNITZ: Right.

9 MR. SIESS: Siting and environmental is a sort of  
10 zero growth basis. It has been going up a little bit. None  
11 of the figures are very high. If it went up to the full  
12 research request, they would be about 20 percent over 1981,  
13 assuming it gets that in 1981.

14 Waste management, that is a nice problem. That is  
15 one we have to look at real hard. Talk about low level,  
16 high level, and priorities, again because there is a big  
17 chunk of increase requested there, and they got a pretty  
18 good share of that from EDO. NRR does not have an opinion  
19 on waste management. That is a nice position to be in,  
20 isn't it?

21 Safeguards and fuel cycle is not exactly a growth  
22 item. It has been moving up. 1981 may not go up that much,  
23 and again, there are not large numbers in there, but there  
24 are relatively large differences between the numbers that  
25 are in there. It means the impact on programs is fairly

1 large within that particular area.

2 The systems and reliability is a growth area. EDO  
3 did not give them much more than the PPPG limit. Dr. Okrent  
4 is going to be very unhappy with the amount of money,  
5 probably about as unhappy as he is with what they are doing  
6 with it.

7 (General laughter.)

8 MR. SIESS: And we have a continuing problem of  
9 talking two years in advance about the budget, of trying to  
10 tell the staff both what they should be doing and how much  
11 money they should be spending to do it, and we frequently  
12 disagree with what they are doing, or that somebody thinks  
13 they are not moving fast enough.

14 I think you know his position, and you will  
15 probably have a chance to hear some comments that he has  
16 written out later on. If you look at the bottom line, such  
17 as it is there, if you try to compare with 1981 those  
18 numbers -- the PPPG figure we commented on earlier, it does  
19 not look like an increase over 1981, but it will probably be  
20 an increase over what 1981 turns out to be, unless Congress  
21 does something radical, and the EDO's mark is a significant  
22 increase over what would be about the maximum of 1981, and  
23 if you remember, before, I think we arrived at a best  
24 estimate for 1981 at about \$180 million.

25 I think the most pessimistic estimate was about

1 \$170 million, Bob, as I recall.

2 MR. BUDNITZ: The appropriation will come out in  
3 the low 180's. Is that fair?

4 MR. BARRY: It would be \$194 million -- \$184  
5 million.

6 MR. SIESS: Some of that you would have to use for  
7 fast and gas.

8 MR. BARRY: We have about \$16 million. We did put  
9 some good words in there on a \$10 million appeal, and \$6  
10 million.

11 MR. BUDNITZ: Over the 184?

12 MR. BARRY: Over the 184.

13 MR. SIESS: The point is, there is one area that  
14 is decreasing, maybe two, depending on where LCFT ends up.  
15 Others are increasing very greatly. These are clearly  
16 TMI-related types of things. Waste management I think we  
17 are going to have to tackle. That is quite a range there.  
18 Although the EDO marked very high on waste management.

19 MR. LAWROSKI: Why did PPPG come out so low on  
20 waste management?

21 MR. SIESS: The Commission, I think, said they  
22 only wanted to spend so much money on waste management,  
23 including research.

24 MR. LAWROSKI: I did not hear that.

25 MR. ARSENAULT: PPPG guidance was --

1 MR. LAWROSKI: I don't think --

2 MR. BARRY: I think you have to realize in the  
3 case of waste management, the Commission only gave a floor  
4 on waste management. It says you will not spend less than.  
5 When you look at this column and you see PPPG, that was  
6 research's distribution of what they would put into waste  
7 management based on the PPPG level.

8 The same thing with the other offices.

9 MR. BUDNITZ: Specifically, we started out asking  
10 what we needed, and we came up with 283. Then we said, what  
11 do we have to cut out to get down to 217, 207 plus 10 for  
12 equipment? And I made a decision that if we had to go down  
13 that low, waste management would end up with a lower number  
14 which then would eliminate the capability in 1982 of  
15 planning and doing some of that extensive site  
16 characterization work that we thought was so important, and  
17 also to substantially reduce or eliminate the low level  
18 waste research program.

19 We talked about that a month ago. That was my  
20 decision.

21 MR. LAWROSKI: That still does not give me a  
22 satisfactory answer. Why is the PPPG so low?

23 MR. BUDNITZ: That is somebody else's  
24 question.

25 MR. SIESS: The waste management figure.

1 MR. LAWROSKI: The waste management figure.

2 MR. BUDNITZ: You have to go from what we wanted  
3 to 217 or 207 for program support. That was the way we did  
4 it.

5 MR. LAWROSKI: You did not know the PPPG?

6 MR. BUDNITZ: I did it.

7 MR. LAWROSKI: You did it?

8 MR. BUDNITZ: The PPPG numbers there which come to  
9 207, the allocation between them was mine.

10 MR. SIESS: Why did you set waste management so  
11 low when you did that?

12 MR. BUDNITZ: Because we decided that was a better  
13 place to take the cut --

14 MR. SIESS: All right.

15 MR. BUDNITZ: -- than other things. And that cut  
16 is not just in high level. There was a substantial cut on  
17 the low level program, too.

18 MR. SIESS: Did you have the same feeling that  
19 Kevin Cornell did, that the Congressional initiative for  
20 waste management was becoming a negative?

21 MR. BUDNITZ: I do not think we solved that at the  
22 time. No, that has happened since.

23 MR. SIESS: They do not read the same newspapers I  
24 do.

25 MR. BUDNITZ: On the other hand, there was the

1 clear conviction on my part that because the NMS's budget  
2 was growing in waste management, that taking this cut would  
3 not compromise the entire agency's mission as substantially  
4 as taking this cut would not compromise the entire agency's  
5 mission as substantially as taking a cut in some of the  
6 reactor areas.

7 MR. SIESS: There has to be a distinction made  
8 between research and other activities, and I think there are  
9 a number of things in low level waste that require simply  
10 engineering effort, not research.

11 MR. BUDNITZ: That was part of what underlay my  
12 decision. If we were stuck with the PPPG, we would eliminate  
13 low level. That does not mean that the agency could not  
14 license low level repositories.

15 MR. SIESS: You only reduced it from 5.5 down to  
16 2.5.

17 MR. BUDNITZ: That was a phase-out.

18 MR. BARRY: Mr. Chairman, I think when you  
19 deliberate the waste management mark, it would help you a  
20 little bit if you would read the House report for 1981 and  
21 see what they have to say, and also look at our appeal  
22 letter that Chairman Ahearne sent up on the 1981 mark which  
23 includes our position on the waste management exercise.

24 MR. SIESS: I am not sure I want to take that  
25 advice. We are supposed to be giving independent advice

T-9  
24

1 both to the Commission and to the Congress. We do not want  
2 to be too influenced by what they already think. We might  
3 like to know why they did what they did, but --

4 MR. BARRY: The point we made in here, in the EDO  
5 mark, was in fact to go with what the President's program on  
6 waste management -- he enunciated that last February, and  
7 even though the 1981 mark has disregarded that program, the  
8 EDO mark in here for 1982 reinstates that program.

9 MR. SIESS: All right. I think it is of help to  
10 us to know what constraints NRC is operating under, but I  
11 think to maintain our independence we should not feel  
12 constrained in the same way. And yet we have to be  
13 realistic. In setting our priorities, we can express our  
14 own opinions, but the Commission, I believe, last year was  
15 quite responsive to the comments that the ACRS made.

16 I have not seen a similar response from the  
17 Congress on any of the comments we made in the last three  
18 years, but we intend to continue to make them. We have no  
19 choice, and we will give them our best shot at it, and if  
20 they do not like it, they will do what they please, as is  
21 their prerogative.

22 MR. KERR: It is not only their prerogative, it is  
23 their responsibility.

24 MR. SIESS: I guess you are right.

25 Gentlemen, I think this is probably as good a time

27  
End T-9

1 to quit for lunch as we will find. After lunch, I propose  
2 to take up Dave's introductory comments which have some very  
3 general statements that I think we ought to examine in view  
4 of what we have heard this morning, and be prepared to  
5 debate those with Dave, probably Thursday, or make whatever  
6 changes we want, and then we will try to go item by item,  
7 the best we can.

8 Be back at 1:30, please.

9 (Whereupon, at 12:28 p.m., the meeting was  
10 recessed, to reconvene at 1:30 p.m. of the same day.)  
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AFTERNOON SESSION

(1:35 p.m.)

1  
2 MR. SIESS: We will reconvene.

3 Is there anyone here who would like to lead the discus-  
4 sion on the ECCS LOCA items, now LOCA and transient, and on LOFT?

5 I'd like to take the items up in order, and I guess  
6 Milt is not going to be here at all today. Who here is on the  
7 ECCS Subcommittee? Nobody. Well, I'll lead it then.

8 The first decision unit, and it's one which is under-  
9 going major changes, is the LOCA and transient research. And as  
10 I've previously indicated -- you've got on that little summary  
11 sheet -- this one is going down in budget level. The EDO mark  
12 was at the minimum level, at the PPPG level, and is in general  
13 stated by the EDO to be at the level supported by NRR.

14 Roger discussed that this morning, and that's exactly  
15 what he said, that that program they would support at the minimum  
16 on the PPPG level. He also gave us some figures as to what he  
17 would do to that program if there was an additional \$25 million,  
18 and those figures, if I can find them, would raise it from the  
19 \$52.9, which was the PPPG and EDO level, to about \$57.4, which  
20 is getting close to what the Research staff requested.

21 He would have added money in for separate effects, code  
22 improvement and maintenance, fuel behavior, and core damage beyond  
23 LOCA. He would have put almost \$8 million of that \$25 back into  
24 that program, and he would have put an additional \$5 1/2 back  
25 into LOFT, just to give you some idea.

1           If you can find it before I do, we can look at the  
2 research reclaimer on that item, which I am now looking for.  
3 Here it is. And we might see what Research would have done,  
4 would propose to do. Their reclaimer on that item is for \$4.1  
5 million, which happens to be less than NRR would put into it if  
6 they had \$25 million.

7           Okay. Looking at that particular item -- have you  
8 found the reclaimer? That was Bob's handout, and you might as  
9 well look over the third page of it, which is the detailed break-  
10 down on that.

11           Bob, what we don't have -- and I don't know how  
12 important it is -- you might tell me -- on the '81 -- of course,  
13 that's based on what you really hope to get for '81, right,  
14 not on some reduced value?

15           MR. BUDNITZ: Yes, sir.

16           MR. SIESS: If you're \$20 million short on '81, do you  
17 have any ideas where it will come from? Because, for example,  
18 if you had to take \$10 million out of here in '81, you just stretch  
19 some of this stuff into '82, right?

20           MR. BUDNITZ: I have an answer on that. We would cut  
21 that some, but we haven't sorted that out exactly as to where  
22 that would come, Chet.

23           MR. SIESS: Okay.

24           MR. BUDNITZ: Clearly this is one area that we would  
25 cut some if we had to sustain like a \$20 million --

1 MR. SIESS: Thank you. This has to come out of something  
2 like this.

3 MR. BUDNITZ: Yes, yes. I can find what we -- if you  
4 give me a moment here, I can find what we told them we'd do.

5 MR. SIESS: Right. I don't think it's that urgent. Just  
6 think about it if you want.

7 Gentlemen, what I'm going to have to ask you to do here  
8 because we don't have a leader, and I'll try to do a little leading,  
9 is to take a look at the draft that Milt Plesset has prepared  
10 for chapter one -- you all have it -- and he's taken each of  
11 these items up.

12 It emphasizes and supports a change in direction toward  
13 improved understanding.

14 MR. BUDNITZ: Mr. Chairman, I'm sorry but I don't know  
15 which one --

16 MR. SIESS: This is chapter one, MSPDA 7-8-80.

17 MR. SHEWMON: Is it part one or chapter one?

18 MR. SIESS: Don't look for part one. I'm sorry, gentle-  
19 men. I told you we'd start off with Dave's stuff, didn't I?  
20 Maybe we'd better do that.

21 MR. BUDNITZ: Mr. Chairman, if we sustained a \$20  
22 million cut in '81, our preliminary notion was we would take  
23 about \$5 million of the \$20 out of this decision unit.

24 MR. SIESS: Okay. Thank you.

25 MR. BUDNITZ: That's subject to some rethinking.

1 MR. SIESS: Okay. Now, everybody is subject to some  
2 rethinking, including me, and I said we would take up what Okrent  
3 had prepared as far as general comments, and I'll ask you to look  
4 for that. That's headed, "Part One, General Comments." It says  
5 "Draft Two" on it.

6 (Pause.)

7 That was passed out to everybody this morning after  
8 you couldn't find it.

9 Okrent's. I've changed the direction, gentlemen. We're  
10 going to go back. We're going to talk about the general comments.  
11 It is headed "Part One."

12 (Pause.)

13 Now, gentlemen, I don't propose to read this through  
14 item by item to you, but I tried to summarize what I think is  
15 some major recommendations that are made in here that we darned  
16 well better agree if they're going to be in there.

17 On the first page there are some very general statements  
18 pointing out some interesting things, and let me just review  
19 those briefly. He says, "The Commission will have to provide  
20 policy guidance on the major open safety issues," which I find  
21 a little bit difficult to disagree with, but I can't get all that  
22 optimistic about it.

23 "The regulatory staff will have to re-evaluate its  
24 previous user requests for research within some broad framework  
25 which accounts for the major issues." That says the regulatory

1 staff. That means the licensing staff. "Needs to re-evaluate  
2 its user requests."

3 "The safety research staff will have to re-evaluate  
4 its current and proposed programs in terms of risk reduction po-  
5 tential and major regulatory needs. The NRC will have to judge  
6 whether some research, particularly that which involves large-scale  
7 component testing of the application of existing methodology,  
8 should be the responsibility of the industry rather than the NRC."

9 "The NRC may have to reduce sharply some research which  
10 is confirmatory in nature where there is good reason to believe  
11 that the current regulatory requirements provide adequate protection  
12 to the public."

13 Now, these are four points, five points, and he elaborates  
14 on those to some extent in the material which follows. But those  
15 are fairly important points.

16 He says, "The Commission ought to define what the safety  
17 issues are." The really important ones, major open safety issues.  
18 That the licensing people ought to review what they really need  
19 and change some things, not just review them and decide they're  
20 all the same.

21 "The staff needs to review its programs in terms of  
22 risk reduction potential." Now, this is something the committee  
23 has recommended. I guess this goes with the Lewis Committee and  
24 a few others, that we've got a technique for evaluating risk  
25 potential, or relative risk, or relative potential, and let's use

1 it.

2 The next item talks about whether the NRC should be  
3 doing it or somebody else should be doing it, in particular in  
4 some of the large-scale component testing. And I think a couple  
5 of things in the back of his mind might have been safety relief  
6 valves and things of that sort. I'm not sure.

7 And then he says at the last, which is sort of a  
8 radical statement, I believe, that there are some places where  
9 we think what we're doing is probably safe enough, we've got  
10 a lot of research to prove it's safe enough, but maybe we could  
11 drop some of that research in favor of doing some in areas where  
12 we're not so sure how it's going to come out.

13 And I don't know whether he's thinking large LOCAs or  
14 something else there. You can read into it what you want.

15 Now, the remaining portions do elaborate on those. If  
16 you'll turn to the second page, he talks about TMI needs, and he  
17 divides it up into two parts, in essentially two paragraphs. The  
18 first is those needs that are related to operating reactors and  
19 reactors under construction where essentially the design is more  
20 or less fixed, and the changes can be made obviously but not  
21 easily. And he lists a number of areas: highly reliable shutdown  
22 heat removal, anomalous transients and small LOCAs, improved  
23 operator capability to understand and respond to transients and  
24 accidents, re-examination of overall design adequacy with regard  
25 to the possible existence of relatively high probability accident

1 sources -- that may be like the sequence V -- and measures to  
2 deal with and mitigate degraded core and core melt accidents.

3           These he's listed as principal areas that have come  
4 to the forefront following TMI and relate to operating reactors  
5 and those in the later stages of construction, or even the earlier  
6 stages.

7           Then for reactors still to be constructed -- and he  
8 doesn't say still to be designed but still to be constructed --  
9 he adds issues: siting, development of new general design criteria,  
10 for example, to deal with the inadequacies of the single failure  
11 criterion and with any new NRC policy on core melt accidents,  
12 possible major changes in system design approach such as the  
13 dedicated bunkered shutdown heat removal system or other similar  
14 features, and a long-range NRC philosophy toward standard reactors.

15           And he adds at the end, "Many of these topics require  
16 policy guidance from the Commissioners if an effective and timely  
17 NRC safety research program is to be implemented."

18           Now, these are not trivial statements. These are  
19 intended to identify significant research -- areas where research  
20 might be needed.

21           Are there any comments or additions, deletions?

22           MR. SHEWMON: What does "bunkered" mean, as a trivial  
23 point to start?

24           MR. SISS: Well, the "bunkered" term developed from the  
25 German reactors where they protected them against airplane crash.

1 They are hardened to resist, in this case, tornadoes, aircraft  
2 crash, fire, anything else.

3 MR. KERR: I personally would suggest replacing  
4 "dedicated bunkered" with "highly reliable."

5 MR. SIESS: Well, he's used the term "highly reliable"  
6 for operating reactors, and I think he makes -- I'm not defending  
7 him; I'm trying to explain -- he makes the distinction you can  
8 improve reliability of a shutdown system --

9 MR. KERR: I understand why Dave has it in here. I'm  
10 just suggesting a different wording.

11 MR. SIESS: His feeling is that if you're starting from  
12 scratch, you can make it highly reliable by different means than  
13 if you make it highly reliable in an operating reactor.

14 MR. KERR: I think that's true, but I'm not just sure  
15 "dedication" and "buffering" is what I want to suggest.

16 MR. SIESS: Yes.

17 MR. MATHIS: Well, this is just as an examples.

18 MR. KERR: Yes, but if you set forth something as an  
19 example, it gives it some importance.

20 MR. LAWROSKI: Well, Bill, it is something the Germans  
21 have used.

22 MR. SIESS: That's not a major philosophical difference,  
23 Bill. I don't think that presents any problem. We can propose  
24 that for later.

25 MR. MATHIS: Chet, just one comment on that.



1 MR. SIESS: Yes, sir.

2 MR. MATHIS: And that is that this long-range NRC  
3 philosophy toward standard reactors, that's one personally I'd  
4 like to see more attention given to. We've tried from time to  
5 time to tie the architect-engineering activity to the NMSS and  
6 so forth, and I'm not advocating --

7 MR. SIESS: You mean more than is given here?

8 MR. MATHIS: Yes.

9 MR. SIESS: Well, this is about as strong as you can  
10 make it. I mean, he picked about three items here for major  
11 emphasis, and that's one of them.

12 MR. MATHIS: But I think the term "standard reactors"  
13 might be subject to some difference of opinion.

14 MR. SIESS: Oh, well, we can elaborate on the words, if  
15 you want to at some point. If we get them all alike, we'll shut  
16 them down easily, I mean all at one time, is the only disadvantage  
17 I can see.

18 Now, if we agree with this list, these are the things  
19 we need to look for. What research is being done toward reliability  
20 of shutdown heat removal in operating reactors, anomalous transients  
21 and small LOCAs -- that's pretty obvious, I think -- improved  
22 operator capability -- we know mostly where the work is there.  
23 Re-examination, looking for relatively high probability accident  
24 sources -- that's NREP, I guess, or HREP -- plus what the industry  
25 is doing. And then degraded core and core melt accidents which

1 gets mentioned as rulemaking, but rulemaking is words and finding  
2 what to do about it I think is important.

3 For the new reactors siting is already identified as an  
4 issue. I don't know much how research there is on it. The  
5 single failure criterion is probably a reliability type probabilistic  
6 assessment approach. Core melt accidents is uppermost in everybody's  
7 minds. The shutdown heat removal system we've just discussed in  
8 the standard reactors.

9 Can you think of other things that ought to be added  
10 to that list, either starting from the research program as it is  
11 or starting from what we know of the problems?

12 Well, let's go on. The re-evaluation of priorities  
13 for user needs -- that's just not the research staff but the people  
14 that they're supposed to be listening to. And I might say that  
15 I do not agree with Roger Mattson that Research's job is simply  
16 to manage research projects. I think they have a much bigger  
17 job. If their job was simply to manage research projects, we  
18 wouldn't spend our time talking to Research when we're doing this  
19 report because they wouldn't have much to say about it.

20 In last year's report we recommended that the staff  
21 give early attention to evaluation of priorities of it existing  
22 research requests in the light of its changed perceptions of  
23 safety research priorities. And he mentions that the user office  
24 endorsement, which we've seen in spades in the last four or five  
25 hours, he says, "It's important that these offices devote adequate

1 attention to assessing their current and future safety research  
2 needs."

3 I think that what NRR talked about this morning repre-  
4 sented a pretty good start toward that. It's certainly the most  
5 serious effort we've heard of along those lines. NMSS may have  
6 done the same thing, but we don't have it documented; and I don't  
7 know to what extent Standards is a client to Research.

8 How many requests do you get from Standards?

9 MR. BUDNITZ: Significant in some areas.

10 MR. SIESS: Did you get the user comments from them?

11 MR. BUDNITZ: Yes, we did. They were generally supportive  
12 and didn't have much detail.

13 MR. SIESS: On what NRR presented, they did say here  
14 are areas we don't think are important, and here are areas we do.  
15 And obviously the thermal shock they didn't think was urgent.  
16 The distinction between urgent and important is a difficult one  
17 to understand when you're planning three years ahead.

end

tp 1

1           It goes on to say we are not satisfied that this  
2 has been the case for ONRR and Standards. He didn't mention  
3 ONMSS. Recommend that these offices devote the effort  
4 needed. We may want to modify this to some extent in view of  
5 what we have heard today. But it is still a valid  
6 suggestion and should be an ongoing effort.

7           Any further comments on that? I think I can  
8 either rewrite this or explain to Dave what happened. He  
9 can hear a little bit Thursday and get that straightened out.

10           The next item is reevaluation of research  
11 priorities. That would be by the Research Office, and we  
12 previously have recommended that. In fact, they did it last  
13 year and we got a report from -- I saw a memo from Research  
14 where they had looked at some areas. I don't have it with  
15 me. Some of you may remember it better than I do. I think  
16 we got it about January of this year.

17           We recommend that Research give priority to such  
18 an effort within the next few months both to provide an  
19 improved basis for setting priorities for FY 1982 and for an  
20 evaluation of possible changes in priority and funding level  
21 for FY 1981.

22           We recommend also that NRC develop criteria for  
23 when safety research should be done by industry. A little  
24 more difficult.

25           MR. MOELLER: Excuse me. Would Bob Bernero know

1 at this time how he would apply the methodology of risk  
2 assessment, if I understand this, to help you determine  
3 priorities for research?

4 MR. SIESS: Like they did on the unresolved issues  
5 probably.

6 MR. BERNERO: Well, we actually gave to the  
7 Reliability Subcommittee a report that was prepared in 1979.

8 MR. SIESS: That is the one I was thinking of.

9 MR. BERNERO: Yes, it is a fairly thick thing.  
10 Ray Di Salvo's name on the cover. And that was an attempt  
11 to apply risk assessment methodology to the evaluation of  
12 the entire research program. Of course it --

13 MR. SIESS: Yes.

14 MR. BERNERO: Yes, it is reactor research it  
15 applied to, because it was based on WASH-1400. Yes, we have  
16 what we think is a credible first iteration of it, and the  
17 method is clear for that, I think.

18 MR. SIESS: Thank you. And the next item relates  
19 to -- so far these subdivisions have followed the items on  
20 the first page. The next two don't exactly: classify in  
21 accidents -- oh, let me interject something here. I have  
22 been reading this. I don't know whether you have been  
23 reading along with me. But if you will notice, I have been  
24 using the first person plural rather than the ACRS or the  
25 committee, and unless I hear some screams and a hard vote,

1 that is the way I would like to see this report go out. I  
2 am getting tired of "the ACRS does this" and "the ACRS does  
3 that," especially in the latter to a report to the  
4 Commission.

5 I didn't hear any howls because it didn't say ACRS  
6 anywhere.

7 On Class 9 accidents there is a strong statement.  
8 The general subject of Class 9 accidents including but not  
9 limited to the proposed rulemaking on degraded cores and  
10 core melts represents the single most important research  
11 area for the next few years. During the past several months  
12 there has been developing a considerably expanded effort  
13 compared to the limited program previously pursued.  
14 However, we believe that the proposed level of effort still  
15 falls far short of what the NRC needs. For example, rather  
16 than a program that consecutively examines the different  
17 containment designs such as the large dry BWR ice condenser,  
18 different BWR containments for hydrogen buildup, core melt,  
19 et cetera, NRC should aggressively be addressing all of  
20 those containment types concurrently in terms of potentially  
21 realistic design approaches and their pros and cons.

22 The research program should be geared to providing  
23 that information most important to the NRC decisionmaking  
24 process as expeditiously as possible, and the appropriate  
25 resources should be assigned not only in FY 1982 but early

1 in FY 1981.

2 Long-term research in this area will also be  
3 needed, but it should arise primarily from the principal  
4 research requirements associated with likely design  
5 approaches.

6 Now that has got an awful lot in it, including  
7 suggestions about the 1981 program. I think this is fairly  
8 typical of Dave's impatience.

9 MR. KERR: I would have to be convinced that it  
10 was the single most important research area. That is a  
11 pretty strong statement.

12 MR. SIESS: Certainly it is.

13 MR. KERR: I am certainly not convinced at this  
14 point.

15 MR. SIESS: You didn't expect differently from  
16 Dave? You got another candidate?

17 MR. KERR: Yes.

18 SPEAKER: Well, just an important research item.  
19 It is not the single most --

20 MR. KERR: I would say a more important area is  
21 better trained operators, how one trains them and how one  
22 manages the interaction of operators with -- I think this is  
23 much more likely to improve safety to the public than  
24 consideration of Class 9 accidents.

25 MR. MOELLER: Is that Research?

1 MR. KERR: It is being done by Research.  
2 Human-machine interactions, for example.

3 MR. SIESS: There is certainly research that can  
4 be done. I don't know how much upgrading of operators might  
5 be achieved without any research as dealing with state of  
6 the art. I have got a feeling it would be fairly  
7 considerable.

8 MR. KERR: I think what has not yet been  
9 determined is how should operators be trained.

10 MR. SIESS: Coming from a teacher that is an  
11 interesting question.

12 MR. KERR: We have done this on an ad hoc basis  
13 ever since we had the BSF reactor at Oak Ridge.

14 MR. SIESS: I know. I would agree that culling  
15 this out as the single most important research area or even  
16 the most important research area is an extreme that the  
17 committee probably could not agree on.

18 MR. SHEWMON: How about at the top of the page we  
19 believe the proposed level of effort still falls far short  
20 of the NRC needs. I personally would need a fair amount of  
21 convincing of that. It seems they are talking about going  
22 up by an order of magnitude one year, which is more than  
23 their -- and what Calvert comes in with is a bunch of great  
24 big programs he is going to commit to before there seems to  
25 be a lot of agreement on what form the regulations are going



1 to take or what their needs are to the organization.

2 MR. SIESS: I think what Dave has here is poorly  
3 stated, but the level of effort is really not what he is  
4 talking about. The next few sentences are really the  
5 significant thing.

6 MR. SHEWMON: The next one says we should do  
7 everything at once instead of sequentially, which fits in  
8 with my --

9 MR. SIESS: Well, it says more than that.

10 MR. SHEWMON: I hope so.

11 MR. SIESS: I can't explain, I am sure Dave could  
12 explain better, but I think what he is bothered by is this  
13 sequential step-by-step following the core, the molten core,  
14 from above the bottom plate down through the bottom of the  
15 vessel and into the containment and on to the concrete, from  
16 there et cetera, et cetera.

17 MR. KERR: I don't really think that is the point  
18 he is trying to make, Chet. I think he is saying that -- in  
19 fact, I think he says it, that instead of starting with one  
20 containment design, then working to others later on, they  
21 all ought to be done simultaneously.

22 MR. SIESS: I agree that is what he says, but I  
23 have heard Dave talk and I am not sure this is what he  
24 means. So let's don't -- I don't think this is going to  
25 influence too much of what we say about the research program

1 because I think the level of effort on core melt is  
2 substantial and I think we all agree that core melt is going  
3 to be a problem over the next few years. Whether it is a  
4 real problem or rulemaking problem. I guess may be beside the  
5 point.

6 MR. SHEWMON: There is a question of, you know,  
7 get mind in gear before setting mouth in motion, and one  
8 could paraphrase that and say be sure that you have a pretty  
9 good idea what you are doing before you commit to major  
10 facilities in six different places, and that it seems to me  
11 is a big problem right now.

12 MR. KERR: Yes, I would like to see this paragraph  
13 say something about the interface between the users or the  
14 contribution of the users of the research vis-a-vis the  
15 research program, because I think that is extremely  
16 important at this stage.

17 MR. SIESS: Sam, what is that from, which  
18 meeting? The last meeting Dave talked about this, and it is  
19 in the transcript, and it is pretty much along the lines of  
20 what Bill Kerr was saying. Look at all the containments,  
21 there is too much attention to the dry containment.

22 MR. KERR: Which meeting is that, Sam?

23 MR. SIESS: The last full committee --

24 MR. KERR: You don't have to bring it over here,  
25 just give me the date.

1                   MR. SIESS: The one on Wednesday before the last --  
2 June 3rd.

3                   MR. KERR: Thank you.

4                   MR. SHEWMON: But there is still the question of  
5 the degree to which the NRR has gotten involved in the  
6 research program, and if you hear Kalber talk about it that  
7 raises your concerns; it doesn't dampen them.

8                   At least it does for me.

9                   MR. SIESS: Well, there are a couple of  
10 questions. One is whether this should be spelled out under  
11 these general comments, and if it isn't the single most  
12 important program it probably shouldn't receive extra  
13 attention in here, and we can work on that with Dave. I  
14 think we can agree that core melt --

15                   MR. KERR: I think it perhaps deserves calling  
16 out, because it affects not only Class 9 accident  
17 rulemaking, so-called, but it also affects what one does  
18 about siting and what one does about emergency planning. So  
19 I think it is an important area of research, and mainly  
20 because it involves three simultaneous rulemakings in an  
21 area which is relatively new. It deserves some special  
22 attention for that.

23                   MR. SIESS: Okay. There is an item here called  
24 Other Areas Requiring Emphasis -- -- I would put them in.  
25 And let me just read it, I guess it is easier.

1           The NRC research program currently includes major  
2 expenditures for research on the large LOCA and for  
3 confirmatory research intended to demonstrate that the  
4 current NRC regulatory requirements are adequately  
5 conservative in areas where this is quite likely to be the  
6 case.

7           Now that is obviously his judgment, whether we  
8 agree with we have to decide.

9           On the other hand, the current research program in  
10 that proposed for 1982 lacks sufficient emphasis in many  
11 areas where either there are large uncertainties or there is  
12 reason to expect that a significant improvement in safety  
13 may be achievable. We believe that the FY 82 program and  
14 the FY 81 program, as practicable, should be reoriented to  
15 provide appropriate emphasis on topics such as the  
16 following. And he lists four.

17           The proposed program includes considerable growth  
18 in areas related to operational safety; however, it still  
19 lacks significant cohesive research on LWR plant operational  
20 behavior as a function of design and control. I don't quite  
21 understand it.

22           MR. MATHIS: Read that again, Chet.

23           MR. SIESS: The proposed program includes  
24 considerable growth in areas related to operational safety.  
25 However, it still lacks significant cohesive research on LWR

1 plant operational behavior as a function of design and  
2 control.

3 I am not quite sure what he is driving at.

4 MR. KERR: Tangentially, it could be they have got  
5 the bucks to have a coherent program that Dave brought out.  
6 In fact, I had thought he might be talking about what is in  
7 part B, but since he singles out part B separately that must  
8 not be what he is talking about

9 MR. SIESS: Well, I am not quite sure.

10 The potential impact of control systems and other  
11 nominally nonsafety systems on safety has become a matter of  
12 increasing interest and research program devoted to this  
13 matter should be formulated.

14 And that is interaction of control and  
15 protection. It is an obvious area of interest. I don't  
16 know where it fits in the program.

17 Emphasis should be placed on a research program  
18 intended both to evaluate the effect of design errors on LWR  
19 safety and to provide a basis for the development and  
20 application of improved approaches to reduce the impact of  
21 design errors on safety.

22 We recommend that such research be initiated in FY  
23 1981 and given strong support in FY 1982.

24 That one --

25 MR. KERR: Is the single failure criteria one

1 example of the kinds of failure?

2 MR. SIESS: No. Dave is talking about design  
3 errors.

4 MR. KERR: Dave talks about it a lot and I still  
5 don't --

6 MR. SIESS: We have seen a number of examples of  
7 design errors and the seismic people shut down five reactors  
8 because of the design errors. We have had Trojan shut down  
9 for six months due to design --

10 SPEAKER: Crystal River was a design error.

11 MR. SIESS: I am thinking of some clear ones where  
12 the designer actually made a mistake.

13 MR. KERR: TMI-2 was a design error. So  
14 everything is a design error.

15 MR. SIESS: You can call them what you want, but I  
16 am talking about what Dave is thinking about here.

17 MR. MATHIS: What kind of research is going to  
18 prevent this?

19 MR. SIESS: But he is talking about errors -- I  
20 don't know.

21 MR. MATHIS: I don't either.

22 MR. SIESS: He is not talking about research to  
23 prevent it so much. He is talking about a program to  
24 evaluate the effect of design errors. And that is not easy  
25 either.

1           And develop approaches to reduce the impact of  
2 design errors on safety.

3           MR. SHEWMON: You have lectured us before on  
4 regulatory or specification writing philosophy, and one of  
5 the things that you talk about is conservatism to compensate  
6 for this.

7           MR. SIESS: Yes. Well, that is the point that  
8 Dave still has trouble appreciating. We have margins in  
9 there not to just cover what we don't know. Uncertainty is  
10 in the calculation method, uncertainty in an input,  
11 uncertainty in the value of a parameter.

12           We have margins to cover mistakes, errors, and not  
13 just errors in design but errors in construction. And we  
14 even have margins that cover errors in operation.

15           MR. KERR: Yes. I don't see why one picks out  
16 design errors in contrast to other errors, why they need  
17 special attention.

18           MR. SIESS: And most of the design errors that we  
19 have discovered after we spent six or eight months working  
20 on them, we found out they didn't make that much difference  
21 anyway. They usually end up by reducing the margins, which  
22 gives the staff a problem, because they figure they should  
23 never reduce the margin, even though the margin is there to  
24 take care of the things they don't know. After they find it  
25 out, they find the margin is reduced, they still want to get

1 it back up to where it was, which isn't right. If you had  
 2 100 percent knowledge you wouldn't need any margin. So if  
 3 you erode your margin a little bit, that is what it was  
 4 there for.

5 But I don't know how you go about this one, and as  
 6 I say I don't agree with that one either.

7 MR. MATHIS: Well, Chet, here is an area where  
 8 maybe standard design criteria would eliminate error.

9 MR. SIESS: No.

10 MR. MATHIS: What?

11 MR. SIESS: Nothing is going to eliminate errors.  
 12 You can reduce errors.

13 MR. MATHIS: Okay, alleviate. Sorry I used the  
 14 word.

15 MR. SIESS: There is such a thing called design  
 16 QA, and it operates to reduce errors. The number of errors  
 17 that are made in nuclear plants I am sure far less than are  
 18 made in conventional construction because they have got so  
 19 many checks and so much independent checking; the design QA  
 20 programs tend to do that. But they are going to slip  
 21 through and there are going to be errors made in  
 22 construction.

23 MR. BUDNITZ: Mr. Chairman, just listening to that  
 24 point, it is not explicit enough to give us the kind of  
 25 guidance that we need to formulate responsive programs.



1 Unlike the first two, where I think it is clear what is  
2 being discussed.

3 MR. KERR: It is not clear to us yet either. So  
4 maybe by the time it gets clear to us -- there is a step  
5 between being clear to you and being clear to us.

6 MR. SIESS: It will either be clear to us, Bob, or  
7 it won't.

8 MR. KERR: You know.

9 MR. SIESS: It will either be clear to us or it  
10 won't be in here. If we know what it means we can state it  
11 better. But right now I can't --

12 MR. SHEWMON: I think one area (inaudible)  
13 contribute to the risk or risks.

14 MR. SIESS: Well, it depends on the error. I  
15 don't know how to get a standard distribution of design  
16 error.

17 MR. SHEWMON: (inaudible)

18 MR. SIESS: Yes. But you really don't -- see,  
19 when you start sticking design errors in SS<sup>MRP</sup>, you haven't  
20 the slightest idea what spectrum of design errors to put in.

21 Those are the only ones you knew about. There is  
22 a whole slough of little ones you never found, and there are  
23 not going to be any big ones you didn't find. They get  
24 caught.

25 Well, that is beside the point.

1           In the next item, the General Design Criteria and  
2 the Associated Supplementary Regulatory Guidance, should be  
3 reexamined using probabilistic methodology for the purpose  
4 of developing recommendations for improvements to the  
5 current criteria.

6           I don't know what that one means. Well, he is  
7 saying failure criteria I know, but that has already been  
8 mentioned.

9           MR. KERR: I think that is what he means. He also  
10 means, for example, maybe the electrical system  
11 requirements. Should one have some sort of reliability  
12 based requirement rather than -- I can think of an example,  
13 just some things that might be done there.

14           MR. SIESS: Well, you could go back into  
15 qualification, environmental qualification, on a  
16 probabilistic basis.

17           MR. KERR: Yes.

18           MR. SIESS: Charlie?

19           MR. GILBERT: Going back to the question of design  
20 errors, perhaps one could get a better feeling if one  
21 approached it from the other end and said, what is the value  
22 of increased QA and where might such increases have the  
23 greatest value. And I have had only one experience with  
24 something like that, which came during the Korean War, but  
25 that at least is a fairly familiar program in production

1 industries. Whether there is a program that is applicable  
2 to nuclear constructions and risk analysis I don't really  
3 know.

4 MR. SIESS: Yes.

5 MR. GILBERT: But that would be the way I looked  
6 at this, consider approaching that type of question.

7 MR. SIESS: Yes, that is not what he says, but  
8 that is a possible approach.

9 MR. GILBERT: I know.

10 MR. SIESS: Yes.

11 MR. GILBERT: It is the other image of that, the  
12 complementary image.

13 MR. SIESS: And Dave ends up that section: In  
14 view of the above recommendations we believe a budget level  
15 of about blank million for research support is required.  
16 And this recommendation is based on the assumption that the  
17 needed large shifts in programs and priorities will be made  
18 in the program description provided to us by Research during  
19 our review of this subject.

20 Large shifts in programs. I don't really see the  
21 large shifts. But then the next section is just an  
22 introduction to part 2 which will be the specific  
23 recommendations. And it mentions the new decision units so  
24 that there is no longer a separate decision unit for  
25 improved reactor safety. And then we would just go into the

1 other things.

2 (Pause.)

3 Now there are three, several general  
 4 recommendations here that I didn't hear any strong  
 5 objections to. The specific ones we have some problems  
 6 with, starting with Class 9 accidents as the single most  
 7 important and then this list of other areas which I am not  
 8 sure are large enough to warrant being included under  
 9 general remarks frankly.

10 I think -- he had another item in that list that I  
 11 deleted and put into a specific section, and I think that  
 12 the committee might feel that some of these belong, once we  
 13 understand them should be mentioned back in the specific  
 14 programs in that they are not that general.

15 The one on general design criteria tends to be  
 16 general, but the one on operational safety it is not very  
 17 clear. The control systems thing is fairly specific.

18 You might look that over as you have more time.  
 19 Now let's go back and start back with LOCA and transient  
 20 research.

21 MR. ARSENAULT: Mr. Chairman?

22 MR. SIESS: Yes.

23 MR. ARSENAULT: Just briefly on a statement you  
 24 made earlier in this discussion that didn't have to do with  
 25 the general thrust of this, and so I waited: you mentioned

1 that NRR had provided their endorsement and documented it to  
2 the subcommittee and that NMSS had not done so.

3 In the briefings that were given to the topical  
4 subcommittees we provided documentation of the three  
5 decision units -- siting, environmental safeguards and fuel  
6 cycle and waste management -- in sheets like this. And on  
7 those sheets were noted the endorsements of NMSS in  
8 safeguards, fuel cycle and in waste management. Also noted  
9 were some endorsements by I&E and Standards. So there was  
10 at least that amount of documentation provided.

11 MR. SIESS: Do you feel like they really reviewed  
12 their own needs carefully in doing this?

13 MR. ARSENAULT: Yes, indeed.

14 MR. SIESS: Reevaluate their needs?

15 MR. ARSENAULT: Yes, indeed. This endorsement was  
16 the result of a coordination process in which my staff and  
17 the staff of the three divisions sat down and went over our  
18 proposed program in detail and their program and arrived at  
19 a mutual description of the relationship of our program to  
20 their needs.

21 MR. SIESS: I see. Which subcommittee was that?

22 MR. ARSENAULT: Well, it was in fact several --  
23 the Waste Management Subcommittee, Fuel Cycle Subcommittee,  
24 Safeguards Subcommittee, and in a -- well, it would also  
25 relate to the Reactor Radiological Effects Subcommittee, but

1 their documents were provided long after that subcommittee  
2 met.

3 MR. SIESS: Well, those chairmen are here, and I  
4 would like for them to consider this and see what changes in  
5 wording we might want to make in there or whether we might  
6 want to, you know it says that they didn't do it.

7 MR. LAWROSKI: Well, one I might suggest, and I  
8 think Frank will recall that this was mentioned more than  
9 once in connection with the review of the waste management  
10 program, that there was a feeling at least on the part of  
11 the subcommittee that although there had been a large number  
12 of reviews involving both NMSS and RES, that this was  
13 essentially all in house. It did not have, unfortunately,  
14 for example, the benefit of experts that are not present in  
15 either NMSS or RES. And it also by not having some outside  
16 individuals involved, it perhaps didn't bring in the broader  
17 perspectives that you might have had if you had had somebody  
18 who had been looking at, say the DOE program, somewhat  
19 differently from what you folks are obliged to.

20 And let me say that in connection with our urging  
21 that there be more staff provided, that one of the problems  
22 we recognized, that it did put a burden on both NMSS, and  
23 particularly Res, to try to do some of the other things that  
24 they also were -- and at the same time follow developments  
25 elsewhere that should impact on what they were proposing.

1 MR. KERR: I didn't know that that was what Mr.  
2 Siess was talking about.

3 MR. LAWROSKI: Well, I thought he asked whether,  
4 what was --

5 MR. SIESS: I asked you to think about what  
6 changes we might make in the words.

7 MR. LAWROSKI: I am sorry, I thought you --

8 MR. MARK: Were you thinking, Chet, when you said  
9 you would recast some of the words perhaps, that there was  
10 no recognition here that NRR had done anything --

11 MR. SIESS: That is right.

12 MR. MARK: -- and you felt it only fair that one  
13 admit that, although they had not done enough they had done  
14 better than before?

15 MR. SIESS: And they ought to keep on doing, yes.

16 MR. MARK: And I think that that same remark  
17 applies to what Frank just mentioned --

18 MR. SIESS: Yes.

19 MR. MARK: -- that there was a start made, which  
20 was new and encouraging and probably, had it been done  
21 further back, would have been better.

22 MR. SIESS: Okay, let's go to LOCA and transient  
23 research. It is up on the board. It is going down from  
24 1981. The original request by Research -- I don't know  
25 whether that is the original, but that is the one that went

1 through -- was 59-9. The EDO marked it down to 52.9, which  
2 was the PPPG level.

3 Now let's keep in mind, the PPPG did not go down  
4 by decision units. It was a lump sum, and Research  
5 allocated money out. If we have only got 207 this is what  
6 we do.

7 MR. KERR: Mr. Chairman, I have a suggestion, that  
8 we for the purposes of this discussion adopt the term "PG."

9 MR. SIESS: Okay.

10 MR. KERR: It will save a lot of time, and it also  
11 makes the discussion more pregnant.

12 MR. SIESS: Fine. I was trying to figure a way to  
13 do it. That is even better than PQ.

14 (Laughter.)

15 What was that? I didn't hear that. Maybe it is  
16 just as well.

17 I am looking through what Milt had. In cutting it  
18 from the research request down to the PG level, cuts were  
19 made in only three areas. Semiscale was not cut; it was  
20 left at 7.5. And if I can find the sheet of paper we had  
21 from NRR?

22 (Pause.)

23 Well, I can dig what I want here. The areas that  
24 EDO cut were separate effects, by a very considerable  
25 chunk. 3D cut a million dollars out it. And core damage



1 beyond LOCA cut two million out.

2 Now Milt in his discussion -- is there anybody on  
3 that committee that helped him write this that can find  
4 things? He did not write it in the format I asked for, so I  
5 can't find -- semiscale (Pause) separate effects and mode,  
6 development, there two phases I can't see any  
7 recommendations.

8 MR. SHEWMON: In Chet's you mean?

9 MR. SIESS: Milt's.

10 MR. SHEWMON: Milt. The last page has nine. I  
11 would go back to there.

12 MR. SIESS: Let's go back to there and see if we  
13 can expedite by looking at -- recommendations.

14 MR. SHEWMON: Three is certainly in that.

15 MR. SIESS: Semiscale is the fourth. TLTA should  
16 be discarded under new facility constructions. Now what  
17 TLTM, the separate effects? I can't tell what that does to  
18 the budget.

19 MR. SHEWMON: Tooling test apparatus.

20 MR. SIESS: Flex C-set is under separate effects,  
21 is that right?

22 MR. SHEWMON: Yes.

23 MR. SIESS: That should be phased out in FY 82.  
24 SSTF should be phased out in 1982. Further separate effects  
25 experiments should be undertaken. Contribute to badly needed

1 code assessment.

2 Now those are all the things that apply to  
3 separate effects, and I can't tell whether that adds up to  
4 less money or more.

5 Let's go on down. The model development program  
6 should be expanded. What is that, code improvement and  
7 maintenance?

8 MR. SHEWMON: No, that is separate effects in  
9 model development.

10 MR. SIESS: That is still separate effects. Well,  
11 I can't tell which way that goes. It is four million  
12 dollars difference in the money.

13 MR. SHEWMON: It is going to be done in university  
14 labs, so it can't be too much.

15 (Laughter.)

16 MR. SIESS: Well, let's go on with the list. NRC  
17 should propose that the international 3-D program be  
18 modified with substitution of more useful facility for the  
19 UPTF in West Germany. Now 3-D has been cut a million. I  
20 don't know whether that is the direction. I can't tell at  
21 all whether Milt's recommendations support the cuts or not.

22 What should we claim on that, Bob?

23 Oh, it is on the board.

24 MR. BUDNITZ: I have details on what is in it  
25 though if you want to know.

1           MR. SIESS: You have asked for everything back on  
2 3-D, and half of it back on core damaged and about half of  
3 it back on separate effects? What would you -- if you were  
4 two million short on separate effects, that is after you  
5 reclaim them, what would you be leaving out?

6           Where do you stand on TLTA?

7           MR. BUDMITZ: TLTA would be included if we got the  
8 requirement and not if we didn't. It is about 600  
9 thousand. The 2.1 also covers the about 600 thousand for  
10 the Flex C-set experiment and some money on containment  
11 response.

12          MR. SIESS: What is SSTF?

13          MR. TONG: That is the Whidden, Massachusetts BWR  
14 scheme.

15          SPEAKER: He said what is SSTF?

16          (Inaudible).

17          MR. TONG: GE land facility (inaudible) BWR.

18          MR. LAWROSKI: What do the letters stand for, so I  
19 can remember it the next time?

20          MR. SHAW: Beats me. I believe it is Steam Sector  
21 Test Facility.

22          MR. LAWROSKI: Steam Sector.

23          SPEAKER: Steam Spray Test Facility.

24          MR. SIESS: All I can say, gentlemen, is that we  
25 will have to get Milt to try to translate these

1 recommendations into something that has some significance in  
2 terms of the budget.

3 MR. BUDNITZ: Chet, the things that we would cut  
4 out are, for example, some further on relief and safety  
5 valve tests, and we would do less on the containment,  
6 compartment flow tests than we would with the full amount,  
7 but with that requirement we will be able to do some of that.

8 MR. LAWROSKI: Which valve tests are those again?

9 MR. BUDNITZ: Relief and safety.

10 MR. LAWROSKI: I see. Well, isn't that being done  
11 at -- -- anyway?

12 MR. BUDNITZ: We are following that.

13 MR. LAWROSKI: It is being monitored. Is that  
14 what you infer in your cost study?

15 MR. BUDNITZ: Yes, sir.

16 MR. SIESS: Now there is the general  
17 recommendation here about replacing 3-D by a more useful  
18 facility. I don't know what that translate to in the sense  
19 of budget. Have you got a commitment on 3-D, do you?

20 MR. BUDNITZ: Yes, we do and the commitment is for  
21 6, which is why we are going to a 6 there.

22 MR. SIESS: It is for what?

23 MR. BUDNITZ: Six million.

24 It is for the -- -- just said it is for the  
25 instrumentation for the South Cortez facility in Hejari.

1 MR. LAWROSKI: Is there a commitment beyond 1982  
2 on it, Chet?

3 MR. BUDNITZ: There is a little in 1983, but it is  
4 smaller. And it is for analysis in 1983 if I remember.

5 MR. SIESS: I am sorry, we will just have to wait  
6 until Thursday when Milt is here and try to argue this one  
7 out with him.

8 MR. MCCRELESS: You do need to talk about the fuel  
9 behavior, core damage beyond it and PBF, those last three  
10 that Dr. Shewmon wrote.

11 MR. SHEWMON: I presume that takes us up to 1.7  
12 then.

13 MR. SIESS: Yes, fuel behavior under operational  
14 transient.

15 Since you are here and you have that  
16 responsibility.

17 Now there is nothing under recommendation on those  
18 three items, is there, because you didn't write  
19 recommendations or you didn't --

20 MR. SHEWMON: That is right.

21 MR. SIESS: Do you have anything to add to  
22 recommendations that relate to those three items?

23 MR. SHEWMON: Well, let's talk about the items and  
24 then I will give you some recommendations.

25 MR. SIESS: Okay.

1           MR. SHEWMON: The fuel behavior under operational  
2 transient I suspect is one of Dave's items where he thinks  
3 the conservatism is well enough established. I think it  
4 would be my candidate, and what I have written here is it  
5 has been a good program and the future function, especially  
6 of the PBF part, should be evaluated over the next couple of  
7 years to see where it should be going.

8           I wouldn't argue with the 8.6 to 6.4 up there, and  
9 since everybody within the organization seems to be agreed,  
10 why I wouldn't start an argument, but I think it is one of  
11 the things that we have been working on for a fair number of  
12 years and it doesn't seem to make an awful lot of waves or  
13 change things much.

14           The PBF and where that will be going we will get  
15 into in August. That was just one subcommittee meeting we  
16 didn't get in before this deadline.

17           MR. MARK: Paul, would you be saying that that  
18 step from 8.6 to 6.4 between 1981 and 1982 one might picture  
19 being extrapolated in the same direction to go to 1983 and  
20 1984?

21           MR. SHEWMON: Yes. I think they ought to come  
22 back in and justify how much longer they need to reevaluate  
23 the operational transients.

24           MR. BUDNITZ: As soon as I find the numbers I will  
25 tell you that it has gone down more in 1983, but I just

1 can't find it here. Wait a minute.

2 MR. SHEWMON: It goes down another half million in  
3 1983.

4 MR. BUDNITZ: And then in 1984 it really falls  
5 away. Do you have the 1984 numbers there?

6 MR. SHEWMON: Yes, it is the same, 5.9. This is  
7 on research six in this oversight.

8 MR. BUDNITZ: Okay. I may be wrong. I accept  
9 what you said.

10 MR. SHEWMON: Yes.

11 MR. BUDNITZ: My recollection of what that program  
12 is is to look at fuel behavior under these high pressure  
13 transients where the pressure stays up and it is not quite  
14 clear how rewet takes place or what the heat transfer  
15 mechanisms are. Is that fair, Longsun?

16 Longsun Tong concurs in that.

17 MR. SIESS: So you go along with it at the level  
18 and the staffs like a reclaim on it, but you are in  
19 agreement with where the Research staff is now?

20 MR. SHEWMON: Yes. I sure wouldn't want to push  
21 it higher.

22 I think on 1.8 I have become more interested in  
23 this clad ballooning than I was last year, as I begin to see  
24 more about the uncertainties in the behavior over an entire  
25 subassembly even, much less the whole core, and the first

1 paragraph deals with this.

2           The NRU tests, which are long and I don't know,  
3 six by six or something in subassembly, is useful in that  
4 regard.

5           We said they should finish the program last year  
6 and the research requirement came in as if we had attacked  
7 their program, and I thought we were just telling them to  
8 get on with it and finish it. So I don't think there is any  
9 argument there.

10           The ESSOR is one of those floating crap games that  
11 could be interesting but it is tough to find out exactly  
12 what it would do, and so I am somewhat more positive about  
13 it than Dave might be. But it is tough to know exactly  
14 where it is and I guess I would like to see some how the NRU  
15 experiments come out.

16           So I have said we should keep looking at it but  
17 really haven't tried to put strong words in your mouth.

18           The other -- it seems to me that everybody is sort  
19 of feeling around for what they are going to do in the core  
20 damage beyond LOCA and that was certainly true here. Since  
21 we haven't talked to them for a couple of months I am not  
22 sure what their thoughts are, and what this says is yes,  
23 keep at it and if you can find ways to bring PBF into the  
24 act fruitfully, do so, otherwise you have a good case before  
25 you bring PBF in. I think the real question is about



1 whether you want to start destroying cores and that thing.

2 And then the last is a short pat on the back for  
3 things that they have done in response to last year's  
4 questions. And as a result of TMI-2.

5 Now PBF operations you know is sort of cut down to  
6 a bare bones, and if you are going to keep doing experiments  
7 in it you have to go with at least that. And that is the  
8 way I interpret what is on the last line.

9 MR. SIESS: Now did you support the RECLAMA level  
10 or some other level?

11 MR. SHEWMON: Well, I have 't seen the words. Is  
12 there some words I could find for that?

13 MR. SIESS: Yes.

14 MR. TONG: ESSOR is a long rod, and attached to  
15 the fuel damage. It is more severe than NRU. You are ask  
16 -- core damage beyond LOCA -- -- core damage mechanism study  
17 and perceive how that -- -- overheating and start to melt  
18 and how the damage mechanism.

19 MR. SHEWMON: Okay. Let me, Chet, say I would  
20 support the RECLAMA on the basis that I don't think, I feel  
21 passionately almost that all of the work on Class 9  
22 accidents shouldn't be for drawing up containments and  
23 soaking or burning molten cores through concrete mats, and  
24 if as a result these people can find some things to do  
25 constructively before the core is disassembling or help to

1 define how it does disassemble, why I would back it.

2 MR. SIESS: You might want to find some words to  
3 indicate what that million will buy and put those in there.

4 MR. SHEWMON: Okay, I will get some to you before  
5 I leave.

6 MR. BUDNITZ: I just wanted to comment that we  
7 have a RECLAMA paper put together for the EDO for tomorrow  
8 and which Ron Scroggins is typing, I mean he is left it,  
9 they are back typing it now. And as a matter of timing we  
10 are going to give it to them tomorrow and you will have it  
11 just right after by Thursday.

12 MR. SIESS: When will decide on your RECLAMA?

13 MR. BUDNITZ: Not until the weekend or early next  
14 week is our understanding.

15 SPEAKER: We are supposed to get something done by  
16 Friday or Thursday.

17 MR. BUDNITZ: But it has to be out of their shop  
18 by the middle of the week and that includes a good deal of  
19 budget manipulation after decisions are made.

20 So the decisions ought to be made by weekend.

21 What I am saying is that if you want to know, for  
22 example on each of these, see that 1.0 or the 2.1 or  
23 whatever, we have words to back up exactly what that is and  
24 so on, which I guess we will provide you tomorrow or early  
25 Thursday.

1 MR. SIESS: If you get it to us tomorrow we will  
2 get it to the appropriate people.

3 MR. BUDNITZ: As I said, Scroggins is back there  
4 typing it now.

5 MR. SIESS: Paul won't be here, but --

6 MR. BUDNITZ: Oh, we will just send it to Tom  
7 McCreless, and Tom, you will have to do it.

8 MR. SIESS: Paul Behner. Paul, you have heard the  
9 discussion and you can work up some words with it.

10 MR. GILBERT: Mr. Chairman?

11 MR. SIESS: Yes.

12 MR. GILBERT: With respect to the core damage  
13 beyond LOCA we are working to get it on this, Longsun and  
14 myself, and one wants to assign technical objectives to this  
15 work, which I think is one of the things we were groping  
16 for. I would suggest consideration of the following  
17 topics: first, as Longsun as pointed out, the mechanisms  
18 for fuel damage and their relative rates; second, and very  
19 important, in line with Paul Shewmon's comments, is the  
20 effective heat transfer coefficient from the damaged fuel to  
21 steam.

22 The technical background, very briefly, to that is  
23 that if the heat transfer coefficient is high enough to have  
24 many hours to recover from severe accident before you go  
25 into core melt, if on the other hand it is as low as was

1 estimated for the Kemeny Commission report then it is true,  
2 you may have just 30 minutes before you are into a true  
3 large scale core melt situation.

4 A third technical objective that one might suggest  
5 in this area is the nature of steam flow in badly damaged  
6 cores and in particular the question of whether there is  
7 recirculation of steam and so on.

8 I don't know whether that helps, those thoughts  
9 help at focusing this area, but it is part of the things  
10 that Longsun and I have been discussing together with Dr.  
11 Murray on our capacity needs.

12 MR. SIESS: As far as NRR is concerned, it would  
13 have put that back up to 57 -- it would have had 57.4 in  
14 this item at the EDO mark level, is that right? That is  
15 what I get. They assign more importance to this than EDO  
16 did. They would have had it up at the 57.4 level with the  
17 total of what EDO gave them.

18 Just if you are interested. So the committee, if  
19 it would support either the EDO mark -- the committee  
20 supported the EDO mark, it would be supporting this at a  
21 lower level than the NRR would support it at. If the  
22 committee supports it at the RECLAMA level, it would be  
23 supporting this at about the same level as the NRR  
24 evaluation and in about the same places, I think.

25 Now I can give you that information as we go

1 through if you are interested in what NRR would do. Of  
2 course I am not arguing that we should go without NRR  
3 areas. But obviously, by supporting this at a higher level,  
4 for the EDO mark, they are supporting something else at a  
5 lower level, if you recall.

6           Okay, let's go to LOFT. That is a nice simple  
7 one. It is a single line. The numbers are  
8 straightforward. They have a nice range from 35 to 48. 35  
9 is the PPPG level. The staff said if we have to work at  
10 that level we phase it out in the middle of 1982. That is  
11 the closeout phase proposition.

12           If we can get the full 48 million, we go back to  
13 our original plan which is essentially phasing out about  
14 1984, getting some large LOCA tests, maybe core damage tests  
15 in 1982, as I recall, and on into 1983. Is that right?

16           The EDO tentatively, as you heard Kevin Cornell  
17 say, went along with the staff at the higher level, went  
18 along with the 1984 phaseout stage for LOFT, but they are  
19 not settled on it. They are still considering it. They  
20 didn't quite say why they were still considering it. It may  
21 be because of the NRR endorsement, which was somewhat  
22 qualified.

23           At the PPPG level NRR would actually have put a  
24 little more in the LOFT than Research would, but I don't  
25 know how they arrived at that number, since it took me three

1 months to find out where the money was going in LOFT anyway.

2 At the EDO level, which is where the EDO put 48  
3 million into LOFT, the staff would have taken that money and  
4 would have only put 43 million into LOFT. They would have  
5 upped it, the NLR staff would have put 43 million into it.  
6 They would have upped some; they would have taken some of  
7 that 25 million and put it into LOFT but not nearly as much  
8 as EDO did.

9 Right now there is no RECLAMA on LOFT because the  
10 staff got what they asked for.

11 MR. SHEWMON: Chet, EDO wants to give an extra  
12 million dollars for personnel and Research doesn't want it.  
13 That sounds incredible.

14 MR. MCCRELESS: That was a person.

15 MR. SIESS: That is people, not dollars. I don't  
16 know why they gave you an extra man there. Let's don't go  
17 into it.

18 MR. BUDNITZ: Beats me.

19 MR. SIESS: It is probably no more rational than  
20 some of the other things we have heard because that section  
21 is --

22 MR. MCCRELESS: There is a very rational reason  
23 for it. If you don't rather not hear it --

24 MR. SIESS: No.

25 MR. MCCRELESS: Okay.

1 (Laughter.)

2 MR. BUDNITZ: Do you want to hear the reason?

3 MR. SIESS: No. Just have to find something to  
4 disagree with, don't you?

5 MR. BUDNITZ: I mean, that doesn't mean that if we  
6 had all the resources in the world we wouldn't take that  
7 extra person but that isn't where we put the first one. We  
8 would put him in some other place.

9 MR. SIESS: I am sure you would. Now last year  
10 the committee supported LOFT at I think about \$48 million  
11 when it wrote its letter to the Commission. OMB cut LOFT  
12 back. Was it the Commission cut it back or -- OMB cut LOFT  
13 back to 43, I guess, and the committee ended up saying,  
14 well, we realize that with all the tremendous base costs for  
15 LOFT it would be cost-effective if we could make eight or  
16 ten tests instead of four or five, but if there is only so  
17 much money we would rather take that 5 million and use it  
18 somewhere else, chiefly for probabilistic risk assessment  
19 and for improved reactor safety. And we accepted the OMB  
20 mark of 43 million and left that in our report much to the  
21 unhappiness of the Research people.

22 This year right now there is not much disagreement  
23 between the staff and EDO. There is some disagreement  
24 between the staff, Research and NRR, of about \$5 million.  
25 In other words, NRR's position is 43 million next year would

1 be good enough, which is what, we do about five or six  
2 tests? How many would it do, Bob?

3 MR. BUDNITZ: In 1982, because of the way the test  
4 schedule is set up we would only do --

5 MR. SIESS: Well, that is right, they are --

6 MR. BUDNITZ: -- four tests, but there is a  
7 shutdown for some safety work, and one of those tests we  
8 will have to change the fuel after, and with that cut we  
9 would have to cut those four, I think to something like two  
10 tests.

11 MR. SIESS: Let's see now --

12 MR. BUDNITZ: Remember that, Don?

13 MR. SIESS: Bob, if you get --

14 MR. BUDNITZ: Don will know.

15 MR. SIESS: Well, let me put the question another  
16 way first. If you get 48 million, you would go a full  
17 program of tests in 1982, don't start cutting down until end  
18 of 1983?

19 MR. BUDNITZ: That is right. The established  
20 program that we have.

21 MR. SIESS: And the established program for 1982  
22 would be what? How many tests?

23 MR. BUDNITZ: Don?

24 MR. MCPHERSON: Dr. Siess, the number of 43  
25 million was just presented to us this week. Normally it



1 requires a reprogram for 500 people, and to do that takes  
2 about two or three months before we can determine how we  
3 would accommodate this lower value.

4 MR. SIESS: But now answer my question, with 48  
5 million in 1982 how many tests do you make?

6 MR. MCPHERSON: Four tests during that year of the  
7 type we plan.

8 MR. SIESS: And they are all large LOCA tests,  
9 including one high power?

10 MR. MCPHERSON: No, sir, two of them are large,  
11 are of that type; one is an intermediate size break, and the  
12 last one is an operational transient.

13 MR. SIESS: But you do expect one of them to  
14 possibly damage the core?

15 MR. MCPHERSON: Two of them.

16 MR. SIESS: Now at the 35 million level, which was  
17 the PG level, you would be in a phaseout in 1982?

18 MR. MCPHERSON: That is correct.

19 MR. SIESS: Probably no tests?

20 MR. MCPHERSON: Well, the plan was we would run it  
21 half a year and do one or two tests and then phase it out.  
22 And that is to us an acceptable scenario, although one that  
23 we would be forced to with that very low number.

24 MR. SIESS: So the difference in the number of  
25 tests you would make in 1982 between the two extremes is not

1 very great, but the thing is that in one case you would  
2 still be making tests in 1983.

3 MR. MCPHERSON: Yes.

4 MR. SIESS: The difference between four tests and  
5 two tests doesn't sound like very many tests.

6 MR. MCPHERSON: Yes, but by definition, if you  
7 close a reactor off at any given moment, then in the three  
8 months before there is no difference in what you would have  
9 done maybe.

10 MR. SIESS: That is right.

11 MR. MCPHERSON: I mean it is the rate effect that  
12 you are seeing there, not a --

13 MR. SIESS: So really I guess there is only two  
14 tests difference in 1982 in the whole period 1982-83-84 how  
15 many tests would you -- it would be about ten tests all  
16 together?

17 MR. MCPHERSON: A total of four tests in 1983,  
18 four tests up till May 1984. That would complete our  
19 program. I have copies of the entire program here.

20 MR. SIESS: So beginning in 1982, along the  
21 schedule it says end of 1984 you would get twelve tests  
22 finished before you shut it down.

23 And if you are on the schedule it says close it  
24 down in 1982 you get two tests.

25 MR. MCPHERSON: Yes.

1 MR. BUDNITZ: Yes, sir.

2 MR. SIESS: I am trying to get that straight,  
3 because the difference just looking at 1982 isn't very much.

4 MR. BUDNITZ: Yes, but, Chet, there is another  
5 point. Even at the \$48 million level that we have there the  
6 LOFT program has some important compromises in it that you  
7 should be aware of.

8 For example, at the \$48 million -- and then you  
9 notice in 1983 it is 48 and so on in our planning -- that is  
10 the last of the fuel. We are not going to order any new  
11 fuel. The contract option with Exxon will be terminated and  
12 unless some reversal takes place or go of course those we  
13 got are the ones we are going to have, plus the one that is  
14 just coming in the pipeline now.

15 We have been careful to plan a test matrix that  
16 minimizes the chance of damaging fuel in 1981 for another  
17 reason, not just that we are not ordering fuel, but we have  
18 an insufficient capability with that budget to be able to  
19 cope with damaged fuel if we got it. If LOFT were funded  
20 the way we really would like, we would have a capability to  
21 cope with damaged fuel and so if we sustained it we would  
22 not have to lose most of a year in the facility getting it  
23 out of there. But that will be the unfortunate consequence  
24 of a fuel -- of an unexpected severe fuel damage incident if  
25 we have one in 1981.

1           So you ought to be aware that the test matrix has  
2 been modified because of the funds limitation even at the 48  
3 million. And that will be true in 1982 also. In 1982 we  
4 plan two tests that are likely to damage fuel, one of them  
5 in the central assembly and perhaps one of them more  
6 extensively. It is not clear.

7           MR. SIESS: Okay, I am just looking at what  
8 Plesset had provided us, and as I read it it sounds like he  
9 is recommending that LOFT be on the minimum schedule, be  
10 decommissioned at the end of FY 82.

11           I don't know whether the committee agrees with  
12 that.

13           (Inaudible speaker.)

14           SPEAKER: That would fully agree with my  
15 understanding of what he was proposing.

16           MR. SIESS: What I am going to propose, gentlemen,  
17 is this. I think LOFT is a clearcut situation. It is  
18 fairly easily understood. We have heard that, together with  
19 this document, I think is very enlightening, and I don't  
20 believe that the subcommittee needs to consider it further.  
21 We can, the full committee can take up LOFT and settle it in  
22 20 or 30 minutes. And I think we have got that much time.  
23 And then even though there is a substantial number of us  
24 here, I would rather have it done at the full committee when  
25 Milt is here.

1 Does anybody object to that?

2 We might reach a tentative decision, but I had  
3 just as soon wait until then to do it.

4 MR. MARK: I would just like to ask a question.  
5 Two large LOCA tests, which I guess are in danger of being  
6 rather expensive tests, are they dearly beloved by NRR or  
7 are they throwing them out?

8 MR. BUDNITZ: Yes, let me describe them. One is a  
9 test with pressurized fuel which -- well, we know the other  
10 LOFT test state, with our nuclear tests have been  
11 repressurized fuel, which will give us some insight into the  
12 question about whether the pressurized fuel leads to  
13 ballooning and flow blockage.

14 The other is a 16 kilowatt per foot test, which is  
15 the power ascension series that we began at eight and twelve  
16 now goes to sixteen, which is a power density higher than  
17 most normal reactors nowadays are running. And both of  
18 those are quite important to our NRR colleagues.

19 MR. SIESS: Bob, let me suggest for the full  
20 committee that you be prepared to tell us what can be done  
21 for 35 million with the FY 82 closeout, what can be done  
22 through the end of the program with the FY 84 closeout, and  
23 then since it was suggested that what Milt had in mind here  
24 was having more money for 1982 but still closing it out in  
25 1982, is it possible to make more tests in 1982 with more

1 money and still close out in 1982?

2 MR. BUDNITZ: Yes. We are prepared to talk about  
3 all that right now, but we will do it under, as you like.

4 MR. SIESS: I think we would just be repeating.

5 MR. BUDNITZ: I understand.

6 MR. SIESS: And I think if you can maybe --

7 MR. BUDNITZ: We are all ready for all that.

8 MR. SIESS: -- have a viewgraph that is -- this  
9 won't make a viewgraph -- but with some of this information  
10 on it, this is good to pass out.

11 MR. BUDNITZ: Thank you. We will do that.

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1 And I think those follow up with the alternatives, plus  
2 this last, the item you just mentioned, what you could do with  
3 more, in the fuel damage. I think it -- the people that are  
4 missing I think are rather crucial, so we just won't try to go  
5 through everything again.

6 Okay?

7 Who wants a ten-minute break? Anybody?

8 Okay, ten minutes.

9 (A brief recess was taken.)

10 MR. SIESS: Plant Operational Safety is on the screen.

11 This program --

12 (Pause)

13 You ready, gentlemen? This is your chapter, Charlie.  
14 There are the numbers.

15 Let me just remind you of something I said earlier and  
16 try to focus it a little better. I said we have got to talk  
17 about and think about priorities, at whatever level we can think  
18 about priorities or at whatever level we can agree about priori-  
19 ties, and I think that our aim really should be to look at pri-  
20 orities on the differences between whatever we end up recommending  
21 and the PG number. That's being pessimistic, if you wish to  
22 think of it that way, that they might be reduced down as far as  
23 the PG number. I don't think that's too likely. But something  
24 in that general neighborhood. We've got to think that there's  
25 going to be some reduction from anything we recommend, and if we

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1 are going to be helpful to the Commission we ought to give them  
2 some indication of priorities -- at whatever level we can agree  
3 on. If we can't agree below decision units, if we can do no more  
4 than write the decision units in order of priority, we'll do that.  
5 But if we can indicate -- if we think LOFT ought to be funded at  
6 48 instead of 35, then we ought to talk about what priority that  
7 13 million is, or what priority five million of it is, or what  
8 priority ten million of it is.

9 MR. MATHIS: Okay. Well, Chet, the variance that you  
10 see up there between --

11 MR. SIESS: And I mention that because what you don't  
12 see up there is the PG figures.

13 MR. MATHIS: No, but I've got --

14 MR. SIESS: You've got them, I am sure.

15 MR. MATHIS: -- not too far away from that. I think  
16 the difference that I have here -- and I don't know how big this  
17 number is, but --

18 MR. SIESS: It was 43 million. Forty-three million.

19 I'm sorry, PG figure was forty --

20 MR. MATHIS: Forty-three six.

21 MR. SIESS: Forty-three six.

22 MR. MATHIS: Compared to an EDO of 43.

23 MR. SIESS: Yeah. So the EDO actually cut this below  
24 the PG figure, which I think is the only case they did it.

25 MR. BUDNITZ: And the place they did it was integral



1 components: 90 they cut to 84.

2 MR. SIESS: That's right.

3 MR. BUDNITZ: And that's that 600 K.

4 MR. SIESS: Well, they cut structural by a million,  
5 which I don't understand, because their statement says they only  
6 cut it a half a million. I hope somebody can explain that one  
7 to me.

8 MR. MATHIS: I don't have an explanation for that one.

9 And again, the difference between what you see up here  
10 and what Roger talked about this morning is very slight, with the  
11 exception of the thermal shock tests. And Paul was basically  
12 saying let's go back and look at that again and not necessarily  
13 drop it. So I think that's one that we've got to come up with a  
14 recommendation on.

15 The other two items that they commented on, or Roger  
16 commented on this morning were the slower growth in instrumenta-  
17 tion electrical, electrical supply design problems, mechanical  
18 components -- and that gets back to the other 600,000 -- and  
19 structural safety effort.

20 Now, we haven't had a chance to go through all of this,  
21 but it looks to me as if trying to resolve any of these differ-  
22 ences, which are minor, shouldn't be too much of a problem.

23 We have some other, minor comments in some other areas,  
24 which we will have to get into in writing if we decide we want to  
25 go that way, such as they are still proposing that they put

1 together some structural mock-ups for some fire testing, and  
2 those of us that were in the subcommittee meeting just feel that  
3 that is just not very productive, a waste of money; there are some  
4 other minor things of that nature.

5 But in the bigger items there doesn't seem to be a lot  
6 at variance as far as priorities are concerned to the total  
7 dollars.

8 So I -- even though we've just got a lot of notes, we  
9 haven't had a chance to put the whole thing together, I see no  
10 particular problem in trying to grind it out today.

11 MR. SIESS: Well, let me ask you something. I'm trying  
12 to get clear. The EDO mark was well below the staff's request.

13 MR. MATHIS: That is right.

14 MR. SIESS: And NRR at the EDO figure would be well  
15 above the EDO mark.

16 MR. MATHIS: But NRR if they put in, put back the 25  
17 million is the same as research request, the 48.6.

18 MR. SIESS: Yeah. That's at the EDO mark. But that's  
19 not really -- you know, what we have to recommend, the number we  
20 will be commenting on will probably not include the NRR mark.

21 You see, even -- even research now in their RECLAMA is  
22 not asking for as much as NRR would have given them at that level,  
23 at the existing level. It is a difference in priorities here  
24 between research and NRR. NRR would have put more money into  
25 this program than research would and take it out somewhere else,

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1 LOFT being one place -- five million was out of LOFT, you see.

2 MR. MATHIS: Well, the NRR PG was 42.7, compared to the  
3 EDO mark of 43.

4 MR. SIESS: Yeah.

5 MR. MATHIS: That's as far as the total.

6 MR. SIESS: Yeah, but those are on different bases.  
7 The NRR would have put 42.7 out of 207 million in the program.  
8 The EDO would have put 43 million out of 230 million into the  
9 program. You see?

10 They're the same numbers, but relatively speaking not.

11 The staff is only asking with the RECLAMA for 46 million  
12 out of 250 million. If you look at it in terms of percentage,  
13 you see, NRR is saying the highest percentage of the budget for  
14 this program, research has assigned the next highest, and EDO has  
15 assigned the smallest percentage.

16 MR. BUDNITZ: Well, Mr. Chairman, if you notice, what  
17 we did, the last column, "Revised Research Request," we backed  
18 down two-and-a-half million from the original.

19 MR. SIESS: Yes.

20 MR. BUDNITZ: And you can see where it is. We backed  
21 down a million in the instrumentation electrical. We accepted  
22 the notion that that was very rapid growth and that seven three  
23 is already a big growth. And then we backed down a half a million  
24 in plant systems behavior, and we backed down a million in mech-  
25 anical components.

0-6  
1 Now, that's not to say that we are pleased with that.  
2 But I guess we -- we came to the conclusion you have got to give  
3 somewheres or they clobber you.

4 MR. MATHIS: You could live with it.

5 MR. BUDNITZ: Yeah.

6 MR. SIESS: And that's at the RECLAMA level.

7 MR. BUDNITZ: Yeah. We could live with it.

8 MR. SHEWMON: Can I ask a question? On the mechanical  
9 components there, it's down for eight four there. In the handout  
10 that was given to us at the subcommittee meeting, it was seven  
11 three for '81 -- seven seven.

12 MR. SHAW: You see, we pick up some of the project from  
13 another decision unit. It was the valve testing used to be did  
14 not belong to mechanical: now it belongs to mechanical.

15 MR. SHEWMON: Okay. So that's over and above the  
16 seismic too, then?

17 MR. SHAW: Right. This is for the relief valve testing.

18 MR. SHEWMON: Well, I'd like to make one comment on  
19 this, Charlie, since I won't get a chance to -- or a couple. It  
20 seems to me on the mechanical components they are talking about  
21 going up a factor of ten from FY '80 to FY '81 -- a factor of  
22 nine, really. And I -- I'm looking at the FY '80 budget, which I  
23 have and you don't, that's where they are now. And that's 650  
24 excluding the seismic. And they're talking about going to five  
25 million seven hundred in '81 for the same three programs that we

1 heard. And it seems to me that if money's tight, if it didn't  
2 grow that fast, given their level of ideas on what they're going  
3 to do, at least, as it came through at the subcommittee meeting,  
4 they could grow a little bit slower without hurting anything  
5 a great deal.

6 MR. SHAW: Okay, maybe -- maybe, Dr. Shewmon, the  
7 mechanical engineering branch was formed about two years ago,  
8 starting from zero. You know?

9 MR. SHEWMON: Mm hm.

10 MR. SHAW: From zero to anything we have grown. Actual-  
11 ly NRC had been doing a lot of research in the other area, but  
12 we have never done any research in the mechanical components  
13 and the structural components.

14 MR. SHEWMON: And it's not too clear they know how  
15 they are going to do research in the area yet, to some of us.

16 MR. SHAW: I think we know how we should tackle these  
17 problems. We have been facing these problems years.

18 MR. SHEWMON: Well, Mr. Chairman, you've heard my  
19 opinion on it, and you can check it out with Harold Etherington,  
20 who was at the meeting.

21 MR. SIESS: Now, you said that they've gone from what in  
22 '80?

23 MR. SHEWMON: Six fifty was what was handed out.

24 MR. SIESS: Six fifty what -- thousand?

25 MR. SHEWMON: Six hundred and fifty thousand dollars.

C 8 1 MR. SIESS: And the same number of projects?

2 MR. SHEWMON: No, I am sure they had many other pro-  
3 jects.

4 MR. SIESS: Oh, okay, I see.

5 MR. SHEWMON: The 5.7 million projected for FY '81.

6 MR. SIESS: How much of that is SSMRP?

7 MR. SHEWMON: None of it.

8 MR. SHAW: In the first year it's almost all of this --

9 MR. SIESS: No, in '81 and '82, what's the --

10 MR. SHEWMON: Chet, the numbers I am quoting to you,  
11 none of it are. I can put the whole thing down on the board, if  
12 you want. Now, the numbers --

13 MR. SIESS: Well, I'm sorry, Paul, I'm just trying to  
14 understand. You're talking about mechanical components, 8.4 mil-  
15 lion in '81; that's what I'm looking at. Okay.

16 (Pause)

17 MR. SHEWMON: These were what were handed out to us.

18 MR. SIESS: Okay.

19 MR. SHEWMON: The totals were 1.8, 7.73, and 10.0.

20 MR. SIESS: Okay. Now I see what you're getting at.

21 Yeah.

22 MR. SHEWMON: And what I got was the three groups which  
23 are still trying to get organized, or which are at an earlier  
24 stage of organization. And one was mechanical reliability; the  
25 other was structural reliability. And the third one was general

1 reliability. And what I am quoting to you are these three --

2 MR. SIESS: And these are all under mechanical com-  
3 ponents.

4 MR. SHEWMON: This is 650 --

5 MR. SIESS: Okay. I see what you mean.

6 MR. SHEWMON: And they hope to take it to 5.730.

7 MR. SIESS: I get you.

8 MR. CARBON: I don't get you. Because how does that  
9 8.4 compare with this 5.7?

10 MR. SHEWMON: This number here, plus whatever you need  
11 to to get to 8.4, is one other valve testing project.

12 The other stuff comes under the fracture mechanics,  
13 and I don't know how the cracking got singled out for considera-  
14 tions, and what I've got in here are words that say in that  
15 section, I think, that the question of thermal shock is probably  
16 the largest single uncertainty with regard to these older  
17 pressure vessels, and I think we ought to get on to doing things  
18 with it, in the next section, on nondestructive examination, I  
19 have got a couple of sentences on the development of the new  
20 nondestructive testing examinations, instead of being sure what  
21 the older ones will do, and that is about the same amount of money,  
22 and it seems to me that in terms of priorities developing new  
23 and untried techniques should take a significantly lower priority  
24 than an established regulatory question, or addressing an  
25 established regulatory question.

1 MR. SIESS: Where does the safety relief valve -- is  
2 the safety relief valve testing program part of that?

3 MR. SHEWMON: Is that part of the reliability for  
4 mechanical components?

5 MR. SHAW: Yes. The safety relief testing program is  
6 including 773,000, the testing part has been eliminated.

7 MR. SHEWMON: But what was your addition in here?

8 MR. SHAW: About 700,000.

9 MR. SHEWMON: Pardon?

10 MR. SHAW: About -- let me see -- about 700,000.

11 MR. SHEWMON: Yeah, but where -- now, if those monies  
12 are someplace else -- do they get described someplace else?

13 MR. SHAW: It was described somewhere and moved here  
14 now. It wasn't in that branch.

15 MR. SHEWMON: Which one of these groups or branches --  
16 what it's in -- it's in another, a fifth branch?

17 MR. SHAW: In the general reliability.

18 MR. SHEWMON: It's in here?

19 MR. SHAW: Yeah.

20 MR. SHEWMON: So these numbers that we got weren't  
21 complete, is that right?

22 Yes?

23 MR. BUDNITZ: We moved that from somewhere else into  
24 here after your -- after you got your numbers. That's all. It's  
25 a bookkeeping issue. Okay?



1 MR. SIESS: Charlies, who is supposed to provide the  
2 information on the SSMRP stuff?

3 MR. SHEWMON: The seismic subcommittee reviewed it,  
4 didn't they?

5 MR. SIESS: It wasn't assigned to anybody else. That's  
6 why I am asking. Because it says here somebody else is supposed  
7 to do it, and I've looked at the assignments and they --

8 MR. SHEWMON: It wasn't gone over with us. And we  
9 were told it was being presented to the seismic subcommittee.

10 MR. SHAW: Dr. Okrent's subcommittee on external phen-  
11 omena.

12 MR. SIESS: Well, I'm afraid I goofed, then. Because --

13 MR. BUDNITZ: The seismic?

14 MR. SIESS: -- it was not assigned today.

15 MR. SHEWMON: Well, that's my fault some too, because  
16 they came in and said, "We're doing this with somebody else," and  
17 I didn't argue with it, because I thought that was what my under-  
18 standing was too.

19 MR. SIESS: Well, we can't -- you're not alone, because  
20 I reviewed the structural and I didn't do the SSMRP either.

21 We'll get something on it.

22 I think Dave might have written something on it.

23 Were there any -- I'd like to ask a question about the  
24 structural stuff.

25 Bob, do you think that's just a typo in there that when

1 they mentioned a half a million instead of a million?

2 MR. BUDNITZ: Yes, Mr. Chairman. That's my understand-  
3 ing, because the half a million would be 6.0 and it's really 6.5  
4 and 5.5.

5 MR. SIESS: Yeah. Well, I couldn't find any of their  
6 percentages that made any sense. Three hundred percent over to  
7 me is four times as great. And it's not. And I just don't  
8 understand the figures at all.

9 MR. MATHIS: Now, the structural safety should be what?

10 MR. SIESS: It's right, the figures are right. But the  
11 EDO's explanation said, "We took a half a million out."

12 MR. MATHIS: Oh.

13 MR. SIESS: And they took a million out. That, that  
14 subtraction I can make without a calculator.

15 (Laughter)

16 MR. MCCRELESS: He can also make that from his personal  
17 checking account.

18 (Laughter)

19 MR. MATHIS: Well, as far as the target is concerned,  
20 Chet, do you feel that most of our discussion should be hinged  
21 around the research PG numbers as a reference point?

22 MR. SIESS: Well, I think that that -- well, I suggested  
23 simply that if we're going to try to think in terms of priorities  
24 -- right? -- we should think in terms of priorities on the  
25 differences between the PG numbers and whatever numbers we arrive

1 at. And those differences represent some kind of priority. And  
2 if we have them well organized, then when the -- if the Commis-  
3 sion doesn't like our number and want to go down, at least we will  
4 have told them where they should start down.

5 If we want them to take it -- if we recommend 48 million  
6 for LOFT and figure that taking 15 million out of LOFT is a good  
7 place to start, then that should be number one. If we think it  
8 should be the last place to start, then it should be number 20,  
9 or whatever it is. Or we might divide LOFT into three cuts and  
10 give them different priorities.

11 MR. MATHIS: Well, I had a little problem with that.  
12 Looking at just this section, we should say that there are  
13 certain numbers of jobs, scope of activity, that should be  
14 covered in our opinion, and it's going to cost so much money.  
15 And whether it's 43 million or 43.6 out of how much is irrelevant  
16 to me.

17 MR. SIESS: Well, the thing is --

18 MR. MATHIS: To the overall it may be. But I'm just --

19 MR. SIESS: Well, I'm thinking of what advice we're  
20 going to give to the Commission that might be taken. And giving  
21 them that kind of advice is not likely to have much influence,  
22 because we've told them in the past that we think they ought to  
23 spend so much money for research and if they decide for any  
24 reason -- political, congressional, rational or irrational -- that  
25 it should be less than that, then if we haven't told them where

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1 we think they could cut if they're going to cut, then we haven't  
2 had any influence; we might not as well have spoken. We can say,  
3 "Yes, you ought to spend \$250 million for research," and they  
4 say, "Well, we're only going to spend 210," we've given advice  
5 -- 250 -- and they didn't take it: we can sit back and say, "That  
6 is fine," or we can say, "Okay, 250 but here's our order of  
7 priorities down to 220 or down to 210," or whatever you want, and  
8 we've got a chance that they'll listen to us.

9 MR. MATHIS: Well, that's playing the "what if" game  
10 again. And I don't know where you stop this thing. Do you have  
11 a target?

12 MR. SIESS: Yeah. I don't think the Commission is  
13 going to go below the PPG. I don't think they're going to go  
14 that low. I suspect the Commission may cut below the EDO figure  
15 -- I don't know. But I've got a suspicion that they're not going  
16 to take the figure we give them and just use it. And then if  
17 they don't, we haven't -- we've given them advice, which is all  
18 we're asked to do. But if we want to give them some advice that  
19 has some chance of being taken, I think --

20 MR. MATHIS: Well, we have advice from research, we  
21 have advice as of today from NRR --

22 MR. SIESS: That's right.

23 MR. MATHIS: -- as to the amount of money in this  
24 particular topic.

25 MR. SIESS: And we have heard from EDO.

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0-15 1 MR. MATHIS: And we have our own opinion. And they  
2 aren't very far apart. But now if you look at the overall, then  
3 they could be if you want to look at it percentage-wise. And  
4 that's the hangup I have got at the moment: which game are we  
5 going to play?

6 MR. SIESS: I don't really understand -- I can only see  
7 two ways to do it. And if all we're going to do is tell the  
8 Commission that we think the budget ought to be \$238,500,000, we  
9 can put that in a letter. Because they're going to be acting on  
10 the budget within a week.

11 I don't think I'd waste much time arriving at that  
12 figure. You know, I think we can go around the table and poll  
13 people and average it and give them an average of the standard  
14 deviation if they wanted to, and, you know, it'd do the job.

15 But I think if we're going to give them any help in  
16 arriving at a budget figure as to what we think is important --  
17 I mean, they're going to have a tough problem with LOFT.

18 MR. MATHIS: Well, that's right -- but that should be  
19 judged on its own.

20 MR. SIESS: But you can't judge it on its own. They're  
21 not going to be able to judge LOFT on its own. They aren't going  
22 to be able to judge fast reactors on their own.

23 MR. KERR: Paul, were you suggesting that if we request  
24 for money we could take some money out of the mechanical com-  
25 ponents budget?

1 MR. SHEWMON: I would not support the RECLAMA up there.

2 MR. SIESS: You don't want to take out 600,000? I  
3 thought maybe you were going to say five million.

4 MR. SHEWMON: Push me on one or two. I don't know. I  
5 just think that they've got ideas and they're trying to get pro-  
6 grams set up and they haven't gotten an awful lot in place yet.

7 Now, I -- I am sorry we can not be hopeful that Mike  
8 will be here and Errol. You can push them for numbers.

9 MR. SIESS: Well, I can give you an example. On the  
10 structural engineering work, we reviewed it very carefully, they  
11 have already made some cuts from their original request and I  
12 criticized them somewhat for cutting all the projects a little  
13 bit rather than maybe just whacking out one whole project; but I  
14 have looked at it and I can find one cut they can make, a project  
15 that the committee was -- subcommittee and the consultants were  
16 rather unanimous as thinking was not too worthwhile, we were  
17 dubious as to its research content and to whether it was really  
18 going to accomplish much, but it's only \$200,000. I'm willing to  
19 put it down; in fact, I've got some words to that effect, without  
20 dollars on it. But otherwise I'd support the RECLAMA pretty much  
21 on the structural.

22 It's growing. And we told them last year they were  
23 growing too fast and it cut back, and I think they've got the  
24 growth down to a reasonable rate, considering the kind of stuff  
25 they're doing.

0-17 1 MR. MARK: Your comment, Paul, was that 0.6 you would  
2 not feel you could support?

3 MR. SHEWMON: Yeah. I -- well, yes. To use Chet's  
4 words, I think they're trying to grow too fast, too. I just  
5 don't think they have projects well defined and where there is  
6 user need. But they're obviously giving some support on backup  
7 and they're doing, they've got some good goals identified. Mike  
8 wasn't particularly happy with their criteria for part of it. He  
9 kept asking them how they'd know when they got there.

10 He can enlarge on that better than I can.

11 I guess I am saying I wouldn't support the RECLAMA, and  
12 I'm reluctant to give a separate number and I think you will have  
13 at least as good guidance with Mike as you will from me.

14 MR. SIESS: But, Charlie, the point you raised is --  
15 is -- I can see one of the problems. I can talk about LOFT as  
16 a decision unit; it's a very straightforward case. If I look  
17 at this decision unit, I find a lot of different items in it.  
18 And I guess I would, the committee would have difficulty assign-  
19 ing a priority to this decision unit. The committee, however,  
20 might look at this and say, "Well, it looks like that you could  
21 take a couple of million out of here, somewhere at research's  
22 discretion out of this decision unit, at a priority level of so  
23 much."

24 And this is what Bob Budnitz had to go through. He  
25 started out with \$269 million and he had a figure of 207, and he

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says, "Well, if I don't have 207, if I don't have but 207, where  
 am I going? All of it's important, but where do I cut?"

NO TAPE 4

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1 MR. KERR: In Mr. Shewmon's comments on -- --  
2 search his list examination. How much money was associated  
3 with the brand new kind of work that you thought maybe  
4 should be or could be deferred, Paul?

5 MR. SHEWMON: They aren't new programs. They are  
6 programs that have been ongoing for some time, and FY 82 I  
7 would guess there is the order of a million dollars looking  
8 at this. I could single them out if you are interested.

9 It is close enough to count the vote of the one  
10 and a half million that was talked about for the pressurized.

11 MR. SIESS: Look, Bob set up his priorities. If  
12 we wanted to agree with those, gee, we are home pretty  
13 quick. The first thing Bob would cut, getting down to  
14 working his way down from 269 million in increments of about  
15 10 million, as he said earlier, he had six levels of  
16 priorities. They ran into reverse order. One was the  
17 lowest priority. Six was the highest. And the only thing  
18 he would cut to get down 10 million, he was going to cut it  
19 out of -- take out fast and gas. If the committee is going  
20 to stick in fast and gas, are we going to give it a first  
21 priority like he did or not.

22 The last thing Bob was going to cut, which  
23 amounted to \$13 million, was LOFT. And those were  
24 clearcut. I mean very simple, straightforward. If he has  
25 got to cut, take out fast and gas first. Leave LOFT in till

1 the very last. In between there was a fair number; there  
2 was steps of 10 million. And in this particular decision  
3 unit there was about 3 million in as the second stage and  
4 another couple of million in at stage 5. There was a total  
5 of 5 million he took out of this to get it down to that  
6 level in about two steps.

7 MR. BUDNITZ: Chet, I have a suggestion. First  
8 off it would be nice to have a list that anybody that had a  
9 magic number could point to and say, well, gee, if you want  
10 to give us 243.8 you cut here, and you know, and everything  
11 -- and then if you are only 243.4, you cut here.

12 MR. SISS: We won't get that, not by any means.

13 MR. BUDNITZ: Of course not. That would be nice,  
14 but that is, while nice it is incomplete. And let me  
15 describe you the way in which it is incomplete. It is  
16 incomplete in the same way that this table that you are  
17 reading off of of mine is incomplete on its face. It  
18 requires some explanation. You see, the first things that  
19 you cut ought to be things that could be deferred, like fast  
20 and gas have these other issues involved with them that  
21 don't affect either operating plants or plants that are  
22 coming on line soon or whatever, or speculative projects  
23 whose payoff is only improbable at best or whatever.

24 But as you begin to cut down you ultimately come  
25 to a state where you say hey, if I cut here I start

1 affecting the ability to license new plants, and if I go  
2 further still I start to affect the ability to assure the  
3 safety of operating plants or whatever. And then of course  
4 you have to mix in the fuel cycle in here somewhere. I mean  
5 that is a judgment about whether waste management is more  
6 important than licensing or something, you know, which then  
7 my judgment is on this piece of paper.

8 Now it is much more useful to come up with a rough  
9 delineation about where as you cut you start impeding the  
10 agency's ability to license new plants or to ultimately  
11 protect the public for operating plants than it would be to  
12 have a list of numbers without it, because without it you  
13 don't have any real guidance as to what the extra dollars  
14 buy in terms of agency mission.

15 MR. SIESS: Now we don't to list the numbers. If  
16 we were going to come up with the kind of list you talked  
17 about, that is the only thing that would go to the  
18 Commission, instead of a 30-page report.

19 MR. BUDNITZ: Yes, of course.

20 MR. SIESS: But I would hope the discussions would  
21 indicate the kind of things you are talking about, and on  
22 the big items I think we just cannot throw them in there and  
23 say this is what we think you ought to do. Now I don't care  
24 what we say about fast and gas, what the Commission does  
25 about fast and gas is going to be independent of anything

1 this committee says. It is probably also true of the  
2 Congress.

3 But I think that what this committee says about  
4 LOFT is going to have a considerable weight, and if we get  
5 it out by Saturday it might even help the EDO in reaching  
6 their decisions.

7 MR. BUDNITZ: Yes, but, Chet, the point is that --  
8 let's go back to the one like on pressurized thermal shots  
9 -- by the way is not the whole of that 1.5 million, but is a  
10 major part of that, and it is on the -- you see pressure  
11 mechanics at 1.5.

12 Okay, now my point is that it is a heck of a lot  
13 more useful to say that that is important to do because it  
14 affects the -- -- operating plan, and that that is important  
15 to do. And if in structural safety you say well, you know  
16 that million is important because it might affect our  
17 ability to license new plants, that is also very important.

18 That sort of thing provides a level of guidance  
19 that the Commission won't get otherwise. Nobody else is  
20 going to tell them that separate from us, and they don't  
21 listen to us on their own because we are the advocates.

22 MR. TONG: By the way all these programs are not  
23 for new plants, all new plants (inaudible) pumps, valves,  
24 piping and also load combinations. Those problems have been  
25 around for a long time. Nobody has been at work on these

1 problems. Now we have a branch line now we want to work on  
2 these problems.

3           These problems occur almost every day on many  
4 plants, and every day you solve another problem. It will be  
5 going on for years. Valve problem, you have piping problems  
6 and load combination problems. Whether we should combat  
7 this -- -- LOCA, small LOCA or big LOCA. But this kind of  
8 problem, it would go into the mechanical part of it. A lot  
9 of mechanical components in the plants.

10           MR. SHAW: Chet, let me just --

11           MR. SIESS: Don't talk to me, talk to them. They  
12 are going to write the report.

13           MR. SHAW: You are the chairman.

14           MR. SIESS: Oh, no, I am just going to put it  
15 together when they get through. The committee is going to  
16 write the report.

17           MR. SHAW: I suppose part of it is in the style of  
18 "Senator always saying Mr. President" --;

19           MR. SIESS: We address the floor.

20           MR. SHAW: -- Mr. Chairman.

21           MR. SIESS: I am listening.

22           MR. SHAW: By the way, the guy sitting up there --  
23 -- nobody is listening --

24           (Laughter.)

25           MR. BUDNITZ: You see, the Commission is going to

1 have a problem because they are going to be reluctant to go  
2 above the 217, which is the PPPG level. In order to  
3 convince them that a higher level is needed they have to be  
4 convinced that there is some problem, either a safety  
5 problem with operating plants or a problem with licensing or  
6 a problem with an inability to do waste management or  
7 something like that whose importance requires the additional  
8 funds, and unless the committee addresses why that is  
9 important to get the additional funds over to the PPPG, its  
10 influence will be diminished.

11 My approach to this whole thing has been that, and  
12 I think that that is the most likely way to convince the  
13 people who don't want to go above it that they are  
14 compromising something when they don't.

15 MR. SIESS: My object is to have some influence on  
16 what the Commission submits as a budget to the Congress, and  
17 I don't think we are going to get everything we ask for. I  
18 don't think that Research is going to get their RECLAMA.  
19 And the Commission is likely to cut below whatever the final  
20 EDO mark is.

21 Now the EDO will give them something of their  
22 RECLAMA, I think. They might lose on LOFT. I don't know  
23 what the total will be. And the Commission is likely to cut  
24 below that. And I think we just have to assume the  
25 Commission is likely to cut rather than to add, and if we

1 put in fast and gas, which is going to be 10 or more, that  
2 is going to make the total look even more and if there was  
3 some way of convincing them that fast and gas should stay in  
4 there, I will guarantee you they will take 10 million out  
5 somewhere else.

6 And I think that if we want to have any influence  
7 and not just give advice and forget about it, we had better  
8 tell them where we think they ought to take it out with the  
9 least effect on the program.

10 MR. MATHIS: Chet, I don't have any complaint  
11 about giving them some alternatives. If we say, if you take  
12 this out, then again tell them what the consequences are, I  
13 think that is an important part of it.

14 MR. SIESS: And tell them what we think is  
15 important.

16 MR. MATHIS: But I think we should tell them what  
17 we think is a reasonable budget. Then you start from that  
18 and then you consider all of these other variables.

19 MR. SIESS: Okay. Well, the report can be  
20 written. I read you the introduction. It says we think  
21 that this budget is required. And that can be 461 million  
22 dollars, which is the RECLAMA figure. Or it can be 431  
23 which is the EDO figure. And then we can comment in the  
24 report on the differences on what we think is most important.

25 It is nice to say what ought to be done, but you

1 got to be realistic. They are not going to come back and  
2 ask us.

3 Well, they might ask us what we mean if we don't  
4 make it clear.

5 MR. MATHIS: Unless somebody else has got some  
6 other comments, I think I have got enough that I can start  
7 out and make an attempt to put this thing together.

8 It is going to take an overview then, when we get  
9 all the sections together, to go back and look at what we  
10 might recommend in the way of plus or minus priorities.

11 MR. SIESS: Well, we are going to have the sheets  
12 to work with, and we will have all these numbers on it, and  
13 we fill it in with numbers and see what it adds up to. We  
14 didn't do that last year. I don't know what will go in the  
15 report, but the committee is going to be asked to arrive at  
16 numbers, what they think is a recommended value for each one  
17 of these elements, to be taken at the RECLAMA level or  
18 whatever, or less. If we don't support the RECLAMA we put  
19 in the EDO level, and that tells it something. But it still  
20 doesn't help if they start cutting below that.

21 For example, if we went in with a list that was,  
22 let's say simply supported the EDO level and EDO gave the  
23 staff 15 million on RECLAMA and the Commission wanted to cut  
24 15 million out, they would have a place for 15. If they  
25 only wanted to cut 5 out, they wouldn't have much help as to



1 which 5 would be the least harmful.

2 Okay, let's go on to another good one. Severe  
3 accident protection and mitigation.

4 Why is it protection? We keep talking prevention  
5 -- phenomena, is it? I don't know why, I keep trying to get  
6 the shorthand in here.

7 Now this is a growth area.

8 MR. KERR: Chet, there should be a later version  
9 of what I wrote, and I would like to see if it is available  
10 before we start looking at the first version.

11 MR. SIESS: Okay. I have got one labeled 7-8 --  
12 how come there are not draft numbers on here?

13 MR. KERR: That is the first draft. There should  
14 be a second draft.

15 Do you want to take a short break while I look for  
16 it here?

17 MR. SIESS: Well, we can just sit in here a while  
18 while you look, gather our minds.

19 (Pause.)

20 MR. KERR: What you have, labeled W. Kerr, Draft  
21 7-8-80, is due only to my input and describes the first  
22 three of the items on the chart, the screen, with some  
23 general comments which purport to indicate that the research  
24 being proposed is very closely tied to three separate  
25 proposed rulomaking activities.

1           As Mr. Mattson mentioned this morning, these  
2 rulemaking activities are plowing rather new ground, and the  
3 approach to be taken by the Commission is not yet  
4 well-defined at all -- well, it is not defined at all  
5 almost. In the face of this the RES unit, decision unit,  
6 has taken the bear by the tail or the bull by the horns or  
7 something or other and proposed research which RES is  
8 convinced is going to be needed in the decisionmaking  
9 process.

10           The big item, as you see, is fuel melt behavior.  
11 It seems to me from what we saw that the amount being  
12 proposed here certainly is not too large. I have difficulty  
13 distinguishing among the various amounts. You also have, I  
14 think, all of you a rather lengthy document prepared by  
15 Charlie Kelber in which he lays out about a four-year  
16 program associated with what he thinks the needs are. I am  
17 not certain that I know how to relate that to the present  
18 budgeting process.

19           I have tried to comment on something somewhat  
20 related to the chart that we have here before us. In the  
21 fuel melt I have simply suggested that it seems to me some  
22 sequencing might be desirable in that one might put early  
23 emphasis on the possibility of in reactor vessel, cooling  
24 possibilities, rather than quite so broad a spectrum of  
25 activities as that being proposed.

1 I am not sure that this is a consensus of the  
2 subcommittee with which I work because they haven't seen  
3 this before. I think I expressed some of Paul Shewmon's  
4 sentiments.

5 Another important part of this area associated  
6 with the three rulemakings is of course the fission product  
7 release and transport in somewhat more mechanistic detail  
8 than has been the sort of thing associated with a Part 100  
9 kind of source term.

10 This kind of work has been going on. It needs to  
11 be continued to get more detailed information.

12 You read some of the comments on severe accident  
13 mitigation in Dave Okrent's writeup. I have tried to  
14 suggest in a brief paragraph here that in my view emphasis  
15 should be placed on phenomena and criteria insofar as one  
16 can separate that from design. In the presentations we  
17 heard, especially the work at Sandia, seemed to me to  
18 indicate that if RES is not careful they might come up with  
19 an approved design, for example, of a filtered-vented  
20 containment, which would then become NRC's filtered-vented  
21 containment. I don't think personally that that is  
22 desirable. But it certainly is a rather unexplored region,  
23 and RES certainly must convince or must have information  
24 that can be useful to the staff in evaluating designs that  
25 other people may arrive at.

1           One is very badly needed in this region, it seems  
2 to me, is more input, more thinking, more work by the  
3 non-RES portions of the NRC staff. I have tried to suggest  
4 that in the introductory paragraph. I don't know how much  
5 emphasis the committee wants to place on that, but it seems  
6 to me it is an extremely crucial part of the final process;  
7 that is, the research finally needed and the usefulness of  
8 this research will be approached very greatly by what  
9 preparation the NRC staff and the Commission have made. by  
10 the direction in which they want to go, by at least their  
11 preliminary evaluations of policy. And in the explorations  
12 of the subcommittee we could find very little evidence of  
13 much activity beyond something like dealing with the  
14 immediate problem of Zion and Indian Point.

15           The two items that deal with fast reactors and  
16 advanced converters have been treated in a draft that Max  
17 Carbon prepared. I would suggest that Max discuss that. I  
18 think all of you have copies of it.

19           MR. CARBON: Shall I go ahead at this time, or is  
20 there yet --

21           MR. SIESS: Well, let's see if there is any  
22 discussion on what Will had.

23           I notice that NRR at the EDO level would support  
24 the revised Research request.

25           MR. KERR: I wrote this before I had seen the

1 whole panoply of numbers that we have seen today, so that it  
2 does have to be more specific about what is being referred  
3 to in Section 4.2.

4           It would seem to me that the RES request or  
5 something close to it could well be expended in research in  
6 this area. It is tough and certainly expensive, and  
7 although it is impossible to estimate all the, plan all the  
8 specifics at this point, certainly work in that general area  
9 has to be done.

10           One of the difficulties of course is that some of  
11 the people that are going to do this are people in some of  
12 the programs which are going to be switched are programs  
13 that have been associated with LMFBR activities, and there  
14 will be some effort needed to make the transition. And at  
15 least the people themselves may have some difficulty  
16 occasionally in knowing whether they are working on advanced  
17 reactor problems or water reactor problems. But I assume  
18 that is a problem that can be dealt with if due caution is  
19 used.

20           MR. SIESS: Okay, then Max?

21           MR. CARBON: I have a writeup -- actually you have  
22 two of them in your hands, and they are both labeled Draft  
23 Number 1, but one of them has some editorial changes on it,  
24 including insertion of a line that was left out when it was  
25 retyped on the front page. So if you would take the copy

1 that has that and throw the other one away, it would be less  
2 confusing.

3 The writeup that I have put together here is  
4 really aimed at the subcommittee. We have not had a chance  
5 to discuss this. It is also aimed at giving the full  
6 committee a better background and appreciation of the whole  
7 advanced reactor thing.

8 It obviously would need very considerable  
9 shortening before it could go into the overall report. I  
10 can go through and point out roughly what is in here,  
11 summarizing it.

12 First of all, I would say something about the  
13 budgetary background beyond what is shown on the board up  
14 there. In 1980, and I will just stick with fast reactors,  
15 LMFBR's for the moment and skip advanced emerged -- in 1980  
16 Congress authorized almost 14 million, 13.7, for Fiscal 1980  
17 I say. Then for Fiscal 1981 the NRC commissioners and the  
18 ACRS endorsed at various times expenditures from about 16  
19 million to about 24 million for LMFBR work. And the House  
20 Appropriations Subcomm. see has recommended 11 million for  
21 Fiscal 1981.

22 And then we get into the Fiscal 1982. Research  
23 is proposing only 9 million for LMFBR work for Fiscal 1982.  
24 Partly this is because they would propose to split the  
25 effort which has been, or split the technology, the advanced

1 reactor safety technology, and devote 50 percent or so of it  
2 to LWR degraded core cooling problems and continue part of  
3 the LMFBR program, particularly some work on natural  
4 convection, accident delineation, fuel safety test needs,  
5 and some similar verification, experimental work.

6 As is indicated up there, the EDO has proposed  
7 zero for fast reactors and zero for advanced converters, and  
8 that is the same as OMB. The EDO office has also proposed  
9 15.7 million for the LWR degraded core cooling, which Dr.  
10 Kalber ties in with the 8 million for the LMFBR work.

11 Well, I point out in the report that in addition  
12 to the confusion in the budgetary thing, side of it, there  
13 has been a lot of activity going on that we perhaps have not  
14 fully appreciated. For example, DOE is carrying out the  
15 conceptual design of a 1000-megawatt electrical LMFBR plan  
16 and intends to give Congress a report on this next March.  
17 And the report will define schedule and cost estimates for  
18 design and construction operation and it will identify the  
19 base R&D program.

20 The DOE people testified to the subcommittee that  
21 they hoped to be able to submit a PSAR within a year after a  
22 congressional authorization to proceed, if one ever comes  
23 through, and that they would expect to be able to achieve  
24 initial criticality within 10 years of any go-ahead.

25 Now while DOE is going ahead with this activity,

1 laying out the design and R&D program and so on, NRC has no  
2 input to that.

3 Then, as you are aware, work on CRBR is  
4 continuing. I simply point out that the development and  
5 design is over 75 percent complete. There has been \$500  
6 million of equipment ordered, \$800 million of expenditure so  
7 far, and in this current year, Fiscal Year 1980, DOE has  
8 budget authority of about 170 million. But NRC stopped its  
9 safety review efforts about three years ago, in fact over  
10 three years ago, and has had no input to CRBR since that  
11 time, even though it is still possible that CRBR will be  
12 built and even though the design people are continually  
13 making safety decisions which will be difficult to overturn  
14 if it is felt that some of them are in the wrong direction.

15 In addition to those activities, DOE is spending  
16 about 140 million in Fiscal Year 1980 on breeder technology  
17 and about 75 million for completing and operating FFTF and  
18 that 140 million has 36.5 million earmarked for LMFBR safety  
19 studies.

20 NRC has practically zero input on all of this  
21 activity, both the 140 million DOE breeder technology effort  
22 and the 76 million this year FFTF effort. This work, much  
23 of it involves important safety development work, concepts,  
24 approaches and so on. NRC does not participate.

25 Finally, as you are probably aware, France in



1 particular is pushing toward commercialization of the LMFBR,  
2 and it is not unreasonable to expect that maybe within five  
3 years U. S. companies would be able to order on the foreign  
4 market, French market, a 1000-megawatt to 1500-megawatt  
5 electrical plants. And the Commission, to the best of my  
6 knowledge, is making no effort to keep abreast of the safety  
7 design of any of the foreign work.

8           They are of course exchanging some research  
9 information, exchange programs, coordinated combined  
10 programs, but the Commission has no effort to keep up with  
11 the licensing activities or the detailed design efforts in  
12 the foreign LMFBR plants.

13           Well, for three times in our preceding three  
14 reports, February this year, July last year and December  
15 earlier, we said that if the U. S. is going to have a  
16 program in LMFBR's then there should be safety work. If we  
17 don't have a program in the U. S., okay, drop it. But until  
18 that is decided we have recommended in the past that the U.  
19 S. continue, that the Commission continue with some LMFBR  
20 safety work.

21           And so I state in this, which again the  
22 subcommittee members have not had a chance to review up to  
23 this time, I state here in my own personal view that we  
24 should reiterate our general support of an advanced reactor  
25 safety research program and add some additional comments.

1 And the first comment that I personally would propose is  
2 that, first, until a consensus is reached that the U. S.  
3 will not utilize LMFBR's, until that consensus is reached, I  
4 believe it important that the commissioners take appropriate  
5 action to ensure that a substantial dedicated long-range  
6 LMFBR licensing research activity exists within the  
7 Commission.

8 I think that the commissioners should put this on  
9 a long-term basis, that they should not allow it to be  
10 subjected, if possible, to violent ups and downs in the  
11 budget because that just destroys efficiency and morale.

12 I believe that the NRC should have a strong input  
13 to activities like this DOE conceptual design study that I  
14 spoke of and that this input should be made while the  
15 activities are in progress or while such a study is in  
16 progress rather than after the study is all over and safety  
17 decisions have been made and plans and everything are all  
18 set up, so that there is less need to come back after a  
19 design is complete and say, gee, we don't agree with that.  
20 The input should be earlier.

21 Third, I personally think it is prudent and  
22 conservative that the NRC have a strong input into the CRBR  
23 design effort. It may never be built, but it may.

24 Fourth, I think that there should be better  
25 liaison between NRC and DOE such that NRC can have an input

1 to DOE's breeder development and safety program.

2 Fifth, I think it would be appropriate for NRC to  
3 give thought to whether it should have a stronger role in  
4 the management or technical direction of FFTF.

5 And finally, I think personally that the NRC  
6 should have a small cadre of people who keep reasonably  
7 abreast of the safety aspects of foreign reactors with  
8 commercial potential so that if the NRC is hit a few years  
9 down the road with a need to act on the licensing of an  
10 imported reactor that at least it would be in a position to  
11 expand and undertake such a responsibility without being  
12 totally lost.

13 It is quite possible that another LMFBR will not  
14 be built in the United States for several decades, but I  
15 think prudence dictates that the NRC should assume a more  
16 conservative approach to this.

17 In the writeup here I have not made a distinction  
18 between licensing and research. I have made no effort to  
19 separate the two. I think that NRC should have people  
20 versed in and active in both areas and that these people  
21 ought to cooperate very closely and perhaps be interchanged  
22 frequently. I think the way the licensing and research was  
23 proceeding on the CEFR effort a few years ago was wrong. I  
24 think there was too much, too big a gap between the  
25 licensing and the research people, and I don't think that

1 should be permitted to exist.

2 I believe that only by having a suitable cadre of  
3 competent, knowledgeable people in both activities can the  
4 Commission be reasonably prepared to meet the safety  
5 challenges which may occur in the future, and by "cadre" I  
6 incorporate knowledgeable people on the NRC staff as well as  
7 knowledgeable people at the national labs in the  
8 universities.

9 Then the subcommittee has another meeting tomorrow  
10 morning, and whatever we have put in here on budget level  
11 will have to be adjusted to reflect that. But I do put some  
12 of my own views here. It is difficult for the committee, or  
13 subcommittee, for us, to comment meaningfully on a budget  
14 level because no one has proposed, prepared a budget in line  
15 with the thinking outlined above.

16 In general, the newer efforts discussed above will  
17 necessitate a budgetary increase, but I think that savings  
18 can be made in some of the current programs and so to a  
19 first approximation I personally think the budget approved  
20 by the commissioners and the ACRS for Fiscal Year 1981, with  
21 an increase to allow for inflation, would be appropriate for  
22 1982.

23 This would then represent about \$18 million for  
24 LMFBR research. I personally think the \$18 million is quite  
25 reasonable, magnitude-wise, when we have a United States \$615

1 million development effort in progress. We did in 1980; I  
2 don't know what it will be in 1981; and this writeup should  
3 be changed to reflect that as much as possible.

4 I also suggest that the funds should be set up in  
5 a separate account so that they can't be tapped for LWR or  
6 other work.

7 I personally do not go along with the research  
8 proposal to decrease the LMFBR budget to 8 million. I think  
9 that is too drastic a reduction, and I think it is a  
10 pessimistic approach to the importance of LMFBR work.

11 I do appreciate that the LMFBR and the LWR  
12 degraded core cooling work does have some common grounds and  
13 that some financial savings can be made by combining the  
14 two. But I am personally not aware of any studies on  
15 Research's part that really give firm data on what savings  
16 could be realized and how this truly could be worked out.  
17 All I am aware of are general comments that certainly some  
18 savings can be made, and I agree that some can, but I don't  
19 know just how much.

20 Then the last paragraph in the writeup here is a  
21 suggestion to the commissioners that not only should they  
22 put these funds in, propose it because it is needed, but  
23 also because if it is not needed Congress may very well go  
24 in the direction of simply saying, well, take it out of  
25 something else. And we think there is less chance that they

1 would say that if the LMFBR amount is proposed on its own  
2 two feet rather than left hanging and dangling.

3 MR. SIESS: Bob?

4 MR. BUDNITZ: Yes, I have a comment which I think  
5 may put what you said in a slightly different light. The  
6 probability that there will be a new President in the White  
7 House in January is somewhere one and ninety-nine percent.  
8 I don't know what it is. But I will let you come to your  
9 conclusions.

10 Maybe it is between 30 and 70. The probability,  
11 if that occurs, that there will be a change in policy on the  
12 breeder is very, very high, an administration change, right.

13 So if you multiplied those two probabilities  
14 together, it is the first that governs. And it seems to me  
15 realistic to plan, as we have, for an LMFBR program that  
16 would be responsive to the needs of a new administration  
17 were it to come about. And that is part of what we are  
18 trying to do.

19 Much of the discussion I have had within the  
20 agency, with both senior officials and others, about the  
21 LMFBR program plans for 1982 is based upon a blanket  
22 assumption that the present policy will continue through the  
23 full 1982 budget deliberation cycle, which goes all the way  
24 through another year, meaning, to be blunt, based upon the  
25 fact that -- pretending there was no election -- it is just

1 as if there wasn't going to be an election. Or to put it  
2 another way, the assumption that the probability of the  
3 present administration is going to be reelected 100 percent,  
4 I find that naive and not prudent.

5 MR. CARBON: Naive and not prudent to assume zero  
6 up here is what you are saying?

7 MR. BUDNITZ: Yes, sir. The zero being of course  
8 what we would expect the OMB under the guidance of the  
9 present administration to give us again, because that is  
10 what they gave us -- you know (inaudible).

11 MR. CARBON: Now in addition to what is written  
12 here, much too long as it is, I need also to have technical  
13 comments in here, in particular in two areas. We will be  
14 hearing tomorrow from Research on how they have or have not  
15 responded to the recommendations that we have been making  
16 for the past year and a half, and I know that they have done  
17 some of the things we have recommended and I think probably  
18 they have not done some of them. And then we should have  
19 technical comments in here, or comments of a more technical  
20 nature anyway, about what could be dropped or needs more  
21 effort and so on, a matter on which I need input from the  
22 subcommittee members.

23 MR. MARK: Max, I don't know, did you say that  
24 there is sort of a traditional relationship between the  
25 amount of money spent on some national program such as

1 breeder reactors and the NRC type of activity funding -- 10  
2 percent of the total or 5 percent or anything of that kind?

3 MR. CARBON: I don't think I said exactly.

4 MR. MARK: No, you didn't exactly.

5 MR. CARBON: But I did say this, that what I would  
6 personally recommend for LMFBR work for Fiscal 1982 would be  
7 what we recommended, the minimum of what we recommended for  
8 1981 plus cost of living inflation, which would bring it to  
9 a total of about \$18 million. And my comment was that I  
10 believe an expenditure of 18 million on NRC's part is quite  
11 reasonable when the remaining national governmental  
12 expenditure is 615 million.

13 That turns out to be what -- 3 percent or some  
14 such thing -- 3 percent for NRC safety work of the amount  
15 they have spent -- is that answering your question, Carson?

16 MR. MARK: Well, fine.

17 Another trivial question, Bob: in view of the  
18 expectation, I guess it is fairly large, but there will be  
19 11 million or some number, 10 million sort of number,  
20 specifically on fast breeder reactors for FY 81.

21 MR. BUDNITZ: Appropriated, yes.

22 MR. MARK: You won't spend it?

23 MR. BUDNITZ: Yes, we will spend it.

24 MR. MARK: You will then need something in 1982  
25 just to close out the activity that you have maintained



1 through 1981. But if you are not going to spend that 10  
2 million to close out the program, Congress didn't give it to  
3 you for that reason, I expect.

4 That means that it would have to be two or three  
5 in that box in 1982 anyway?

6 MR. BUDNITZ: Yes, but you recall that the  
7 planning assumption for 1982 in this exercise is 1981  
8 President's budget.

9 MR. MARK: True --

10 MR. BUDNITZ: Which has a 5 million closeout.

11 MR. MARK: Yes, a 5 million closeout.

12 MR. BUDNITZ: By definition it is closed out.

13 MR. MARK: But as the real world is proceeding you  
14 are going to need 5 million in 1982 just to close out.

15 MR. BUDNITZ: Eight million. Yes. Charlie says 8  
16 million to close out.

17 MR. GILBERT: I might say the NRC people who make  
18 decisions on this have never been noted for their attention  
19 to the real world.

20 MR. CARBON: Bob, would you comment to the  
21 committee on something else? I have made it clear that I  
22 personally do not support dropping the LMFBR work to 8  
23 million. Would you give the committee your view so that  
24 they can have the benefit of that?

25 MR. BUDNITZ: Yes, that was a judgment. I must

1 say a hard judgment about how much of a program we would  
2 want to have if we were faced with the inevitable problem of  
3 eating it. Do you understand what I mean by that?

4 If we put 20 million in --

5 MR. CARBON: Let me interject. You are being  
6 pessimistic right there, are you not?

7 MR. BUDVITZ: I am trying to be realistic about  
8 the Congress as wanting it but pessimistic about their  
9 wanting to fund it separately.

10 This year we are being asked to eat the -- well,  
11 not the 11 but the difference above the 5. That piece of  
12 jargon means they are going to tell us to do it but find the  
13 funds out of our other programs. And I was being realistic  
14 about how much I thought we would be willing to eat  
15 vis-a-vis other priorities.

16 That is, if they would fund 20 million and give it  
17 to us, why that is great. But if they are going to tell us  
18 to eat it, we didn't think we wanted to eat 20 but we were  
19 willing to eat 8 and 2, makes 10, with that sort of a  
20 compromise view which folds in some nontechnical judgments  
21 on top of our technical needs.

22 All right, you can of course -- then we arrive at  
23 a different view even on the same basis, but then express  
24 that if you would like.

25 It is a hard, it is a very hard decision.

1 MR. CARBON: Chet, I have presented this. What do  
2 you suggest or propose here, or perhaps I should --

3 MR. SIESS: Well, the first suggestion that comes  
4 to my mind is I think you can shorten what is in the  
5 report. We have said it before. I have got nothing to  
6 offer. I think we have heard it. I think the decision is  
7 going to be -- I won't say arbitrary but made on -- what the  
8 committee says is going to be said on classical grounds.

9 We think it is a good idea. We know the Congress  
10 doesn't and don't understand why the Commission doesn't.

11 MR. KERR: But we also have to decide where we put  
12 this in our scheme of priorities --

13 MR. SIESS: That is right.

14 MR. KERR: -- as you suggested earlier. If one  
15 has a fixed sum of money, does this go early or late?

16 MR. SIESS: If the Commission asks us the  
17 question, if you think we are going to be spending 10  
18 million or 15 or whatever for fast and gas, what should we  
19 take out?

20 I think we ought to be prepared to answer that  
21 question. And it is a tough question if you are devoted to  
22 the public safety over the next year or so.

23 Bob?

24 MR. BUDNITZ: You notice that our priorities --

25 MR. SIESS: Well, I should take that back.

1 Research is not going to affect the public safety over the  
2 next year or so.

3 MR. BUDNITZ: Well, it might in some areas, but it  
4 is generally longer range.

5 MR. SIESS: Well, even when we spill water on the  
6 floor, and I don't think the public safety was changed  
7 because the water was spilled.

8 MR. BUDNITZ: My comment was addressed to where  
9 would we eat it.

10 Let me give you some insight into how we --

11 MR. SIESS: Well, you are thinking ahead to the  
12 Congress, I think.

13 MR. BUDNITZ: Yes, but --

14 MR. SIESS: And I am talking right now about the  
15 advice to the Commission.

16 MR. BUDNITZ: Yes, but now look, there are two  
17 ways to absorb \$10 million. And just to give you some  
18 insight into what we would do -- well, I will tell you what  
19 we are going to do this year. I am not going to be here to  
20 implement that, but I am sure that that is going to happen.  
21 We are going to have to eat \$6 million because they  
22 appropriated 11 and there are only 5 in the President's  
23 budget. So how are we going to find that \$6 million?

24 I insist to you it is very unlikely we are going  
25 to find it in one place. We are going to take the

1 \$180-something million we have got and we are going to  
2 nickel and dime it down to find the 6. That is just exactly  
3 what we are going to do.

4 All right. That is realistic and it is just the  
5 only thing anybody I guess would do, unless there was some  
6 one sitting duck that we really felt was ripe. And while it  
7 is expedient in a list like this that I put together a month  
8 ago to list -- you know, the first thing to go is this, and  
9 the second thing to go is that, and finally it is LOFT or  
10 something.

11 The reality is that when you come to the end and  
12 then the appropriation comes through in October, as is the  
13 case here, you know we may not get that money till October  
14 if then. The way it is done and the way it will be done is  
15 that way.

16 We are just going to take 500 out of this and 200  
17 that and find the money. But that is where that 10 million  
18 came, that is why that is 10 and not 20. It was just kind  
19 of a judgment.

20 MR. LAWROSKI: Mr. Chairman?

21 MR. SIESS: Yes, sir.

22 MR. LAWROSKI: May I ask a question that is  
23 somewhat related to the LMPER?

24 MR. SIESS: You are not asking me, are you?

25 MR. LAWROSKI: No.

1 MR. SIESS: Okay, go ahead.

2 MR. LAWROSKI: I would like to know how  
3 well-prepared the NRC feels it is if it had to start  
4 licensing a reprocessing plant which has got to come with  
5 fast breeders. I doubt if you are going to get all that  
6 plutonium from DOE, you know, from the Hanford and --

7 (Inaudible speaker.)

8 Well, I think that -- it may be that the first  
9 thing that people will come in, assuming if there is a  
10 change in administration --

11 SPEAKER: Yes. Barnwell.

12 MR. LAWROSKI: What?

13 SPEAKER: Barnwell.

14 MR. LAWROSKI: Barnwell for one, or Exxon could  
15 retread their --

16 MR. ARSENAULT: If I may, I can't answer the  
17 question directly since I am not responsible for licensing,  
18 and our contacts with the Fuel Cycle Division, however,  
19 which is responsible for licensing, I have developed the  
20 impression that they feel there is a considerable amount of  
21 work that was underway a few years ago that was terminated,  
22 that they would prefer to have under their belt before faced  
23 with that responsibility. That is not the same as saying  
24 that they are unprepared to license such a plant, but I  
25 think it does indicate that some rather rapid footwork would

1 be necessary to restructure programs that were significantly  
2 affected when the decision to defer reprocessing was  
3 underway.

4 I know that is true within the Research program.  
5 I have every reason to believe that the Fuel Cycle Division  
6 feels that way about their program.

7 MR. LAWROSKI: They would be quite strained  
8 initially to really undertake a full-fledged licensing  
9 activity for a reprocessing.

10 That is all I wanted to know at this time on this  
11 matter, that we can't forget it.

12 MR. SIESS: Anything else anybody wants to hear  
13 about these items, most of which has been fast and gas?

14 Let's move on then to item 3, which is --

15 MR. MARK: If we were talking to --

16 MR. SIESS: If Bob will put up the new slide up  
17 for us.

18 MR. MARK: Excuse me, Chet. If we were talking to  
19 the Congress, which we are not --

20 MR. SIESS: Not now. We will be eventually.

21 MR. MARK: -- at the moment, it would not be  
22 totally unreasonable when they are considering budgets on  
23 the general subject of breeder reactors and deciding it is a  
24 big program, they want to put money into it, that X percent  
25 of it be devoted to the areas that we are concerned with,

1 and that of course would then solve the problem. We would  
2 either cut up the whole program or the -- it wouldn't be an  
3 NRC budget; it would be a fast reactor budget of which X  
4 percentage for safety research. This would make a sensible  
5 way of handling money at the national level, but it wouldn't  
6 be politically possible, I am sure.

7 MR. LAWROSKI: I might have added that over and  
8 above what the needs that the LMFBR would have for a fuel  
9 reprocess, it is not impossible that the first place that  
10 people would want -- the first reason people would want to  
11 recycle, would want to reprocess is to enable the recycling  
12 of plutonium in existent LWR's on a large scale.

13 MR. MOELLER: In terms of siting an environmental  
14 research I think you can see from the slide that the  
15 seismology and geology is down about 1.8 or so and then  
16 meteorology, hydrology, not much change. There is not much  
17 change in anything down to socioeconomic impacts, which they  
18 propose a cut of either .2 or .5 million.

19 Then the siting alternatives EDC proposed zero,  
20 which would have impact there. In emergency preparedness,  
21 no change.

22 Dr. Okrent, I am sure will be, since he is  
23 covering the seismology and geology, I am sure he may have  
24 comments on that.

25 In terms of the other items the socioeconomic



1 impact reduction I don't think will probably bother the  
2 committee too greatly, certainly not the subcommittee too  
3 greatly although we did come up with some areas, some  
4 problems in that area that we thought needed to be addressed.

5           However, the siting alternatives I think is  
6 something that certainly I believe I would want to discuss  
7 to some degree, because, as you will note in the chapter  
8 writeup under 5.8 on page 6, that the committee for some  
9 time has been concerned about the lack of definitive data  
10 concerning the advantages and disadvantages of multi-unit  
11 sites.

12           Now whether that comes under siting alternatives,  
13 in a sense it does to me, because you either select new  
14 sites for the new reactors or you encourage utilities to put  
15 the new units on existing sites and make them --

16           All right, where would this, the problem then of  
17 consideration of multi-unit sites -- Frank, would that be  
18 covered anywhere?

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20  
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1 MR. ARSENAULT: The specific problem of multi-unit  
2 sites is not within our program. If it were to be introduced,  
3 it would depend a little bit on the perspective placed on the  
4 subject by user office or anyone else. This is as likely a sub-  
5 unit as any to pick it up.

6 MR. MOELLER: All right. Well, we thought we might, or  
7 I was certainly going to suggest to the committee that they  
8 comment on the multi-unit site question under this item. And if,  
9 indeed, there is interest in this topic, then we certainly would  
10 like to see some funding, or not to see it be at a zero level, as  
11 the EDO had suggested.

12 One other item. In terms of the material that has been  
13 provided to you, there is confusion and it's of my origin. In  
14 terms of item 5.6 on page 4, which is occupational exposure and  
15 health effects, when the staff staff presented that topic to the  
16 subcommittee, they presented it to us as a rad. effects sub-  
17 committee, and so they brought to our attention several items  
18 which are more properly covered in safeguards and security. And  
19 so we provided write-ups there on such things as the decontamina-  
20 tion of the cooling systems in reactors and crud build-up and so  
21 forth, transport of radionuclides within reactor systems. So I  
22 am preparing a new write-up for section 5.6, page 4, of our draft  
23 chapter.

24 Now, what that section actually covers, rather than what  
25 I had, is, it covers projects pertaining to neutron dosimetry and

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1 neutron effects, the behavior and health effects of ingested and  
2 inhaled radionuclides -- my write-up, the write-up doesn't say  
3 it, but it pertains to yellow cake and thorium and some of the  
4 naturally occurring radioactive materials, as well as a few  
5 others -- and then they include epidemiological studies of human  
6 populations, particularly people who have received iodine 131  
7 among other things. And I would certainly recommend that the  
8 committee endorse these projects, particularly those related to  
9 neutron dosimetry.

10 And they have an item in there on the decorporation  
11 techniques for internally deposited radionuclides, and I think  
12 that is an item worthy of consideration. And the indicated fund-  
13 ing levels certainly appear to me to be appropriate.

14 So, Mr. Chairman, that -- those are my main remarks on  
15 that, on that section.

16 I'd be glad to hear any questions or comments.

17 MR. SIESS: Any questions or comments from the committee  
18 on this?

19 I never did understand the reason they gave for cutting  
20 the seismology-geology.

21 MR. MOELLER: Yeah, I didn't either, because the meteor-  
22 ology they seemed to stick with.

23 MR. SIESS: Even NRR supported that.

24 MR. SHAW: Okay, I can understand why they do it, I can  
25 deal with the misunderstanding. The comment was "Maintain current

1 program to existing sites." There was -- "Maintain current pro-  
2 gram to existing sites" -- there was an impression that we are  
3 doing all the work for new plants, for new plants which they are  
4 not coming in. But essentially, our work essentially is for  
5 open plants, there all kind of open plants in the eastern United  
6 States.

7 So I think that was the reason. The only --

8 MR. SIESS: Well, in its fundamental approach of trying  
9 to see if we can tie seismic activity in certain areas into local  
10 geology, you know, it was sort of related to future siting  
11 criteria. But every time we looked at an old plant, under SEP or  
12 something else, you know, we have to know the same thing.

13 MR. SHAW: Right, exactly.

14 MR. SIESS: And --

15 MR. SHAW: Because I think we are meeting on June the  
16 4th with the subcommittee on the external phenomena. (WORDS UN-  
17 INTELLIGIBLE) plant had problem with the seismic input. And so --

18 MR. SIESS: On our first report, we pointed out that  
19 this program would probably take about five years to find out  
20 whether it was going to get anywhere, it was so basic in terms of  
21 the seismologist. I'm a little more optimistic in three years  
22 in beginning to see some things come out of it. The alarming are  
23 a little more easy to see than the comforting. I mean, when  
24 people start moving Charleston anywhere up and down the coastal  
25 plain, which is one thing that seems to have been suggested,

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1 that's a little easier to accept than the negative that we might  
2 get which says N-Ohio (?) can't be moved more than 30 miles and  
3 New Madre can't be moved more than 200. We're not getting  
4 results in that direction very well.

5 But I just can't see why they cut that. There's a  
6 full RECLAMA on that, is there?

7 Yeah. I think you've got a good chance of arguing it.

8 MR. BUDNITZ: We feel more strongly about that than  
9 most anything else. It's a small sum, and a cut would be very --

10 MR. SIESS: You're getting a lot of --

11 MR. BUDNITZ: -- sizable in its impact.

12 MR. SIESS: You're getting a lot of cheap work done  
13 by state surveys and universities.

14 MR. BUDNITZ: Right. Yes.

15 MR. SHAW: Siting input is the most important portion  
16 of the seismic analysis of it.

17 MR. SIESS: On the siting alternatives, can you con-  
18 vince them that you're not doing what NRR is doing?

19 That's what they said, didn't they? They said you  
20 were just doing the same thing as their early site review study.

21 MR. ARSENAULT: Yes, but it's -- it's important to  
22 understand the sequence of events here as well. We prepared  
23 our program description for the EDO in a set of E3A forms which  
24 were requested a month ago or so. After receiving the E3A forms  
25 the EDO requested that we coordinate our programs with the

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1 user offices for purposes of defining which portion of the  
2 programs they would endorse. As a result of that coordination  
3 exercise, which resulted in user office endorsement for portions  
4 of the programs, we learned, as Dr. Budnitz said earlier today,  
5 we learned a great deal that allowed us to restructure our  
6 proposals. None of these revisions, restructurings, and initial  
7 agreements with the user offices were reflected in the documenta-  
8 tion used by the EDO to set its mark.

9 The only input they received from that process was  
10 by talking to the user offices, not research I might point out.  
11 So that I really believe that in the -- this and a couple of  
12 other decision units their mark represents some degree of mis-  
13 understanding concerning the net results of the coordination  
14 process.

15 Now, that, that's background. In fact, NRR together  
16 with standards development do support the entire socioeconomic  
17 impact and siting alternatives programs. So I think that when  
18 we talk to the EDO tomorrow we have a very good chance of get-  
19 ting some of this back.

20 MR. MOELLER: Well, and I wanted to comment, too, on  
21 the socioeconomic impacts, because I would certainly strongly  
22 support you. If you look at the problems that the NRC has  
23 faced, for example, at TMI, and so forth, in venting the contain-  
24 ment, and when we looked at emergency planning and talked to the  
25 state people in terms of that, they point out to us that you

1 don't know whether people are going to stop and go take their  
2 potassium iodine pill and then evacuate or whether they'll just  
3 flee. And there are a lot of these types of aspects of safety,  
4 safe operation of nuclear power plants that need to be investi-  
5 gated. Even there is --

6 MR. SIESS: These don't have anything to do with safe  
7 operations. These have to do with unsafe operations.

8 MR. MOELLER: Well, they have to do with unsafe, right.  
9 But it's all part of the picture.

10 But as we have looked at the feed and bleed system, if  
11 you bleed and feed to cool a reactor under emergency conditions,  
12 you're trading a known dose with a probability of one for  
13 chancing a much higher dose with an unknown probability. Well,  
14 these are sort of socioeconomic decisions.

15 MR. MOELLER: Don't you think we should have moral  
16 research somewhere in there?

17 MR. SIESS: Probably so.

18 MR. MOELLER: I remember when venting to reduce the  
19 hydrogen concentration was considered a moral question. Then  
20 it became a probabilistic one. And now it's something else --  
21 I'm not sure what.

22 MR. SIESS: I don't know whatever happened to the  
23 idea of what people don't know don't hurt them.

24 Okay, we'll move on to one of our favorite subjects.  
25 And I know it's Steve's. Less than an hour on this trip, Bob.

1                   You can leave them up there: I can change them. I  
2 thought he was hauling them up there each time.

3                   MR. BUDNITZ: Frankly, I need the exercise. Which --

4                   MR. SIESS: Waste management.

5                   MR. MOELLER: Waste management. It's making your hair  
6 fall out, Bob.

7                   (Laughter)

8                   MR. BUDNITZ: I've only got five hairs left up there.

9                   Well, here, here the only issue between us and the  
10 user office is a small -- here the only issue between us and  
11 the user office is a small sum for high-level waste work that  
12 we would like to perform without anybody else's endorsement.

13                  MR. LAWROSKI: Is that the predictive work on --

14                  MR. BUDNITZ: I will discuss it. And which the --  
15 Kevin Cornell indicated this morning, he said they kind of went  
16 along with the user office here and they will listen to us  
17 tomorrow.

18                  I think that's -- or do you want to say what it is,  
19 Frank?

20                  Now, you may want to comment separately.

21                  MR. ARSENAULT: In predicting long-term performance of  
22 sites, in the retardation of radionuclide migration, some of the  
23 future events that might affect the rates are these low-proba-  
24 bility or low-rate events, such as volcanism, tectonic movement,  
25 seismic effects, and so on. The project that we had in mind was



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1 to acquire sufficient information to determine whether our  
2 understanding at this time is adequate to allow us to predict  
3 the effects that such events would have on long-term performance.  
4 It is a, basically a scoping study, not long-term research.

5 Depending on the results of such a study, we may dis-  
6 cover that our understanding needs to be improved in certain  
7 areas and then we would propose research for that purpose.

8 MR. KERR: I would predict that you would discover  
9 that your understanding needed to be improved. I sure would  
10 like to have the contract to do that research.

11 I think one could do it in about what, maybe 15  
12 minutes?

13 I just don't see how there's very much doubt that we  
14 don't understand enough about volcanism to be able to predict  
15 the effect of volcanism, or whatever it is, on high-level waste  
16 storage.

17 MR. ARSENAULT: There are people who feel that our  
18 understanding is adequate to allow us to do one of two things,  
19 either remove the problem from the area of consideration by  
20 establishing exclusion criteria for site selection or, alterna-  
21 tively, to take into account the effects of volcanism -- for  
22 example, I think this is one of the more trivial of the potenti-  
23 al events, but to take it into account accepting that we can --  
24 the low frequency of such events will allow us to tolerate a  
25 very large uncertainty in the prediction.

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1 MR. LAWROSKI: How would you go about the exclusion,  
2 the plant exclusion?

3 MR. ARSENAULT: Well, in the -- in the case of volcan-  
4 ism, again, which is a good example because no one takes it very  
5 seriously, by establishing exclusion criteria which would reduce  
6 the probability of any volcanic event, based on our current  
7 understanding, to an extremely low level, to effectively zero,  
8 one then excludes from consideration this particular future  
9 event.

10 MR. KERR: I just remembered Jim Wilson's comment,  
11 which was that if you were talking about, let's say, 100,000  
12 years, you couldn't exclude a volcano from any site. That's, of  
13 course, one man's opinion.

14 MR. ARSENAULT: Well, I want to make clear that I was  
15 explaining the various positions that were held --

16 MR. KERR: Sure.

17 MR. ARSENAULT: -- and not advocating any one of them.  
18 My feeling is that we should get our feet a little  
19 more solidly on the ground before forming any firm opinions on  
20 this. And that is the purpose of this project.

21 (Pause)

22 MR. SIESS: There seemed to be an apparent difference  
23 of opinion in priorities between the staff and the EDO in this  
24 area, where the staff would have made a substantial cut in waste  
25 management, EDO made a negligible cut there. Is this something

1 the Commission is likely to look at, wonder about?

2 Well, you had a very high priority on cutting waste  
3 management, if you had to go down to the PPPG.

4 MR. LAWROSKI: Yes, they can cut --

5 MR. KERR: That was my impression, too, Chet, that he  
6 was going to cut pretty early in respect to that one.

7 MR. SIESS: I'm just looking at a list I made of how  
8 far the EDO was above your PPPG level.

9 MR. BUDNITZ: Oh, yeah. Oh, wait a minute.

10 MR. SIESS: You see?

11 MR. BUDNITZ: We would have cut low-level waste  
12 research and some uranium recovery work rather early.

13 MR. SIESS: Yeah.

14 MR. BUDNITZ: And the high-level work quite -- we were  
15 -- we would have had to defend fairly heavily.

16 MR. SIESS: See, I'm looking at priorities, and I'm  
17 starting with PPPG as a level. And I look down the line and I  
18 see in decision unit one EDO didn't put anything in above that.  
19 In LOFT they put in 13 million. In operational safety they cut  
20 six-tenths of a million below. In the severe accident part they  
21 added a million and a half. The site and environmental, they  
22 cut it below the PPPG level by a little under a million. And  
23 waste management -- they added ten million, which looks like a  
24 big chunk, because that was where you had cut heavily.

25 MR. BUDNITZ: No, no, no. No. Nine million was where

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1 we had given it priority four, which was a very high priority;  
2 that was my level. And they more or less went along with most  
3 of that.

4 MR. SIESS: Yeah, but again, it's a big cut.

5 MR. BUDNITZ: Where we were willing to take a cut  
6 early was in the low-level and uranium recovery, where they  
7 didn't cut at all.

8 MR. SIESS: Yeah. I know. They disagreed. But I'm  
9 still sitting here trying to figure if we try to talk priorities  
10 can we lump some things, can we do it by decision units or do  
11 we have to break some things out of decision units.

12 MR. BUDNITZ: Well, it seems to me clear that there is  
13 a very great difference in agency priority between those three  
14 subelements up there.

15 MR. SIESS: Yeah.

16 MR. BUDNITZ: You know.

17 MR. SIESS: I know. That would have to be broken out.  
18 And just like on the siting thing, we'd probably want to break  
19 out the seismology as a clear-cut case.

20 There are some of these numbers where the differences  
21 are within the background noise and two years from now things  
22 are going to be changed anyway, and I don't see how we can even  
23 talk about them down at that level.

24 Okay, let's move onward to the next item, which is a  
25 mishmash -- safeguards and fuel cycle. Dr. Carbon, I think you

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1 have got that mess, haven't you? And Mark.

2 MR. MARK: Yes, and I'm not sure that I'm able to  
3 recover it from that state, either.

4 Looking for the moment only at the first three top  
5 ones --

6 MR. KERR: Are we supposed to be looking at numbers  
7 or at your write-up or some combination thereof?

8 MR. MARK: No. I'm just looking at one of the tables,  
9 which Dottie just passed out to us, which has the PP -- the PG  
10 numbers as well as EDO and RECLAMA, et cetera.

11 There really seems not to have been a very traumatic  
12 argument in the little group of things, the top three, referred  
13 to as safeguards. The PG number did cut the physical protection,  
14 but EDO put it back. And the PG left alone the material control  
15 and accounting, which EDO cut. So their totals are hardly  
16 different -- 4.8 against 4.5.

17 And where it says here "NRC RECLAMA," I guess that's  
18 RES RECLAMA really.

19 MR. SIESS: That's not really the RECLAMA. That's  
20 the NRC revised. It's what they get if they got the RECLAMA.  
21 So it just clarified things.

22 MR. MARK: As far as I know, there's a user support  
23 in here, not from NRR but from NMSS. And if I say it wrong,  
24 Frank Arsenault can straighten it out. There has perhaps been  
25 in the past some argument about getting these numbers developed,

10-13 1 but before the numbers actually got onto these lists a major  
2 part of earlier differences had been absorbed and there's at  
3 debate between the underwritten user office support and the RES  
4 numbers only two or three hundred thousand dollars.

5 And I'm sure it could be clearer.

6 MR. ARSENAULT: Mr. Chairman, if I may, may I --

7 MR. MARK: Please do.

8 MR. ARSENAULT: There's a considerable amount of con-  
9 fusion in the periphery of the subject, but there is general  
10 agreement in the main. The RES '82 request, which is the  
11 second column, totaled \$5.9 million. This, this was adjusted  
12 downwards in -- in a discussion among all offices within the  
13 agency, all of whom were subject to a \$14-million ceiling on  
14 the entire agency's program. Through mutual consent we reduced  
15 our request level to \$5.2 million. This is nowhere shown on  
16 this chart and was not reflected within the EDO's review, for  
17 reasons which I mentioned earlier -- they were working on a set  
18 of documents which were prepared prior to the interoffice coordi-  
19 nation.

20 The result of the reduction from 5.9 to 5.2 one can  
21 see if you look at the second column. The 3.1 was reduced to  
22 2.4. EDO is unaware of this. Now, if we consider the second  
23 column with the 2.4 in the first place, NMSS together with other  
24 user offices endorses the physical protection at a level of 2.4,  
25 material control and accounting at a level of 2.4, and threat

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1 and strategy at a level of 0.1.

2 The EDO gave us a mark of 3.1 and 1.4 and 0.4, not  
3 aware of this line structure discussion between the offices.

4 Our RECLAMA, RECLAMA-ed 0.3 under material control and  
5 accounting, because, in fact, some of the work to be done in  
6 that area, some of the work to be done in material control and  
7 accounting, could be done either under physical protection or  
8 MC&A; it really doesn't make any difference which, because it  
9 really deals with the integrated effect of the entire safeguards  
10 program. So in the RECLAMA we chose not to try to sort out that  
11 confusion but merely RECLAMA at the EDO mark.

12 I believe that the EDO now is in possession of all  
13 the detailed information from the user offices, and we have a  
14 revised EDO mark which would read 2.4, 2.4, 0.1, at which point  
15 RES would RECLAMA the 0.3 residual in the threat and strategy  
16 area as three \$100,000 projects which we wish to initiate on the  
17 RES initiative.

18 That, I hope, clarifies the situation, although there's  
19 some doubt in my mind.

20 MR. MARK: Well, then, of the 5.2 -- it's either 5.2  
21 or 4.9, that's the whole spread in which arguments, I think, are  
22 still open.

23 MR. ARSENAULT: Out of the 5.2 proposed by RES, 4.9 is  
24 endorsed by the user office, and 0.3 we are proposing to RECLAMA  
25 to initiate on our own initiative.

JO-15

1 MR. MARK: Now, I think it might be best if Steve  
2 would say what need be said about the next three or four items.

3 MR. LAWROSKI: The first one there, underneath threat  
4 and strategy, fuel cycle facility safety, that really covers two  
5 principal areas, one of which really is more or less out of our  
6 scope, and that, I'll mention that one first. One of their  
7 research studies has to do with the problem of radioisotope  
8 utilization, and there they are concerned with facilities that  
9 might be handling large amounts of these things, and so they  
10 need to look at what might be accident scenarios and so on.

11 Now, the other part of that, which is under the  
12 committee's purview, has to do with the fuel cycle facility  
13 safety as it relates to the fuel cycle facilities as we know  
14 them, whether it's reprocessing, which is at the moment in  
15 abeyance, but fuel fabrication, waste management to some extent  
16 would come under that. But there the work relates to the  
17 studies of possible accident scenarios and then analysis models  
18 of how big the source terms might be and then their transport  
19 of the releases within the fuel cycle facility, followed by  
20 what might be the atmospheric release points.

21 The decommissioning, I think the committee members  
22 will recall that in our report to Congress last year we urged  
23 the NRC to accelerate its work on decommissioning, and this I  
24 think represents a continued response to the extent that funding  
25 allows. There's 1.4 million planned in '81. The increase in

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1 '82 is rather small, perhaps amounting only to what inflation  
2 might bring about.

3 The transportation, we -- the situation is about that  
4 which we heard last -- yeah, the full committee heard, I think,  
5 last year. The subcommittee was apprised of the fact that there  
6 are still some important questions being raised with respect to  
7 risks associated with alternate transport routes -- I think.  
8 Isn't that one of the large questions? Isn't it, Frank? And  
9 the -- maybe I should let --

10 MR. MARK: Explosive study of source term is another --

11 MR. LAWROSKI: Yes.

12 MR. MARK: -- item. Study of source terms resulting  
13 from explosives.

14 MR. LAWROSKI: Have I omitted anything or stated it  
15 wrong?

16 MR. ARSENAULT: I believe that NMSS considers the  
17 highest priority transportation question. Let's look at this.

18 Between the issue of making the regulations for  
19 package testing more realistic with regard to accident environ-  
20 ments and the associated acceptance criteria, consistent with  
21 those test criteria, that really they regard as the highest  
22 priority.

23 Alternative routing and administrative controls to  
24 reduce risk is an additional item.

25 I might point out that they feel that this is, the RES

JO-17

1 request funding is too low.

2 MR. LAWROSKI: This is with respect to packaging a  
3 rather large radioactive release content, as opposed to the  
4 packaging of materials that have created so much attention  
5 recently and last year, when it began to result in shutting --  
6 well, in causing the governors of the states that had low-level  
7 burial sites to tell the NRC, "You better enforce better your  
8 regulation better with respect to the way the materials are  
9 packaged by the licensee before he gives it to the shipper for  
10 delivery to Hanford or Barnwell or Beatty (?).

END  
TAPE 7

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1 Let's see, on the -- the effluent control has to do with the  
2 generation of data on the response of ventilation systems to  
3 tornado conditions.

4 Now after the subcommittee meeting it was pointed  
5 out that there should have been a wealth of data obtained in  
6 connection with this problem of reactor operations. So it  
7 was one of the things there was question about, whether  
8 there was a need on the part of the people working in this  
9 area to look and see what was available. And it may well be  
10 that contrary to what some of us may have thought, that when  
11 one examines this he can find a little useful information,  
12 just like, for example, there is a situation with respect to  
13 routine releases, that some of the older data that were  
14 collected really haven't proved to be very useful, and yet  
15 they were a part of the Technical Specifications.

16 Well, that is --

17 MR. MARK: Those are yours?

18 MR. LAWROSKI: Right.

19 MR. MARK: There is another item then, product --  
20 which means I think -- well, product safety, or is it  
21 by-product safety -- it has been said both ways.

22 It is a new program, isn't very large, and my  
23 understanding that PPG number, 300 thousand out of the  
24 proposed 600 thousand, and it took it out of a particular  
25 subproject, leaving in another one, each of them having been

1 about 300 thousand.

2 The one it crossed down to zero was the one which  
3 was going to make a relative assessment as to which of the  
4 by-products -- how did they rank in risk. That they cut out  
5 and they left in the program whereby you could measure the  
6 amount of radioactivity in the by-product. And that seemed  
7 absolutely marvelously backwards.

8 (Laughter.)

9 That if you are going to do anything at all you  
10 should first get an inventory of relative risk and then  
11 decide which ones you should pay further attention to.

12 MR. ARSENAULT: The thrust of your question is  
13 correct. I assume fine structure in there that might  
14 deserve attention.

15 We had basically three projects: one to compile  
16 design and testing requirements on products, another one to  
17 develop the capability to perform tests, in a sense results  
18 for products containing by-product materials, and a third  
19 one to estimate public risks resulting from the various  
20 types of products.

21 The latter one was thrown out, was terminated, and  
22 the project to develop testing capabilities was reduced in  
23 level of effort.

24 MR. MARK: No, it is my belief that if you would  
25 have a sensible program the one that they zeroed was the

1 first run worth looking at.

2 MR. ARSENAULT: I would question those  
3 priorities. You will notice we don't tend to RECLAMA this  
4 level, although we would expect to be able to deal with the  
5 risk question at some level of effort perhaps when in the  
6 overall fuel cycle risk assessment project which I described  
7 in the subcommittee meeting, that maybe should be touched on.

8 MR. LAWROSKI: Yes, I wanted to touch on that.

9 MR. ARSENAULT: If I may, as long as I am pointing  
10 it out, the 7.7 RECLAMA in fuel cycle facility safety is for  
11 the only project within that area that was not endorsed by  
12 the Fuel Cycle Division, and that is the project to develop  
13 a capability for assessing risks arising from the fuel cycle  
14 in a broad comprehensive way.

15 It was the intention to direct that project to  
16 fuel cycle facilities exclusively; that is, facilities  
17 dealing with reactor fuels. Given the elimination of the  
18 risk project associated with by-product utilization; that  
19 is, radioactive and consumer products, we are considering  
20 including that as one of the elements to be dealt with in  
21 the fuel cycle risk project.

22 MR. LAWROSKI: And there was also the matter that  
23 you have been asked to reexamine, the adequacy of our  
24 information with respect to criticality assessments in the  
25 more intensified fuel pools under shipments, which I think

1 you mentioned. Then you said you had available a critical  
2 facility where you can -- I think you mentioned to us -- but  
3 that was under fuel cycle facility safety. Right?

4 MR. ARSENAULT: That is correct.

5 MR. MARK: In view of the fact that the Commission  
6 will only look at this thing under decision unit finding  
7 scale --

8 MR. ARSENAULT: No.

9 MR. MARK: The Commission?

10 I am wondering whether if they approve your 10.7  
11 or --

12 MR. BUDNITZ: Well, we can focus their attention  
13 on specific issues if we need to, and we will so focus.

14 MR. MARK: No, but can't you move things between  
15 the sort of --

16 MR. BUDNITZ: Oh, yes.

17 MR. MARK: -- thing that Frank and I were just  
18 discussing?

19 MR. BUDNITZ: Move them around, right.

20 MR. MARK: They zeroed out something and left  
21 something else in and you felt the order should have been  
22 the other way around, you can do that? I would hope?

23 MR. BUDNITZ: Yes. Yes, I understand.

24 MR. MARK: The only other item, I don't know if  
25 you have anything about to say about, Dade, is that

1 occupational protection thing which you had written about in  
2 the old 5.6, and you produced something updated, I believe.

3 MR. MOELLER: Yes. We have deleted from the  
4 siting and environmental research chapter, and so you are  
5 the only one who will be covering it.

6 MR. MARK: No, but I believe you commented on the  
7 item, did you not?

8 MR. MOELLER: Yes, I provided a paragraph to you.  
9 It mainly deals with the understanding behavior of crud  
10 deposits and so forth within reactor systems.

11 MR. MARK: Did you have a point you could urge on  
12 the fact that the 1.2 has been cut to .6?

13 MR. MOELLER: At the time I wrote the thing I did  
14 not realize that, but yes, indeed, I would think that would  
15 be the wrong way to go. And perhaps we should add some  
16 words to that effect.

17 MR. MARK: RES didn't.

18 MR. MOELLER: Doesn't ask for a RECLAMA.

19 MR. MARK: So you think we should have something  
20 in there which says this program --

21 MR. MOELLER: Is important.

22 MR. MARK: -- is important and is not getting  
23 enough attention?

24 MR. MOELLER: That is what I would say.

25 MR. MARK: The occupational protection item,

1 bottom line.

2 MR. MOELLER: The last item.

3 SPEAKER: They cut it from 1.2 to .6.

4 (Pause.)

5 I am sending in my relief pitcher to change the  
6 next viewgraph.

7 (Laughter.)

8 MR. MOELLER: While we are changing the viewgraph,  
9 Mr. Chairman, I find I am quite confused, and that is again  
10 in --

11 MR. KERR: Well, then the viewgraph is changed, so  
12 you are no longer confused.

13 MR. MOELLER: In Chapter 5 on siting and  
14 environmental research, I find now following the new  
15 breakdown of the subelements that very little of what we  
16 have written matches one on one the budgetary listings that,  
17 you know the items, the categories and subelements as  
18 distributed to us with the budgetary information.

19 We are okay under seismology and geology and we  
20 are okay under meteorology and hydrology. We are halfway  
21 coordinated under airborne effluents, but the aquatic  
22 effluent portion is totally different now. I had changed  
23 the occupational exposure to make it match, but I look at  
24 emergency preparedness for example, and the subcommittee  
25 heard nothing about emergency preparedness, state and local,



1 at least research on it, so far as I know, and if we have  
2 emergency preparedness at a budget level of a half a  
3 million, I have no idea which of these projects is being  
4 supported.

5 MR. SIESS: You have got a cross-listing of old  
6 decision units and new ones, Dade. I am not quite sure how  
7 accurate it is. I can give you an update.

8 MR. MOELLER: Well, see, we wrote the chapter --

9 MR. SIESS: I didn't know where emergency  
10 preparedness went. Let's see if I can find the update.

11 MR. MOELLER: We wrote this on the basis of the  
12 charts that we had, and now that the subelements are all  
13 changed it would be very confusing.

14 MR. SIESS: Change from what, Dade?

15 MR. MOELLER: Changed in terms of titles and  
16 changed in --

17 MR. SIESS: Not from last month?

18 MR. MOELLER: Yes, sir.

19 MR. SIESS: No. They are exactly the lists you  
20 were given last month. I haven't seen any changes.

21 (Pause.)

22 MR. MOELLER: We were given last month three  
23 categories under emergency preparedness.

24 MR. SIESS: No. I am talking about the headings  
25 of the subelements.

1 MR. MOELLER: Oh, the headings are the same, but  
2 the individual projects --

3 MR. SIESS: You are talking about the projects?

4 MR. MOELLER: Yes.

5 MR. SIESS: Oh, I am sorry.

6 MR. MCCRELESS: I think the point that Dr. Moeller  
7 is raising, that if in fact that they are not going to ask  
8 for more money than what EDO cut the budget to be, you don't  
9 know which of the subprograms they are going to fund with  
10 that money?

11 MR. MOELLER: Right, and we reviewed a different  
12 set of subprograms than those shown on the material we have  
13 been provided.

14 MR. SIESS: Oh, you mean on the budget list, on  
15 this thing?

16 MR. MOELLER: Yes.

17 MR. SIESS: They are different than the one that  
18 went to the -- that we had last month?

19 MR. MOELLER: They are different than we covered  
20 in our subcommittee meeting on what, June the 27th.

21 MR. SIESS: Well, I would suggest that tomorrow  
22 you get hold of somebody -- is anybody here can tell him  
23 what is --

24 MR. MCCRELESS: Yes, we can.

25 MR. SIESS: Do you want to try to do it now or do

1 you want to do it just with Dade?

2 MR. MCCRELESS: It might be easier to do it just  
3 with Dade.

4 MR. SIESS: I think so.

5 MR. MOELLER: Okay.

6 MR. SIESS: These are under the planned  
7 achievements. They are listed differently in the markup we  
8 got back from EDO and the ones we had last month?

9 MR. ARSENAULT: That is the basic problem, that  
10 the documentation used by the EDO did not reflect the  
11 adjustments in our program that followed the coordination of  
12 the user offices which they requested.

13 MR. SIESS: I see. Well, I don't think a half a  
14 million dollars is going to be a great big item if we don't  
15 get it exactly right, but we certainly want to know what you  
16 are talking about.

17 MR. LAWROSKI: Just a half million is not a proper  
18 reflection of the importance that is being attached to  
19 emergency, especially in the rulemaking right now.

20 MR. SIESS: Well, it may be a proper reflection of  
21 the research on emergency preparedness. We have to  
22 distinguish. We are talking about research, and there is a  
23 lot needs to be done, and I don't know how much of it has  
24 to be research, although apparently maybe we should have  
25 instituted a research project to look into the Missasauga

1 evacuation. It took the staff six months to get up there  
2 and ask them about it, and I have gotten two different  
3 versions of what happened. So how do you get just simple  
4 information?

5 The research project took too long, and now they  
6 can't even send anybody up to Canada to find out how they  
7 did it.

8 Okay, let's here Mr. Bernero -- it is a shame Dave  
9 isn't here to support you, Bob, but he will be here Thursday.

10 SPEAKER: We have got all the support we need  
11 right in the room.

12 MR. BERNERO: If Dave were here he would just ask  
13 for another document.

14 (Laughter.)

15 MR. SIESS: You might just run down the -- the  
16 reasons the EDO gave were basically, in a couple of cases  
17 were basically they thought it was just going up too big too  
18 fast, and one thing I don't have a feel for is how much of  
19 it is in-house, you know where you really have to get the  
20 people on board to do it, and how much of it is contract.

21 MR. BERNERO: It is both. I think a point to get  
22 out of the way, Roger Mattson mentioned earlier that there  
23 was confusion about the IREP-NREP interplay there. And that  
24 is a significant difference in the systems analysis area.  
25 And that confusion existed when EDO was doing its mark, and

1 it has been resolved. And I believe Roger explained it  
2 reasonably well. I would be happy to repeat it if you would  
3 like.

4 MR. SIESS: That means that Roger would support  
5 your RECLAMA?

6 MR. BERNERO: Well, I say he is partially in  
7 support. The NRR endorsement was at a lower level, but then  
8 he acknowledges now the tepid endorsement was associated  
9 with confusion about whether we were both supporting the  
10 same program.

11 MR. KERR: What we need is the probability and the  
12 confidence level with which he would support.

13 MR. BERNERO: I would say, you know, he would give  
14 a level of effort support, just as for instance AECD does.  
15 Now the --

16 MR. SIESS: Let's take them in order. The  
17 methodology part --

18 MR. BERNERO: Yes, the methodology part was  
19 accompanied by an EDO remark about the large growth in the  
20 area, and what we are trying to do is build up their human  
21 reliability and system reliability methodology.

22 MR. SIESS: There you ask for more people?

23 MR. BERNERO: Yes, we did.

24 MR. SIESS: You have asked overall for more  
25 people, but that isn't broken down by --

1 MR. BUDNITZ: Yes. We asked for more people in  
2 each of these.

3 MR. BERNERO: Yes. Our people were split almost  
4 proportionately.

5 MR. SIESS: Then going back to the first part of  
6 the EDC review, the very general statement you know that  
7 applies to the whole decision unit, okay, it says -- there  
8 is a whole lot of gunk in here about the FY 82 Research risk  
9 assessment program. There is 25,600. There was 22,900, is  
10 in this unit. PPPG guidance for risk assessment,  
11 recommended a total agency funding level no less than 15,000.

12 And some of your requests in Research totals 33.5  
13 million. Is that supposed to mean anything, all that  
14 discussion?

15 MR. BERNERO: Well that states the crosscut  
16 level. They gave in the PG guidance, there was a floor, and  
17 then we were asked to do the crosscut, and we set up an  
18 agreed definition of what constitutes the risk assessment  
19 crosscut. And we came out with a crosscut level that was  
20 substantially above the floor.

21 MR. SIESS: Where is the risk assessment that  
22 isn't in this program --

23 MR. BUDNITZ: In other offices.

24 MR. SIESS: No, in Research. It says the FY 82  
25 Research program is 25.6, of which 22.9 is in this unit.

1 MR. BERNERO: You will find a certain amount of  
2 exported risk assessment. It is PAS effort that is exported  
3 to Frank Arsenault in Waste Management and a little bit in  
4 Fuel Cycle.

5 MR. SIESS: All right.

6 MR. BUDNITZ: You will remember that we had Waste  
7 Management studies in this decision unit when it used to be  
8 called risk assessment, but we moved all Waste Management  
9 into the Waste Management unit.

10 MR. LAWROSKI: This is only reactors now.

11 MR. BERNERO: You would find the probabilistic  
12 analysis or risk analysis of waste management counted as  
13 part of the risk assessment crosscut. You would also find  
14 them agencywide crosscut, the Reliability Branch under Roger  
15 Mattson, and their program support.

16 No, we left out the AEOD, we didn't count it risk  
17 assessment. That was in another crosscut.

18 MR. SIESS: Now looking at the methodology  
19 development, what argument are you going to use to get back  
20 your 700K? What would you leave out if that held?

21 MR. BERNERO: Well, basically some research in  
22 operator selection and training. It would delay work in  
23 operator selection and training, and some evaluation tools  
24 for emergency procedures.

25 MR. SIESS: Where in the program -- or should I be

1 looking under methodology development on this point that  
2 Dave made about using probabilistic bases for selecting  
3 research programs?

4 MR. BERNERO: We don't have anything explicit in  
5 the program to cover that. That I tend to think of as an  
6 overhead function. This is where we do a specific  
7 evaluation of the research program. If we repeat the Di  
8 Salvo effort, that I consider an overhead function.

9 MR. SIESS: Now I see an item in here, I am  
10 looking at page RES-58, it is the sixth item under a  
11 detailed list -- adapt promising reliability engineering  
12 techniques into a form suitable for an industry-implemented,  
13 NRC-audited safety function reliability assurance program  
14 spanning the whole of the nuclear plant life cycle except  
15 for design through decommissioning.

16 That is a pretty good description of the whole  
17 program, isn't it?

18 Could I stretch that by interpretation into this  
19 question of design errors that Dave is talking about?

20 MR. BERNERO: I don't think so myself. That  
21 particular item is associated with component and subsystem  
22 reliability monitoring and prediction, and I would consider  
23 it a significant stretch to try to get that design. The QA,  
24 the risk of ineffective QA is kind of up in the air.

25 To us it is part of uncertainty analysis.



1 MR. SIESS: Yes, but that is what errors are,  
2 ineffective QA, ineffective QC.

3 MR. BERNERO: Yes.

4 MR. SIESS: And this says from conceptual design  
5 through commissioning.

6 Think about it.

7 So how do you argue to get back 14 percent of your  
8 money?

9 MR. BERNERO: Well, the argument we have prepared  
10 is, you know it is arguing for a better level of effort and  
11 hinges on -- it does mention that third one, the reliability  
12 assurance for the whole of the nuclear plant life cycle  
13 there.

14 We have three things in it: operator selection  
15 and training, evaluation tools for emergency procedures and  
16 the reliability assurance for the whole of the nuclear plant  
17 life cycle.

18 MR. BUDNITZ: Mr. Chairman, of all of the four  
19 numbers there for RECLAMA, the 0.7 is the weakest case.

20 MR. SIESS: But you know, they just said --

21 MR. BUDNITZ: I mean, it is kind of more.

22 MR. SIESS: Yes, that is right, it is just more.

23 MR. BUDNITZ: But the other three are all specific  
24 and we can outline them differently.

25 MR. SIESS: Well, now let's go to the second one,

1 reliability and human.

2 MR. BERNERO: Yes.

3 MR. SIESS: That is straightforward. They say  
4 take 1.2 million and give it to Carl Michelson, because that  
5 is what he is doing.

6 MR. BERNERO: Well, there was a confusion there.  
7 If you go back in history before Michelson's office existed,  
8 when the Commission was committed to create that office, PAS  
9 became a repository for their money, their dowry. We had  
10 \$500 thousand in FY 80 supplement funds and 1.2 million in  
11 FY 81 funds earmarked for AEOD purposes.

12 When Carl Michelson's office was constituted we  
13 talked to him, and, as you already know, we are deeply  
14 involved in operational data research and evaluation. And  
15 we reached agreement that those funds, FY 80 supplement and  
16 FY 81 would remain in PAS and would be expended on -- I will  
17 call them AEOD-related areas.

18 Somehow in the EDO mark they got the impression  
19 that that 1.2 million was in FY 82. We have since confirmed  
20 with AEOD that, you know, this transfer is not  
21 appropriate. AEOD had reviewed our budget, and I will call  
22 it concurred with it or endorsed it on a level of effort  
23 basis, acknowledging that little relationship of previous  
24 funds, which I just described to you.

25 So basically we are saying that 1.2 million is a

1 mistake.

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1 MR. SIESS: So they will be doing some work, and  
2 they will be doing some work. There is not a duplication,  
3 and that is not their work.

4 MR. BERNERO: That is right.

5 MR. KERR: That is almost a 50 percent increase in  
6 effort compared to '81, which was a pretty big increase  
7 compared to '80.

8 BERNERO: Yes. This is true of the entire PAS  
9 budget, if you go back to FY-80, and carry the program on  
10 through. A little it was mentioned if you go back to the  
11 FY-80 budget it does not show on there, it is \$7.6 million  
12 for this whole decision unit, and then it goes up to \$11.6,  
13 and then on up to the levels under debate right now. It is  
14 a substantial growth.

15 MR. SIESS: That one is clear cut.

16 MR. BUDNITZ: And it is a growth that I must say I  
17 am not sure is completely fleshed out. In fact, I know that  
18 it is not completely fleshed out project by project. It is  
19 something that is formulating itself in a very rapid fashion.

20 MR. KERR: I have an uneasy feeling that the  
21 locomotive is leaving the train.

22 MR. BUDNITZ: I would have thought that last year,  
23 but the tremendous growth in demand on our staff's time for  
24 the last six or 12 months to these numerous assessments that  
25 have been done leaves us uneasy about being unresponsive.

1 I mean, who would have thought last year that  
2 Denton would be asking Limrick to do a risk assesement in  
3 120 days, or that the Indian Point decision on the UCS  
4 petition would require Bernaro and colleagues to do a quick  
5 risk evaluation of Indian Point itself, or other such things.

6 Who would have thought that we would have been as  
7 short handed as we are.

8 MR. SIESS: But, Bob, this objective is not  
9 research.

10 MR. BUDNITZ: That is application.

11 MR. SIESS: I agree that it is well done and it  
12 has been useful, but it is not research. It is, indeed,  
13 making use of the results of research, and maybe argue that  
14 in order to stay ahead of this demand. I would say that  
15 your ultimate goal should be getting this sort of stuff out  
16 of research.

17 MR. BORNERO: But is underway. However, all the  
18 things I have just mentioned, and a few others like the  
19 Crystal River study are really research. What I mean by  
20 that is that they still high in hearing applications. The  
21 first application of something like this is a lot of  
22 research.

23 When I say pioneering, I mean that, for example,  
24 in the Crystal River study the staff examined some of the  
25 issues in the control system in relationship for the first

1 time in a way that had not been examined in any plan before.

2 MR. SIESS: But, Bob, the point is that those  
3 kinds of accomplishments don't get listed in this document.  
4 Presumably by 1982 you will not be doing that type of jobs  
5 for licensing, or if you will I don't see them listed here.  
6 I don't see an item that says that this is a service  
7 function in the budget.

8 MR. BUDNITZ: That is a lot of what they are  
9 doing, systems analysis.

10 MR. BERNERO: There is some awfully strong flavor  
11 of service in this entire budget. PAS has a budget that is  
12 quite a bit different from what one would ordinarily think  
13 of.

14 MR. SIESS: I see, "To assess risk in existing  
15 plants and systems."

16 MR. BUDNITZ: This budget has less of what you  
17 would define as research than any other budget in the office.

18 MR. KERR: At what point is NRR or somebody going  
19 to be equipped to assess risk in existing functions? Is  
20 that part of your responsibilities?

21 MR. BUDNITZ: Yes, to impeach the Gospel.

22 MR. KERR: Is it part of your responsibilities,  
23 for example, to train their people?

24 MR. BERNERO: Yes, it is. We have a training  
25 program. We are working with NRR to maximize --

1 MR. SIESS: Does the training program show up here  
2 anywhere?

3 MR. BERNERO: Yes, I think you will find it in  
4 systems analysis. We have \$500,000, and I think that it is  
5 in systems analysis.

6 MR. SIESS: I see that the Guide Research  
7 Priorities under systems analysis.

8 MR. BUDNITZ: It is fair to say that an awful lot  
9 of this stuff is work that in a more perfect world would not  
10 be in RES, and should not be in RES, but remains there. We  
11 would like to transfer our talents in this area as quickly  
12 as we could to doing the server research. Reliability  
13 analysis, after all, is routine, too, after you have been  
14 doing it. But we don't know whether that would more  
15 properly be our special mission, and nobody else could do it.

16 MR. SIESS: these items on publishing manual and  
17 production courses, we have recognized in the past that you  
18 had this teaching function. We have got a new discipline.  
19 The people in the other disciplines are not yet competent in  
20 it, and I guess I have to agree, although a little  
21 reluctantly that almost anything you are doing here is  
22 research, and that it is all new.

23 MR. BUDNITZ: It is an exaggeration that it all  
24 is, Chet. I was perhaps exaggerating myself. But the fact  
25 is that enough of it is that it is a long ways from

1 routine. It is just a long way from routine.

2 MR. KERR: The fact that something is not routine  
3 does not mean that it is research.

4 MR. BUDNITZ: Yes, sir.

5 MR. SIESS: It is creative.

6 MR. BUDNITZ: No university professor's  
7 definition, and I come from a university, would call that  
8 stuff research. You are absolutely right. But then neither  
9 is co-assessment and application back in the local program  
10 either.

11 MR. MARKS: The definition here is that it cannot  
12 be well done by I&E.

13 MR. SIESS: As well done by I&E.

14 Now, in your system analysis, you got cut on the  
15 basis as in methodology. It is a high priority program, but  
16 the resources appear to be excessive. You are asking for an  
17 increase, and they recommend about double what you were  
18 getting in '81, instead of as much more as you are asking.

19 About all you can do is go in and say, "These are  
20 the things we won't do," which is a heck of a list, or just  
21 say more.

22 MR. BERNERO: We have a list on what appears to be  
23 deferred or delayed by the \$0.7 million, and it seems like  
24 accident sequence diagnosis --

25 MR. SIESS: Are you reading from the same list I



1 am reading from?

2 MR. BERNERO: No, I don't think you have the  
3 RECLAMA. You are going to get it tomorrow.

4 MR. SIESS: No, but I got a list here that lists  
5 six things, and then it lists conduct, provide, publish,  
6 conduct, begin, type of thing.

7 MR. BERNERO: I have the E3A.

8 MR. SIESS: Can you tell me which of those things  
9 would not get done out of \$10.4 million versus the \$13.1  
10 million level?

11 MR. BERNERO: Let me see if I can cross my RECLAMA  
12 List with that list.

13 MR. SIESS: You are going to give us the RECLAMA  
14 List?

15 MR. BERNERO: Yes, we are going to give you the  
16 RECLAMA List, and it is going to give you the itemization.

17 MR. SIESS: I have a feeling that the committee  
18 will probably end up saying that this area ought to be  
19 increased. It might say as much as you are asking for in  
20 the RECLAMA. It might say more, but it is also going to  
21 want to tell you what to do with it.

22 MR. BUDNITZ: We welcome specific advice, if for  
23 no other reason than the program is now not well formulated  
24 in '82, and we are not claiming that it is.

25 MR. SIESS: You are not likely to get it as

1 specific as you would like, that is the trouble.

2 MR. BUDNITZ: No. I want to make a key point  
3 here. The 10 person, from 27 to 37, are in our view more  
4 important than any of the other people issues within the  
5 Office of Research. I am the only guy that can say that,  
6 and that is why I have just said it.

7 You notice that the '81 staffing was 29, and we  
8 asked for 37, and they are recommending 27. I just can't  
9 follow that for love or money, how anybody could give us a  
10 mark that reduced the number of people in this group while  
11 the budget was going from \$11 million to \$19 million, and at  
12 a time when the need for interoffice coordination and  
13 interaction was so great.

14 MR. KERR: Is it a typo?

15 MR. BUDNITZ: It is not a typo. It is a  
16 considered, and in my view a wrong decision.

17 MR. SIESS: Bob, I have a problem with this EDO  
18 mark. I can't find where their positions are.

19 MR. BORNERO: It is elsewhere.

20 MR. BUDNITZ: As I understood it was on their  
21 model for the appropriate amount of professional manpower to  
22 go with research dollars.

23 MR. SIESS: Here is your office request, and down  
24 here for the dollars they give their mark, but they don't  
25 have it here.

1 MR. BUDNITZ: We just need those people. That is  
2 just the place where we need the people.

3 MR. SIESS: You used to tell us that you could not  
4 get them.

5 MR. BUDNITZ: We are going to transfer some people  
6 in the out years to them.

7 MR. SIESS: I am sorry, it was Sol that used to  
8 tell us there were not enough around.

9 MR. KERR: Has long range thought been given to  
10 two probabilistic assessment groups, one in research, and  
11 one somewhere else?

12 MR. BERNERO: It is more than long range thought.  
13 It exists. Mattson has a group in whatever you call his  
14 division, System Technology or something like that. He has  
15 a branch now under the acting leadership of Sandy Israel  
16 which is Reliability Assessment, or Risk Assessment Branch,  
17 and it exercises that function.

18 On the inerting thing, the BWR mark one and mark  
19 two inerting, the PAS position had been expounded to you  
20 people that it really was not risk beneficial. They  
21 independently look at that branch, and they came to the same  
22 conclusion. Therefore, NRR proposed to inert it.

23 MR. KERR: I read that wonderful SECY.

24 MR. BERNERO: I work virtually on a daily basis  
25 with that group in order to get them as quickly as possible

1 --

2 MR. KERR: I was not thinking so much of  
3 coordination as I was what seems to me to be the case, the  
4 people who do daily application are not the sort of people  
5 that you will have doing research, and vice versa. They are  
6 not happy doing.

7 What you are doing now, probably, is a lot of  
8 taking of research people and putting them on that, which is  
9 okay, and indeed may be helpful on occasion, but it is not  
10 something, it seems to me, you would want to do over the  
11 long term.

12 MR. BUDNITZ: I just made the point that I think  
13 that in the distant out years PAS is liable to contract in  
14 its program breadth from this rather broad applications area  
15 back into the more research area, and some of the people we  
16 bring in may end up finding position elsewhere, and the  
17 whole thing is nebulous. But in the meantime, I don't want  
18 to use the words "we are stuck with it" because that implies  
19 something negative, but really we are stuck with a function  
20 that is broader than is appropriate for us if we are going  
21 to discharge to the best of our ability.

22 MR. SIESS: What about that last item on  
23 consequence analysis?

24 MR. BERNERO: That is a much smaller delta. The  
25 EDO mark was to remove \$1.3 million. We asked for it back.

1 The four things involved were degraded core cooling  
2 rulemaking sort of things alterations in containment system  
3 requirements. There is a consequence analysis associated  
4 with that.

5 The specific accident scenario things that go with  
6 reliability assessment, remember these IREPs and NREPs just  
7 do sequence probabilities. They don't do the consequence  
8 analysis. They just assert a relationship, and there is a  
9 support for that that we feel is appropriate.

10 We had intended to do some statistical analysis of  
11 real life evaluations for the critical factors, evacuation  
12 speed and effectiveness as part of improving our evacuation  
13 model and our consequence model.

14 MR. SIESS: What is your argument now for getting  
15 that money back?

16 MR. BORNERO: The things I am just enumerating are  
17 what would be deferred or delayed if you don't have that  
18 money.

19 MR. SIESS: I have trouble in that I cannot find  
20 some of the things you describe necessarily in the list I  
21 have here. I can find some of them. I see something on  
22 evacuations and emergency responses. I see something on  
23 develop information on ad hoc respiratory protective  
24 measures.

25 MR. BORNERO: That is part of the consequence

1 model. It is a refinement we were hoping to get in there.

2 MR. SIESS: Is this something like Crack Code that  
3 we are talking about?

4 MR. BERNERO: Yes, there would be improvement in  
5 the Crack Code analysis.

6 MR. SIESS: The biggest criticism I have heard of  
7 Crack Code is the uncertainties about its use for large  
8 distances.

9 MR. BUDNITZ: No. While that uncertainty exists, I  
10 want to add something to it. In fact, there is a whole  
11 chapter in the Lewis report about uncertainties in the  
12 WASH-1400 consequence analysis of this sort. There are  
13 uncertainties that PAS would not clarify, but that would be  
14 clarified in a SAFER Division about deposition velocity and  
15 the like, which together although not big factors are  
16 important refinements to enable us to do the sort of site  
17 specific stuff better.

18 There isn't a good enough model for deposition  
19 velocities in various neurological conditions under various  
20 particulate molting in the atmosphere and as a function of  
21 chemical composition.

22 So the Crack Code, while in decent shape for some  
23 purposes, could stand some work, and it is the research  
24 function that had to fill that in.

25 MR. KERR: Is the accuracy of the meteorological

1 diffusion model which you use sufficiently great that these  
2 refinements make sense? I assume that it must be or you  
3 would not be suggesting them?

4 MR. BUDNITZ: No. It is something that we have to  
5 work on, too. We are going to try to gather all this  
6 information so that some years hence we will be able to do a  
7 better than we can.

8 My point is just to say that the Crack Code as an  
9 existing code is not something that we are just standing pat  
10 with.

11 MR. SIESS: Of course, if you could establish  
12 where the uncertainties exist that would give somebody a  
13 basis for research to reduce them, if it is possible. Some  
14 of them may be irreducible.

15 MR. BUDNITZ: Yes, and some of them may be  
16 unnecessary.

17 MR. SIESS: Some of them may be so small compared  
18 to others that you don't want to bother with them. But we  
19 have been talking about developing quantitative risk  
20 criteria, and one quantitative risk criterion will be  
21 societal impact, or societal doses which now starts looking  
22 at 50 or 100 miles out from a site. If Crack is not any  
23 good out there, or has such uncertainties that you can't,  
24 then you have a problem.

25 MR. BUDNITZ: Then there are some other points,

1 too.

2 Just last week Propanero presented a Commission  
3 paper about Indian Point, in which comparisons were made of  
4 property damage, sort of a dollar value for property damage  
5 as a function of various accidents. You may recall the  
6 WASH-1400 curves about that.

7 It is recognize now, in fact Ron Rasmussen  
8 recognized it then, that those models are quite crude, and  
9 work has to be done on that, and that is another part of the  
10 consequence analysis because those are additional figures of  
11 merit besides the sort of deaths or illnesses that are  
12 thought of more commonly.

13 MR. SIESS: Is all the work on consequence  
14 analysis going to be done in this area, or is this just the  
15 probabilistic aspect of it?

16 MR. BUDNITZ: there is some in SAFER.

17 MR. SIESS: How do you divide it up? If it is  
18 deterministic they do it, and if it is probabilistic you do  
19 it.

20 MR. BUDNITZ: If it is phenomena or the like, it  
21 is done in SAFER. These are model development, development  
22 of analytical techniques, first round applications, and so  
23 on. This is intended as the title of the decision Unit  
24 states to be analysis for the development of tools for  
25 analysis, and not supporting phenomena, and so on, more or



1 less.

2 MR. SIESS: This thing is getting involved because  
3 in the ideal world, I guess, the people who were developing  
4 the Crack Code would develop it on a probabilistic basis,  
5 and that would be it. They would not need to assign the  
6 probabilistic part of it to some other group. But the  
7 people with knowledges in those disciplines don't have the  
8 knowledges in probability, I guess, so you have to divide it  
9 up.

10 MR. BUDNITZ: We saw some of the questions of  
11 deposition velocity and the like as being best dealt with by  
12 people in the environmental field.

13 MR. SIESS: My point was a little different.  
14 There is a whole area of risk analysis, fault-trees of  
15 entries, etc., that has become a discipline almost all its  
16 own. Then there is a lot of work where there are just  
17 probabilistic aspects of any phenomenon that have to be  
18 treated, and they are all being treated in this group  
19 because that is where the expertise lies.

20 Eventually, I think, and I think this was somewhat  
21 the direction Bill Kerr was getting, although not  
22 completely, that there be a certain type of analysis being  
23 done, research in that area, and other people would be  
24 utilizing probabilities as necessary in what they did.

25 MR. BUDNITZ: There is no compelling and

1 overwhelming logic for this not be, for example, in SAFER.  
2 It started in SAFER, but there are a lot of ways to skin a  
3 cat, or to run a research program, and it is there because  
4 it is there.

5 MR. KERR: That is a logical reason, isn't it?

6 MR. SIESS: This grouping by decision units is  
7 logical up to some point, and then it becomes fairly  
8 arbitrary. If you can get that point about 50 percent down  
9 the road, I think that is pretty far. I think you might  
10 have it a little bit farther than that, but there is never  
11 any way you are going to get this thing set up in eight  
12 units, 10 units, or 12 units, and have it a completely  
13 logical organization. It just does not work that way.

14 You can divide the core melt as to the bottom  
15 support plate, you know, but that is pretty arbitrary. I  
16 can put it at the bottom of the vessel.

17 Anything else, gentlemen?

18 MR. LAWROSKI: Chet, you had mentioned this  
19 morning that we had a question on waste management. Mr.  
20 Bell from the Division of Waste Management is here.

21 MR. SIESS: I don't have any questions on waste  
22 management. That is your chapter. If you have got them,  
23 ask them.

24 MR. BUDNITZ: I have a comment on waste  
25 management.

1           It was pointed out to me that I need to say that I  
2 misspoke earlier about the extent to which the NMSS budget  
3 for '82 is totally activities that we would call research.  
4 They have a diligent effort over the last year or two, and  
5 certainly the next year or two, to turn the research type  
6 activities over to us, and to undertake only those  
7 activities that are more properly technical assistance over  
8 there. It is not complete, and I have no problem with it  
9 being not complete.

10           We are not arguing about the fact that all the  
11 offices do some research. But I want to point that trend is  
12 clear, and that the big difficulties that we had, let us  
13 say, two years ago with their larger research budget and our  
14 rather smaller one, are superseded. We are receiving pretty  
15 good cooperation.

16           MR. SIESS: Let me say something about that. At  
17 this time, we are trying to prepare comments to the  
18 Commission on the budget of the Office of Nuclear Regulatory  
19 Research, and the Commission has never raised any question  
20 as to whether everything was in that office that should be,  
21 etc.

22           When we start writing our report to Congress, the  
23 Congress has asked us to report on the NRC's research  
24 program. There is nothing in the language that said, the  
25 program of the Office of Nuclear Regulatory Research. In

1 that report, from time to time, in our studies in preparing  
2 for that report, we have tried to look at research being  
3 done in other places.

4 We have looked at the relationship between TAPs  
5 and research, and have tried to find the research content in  
6 those. Three years ago we thought that the content was  
7 there, and it was small enough that it did not really  
8 deserve an awful lot of digging out to get at.

9 We continued to look at it, and occasionally  
10 commented on it. I still have the feeling -- although  
11 taking the Congress literally we should look at all the  
12 research -- I would hate to try to dig into every TAP in  
13 every area, some of them are not even going to be in two  
14 years from now, but are going on now, but to look at how it  
15 is being divided out, and if you think that it is excessive,  
16 or having a serious effect on how one office operates on  
17 balance in the budget.

18 At this stage, I don't think we have any  
19 particular problem with who is doing what because of the  
20 limit that I would put on this report. But for the other  
21 part, for the Congress report, it could be looked at more  
22 thoroughly.

23 So if you have any questions that you want to ask,  
24 feel free to ask them, and we will listen.

25 MR. LAWROSKI: Due to the lateness of the hour, I

1 don't have anything really.

2 MR. SIESS: Gentlemen, there is still time to  
3 revise your draft chapters. We will need to have for the  
4 Thursday effort by the committee -- The main thing that we  
5 are going to want to do is to try to reach some positions on  
6 dollar items, and why. I will try to have some framework  
7 for discussing priorities.

8 Any drafts we have that are reasonably near  
9 completion, we will try to work on them. We will have some  
10 time Friday, and at that point I would like for the  
11 committee to start reading drafts, if they want to read  
12 them.

13 Tomorrow I am going to spend some time doing some  
14 editing on the drafts that I have got, simply on format and  
15 arrangement, and will probably run them back through the  
16 bydeck, and see if we can come up with cleaner copies. So  
17 if you have any changes you want to make, you get to me, to  
18 Dot or to Tom tomorrow, and they will see that I get them.

19 If you want your words in the report, the sooner  
20 you get them in, the better the chance. If you get them in  
21 too late, I am going to be editing it on Saturday, and you  
22 will not see it.

23 (Whereupon, at 6:10 p.m., the committee adjourned.)

24

25

NUCLEAR REGULATORY COMMISSION

This is to certify that the attached proceedings before the

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in the matter of: ADVISORY COMMITTEE ON REACTOR SAFEGUARDS - SUBC. ON  
REACTOR SAFETY RESEARCH

Date of Proceeding: July 8, 1980

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.

Suzanne Babineau

Official Reporter (Typed)

*Suzanne Babineau*

Official Reporter (Signature)

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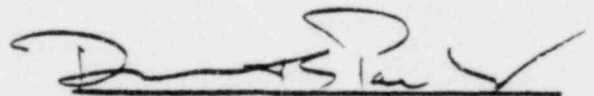
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David S. Parker

Official Reporter (Typed)



Signature of Reporter

NUCLEAR REGULATORY RESEARCH  
FY 1982 INTERNAL REVIEW  
RES RECLAMA - EDO STAFF MARK  
MAJOR ISSUES

- SYSTEMS AND RELIABILITY ANALYSIS
  - ADDITIONAL RELIABILITY DATA ANALYSIS REQUIRED TO SUPPORT AEOD MISSION
  - CONSEQUENCE ANALYSIS NEEDED TO SUPPORT NEW RULEMAKING INITIATIVES
  - WASH 1400 UPDATE
  - SYSTEMS ANALYSIS EFFORT EXPECTED TO SUPPORT REGULATORY REVIEWS
- FAST/GAS REACTORS
  - MAINTENANCE OF BASE PROGRAM
- PLANT OPERATIONAL SAFETY
  - HIGH PRESSURE THERMAL SHOCK TESTS
- SEISMOLOGY AND GEOLOGY
  - SUPPORT OF SITING RULEMAKING AND CONTINUING NEED FOR SEISMIC DATA COLLECTION
- FUEL MELT BEHAVIOR
  - RESEARCH TO SUPPORT AND CONFIRM DEGRADED CORE RULEMAKING
- LOCA AND TRANSIENT RESEARCH
  - SUPPORT REQUIRED TO MEET CONTRACTUAL AND INTERNATIONAL COMMITMENTS CONSISTENT WITH ORDERLY PHASE-DOWN



FY 1982  
RES RECLAMA - EDO STAFF MARK  
PERSONNEL

- SYSTEMS AND RELIABILITY ANALYSIS
  - ADDITIONAL STAFF REQUIRED TO MANAGE EXPANDED RESEARCH CONTRACT EFFORT AND IN-HOUSE DATA EVALUATION AND SYSTEMS ANALYSIS
- SEVERE ACCIDENT PHENOMENA AND MITIGATION
  - FAST AND GAS REACTOR RESEARCH PROGRAM STAFF
- SAFEGUARDS AND FUEL CYCLE
  - MAINTENANCE OF ON-GOING PROGRAM
- PLANT OPERATIONAL SAFETY
  - ADDITIONAL STAFF FOR EXPANDED MAN-MACHINE AND INSTRUMENT AND ELECTRICAL RESEARCH MANAGEMENT
- LOCA AND TRANSIENT RESEARCH
  - STAFF REDUCTION TO LEVEL NECESSARY TO SUPPORT PROGRAM CLOSE-OUT AND RESEARCH APPLICATION ACTIVITIES, AND INTERNATIONAL COMMITMENTS

7/7/80

NUCLEAR REGULATORY RESEARCH  
 FY 1982 INTERNAL REVIEW  
 (DOLLARS IN MILLIONS)

DECISION UNIT (PERSONNEL)	'81 PRES (178)	RES '82 (216)	EDO STAFF MARK (178)	RECLAMA (30)	REV. RES '82 (208)
LOCA & TRANSIENT	\$ 71.1	\$ 59.9	\$ 52.9	\$ 4.1	\$ 57.0
LOFT	43.0	48.0	48.0	-	48.0
PLANT OPERATIONAL SAFETY	34.1	48.6	43.0	3.1	46.1
SEVERE ACCIDENT PHEN. & MITIGATION	8.6	30.2	17.2	11.5	28.7
SITING & ENVIRONMENTAL	13.9	16.9	14.2	2.4	16.6
WASTE MANAGEMENT	14.9	27.8	24.8	0.4	25.2
SAFEGUARDS & FUEL CYCLE SAFETY	9.9	13.3	10.7	1.0	11.7
SYSTEMS & RELIABILITY ANALYSIS	11.6	24.8	18.9	5.9	24.8
PROGRAM DIRECTION & SUPPORT	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
TOTAL PROG. SUPPORT	\$207.1	\$269.5	\$229.7	\$28.4	\$258.1
EQUIPMENT	<u>10.3</u>	<u>14.1</u>	<u>12.5</u>	<u>0.8</u>	<u>13.3</u>
TOTAL RES	\$217.4	\$283.6	\$242.2	\$29.2	\$271.4

NUCLEAR REGULATORY RESEARCH  
 FY 1982 INTERNAL REVIEW  
 PERSONNEL

<u>DECISION UNIT</u>	<u>'81 PRES</u>	<u>RES '82</u>	<u>EDO STAFF MARK</u>	<u>RECLAMA</u>	<u>REV. RES '82</u>
LOCA & TRANSIENT RESEARCH	29	28	23	4	27
LOFT	8	8	9	-1	8
PLANT OPERATIONAL SAFETY	29	34	28	4	32
SEVERE ACCIDENT PHEN. & MITIGATION	11	21	16	5	21
SITING & ENVIRONMENTAL	15	17	15	1	16
WASTE MANAGEMENT	17	24	24	-	24
SAFEGUARDS & FUEL CYCLE SAFETY	14	16	10	4	14
SYSTEMS & RELIABILITY ANALYSIS	29	37	27	10	37
PROGRAM DIRECTION & SUPPORT	<u>26</u>	<u>31</u>	<u>26</u>	<u>3</u>	<u>29</u>
TOTAL RES	178	216	178	30	208

NUCLEAR REGULATORY RESEARCH  
 FY 1982 INTERNAL REVIEW  
 (DOLLARS IN MILLIONS)

LOCA & TRANSIENT RESEARCH	'81 <u>PRES</u>	RES '82 <u>    </u>	EDO STAFF MARK <u>    </u>	RECLAMA <u>    </u>	REV. RES '82 <u>    </u>
PERSONNEL	<u>29</u>	<u>28</u>	<u>23</u>	<u>4</u>	<u>27</u>
SEMISCALE	\$ 8.8	\$ 7.5	\$ 7.5	-	\$ 7.5
SEP. EFFECTS EXP. & MODEL DEV.	13.0	9.7	5.7	2.1	7.8
3-D PROGRAM	10.0	6.0	5.0	1.0	6.0
CODE IMPROVEMENT & MAINT.	7.2	4.5	4.5	-	4.5
CODE ASSESSMENT & APPL.	6.9	7.9	7.9	-	7.9
FUEL BEHAV. UNDER OPER. TRANSIENTS	8.6	6.4	6.4	-	6.4
CORE DAMAGE BEYOND LOCA	10.3	13.1	11.1	1.0	12.1
PBF OPERATIONS	<u>6.3</u>	<u>4.8</u>	<u>4.8</u>	<u>-</u>	<u>4.8</u>
TOTAL PS	\$71.1	\$59.9	\$52.9	\$4.1	\$57.0
EQUIP.	3.3	2.8	2.8	-	2.8

NUCLEAR REGULATORY RESEARCH  
 FY 1982 INTERNAL REVIEW  
 (DOLLARS IN MILLIONS)

LOET	'81 PRES	RES '82	EDO STAFF MARK	RECLAMA	REV. RES '82
PERSONNEL	<u>8</u>	<u>8</u>	<u>9</u>	<u>-1</u>	<u>8</u>
ENGINEERING & ANALYSIS	\$ 8.4	\$10.4	\$10.4	-	\$10.4
FUEL	5.5	4.5	4.5	-	4.5
INSTRUMENTATION	7.4	10.0	10.0	-	10.0
OPERATIONS	8.9	9.5	9.5	-	9.5
FACILITY SUPPORT	<u>12.8</u>	<u>13.6</u>	<u>13.6</u>	<u>-</u>	<u>13.6</u>
TOTAL PS	\$43.0	\$48.0	\$48.0	-	\$48.0
EQUIP.	2.2	2.4	2.4	-	2.4

NUCLEAR REGULATORY RESEARCH  
 FY 1982 INTERNAL REVIEW  
 (DOLLARS IN MILLIONS)

<u>PLANT OPERATIONAL SAFETY</u>	'81 <u>PRES</u>	RES '82 <u>      </u>	EDO STAFF MARK <u>      </u>	RECLAMA <u>      </u>	REV. RES '82 <u>      </u>
PERSONNEL	<u>29</u>	<u>34</u>	<u>28</u>	<u>4</u>	<u>32</u>
MAN-MACHINE INTERFACE	\$ 2.7	\$ 4.8	\$ 4.8	-	\$ 4.8
INST. & ELECTRICAL	3.4	8.3	7.3	-	7.3
PLANT SYSTEMS BEHAVIOR	0.7	2.0	1.5	-	1.5
MECHANICAL COMPONENTS	8.4	10.0	8.4	0.6	9.0
STRUCTURAL SAFETY	4.6	6.5	5.5	1.0	6.5
FRACTURE MECHANICS	4.3	6.0	4.5	1.5	6.0
OPER. EFFECTS ON MATERIALS	6.9	7.6	7.6	-	7.6
NON-DESTRUCTIVE EXAMINATION	<u>3.1</u>	<u>3.4</u>	<u>3.4</u>	<u>-</u>	<u>3.4</u>
TOTAL PS	\$34.1	\$48.6	\$43.0	\$3.1	\$46.1
EQUIP.	2.8	3.8	3.5	-	3.5

NUCLEAR REGULATORY RESEARCH  
 FY 1982 INTERNAL REVIEW  
 (DOLLARS IN MILLIONS)

	'81 PRES	RES '82	EDO STAFF MARK	RECLAMA	REV. RES '82
SEVERE ACCIDENT PHENOMENA & MITIGATION RESEARCH PERSONNEL	<u>11</u>	<u>21</u>	<u>16</u>	<u>5</u>	<u>21</u>
FUEL MELT BEHAVIOR	\$ 3.1	\$12.0	\$ 9.0	\$ 1.5	\$10.5
FISSION PRODUCT RELEASE & TRANSPORT	2.5	4.3	4.3	-	4.3
SEVERE ACCIDENT MITIGATION	0.8	3.9	3.9	-	3.9
FAST REACTORS	2.2	8.0	0	8.0	8.0
ADV. CONVERTER REACTORS	<u>0</u>	<u>2.0</u>	<u>0</u>	<u>2.0</u>	<u>2.0</u>
TOTAL PS	\$ 8.6	\$30.2	\$17.2	\$11.5	\$28.7
EQUIP.	0.3	2.2	1.2	0.8	2.0

NUCLEAR REGULATORY RESEARCH  
 FY 1982 INTERNAL REVIEW  
 (DOLLARS IN MILLIONS)

	'81 RES	RES '82	EDO STAFF MARK	RECLAMA	REV. RES '82
<u>SITING &amp; ENVIRON. RESEARCH</u>					
PERSONNEL	<u>15</u>	<u>17</u>	<u>15</u>	<u>1</u>	<u>16</u>
SEISMOLOGY & GEOLOGY	\$ 4.7	\$ 5.3	\$ 3.5	\$ 1.8	\$ 5.3
METEOROLOGY & HYDROLOGY	1.3	2.0	2.0	-	2.0
AIRBORNE EFFLUENTS ENVIRON. IMPACTS	1.1	2.3	2.3	-	2.3
AQUATIC EFFLUENTS ENV. IMPACTS	2.3	1.8	1.8	-	1.8
OCCUP. EXPOSURE & HEALTH EFF.	3.5	3.6	3.6	-	3.6
SOCIOECONOMIC IMPACTS	0.5	1.0	0.5	0.2	0.7
SITING ALTERNATIVES	0	0.4	0	0.4	0.4
EMERGENCY PREPAREDNESS	<u>0.5</u>	<u>0.5</u>	<u>0.5</u>	<u>-</u>	<u>0.5</u>
TOTAL PS	\$13.9	\$16.9	\$14.2	\$ 2.4	\$16.6
EQUIP.	0.5	0.6	0.6	-	0.6



NUCLEAR REGULATORY RESEARCH  
 FY 1982 INTERNAL REVIEW  
 (DOLLARS IN MILLIONS)

WASTE MANAGEMENT	'81 PRES	RES '82	EDO STAFF MARK	RECLAMA	REV. RES '82
PERSONNEL	17	24	24	-	24
HIGH LEVEL WASTE	\$ 9.0	\$19.3	\$16.3	\$ 0.4	\$16.7
LOW LEVEL WASTE	4.5	5.5	5.5	-	5.5
URANIUM RECOVERY	1.4	3.0	3.0	-	3.0
TOTAL PS	\$14.9	\$27.8	\$24.8	\$ 0.4	\$25.2
EQUIP.	1.0	2.0	1.7	-	1.7

NUCLEAR REGULATORY RESEARCH  
 FY 1982 INTERNAL REVIEW  
 (DOLLARS IN MILLIONS)

SAFEGUARDS & FUEL CYCLE SAFETY	'81 PRES	RES '82	EDO STAFF MARK	RECLAMA	REV. RES '82
PERSONNEL	<u>14</u>	<u>16</u>	<u>10</u>	<u>4</u>	<u>14</u>
PHYSICAL PROTECTION	\$ 3.2	\$ 3.1	\$ 3.1	-	\$ 3.1
MATERIAL CONTROL & ACCOUNTING	1.4	2.4	1.4	0.3	1.7
THREAT & STRATEGY	0.2	0.4	0.4	-	0.4
FUEL CYCLE FACILITY SAFETY	1.3	2.0	1.3	0.7	2.0
DECOMMISSIONING	1.4	1.6	1.6	-	1.6
TRANSPORTATION	1.2	0.8	0.8	-	0.8
EFFLUENT CONTROL	1.2	1.2	1.2	-	1.2
PRODUCT SAFETY	0	0.6	0.3	-	0.3
OCCUP. PROTECTION	<u>0</u>	<u>1.2</u>	<u>0.6</u>	<u>-</u>	<u>0.6</u>
TOTAL PS	\$ 9.9	\$13.3	\$10.7	\$ 1.0	\$11.7
EQUIP.	0.2	0.3	0.3	-	0.3

NUCLEAR REGULATORY RESEARCH  
 FY 1982 INTERNAL REVIEW  
 (DOLLARS IN MILLIONS)

<u>SYSTEMS &amp; RELIABILITY ANALYSIS</u>	'81 <u>RES</u>	RES '82 <u>      </u>	EDO STAFF MARK <u>      </u>	RECLAMA	REV. RES '82 <u>      </u>
PERSONNEL	<u>29</u>	<u>37</u>	<u>27</u>	<u>10</u>	<u>37</u>
METHODOLOGY DEVELOPMENT	\$ 2.4	\$ 5.7	\$ 5.0	\$0.7	\$ 5.7
RELIABILITY & HUMAN ERROR DATA ANALYSIS	2.6	3.5	2.3	1.2	3.5
SYSTEMS ANALYSIS	6.0	13.1	10.4	2.7	13.1
CONSEQUENCES ANALYSIS	<u>0.6</u>	<u>2.5</u>	<u>1.2</u>	<u>1.3</u>	<u>2.5</u>
TOTAL PS	\$11.6	\$24.8	\$18.9	\$5.9	\$24.8
EQUIP.	0	0	0	-	0

OFFICE  
OF  
NUCLEAR REACTOR REGULATION  
EN. EMENT

OFFICE OF NUCLEAR REGULATORY RESEARCH

FY 1982 BUDGET REQUEST

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ACRS PRESENTATION

JULY 8, 1980

NRR

GENERAL COMMENTS

1. PRIORITIES BASED ON:
  - o NRC POLICY, PLANNING, AND PROGRAM GUIDANCE (PPPG) FY 82-86
  - o TMI ACTION PLAN
  - o LICENSING NEEDS
  - o RESEARCH IN PROGRESS
  
2. NRC PPPG RESEARCH MARK (\$207M) APPEARS ADEQUATE
  
3. IN VIEW OF EXPECTED SHORTAGE OF NUCLEAR-QUALIFIED PEOPLE TO MEET INDUSTRY & NRC NEEDS OVER THE NEXT FEW YEARS, WE BELIEVE SIGNIFICANT INCREASES IN RES OR NRR CONTRACT MONEY BEYOND THE PPPG LEVEL PROBABLY CANNOT BE PRODUCTIVELY APPLIED.

NRR

SPECIFIC COMMENTS

1. IN OUR ASSESSMENT, WE HAVE ASSUMED THAT THE DEPARTMENT OF ENERGY WILL PROVIDE THE RESEARCH ON IMPROVED REACTOR SAFETY REQUESTED BY NRC UNDER THE "DOE-NRC INTERAGENCY PROGRAMMATIC AGREEMENT IN SUPPORT OF IMPROVED REACTOR SAFETY."
2. NRR DOES NOT HAVE SUFFICIENT NEEDS TO ENDORSE ANY FUNDING OF THE FAST REACTORS AND ADVANCED CONVERTER REACTORS PROGRAMS IN THE PRESENT PERIOD OF RESTRICTED RESOURCES. IF THESE PROGRAMS ARE REQUIRED BY CONGRESS ADDITIONAL FUNDING WOULD BE REQUIRED TO PREVENT CUTS IN HIGH PRIORITY PROGRAMS OF IMMEDIATE NEED.
3. WE ENDORSE THE "SYSTEMS ANALYSIS PROGRAM." WE NEED FURTHER DISCUSSION AND CONSIDERATION OF THE ROLES OF NRR AND RES IN MANAGING THE NREP.
4. WITH RESPECT TO LOFT -
  - o PROGRAM SHOULD CONTINUE IN FY 82
  - o SMALL BREAK LOCA'S COMPLETED
  - o AUGMENT PROGRAM FOR ENHANCED OPERATOR CAPABILITY
  - o COMPLETE LOFT TESTING IN FY 84 SUBJECT TO RESULTS OF TESTING THROUGH FY 83, OR OTHER NEW INFORMATION.

NRR ASSESSMENT OF PRIORITIES OF  
RESEARCH PROGRAM DECISION UNITS FOR FY 82 RELATIVE TO FY 81

- |   |          |
|---|----------|
| 1. SEVERE ACCIDENT PHENOMENA & MITIGATION | INCREASE |
| 2. SYSTEMS & RELIABILITY ANALYSIS         |          |
| 3. PLANT OPERATIONAL SAFETY               |          |
| -----                                     |          |
| 4. LOFT                                   |          |
| -----                                     |          |
| 5. SITING AND ENVIRONMENT                 | DECREASE |
| 6. LOCA TRANSIENT RESEARCH                |          |

## IMPLICATIONS OF NRR-PROPOSED "PPPG" LEVELS

### 1. LOCA & TRANSIENT RESEARCH

- 0 PHASE OUT MOST FLUID FLOW & HEAT TRANSFER EXPERIMENTS UNDER ACCIDENT & TRANSIENT CONDITIONS.
- 0 DROP ESSOR SUPPORT.
- 0 REDUCE CODE IMPROVEMENT & MAINT. EFFORT AND SHIFT TOWARD SIMULATOR DEVELOPMENT & OTHER USES OF REALISTIC ANALYSES.
- 0 SMALL REDUCTION IN FUNDING OF EFFORT ON FUEL BEHAVIOR UNDER OPERATIONAL TRANSIENTS.

### 2. LOFT

- 0 CONSIDERABLY REDUCED EFFORT RELATIVE TO FY 81.
- 0 MAY REQUIRE EARLIER THAN PREVIOUSLY AGREED FY 84 PHASE-OUT
- 0 WOULD LIKELY LOSE STEAM GENERATOR RUPTURE TESTS.

### 3. PLANT OPERATIONAL SAFETY

- 0 MAN/MACHINE INTERFACE AND OPERATING EFFECTS ON MATERIALS SUPPORTED AT RES PROPOSED LEVEL.
- 0 SLOWER GROWTH IN: STUDY OF GENERIC PROBLEMS WITH SAFETY-RELATED INSTRUMENTATION AND ELECTRICAL EQUIPMENT, SOFTWARE VERIFICATION, AND STUDY OF ELECTRICAL SUPPLY DESIGN PROBLEMS.
- 0 SLOWER GROWTH IN: PLANT SYSTEMS BEHAVIOR EFFORT, MECHANICAL COMPONENTS SAFETY EFFORT, AND STRUCTURAL SAFETY EFFORT.
- 0 DROP HIGH PRESSURE THERMAL SHOCK TESTS.



0 MAINTAIN NON-DESTRUCTIVE EXAMINATION EFFORT AT FY 81 LEVEL.

#### 4. SEVERE ACCIDENT PHENOMENA & MITIGATION

- 0 SIGNIFICANT INCREASE IN FUEL MELT, FISSION PRODUCT, AND SEVERE ACCIDENT MITIGATION.
- 0 NO FAST OR GAS RESEARCH.

#### 5. SITING & ENVIRONMENT

- 0 REDUCE NON-RAD AQUATIC EFFLUENTS EFFORT RELATIVE TO FY 81
- 0 SLOWER GROWTH IN SITING AND SOCIOECONOMIC RESEARCH.
- 0 SLOWER GROWTH IN AIRBORNE EFFLUENTS

#### 6. SYSTEMS & RELIABILITY ANALYSIS

- 0 SUPPORT METHODOLOGY AND RELIAB. & HUMAN ERROR DATA ANAL. AT RES PROPOSED LEVEL.
- 0 BASED UPON NRR IREP EFFORT IN FY 82, SYSTEMS ANALYSIS LEVEL OF EFFORT IS SUPPORTED AT RES-PPPG.
- 0 SIGNIFICANT INCREASE IN EFFORT RELATIVE TO FY 81 IN CONSEQUENCE ANALYSIS.

#### 7. SAFEGUARDS & FUEL CYCLE SAFETY

- 0 SLOW GROWTH IN OCCUPATIONAL PROTECTION RESEARCH.

NRR ANALYSIS OF RES BUDGET

FY 82 - \$M

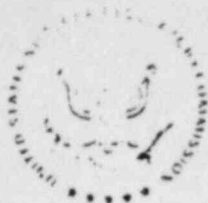
PROGRAM	URR		RES	EY
	PPPG	EXPANDED		
<u>LOCA AND TRANSIENTS</u>				<u>81</u>
1. SEMISCALE	7.5	7.5	7.5	8.8
2. SEPARATE EFFECTS	5.7	8.2	5.7	13.0
3. 3-D	5.0	5.0	5.0	10.0
4. CODE IMPROVEMENT & MAINTENANCE	2.9	4.5	4.5	7.2
5. CODE ASSESSMENT & APPLICATION	7.9	7.9	7.9	6.9
6. FUEL BEHAVIOR (OP. TRANSIENTS)	4.6	6.4	6.4	8.6
7. CORE DAMAGE (BEYOND LOCA)	11.1	13.1	11.1	10.3
8. POWER BURST FACILITY	4.8	4.8	4.8	6.3
LOFT	37.5	43.0	35.0	43.0
<u>PLANT OPERATIONAL SAFETY</u>				
1. MAN/MACHINE INTERFACE	4.3	4.8	4.3	2.7
2. INSTR. AND ELECTRICAL	7.3	8.3	7.3	3.4
3. PLANT SYSTEMS BEHAVIOR	1.5	2.0	1.5	0.7
4. MECH. COMPONENTS SAFETY	8.4	10.0	9.5	8.4
5. STRUCTURAL SAFETY	5.5	6.5	5.5	4.6
6. FRACTURE MECHANICS	4.5	6.0	4.5	4.3
7. OPERATING EFFECTS ON MATERIALS	7.6	7.6	7.6	6.9

(CONTINUED)

PROGRAM	NRR		RES	FY
	PPPG	EXPANDED	PPPG	81
<u>SEVERE ACCID. PHEN. &amp; MIT.</u>				
1. FUEL MELT	9.0	10.5	9.0	3.1
2. FISSION PRODUCTS	4.3	4.3	3.8	2.5
3. SEVERE ACCID. MITIGATION	2.9	3.9	2.9	0.8
4. FAST REACTORS	0	0	0	2.2
5. ADVANCED CONVERTERS	0	0	0	0
<u>SITING AND ENVIRONMENTAL</u>				
1. SEISMOLOGY AND GEOLOGY	3.5	4.7	4.7	4.7
2. METEOROLOGY & HYDROLOGY	1.3	1.3	1.3	1.3
3. AIRBORNE EFFLUENTS	1.4	2.0	2.0	1.1
4. AQUATIC EFFLUENTS	1.2	1.8	1.3	2.3
5. OCCUPATIONAL EXPOS. & HEALTH EFF.	3.6	3.6	3.6	3.5
6. SOCIOECONOMICS	0.7	0.7	0.7	0.5
7. SITING ALTERNATIVES	0.2	0.4	0.3	0
8. EMERGENCY PREPAREDNESS	0.5	0.5	0.5	0.5

(CONTINUED)

PROGRAM	NRR		RES	FY
	PPPG	EXPANDED	PPPG	81
<u>SYSTEMS &amp; RELIABILITY ANALYSIS</u>				
1. METHODOLOGY DEVELOPMENT	5.7	5.7	2.9	2.4
2. RELIABILITY & HUMAN ERROR DATA	3.5	3.5	2.3	2.6
3. SYSTEMS ANALYSIS	11.4	11.4	11.4	6.0
4. CONSEQUENCE ANALYSIS	1.2	1.2	1.2	0.6
<u>SAFEGUARDS AND FUEL CYCLE SAFETY</u>				
5. DECOMMISSIONING	1.6	1.6	1.6	1.4
7. EFFLUENT CONTROL	1.0	1.2	1.2	1.2
9. OCCUPATIONAL PROTECTION	0.7	0.7	0.7	0
ADDITIONAL PROGRAMS FOR OTHER OFFICES			23.6	22.2



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

JUN 28 1980

MEMORANDUM FOR: Robert J. Budnitz, Director  
Office of Nuclear Regulatory Research

FROM: Harold R. Denton, Director  
Office of Nuclear Reactor Regulation

SUBJECT: NRR USER OFFICE ENDORSEMENT OF FY-82  
RES PROGRAM ELEMENTS

As you have requested, we have reviewed the proposed FY-82 RES budget package that we received on June 4 against NRR needs as reflected by existing research requests, our licensing requirements and experience to date, the TMI Action Plan and the Commission's Policy, Planning, and Program Guidance for FY-82 to 86. The scope and depth of our review has been limited by the time available and the limited detail provided in your budget package. Before finally endorsing the RES program elements, we will need to be informed of the major tasks and their approximate costs that are proposed to accomplish the program elements. The descriptions in the budget material are insufficient by themselves to satisfy this need. We are continuing to review your programs in more detail and expect to be able to comment on your budget in more detail at the time of the ACRS meeting in July. Although we need more technical detail to understand your program goals and planned accomplishments, we do not intend to duplicate your detailed program management responsibilities or cost control measures.

The endorsement provided in this memorandum reflects our assessment of the general program areas as defined by the first level of sub-elements under each of your decision units.

NRR endorses the general program areas within our cognizance in your FY-82 package with the following comments and exceptions:

1. In our assessment, we have assumed that the Department of Energy will provide the research on Improved Reactor Safety requested by NRC under the "DOE-NRC Interagency Programmatic Agreement in Support of Improved Reactor Safety."
2. NRR does not have sufficient needs to endorse any funding of the Fast Reactors and Advanced Converter Reactors programs in the present period of restricted resources. If these programs are required by Congress additional funding would be required to prevent cuts in high priority programs of immediate need.

3. The text provided for the Emergency Preparedness Program does not adequately reflect NRR needs. Enclosure 1 provides suggested rewording.
4. We find that, in general, many of the program descriptions lack sufficient explicit recognition of the need for human factors and other operational safety considerations.
5. We endorse the "Systems Analysis Program." We need further discussion and consideration of the roles of NRR and RES in managing the NREP. Although we believe that the RES-PPPG allocation to this subelement is appropriate, we need to assure that the details of the program avoid overlap with the NRR FY 82 budget.
6. Our endorsement of the LOFT program is based on the assumption that presently planned LOCA research including redirection to support human factors and other operational safety objectives will be completed over the next 2 years. We recognize this assumption may require limited additional funds over your RES-PPPG allocation to LOFT.

Our preliminary endorsement of your program provided by this memorandum is applicable to the funding levels proposed by RES to meet the PPPG guidance. However, in a number of instances, we do not agree that the levels proposed by RES for particular program subelements appropriately reflect relative priorities, in our judgment; i.e., some subelements should receive more and some less than the amounts proposed by your office in order to meet the PPPG mark. Enclosure 2 provides in tabular form our qualitative comments on the allocations to each program.

We are prepared to discuss these comments at your convenience.

Harold R. Denton, Director  
Office of Nuclear Reactor Regulation

Enclosures:

1. Proposed Text for Emergency Preparedness Program
2. NRR Funding Categories for RES FY 82 Budget

PROPOSED TEXT FOR EMERGENCY  
PREPAREDNESS PROGRAM

Improve basis for emergency preparedness requirements and NRC response capability (other than NDL) by evaluating meteorological models and data analysis systems; by evaluating limitations and needs for real time dose monitoring outside the facility, by development of techniques and manuals for conversion of data into useable dose information, and by evaluation of the adequacy of emergency action classes by analyzing actual off-normal event sequences.

NRR FUNDING CATEGORIES  
FOR RES FY 82 BUDGET

The Categories are defined

- I. NRR would endorse greater than RES-PPPG level
- II. NRR endorses RES-PPPG level
- III. NRR recommends some decrease in RES-PPPG level
- IV. NRR recommends consideration of substantial decrease in RES-PPPG level
- V. NRR does not endorse

<u>PROGRAM</u>	<u>CATEGORY</u>	<u>COMMENTS</u>
LOCA & TRANSIENT RESEARCH		
1. Semiscale	II	
2. Separate Effects	II	
3. 3-D Program	II	
4. Code Improvement & Maintenance	III <del>IV</del>	
5. Code Assessment & Application	III <del>II</del>	
6. Fuel Behavior, Op. Transients	III	Focus on NRR research requests on pellet/cladding and on TMI task II E 2.2.
7. Core Damage Beyond LOCA	II	
8. PBF	II	Focus on Severe Core Damage tests.
LOFT	I	
PLANT OPERATIONAL SAFETY		
1. Man-Machine Interface	I	Do not reduce this program. Funds should not be used for equipment development.
2. Inst. & Electrical	II	
3. Plant Systems Behavior	II	
4. Mechanical Components	III	Industry should do the ATWS component work.
5. Structural Safety	II	
6. Fracture Mechanics	II	
7. Oper. Effects on Materials	II	
8. Non-Destructive Examination	III	



SEVERE ACCIDENT PHENOMENA & MITIGATION

- |                               |                 |                                 |
|-------------------------------|-----------------|---------------------------------|
| 1. Fuel Melt                  | II              |                                 |
| 2. Fission Product            | <del>II</del> I | Do not reduce.                  |
| 3. Severe Accident Mitigation | II              | Should supplement DOE's program |
| 4. Fast Reactors              | II              | Do not fund.                    |
| 5. Advanced Converter         | II              | Do not fund.                    |

SITING & ENVIRONMENTAL

- |                            |               |  |
|----------------------------|---------------|--|
| 1. Seismology & Geology    | III           | Maintain current programs germane to existing sites. |
| 2. Meteorology & Hydrology | II            |  |
| 3. Airborne Effluents      | III           |  |
| 4. Aquatic Effluents       | III I,        | Retain liquid pathway work                           |
| 5. Occup. Exposure         | II            |  |
| 6. Socioeconomic           | <del>II</del> | Retain TMI impact study.                             |
| 7. Siting Alternatives     | IV II         | Include remote siting effort                         |
| 8. Emergency Preparedness  | II            | Do not reduce.                                       |

SYSTEMS & RELIABILITY ANALYSIS

- |                              |    |                |
|------------------------------|----|----------------|
| 1. Methodology Development   | I  | Do not reduce. |
| 2. Reliability & Human Error | I  | Do not reduce. |
| 3. Systems Analysis          | II | Do not reduce. |
| 4. Consequences Analysis     | II |                |

SAFEGUARDS AND FUEL CYCLE SAFETY\*

- |                            |       |  |
|----------------------------|-------|--|
| 5. Decommissioning         | III I |  |
| 7. Effluent Control        | III   |  |
| 9. Occupational Protection | II    |  |

\*These categories apply only to NRR Cognizant Tasks within these programs.

NRR  
 CONSIDERATION OF RESOURCE ALLOCATION  
 IN  
FY 82 RES BUDGET

<u>DECISION UNIT</u>	<u>NRR PROPOSED</u>	<u>RES PPPG</u>	<u>FY 81</u>
LOCA & TRANSIENTS	49.54	52.95	71.1
LOFT	37.51	35.0	43.0
PLANT OPER. SAFETY	42.7	43.6	34.1
SEVERE ACCID. & MTIG.	16.52	15.7	8.6
SITING & ENVIR.	11.9	4.9	13.9
SYST. & RELIA. ANAL.	21.82	17.8	11.6
WASTE MANAGEMENT	14.83	14.8	14.9
SAFEGUARDS & FUEL CYCLE	<u>12.33</u>	<u>12.3</u>	<u>9.9</u>

NOTES:

1. Completion of small breaks and a large break in FY 82 could achieve considerable Human Factor Safety Information from the "Augmented Operator Capability Program" portion in addition to the small-break and one large break LOCA information.
2. These Decision Units have significant priority based upon "PPPG", TMI Action Plan and NRR for TMI Action Plan.
3. Most effort in these Decision Units are OMNSS and OSD Research needs.
4. This Decision Unit includes operation of FBF to supply information for core degradation under "Severe Accident & Mitigation" programs.

NRR consideration of Resource Allocation In the FY 82 RES Budget

<u>PROGRAM</u>	<u>RES REQ.</u>	<u>RES PPPG</u>	<u>NRR PPPG</u>	<u>FY 81</u>
<b>LOCA &amp; TRANSIENT RESEARCH</b>				
1. Semiscale	7.5	7.5	7.5	8.8
2. Separate Effects	9.7	5.7	5.7	13.0
3. 3-D Program	6.0	5.0	5.0	10.0
4. Code Improvement & Maintenance	4.5	4.5	4.5 <sup>2.9</sup>	7.2
5. Code Assessment & Application	7.9	7.9	<del>6.3</del> 7.9	6.9
6. Fuel Behavior, Op. transients	6.4	6.4	4.6	8.6
7. Core Damage Beyond LOCA	13.1	11.1	11.1	10.3
8. PBF	4.8	4.8	4.8	6.3
LOFT	48.0	35.0	37.5	43.0
<b>PLANT OPERATIONAL SAFETY</b>				
1. Man-Machine Interface	4.8	4.3	4.3	2.7
2. Inst. & Electrical	8.3	7.3	7.3	3.4
3. Plant Systems Behavior	2.0	1.5	1.5	0.7
4. Mechanical Components	10.0	9.5	8.4	8.4
5. Structural Safety	6.5	5.5	5.5	4.6
6. Fracture Mechanics	6.0	4.5	4.5	4.3
7. Oper. Effects on Materials	7.6	7.6	7.6	6.9
8. Non-Destructive Examination	3.4	3.4	3.1	3.1
<i>TOTAL BUDGET</i>	<u>269.5</u>	<u>207</u>	<u>207</u>	<u>207.1</u>
	<u>14.1</u>	<u>10.</u>		
	283.6	217		

<u>PROGRAM</u>	<u>RES REG</u>	<u>RES PPPG</u>	<u>NRR PPPG</u>	<u>FY 81</u>
<b>SEVERE ACCIDENT PHENOMENA &amp; MITIGATION</b>				
1. Fuel Meltdown	12.0	9.0	9.0	3.1
2. Fission Product	4.3	3.8	4.3	2.5
3. Severe Accident Mitigation	3.9	2.9	2.9	0.8
4. Fast Reactors	8.0	0	0	2.2
5. Advanced Converter	2.0	0	0	0
<b>SITING &amp; ENVIRONMENTAL</b>				
1. Seismology & Geology	5.3	4.7	3.5	4.7
2. Meteorology & Hydrology	2.0	1.3	1.3	1.3
3. Airborne Effluents	2.3	2.0	1.4	1.1
4. Aquatic Effluents	1.8	1.8	1.2	2.3
5. Occup. Exposure	3.6	3.6	3.6	3.5
6. Socioeconomic	1.0	0.7	0.7	0.5
7. Siting Alternatives	0.4	0.3	0.2	0
8. Emergency Preparedness	0.5	0.5	0.5	0.5
<b>SYSTEMS &amp; RELIABILITY ANALYSIS</b>				
1. Methodology Development	5.7	2.9	5.7	2.4
2. Reliability & Human Error	3.5	2.3	3.5	2.6
3. Systems Analysis	13.1	11.4	11.4	6.0
4. Consequences Analysis	2.5	1.2	1.2	0.6
<b>SAFEGUARDS AND FUEL CYCLE SAFETY</b>				
5. Decommissioning	1.6	1.6	1.6	1.4
6. Effluent Control	1.2	1.2	1.0	1.2
9. Occupational Protection	1.2	0.7	0.7	0

Increases  
O.ER  
CMD MARK FY 82

<u>DECISION UNIT</u>	<u>OMB MARK</u>	<u>RES PDPG</u>	<u>LRR PDPG</u>
<u>PLANT OPERATIONAL SAFETY</u>			
1. Man/Machine Interface	4.0	4.3	4.8
2. Instrumentation & Electrical	5.0	7.3	7.3
<u>SEVERE ACCID. PHEN. &amp; MITIG</u>			
1. Fuel Melt Behavior	(4.7)	(15.7)	(6.5)
2. Fission Product	2.0	9.0	9.0
3. Severe Accid. Mitigation	1.6	3.8	4.3
	1.1	2.9	2.9
<u>SITING &amp; ENVIRONMENT</u>			
6. Socioeconomic	0.5	0.7	0.7
7. Siting Alternatives	0	0.3	0.2
<u>SAFEGUARDS AND FUEL CYCLE SAFETY</u>			
5. Decommissioning	1.3	1.6	1.6
9. Occupational Protection	0	0.7	0.7
<u>SYSTEMS &amp; RELIABILITY ANALYSIS</u>			
1. Methodology Development	3.1	2.9	5.7
2. Reliability & Human Error Anal.	2.3	3.5	2.6
3. Systems Analysis	8.0	11.4	11.4
4. Consequence Analysis	1.0	1.2	1.2