

RETURN TO SECRETARIAT RECORDS

NUCLEAR REGULATORY COMMISSION

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IN THE MATTER OF:

PUBLIC MEETING  
BUDGET PRESENTATIONS

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Place - Washington, D. C.

Date - Tuesday, 31 July 1979

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

PUBLIC MEETING  
BUDGET PRESENTATIONS

- - -

Room 1130  
1717 H Street, N. W.  
Washington, D. C.

Tuesday, 31 July 1979

The Commission met, pursuant to notice, at 2:45 p.m.

BEFORE:

- DR. JOSEPH M. HENDRIE, Chairman
- VICTOR GILINSKY, Commissioner
- RICHARD T. KENNEDY, Commissioner
- PETER A. BRADFORD, Commissioner
- JOHN F. AHEARNE, Commissioner

PRESENT:

Messrs. Barry, Budnitz, Cooper, Engelhardt, Gossick, Levine,  
Murley, and Smith.

\* \* \*

gsh 1 CHAIRMAN HENDRIE: Why don't we go ahead? The other  
2 commissioners will join us at some point, I trust.

3 Okay, Lee, fire away.

4 MR. GOSSICK: I sent down yesterday, and I don't  
5 know whether you had a chance to look at it or not, the little  
6 paper that summarizes the ACRS comments and the VRG comments.  
7 I thought it might be helpful to you in seeing how well they  
8 are put together, and the areas in which there are some  
9 differences.

10 Ray Smith was the chairman of the panel in this  
11 rather sizable effort, and he is back here with members of  
12 his panel. And I will turn this over to Saul, with his  
13 99 viewgraphs.

14 MR. LEVINE: The first thing I have to say is that  
15 we're not going to use all 99 viewgraphs. We've whittled it  
16 down to about 70. We have some back-ups, however. If you  
17 ask questions, we will put up back-ups.

18 Also, we have no wedges in our budget.

19 As you know, there are some understandings about  
20 reactor safety as a result of the Three Mile Island accident,  
21 and these new perceptions have a major impact on the level of  
22 our fiscal '80 supplement and our fiscal '80 budget request.

23 Our fiscal '80 supplement is \$29 million for safety  
24 and an additional \$3 million for waste. And the Three Mile  
25 Island part of our '81 budget is about \$76 million. I plan

gsh

1 to present here an overview of the new research directions  
 2 as perceived by ourselves, and to summarize the ACRS views on  
 3 the research directions to show a reasonable parallel.

4 And what I've done is summarize the first part of  
 5 the ACRS letter to you that reviewed our fiscal '80  
 6 supplemental and fiscal '80 budget.

7 I then will present a summary of our budget  
 8 indicating its trends over time and the areas in which we  
 9 will focus. The division directors are prepared to discuss  
 10 each budget decision unit in detail and to indicate issues.

11 We can cut the number of viewgraphs down a bit, if  
 12 we don't have to, to cover every decision unit, but then you  
 13 will miss some of our program description. And if we're going  
 14 too long, you just tell us what to cut out.

15 COMMISSIONER AHEARNE: As you go through, Saul, could  
 16 you comment when and if appropriate as to what programs you  
 17 have either reduced or deferred or dropped as a result of  
 18 this re-evaluation?

19 MR. LEVINE: I think we can try to do that.

20 Now last week we sent down SECY-79-459 for your  
 21 information. And this paper presents the basic logic of  
 22 our approach to the TMI-related research.

23 You should note that the NRR has given endorsement  
 24 to this approach and level of funding. Of course, some  
 25 details will change. Viewgraph 1, please.

gsh

(Viewgraph)

1  
2 This viewgraph is intended to show the area between  
3 design basis accidents and core melt accidents, where  
4 additional research and understanding of reactor safety is  
5 needed. These are accidents that lead to extensive core  
6 damage but without core melt.

7 I guess slide 2 --

8 (Viewgraph.)

9 -- shows a view of how to think about that. And the  
10 top part of the slide shows the definition of accident  
11 sequences prior to TMI, starting from design basis accidents  
12 and going through --

13 COMMISSIONER GILINSKY: Why do you separate the  
14 severe core damage accidents from the core melt accidents?

15 MR. LEVINE: Because -- well, I'm trying to present  
16 this from a risk perspective. And the risk perspective, the  
17 cores that do not melt do not threaten the containment -- that  
18 is, there is not a coupled failure between the core and  
19 containment integrity. Whereas, with the core melt, there is  
20 a couple there.

21 So in doing WASH-1400 --

22 COMMISSIONER GILINSKY: What do you mean, a coupled  
23 failure?

24 MR. LEVINE: Well, if you melt the core, you will  
25 surely rupture the containment integrity in one of a number of

gsh 1 ways. If you don't melt the core, you can fail the containment  
2 by leakage, but not as a result of melting the core.

3 There are physical processes associated with the  
4 melted core that can rupture the containment in any one of  
5 a number of ways.

6 So in doing the reactor safety study, we did not  
7 pause at the severe core damage area because they didn't  
8 threaten risk; whereas, the licensing process has always  
9 stopped at design basis accident.

10 So the idea is that we did not define -- Mullen  
11 really has defined accident sequences involving severe  
12 core damage. The design basis accident does not and WASH-1400  
13 did not. And by severe core damage, I mean cores that are  
14 mechanically disrupted but which fuel has not gotten molten.

15 COMMISSIONER GILINSKY: You could have an explosion  
16 in a containment.

17 MR. LEVINE: Yes. That is the severe core damage  
18 area. We would have said, I think,, virtually all the people  
19 I know that if you had a 30 or 40 percent metal-water reaction  
20 involving cladding, that the core would have been a molten  
21 core. And this is new information, that they can get that  
22 large a metal reaction without melting the core, and that's  
23 the information we have.

24 And so what we're proposing after TMI, on the bottom  
25 half of this slide is to draw the accident sequences, to

gsh 1 define the accident sequences involving severe core damage,  
2 but which stops short of melting the core.

3 COMMISSIONER GILINSKY: Let me understand. Is the  
4 point that you have in some way or another covered the core  
5 melt accident?

6 MR. LEVINE: We have better than -- what I'm trying  
7 to say is that if you look at core melt, and worse, and you  
8 look at design basis accidents and less, those are all better  
9 covered than this area of severe core damage.

10 We understand less about this middle area than we  
11 do about both ends of the spectrum. Not that we don't have  
12 to understand more about core melt accidents, but certainly  
13 we understand more about them than we do about severe core  
14 damage accidents.

15 COMMISSIONER GILINSKY: Okay.

16 MR. LEVINE: And, of course, I've listed some of the  
17 areas that have to be looked at to define that middle area.  
18 We have to look at event trees. We need better understanding  
19 of small LOCAs and transient. We need better understanding of  
20 enhanced operator capability, better understanding of  
21 coolant chemistry. And we need some information from TMI,  
22 the post-mortem.

23 Now I've jotted down on the next several slides --  
24 number 3, please.

25 (Viewgraph.)

gsh 1 -- lessons that we in research feel that we've  
2 learned from TMI. We need that improved understanding of  
3 potential accidents involving small LOCAs, transients, and  
4 enhanced operator capability.

5 All these need research attention to enhance our  
6 understanding.

7 COMMISSIONER GILINSKY: Let me pursue this point  
8 again. Is the point -- it seems to me that if you look at the  
9 sequences heading toward core melts, if you covered all of the  
10 sequences, you will have covered the severe core damage.

11 Isn't the point that we have simply not covered  
12 certain kinds of sequences?

13 MR. LEVINE: That is just what I'm saying. In fact,  
14 put number 2 back up, please.

15 (Viewgraph.)

16 MR. LEVINE: You'll see in that middle area that  
17 event tree in the middle area shows some sequences that stop  
18 short of core melt, but some will go through to core melt.  
19 And so far, we have considered only the ones that go through  
20 to core vent, but not the ones that stop short of core melt.

21 COMMISSIONER GILINSKY: Maybe this is quibbling, but  
22 presumably, there are severe core damages pre-TMI.

23 MR. LEVINE: Yes, and they were not reviewed very  
24 well by anyone, and that is what we have to do now. They are  
25 still undefined.

gsh

1           CHAIRMAN HENDRIE: In WASH-1400, typically, when you  
2 went along with an event tree and took a path that went past  
3 the design basis, you just then drew that without further  
4 elaboration.

5           MR. LEVINE: Our LOCA and transient event trees had  
6 two outcomes -- either core melt or no core melt. And the  
7 no core melts were all trivial accidents. The ones that  
8 could have been stopped before core melt were not considered.

9           CHAIRMAN HENDRIE: They sort of shot across the  
10 area.

11          MR. BUDNITZ: If you started to have several percent  
12 oxidation, WASH-1400 called it a core melt. They just said,  
13 okay, that's a core melt.

14          We now have one very good example where that didn't  
15 happen and we realize that there are a plethora.

16          MR. LEVINE: Well, that's not exactly right. We had  
17 a sequence like the B&W sequence, which we said we didn't  
18 know whether it would melt or not, but we called it core  
19 melt because we were being conservative and that we didn't  
20 know enough to define that area, and we simply did not get  
21 involved in that area.

22          But that sequence is in WASH-1400 as a core melt  
23 sequence called PMLQ. And the footnote says that we are not  
24 sure whether this would melt or not. And we gave some  
25 logical reasons why, and said, but we're calling it core melt

gsh

1 for the purpose of this exercise.

2 MR. BUDNITZ: But the point is that here today in  
3 the summer of 1979, there has not been a thorough drawing  
4 of event trees in this area at all. It just hasn't been  
5 explored.

6 MR. LEVINE: And this is a very difficult area because  
7 to get involved in this area, you have to know much more about  
8 fuel behavior than we now know.

9 As I say, the perception we had that a core with  
10 this much metal reaction that melted is clearly wrong and we  
11 have to understand that better.

12 We have to know --

13 COMMISSIONER GILINSKY: In order to do what? What  
14 is the question?

15 MR. LEVINE: There are two questions -- one to define  
16 the risk and to prevent these things from happening, to  
17 design preventive mechanisms to help enable operators to  
18 cope with them when they do have them.

19 By "prevent," I mean reduce the likelihood of them  
20 because you can never prevent anything. But to make them  
21 less likely.

22 For instance, the bulletins that IME has issued have  
23 already made the likelihood of the sequence that happened in  
24 the B&W reactor much smaller than it used to be, because you  
25 now don't lift that relief valve every time that makes the

gsh

1 situation much better than it was.

2 There may be -- the technical consensus is that  
3 the TMI accident sequence was a rather unique one in the  
4 sense that it was one sequence. There may be dozens of others  
5 that we haven't explored yet that could get you into similar  
6 troubles.

7 COMMISSIONER GILINSKY: So it is a matter of looking  
8 at the sequences that we haven't looked at.

9 MR. LEVINE: Yes, exactly.

10 COMMISSIONER GILINSKY: Rather than have a middle  
11 portion of sequences.

12 MR. BUDNITZ: Some of each.

13 MR. LEVINE: Mostly what you said.

14 MR. BUDNITZ: Some of each because sometimes in  
15 WASH-1400, it wasn't fleshed out. And as Saul said, to explore  
16 them in terms of the real physics and chemistry, requires an  
17 understanding of a lot of chemistry that has not been  
18 explored.

19 MR. LEVINE: There have to be experiments to define  
20 the behavior of materials, to define the physical phenomena.  
21 We have to be able to make models to describe them so we know  
22 how to construct the event trees and we have to construct the  
23 event trees so the modelers know what to model.

24 COMMISSIONER KENNEDY: But you're going to be  
25 discussing some of that in programmatic terms later on.

gsh

1 MR. LEVINE: Yes. Yes, of course. Okay, going back  
2 to slide 3, please.

3 (Viewgraph.)

4 MR. LEVINE: We have to enhance our understanding  
5 of the small LOCAS and transients. We need a large number of  
6 studies to be made of these types of events. And there are  
7 many variations and we have to be able to predict plant  
8 behavior with greater precision.

9 We have to develop aids to assist plant operators  
10 in coping with the situations.

11 Next slide, 4.

12 (Viewgraph.)

13 MR. LEVINE: We have to develop -- there are two  
14 types of computer codes that have to be developed. We have  
15 so far been developing a research program, very long running,  
16 complex codes as precise as we know how to make them. We  
17 are still going to do that and use them as benchmarks for  
18 faster running codes.

19 We have to develop fast running codes which will  
20 be less precise to conduct multitudinous studies of plant  
21 behavior. And of course we have to do experiments in existing  
22 facilities to provide data for modeling and testing codes.

23 Event trees and other techniques will have to be  
24 developed and used to define accident sequences that result in  
25 severely damaged cores. Number 5, please.

gsh 1

(Viewgraph.)

2 MR. LEVINE: Capability will have to be enhanced.  
3 Codes will be used to study requirements for accidents that  
4 go beyond DBAs on operating training simulators. I spoke  
5 about this this morning.

6 Requirements needed to be studied for plant  
7 instrumentation to follow the course of accidents for improved  
8 control room displays of such information and for diagnostic  
9 systems to aid operators in telling what is going on.  
10 Requirements needed to be developed for improved automatic  
11 monitoring of the operatability status of safety systems.

12 You have an antique system now for deciding whether  
13 systems are operable or not, and it requires mountains of  
14 paperwork.

15 It seems to me very easy to implement data processors  
16 to do the sort of thing.

17 COMMISSIONER AHEARNE: Have you looked at the kind  
18 of monitoring people who run pipelines?

19 MR. LEVINE: No. But part of our study will be to --  
20 we know the objective. We will have to start the studies and  
21 see what people can do.

22 COMMISSIONER AHEARNE: You might look at that.  
23 They have developed a fairly elaborate automatic monitoring  
24 system for all of the relay stations that go down the line.

25 In some cases, they have as many as 2000 points and

gsh 1 digital monitoring and use a small processor right at each  
2 point.

3 MR. LEVINE: That is just what we have in mind. Do  
4 you know where we can get information on that?

5 COMMISSIONER AHEARNE: Yes.

6 MR. LEVINE: And then, of course, we have to look at  
7 requirements that need to be developed for plant data  
8 transmission to meet external needs.

9 As one of the people, one of the large number of  
10 people who were trying to help the site by doing analyses,  
11 we just didn't have enough information about the plant, what  
12 was going on. And when we finally got the plots of plant  
13 parameters on Monday or Tuesday after the accident, it was  
14 clear that if we had had those in time, we would have been  
15 able to give advice to the people on the site about what  
16 was going on.

17 And so, we don't plan to build the systems or  
18 design them, but really, to define the requirements for data  
19 that need to be delivered, and that can then become a  
20 regulatory requirement which the industry will have to make.

21 I think that this information should go to vendors  
22 and to the NRC. But that can all be decided later once we  
23 define what is needed.

24 Next slide, please, 6.

25 (Viewgraph.)

gsh

1 Plant response under accident conditions. We need  
2 improved understanding of coolant chemistry and better  
3 sampling methods. We need to know more about hydrogen  
4 behavior in coolant and in the containment, especially mixing.  
5 We need to know more about the effects of hydrogen burning  
6 and explosions -- particularly explosions.

7 We need to know about the response of plant equipment  
8 and structures to accident conditions.

9 COMMISSIONER GILINSKY: What do you mean by "effects  
10 of hydrogen burning and explosion"?

11 MR. LEVINE: When hydrogen burns, you get a pressure  
12 in the containment, depending upon the a priori steam pressure.  
13 For instance, if you had a large LOCA and a large steam  
14 pressure is existing in the containment each time you get a  
15 hydrogen burn, you can rupture the containment.

16 This was predicted in WASH-1400.

17 While we probably had a hydrogen burn in Three Mile  
18 Island, there was no steam pressure present. There was  
19 essentially an ambient pressure. And one has to think this  
20 through very carefully and find out what can happen under a  
21 variety of conditions.

22 We did our work, I think, rather crudely in  
23 WASH-1400. We ought to take a more precise look at it.

24 MR. BUDNITZ: There is also the effect upon equipment,  
25 as well as the containment itself.

gsh

1 MR. LEVINE: And then we need to know about the  
2 behavior of time components under long-term severe accident  
3 conditions of high temperature, pressure, radiation, et cetera,  
4 and what requirements should we set up for testing.

5 Slide 7, please.

6 (Viewgraph.)

7 MR. LEVINE: And finally, the post-mortem and plant  
8 recovery. I guess we have had several meetings now with  
9 DOE, EPRI, and GPU about how to go about getting the data  
10 out of TMI.

11 It's clear that DOE is willing to spend a significant  
12 amount of money to manage getting the stuff out of the plant.  
13 We will help plan how to do this, along with the other three  
14 parties, and we will probably want to look at some of this  
15 stuff experimentally to determine its condition.

16 COMMISSIONER AHEARNE: When you say, DOE is  
17 interested in getting the stuff out of the plant --

18 MR. LEVINE: Paying for getting it out, having the  
19 lab get it out.

20 COMMISSIONER AHEARNE: By "the stuff," what do you  
21 mean?

22 MR. LEVINE: The core components which are damaged  
23 and should be examined, cabelling, all kinds of things. The  
24 dispersion and amount of radioactivity.

25 COMMISSIONER AHEARNE: Are you saying DOE is

gsh

1 interested in paying for the movement of the core?

2 MR. LEVINE: Yes. Whether it is all of it or part  
3 of it, all this remains to be worked out. But they have  
4 indicated strong interest in participating in this.

5 CHAIRMAN HENDRIE: I would say that we have solicited  
6 their interest in the post-mortem. That does not mean that  
7 DOE would assume responsibility, the financial obligation of  
8 the recovery operation in any sense.

9 But only that, as materials are removed both in  
10 terms of the way in which they are removed, and what is done  
11 in terms of subsequent examination of them, I think there are  
12 a number of things that ought to be looked at which, from the  
13 licensee's standpoint, in trying to get the plant recovered,  
14 are going to be of considerably less interest than they are  
15 to us from the standpoint of nuclear safety and regulatory  
16 matters.

17 MR. LEVINE: It could be those funds required to get  
18 data as opposed to just getting the plant back in operation.

19 CHAIRMAN HENDRIE: And we have talked to DOE about  
20 it. They are willing to include that in their list of  
21 programs associated with their general mandate in lightwater  
22 reactor safety, and so on.

23 And there will be a draft letter around for review  
24 that details some of the things that ought to be looked at.

25 MR. BUDNITZ: We have here a proposal to have just a

gsh 1 little bit of funds to make sure that we can monitor that for  
 2 our own important safety purposes.

3 MR. LEVINER: Slide 3, please.

4 (Viewgraph.)

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*ew*

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gsh

1           In the letter that the ACRS wrote to you about our  
2 budget, they have a long section, the beginning of which is  
3 sort of their philosophy about new research directions needed  
4 as a result of TMI. And I would like to summarize these for  
5 you just to be sure that we understand them together and to  
6 show that there is quite a parallelism between the slides  
7 I just showed you were very similar to those that I generated  
8 for testimony for McCormick's committee.

9           So the thinking has gone along in parallel.

10          The first thing they say is you have to consider  
11 a broader range of safety issues in research. By this they  
12 mean that we should be doing exploratory, as well as  
13 confirmatory research, and we should have additional  
14 flexibility in our research program over and above what we  
15 now have. And they have written a separate letter on this  
16 subject.

17          The research should cover the prevention and  
18 mitigation of accidents that result in severely damaged cores.  
19 That's what I've been talking about.

20          COMMISSIONER GILINSKY: Well, let's see if I have  
21 it right.

22          MR. LEVINE: We have to consider multiple failures  
23 as opposed to only single failures. And we have already  
24 presented to ACRS our reviews about how to study this matter  
25 and we will make recommendations to NRR. The ACRS recognizes

gsh

1 that the research is already underway in many new areas and  
2 others can be considered and implemented without delaying  
3 the budgetary process.

4 .Of course, priority should continue to be  
5 re-examined and we have already done some re-examination as  
6 a result of the BRG and the ACRS comments. And of course,  
7 we will continue to do this.

8 .Specifically, Slide 9 --

9 (Viewgraph.)

10 -- they want a greater emphasis on small LOCAs and  
11 anomalous transient. They want analytical studies of a broad  
12 spectrum of accidents that go beyond DBAs. They want to  
13 study the practicality retaining molten core within the  
14 containment or reducing radioactivity in liquid pathways  
15 following meltdown.

16 Some of this work is already in our approved  
17 research program to augment ongoing studies of steam  
18 explosions for better understanding, more extensive evaluation  
19 of liquid pathway consequences for core melt accidents.

20 Slide 10?

21 (Viewgraph.)

22 Identify research needs related to procedures for  
23 operation, maintenance, testing and surveillance. Review  
24 operating experience to determine problems important to  
25 safety.

gsh 1           Of course, the operation's evaluation function will  
2 do this and our little select group will work them, develop  
3 fast-running codes for postulated transient and accident  
4 sequences to aid improved operator training, diagnostic  
5 instrumentation, and computer-aided operator guidance. Develop  
6 real time methods for analysis of system disturbances to  
7 provide to operators improved diagnostic information about  
8 abnormal sequences.

9           Slide 11?

10           (Viewgraph.)

11           Research on systems behavior and interaction to  
12 increase insights on operating limits, abnormal transients,  
13 and improved design of safety systems.

14           This is much like the Lewis committee recommendations

15           COMMISSIONER GILINSKY: How does all this relate to  
16 your program?

17           MR. LEVINE: Well, I gave you what I thought we had  
18 to do and there is quite a parallel between all of these  
19 viewgraphs and mine. They are not exactly the same.

20           COMMISSIONER GILINSKY: When are you going to show  
21 it?

22           MR. LEVINE: I am going to show it later. It's hard  
23 to understand the logic of a program when it is broken down  
24 into decision unit format. I am trying to give the overall  
25 logic for the program and to show that we and the ACRS are

gsh' 1 thinking very much alike.

2 Slide 12, please.

3 (Viewgraph.)

4 Budget comments.

5 COMMISSIONER AHEARNE: But there were, when you get  
6 into specifics, they did have some places.

7 MR. LEVINE: There were some specific differences and  
8 these can be worked out.

9 COMMISSIONER AHEARNE: Will they be mentioned later  
10 as you go through?

11 MR. LEVINE: Yes. Each division director will cover  
12 those as we go through.

13 In regard to our budget, the ACRS supports an  
14 additional \$30 to \$31 million for TMI-related research in  
15 Fiscal '80, plus \$3 million for waste management.

16 We have now requested from you \$29 million, plus  
17 \$3 million for waste management. The ACRS generally supports  
18 the Fiscal '81 budget, not as strongly as the '80 supplement,  
19 but generally very strongly.

20 And the ACRS support is based on the understanding  
21 that some reorientation might be necessary as a result of  
22 further study.

23 Number 14?

24 (Viewgraph.)

25 This is an attempt to show you the budget trends and

gsh

1 to show, starting with '79 -- the top line are the budget  
2 requests. The dark line is the budget request that we've  
3 asked for in the '79 budget, our '80 budget plus the  
4 supplement. And then our '81 budget. And the dashed line  
5 shows you that in '79, we reoriented \$12 million of funds  
6 to TMI. In '80, we're reorienting \$34-1/2, in addition to  
7 \$32 we're already asking for, we're asking for additionally.  
8 And in 1981, \$76 million of our budget will be TMI-related  
9 research.

10 And while the budget is very large, I should point  
11 out that we have in '79 and '80 picked up the operating  
12 cost of \$25 or \$30 million a year.

13 So that is to be considered.

14 COMMISSIONER AHEARNE: The \$244.6 -- that is neither  
15 the EDO, OMB mark or the original request.

16 MR. LEVINE: That's right. That is in the middle.

17 Number 16 --

18 (Viewgraph.)

19 -- will show this better. It shows our Congressional  
20 '80 budget, our EDO mark, and our Reclama, I guess the  
21 Congressional has --

22 MR. BUDNITZ: The Congressional is the President's  
23 budget.

24 COMMISSIONER AHEARNE: But it has not been the result  
25 of Congressional action.

gsh

1 MR. BUDNITZ: That's right.

2 MR. LEVINE: It is the President's budget. It is  
3 not the Congress' action.

4 MR. BUDNITZ: It was what was sent to Congress.

5 MR. LEVINE: We are going to be less by about \$5  
6 million, roughly.

7 MR. BARRY: I would say more like \$7.

8 MR. BUDNITZ: There is \$5 we're going to have to eat  
9 and then \$2 in gas.

10 MR. LEVINE: We are Reclama-ing \$4.8 million over and  
11 above what the EDO gave us. And that includes the set-aside.  
12 The division directors will cover each of these as we go  
13 through.

14 COMMISSIONER AHEARNE: The EDO mark -- it is the  
15 mark on the '80 supplement. And so it is the supplement  
16 added to \$168.

17 MR. LEVINE: Yes, exactly.

18 COMMISSIONER AHEARNE: Then your Reclama then is an  
19 additional amount over and above that.

20 MR. LEVINE: Over and above that.

21 In Fiscal '81, we show the EDO mark with \$25 million  
22 of set-asides, \$25.9. And we are Reclama-ing to a level of  
23 \$244.6, which is \$52 million.

24 Now I would like to discuss just a few of these  
25 items.

gsh

1 The division directors will cover the rest in detail.  
2 In seismic safety --

3 COMMISSIONER AHEARNE: One question still on this  
4 chart. You have a Reclama that the EDO had put in as a  
5 set-aside.

6 MR. LEVINE: We are asking that that be put in the  
7 budget.

8 COMMISSIONER AHEARNE: Although the EDO's comment is,  
9 it is the commission decision. It has to decide one way or the  
10 other. And what you're doing is reminding us.

11 MR. LEVINE: My advice to you is that we would like  
12 it in the budget.

13 COMMISSIONER AHEARNE: That is a different character  
14 than what EDO has produced before.

15 MR. LEVINE: Yes. Aside from the set-aside, there  
16 is only a \$1.4 million difference between us and EDO. Now  
17 going on to '81, I would like to talk about seismic.

18 COMMISSIONER AHEARNE: Just a minute. Your Reclama,  
19 if I add your Reclama to the EDO, to what the EDO mark was,  
20 it looks like you are essentially Reclama-ing the mark.

21 Is that right?

22 MR. LEVINE: That's right.

23 MR. BUDNITZ: That's exactly right.

24 COMMISSIONER AHEARNE: Okay.

25 MR. LEVINE: In '81, I would like to talk about

gsh 1 seismic engineering safety, where we ask for \$19.9 and the  
2 EDO gave us \$13.9.

3 I would like to point out that the ACRS recommend  
4 a level of about \$17 million. And I would also like to point  
5 out to You the importance of this area.

6 We know that there is a lot of difficulty with  
7 seismic safety design of nuclear power plants and we have  
8 organized an extensive research program to try and help  
9 resolve this area to make it more rational than it now is.

10 Many people think it is overconservative and, in  
11 fact, counter to safety in some areas.

12 We are trying to develop by the use of quantitative  
13 risk assessment techniques a more rational basis for safety  
14 design. Also, pipe cracks are in here and you know that there  
15 are a lot of problems with pipe cracks, items that are  
16 very important areas, that will be growing and should be  
17 growing, and in which research is needed.

18 In fast breeders, I guess that we have had some  
19 experience that says that we need a significant increase. The  
20 \$13.7 billion level is sort of below critical mass because the  
21 people, the good people in the research program, are leaving  
22 it.

23 And it seems to me that if we look forward to '81,  
24 the report will be on the street. And there is some reason  
25 to think that the breeder program might be extradited because

gsh 1 of that.

2 Certainly, we ought to be doing the research needed  
3 in advance of the safety issues and licensing reactors, rather  
4 than afterwards, it seems to me.

5 So that your problem is very simple. If you think  
6 that there are going to be breeders, then we ought to be doing  
7 more work on that. If you think that there aren't going to  
8 be breeders, maybe we shouldn't be doing anything.

9 COMMISSIONER AHEARNE: Independent of when we think  
10 there might be breeders?

11 MR. LEVINE: Almost, because I think that we need a  
12 large number of years to resolve some of the safety items.  
13 If you're talking about breeders by 1995 or 2000, it is still  
14 not too early to be working on those issues.

15 COMMISSIONER GILINSKY: Who was spurring the breeders?

16 MR. LEVINE: I think the report is going to say that  
17 most countries in the world are going to be building breeder  
18 reactors. I think that they're going to be predicting a  
19 number which is outrageously high of 50 breeder reactors by  
20 the year 2000.

21 I don't see any way to get there, but it is an  
22 indication that most of the countries are going to go ahead  
23 with the breeder reactor.

24 COMMISSIONER GILINSKY: Where does this come from?  
25 Is there some draft report on it?

gsh

1 MR. LEVINE: There are a lot of draft reports which  
2 I've not read. But I have talked to the DOE rep and he has  
3 given me this information that this is what the report is  
4 going to say and the bulk of the countries are going to go  
5 ahead with the programs.

6 The bulk of the countries who are already in the  
7 breeder area, will be going ahead with their programs. I  
8 suspect this might not be true of Germany. Germany is a very  
9 case because of the political situation within that country.  
10 We are probably a special case, too. But I think the other  
11 countries are going to go ahead.

12 COMMISSIONER BRADFORD: As far as breeders are  
13 concerned, there are probably nothing but special cases.

14 MR. BARRY: Saul, are we going to wait and build  
15 a chain of safety research from foreign countries on their  
16 breeders?

17 MR. LEVINE: We have safety research exchange  
18 agreements with those countries. Not all of them, but some  
19 of them. In fact, we are trying to add a fast reactor  
20 agreement exchange to our current agreement with Germany,  
21 and they are refusing to accept the non-proliferation paragraph

22 They are going to send us a letter to that effect,  
23 so I don't know if we will get it or not. But I think it is  
24 going to be difficult to get the real information you need  
25 because of the highly competitive situation that will exist

gsh 1 about breeders. The French want to sell breeders. The  
2 countries are going to hoard their store of information.

3 In any event, we have to do some work of our own.

4 MR. BARRY: I was just wondering, I was suggesting  
5 that there's a great potential there.

6 MR. LEVINE: We're going to try to get as much as  
7 we can.

8 MR. BARRY: They certainly leaned on us. They must  
9 be doing safety research on breeders.

10 COMMISSIONER GILINSKY: Were you implying that after  
11 this report, that our own program will crank up?

12 MR. LEVINE: No, I didn't imply that at all. I  
13 should have spoken more carefully.

14 I think that our program probably will not change  
15 after the publication. But I think that the pressures will  
16 be in the direction of causing it to change over time.

17 And as Commissioner Ahearne said, it is hardly too  
18 early now on gas advanced converter reactors. I guess we  
19 prepared this before we knew what the Senate did, and we  
20 were saying, if they are going to make us eat the money, let's  
21 not eat it. Let's give us the money in the budget.

22 And the Senate language has changed what the House  
23 did to say, spend as much money as appears to be useful, not  
24 what the House told you to spend.

25 And I don't know what to do about this except I would

gsh 1 like -- whatever it's going to be, I would like it in my  
2 budget, as opposed to having to eat it.

3 COMMISSIONER AHEARNE: What a terrible challenge --  
4 only spend the money if it appears to be useful.

5 MR. LEVINE: Going on to risk assessment, I think with  
6 the publication of the Lewis Report, we've reached the turning  
7 point in risk assessment research and utility to the agency.

8 If you would show Slide 17, please.

9 (Viewgraph.)

10 Here are two slides of recommendations from the  
11 Lewis Report, which I won't bother to read. They simply tell  
12 us to use quantitative risk assessment techniques to  
13 basically reassess the framework of the licensing process on  
14 17 and 18, and I won't spend any more time on those.

15 But we want to do that. And, in fact, Slide 19 --

16 (Viewgraph.)

17 -- is a list of items that we have got up about  
18 things that we ought to do to help them make their licensing  
19 process more rational, if we can.

20 The first item, generic safety, we have already  
21 completed, and that is the separation of the 133 items and  
22 whatever the remainder is.

23 This was done from a quantitative risk assessment  
24 viewpoint. We're going to review the standard review plan to  
25 see whether it needs diminishing or enhancement in various

gsh 1 areas.

2 We are going to review the Category 2, RQC things.  
3 We're going to look at the systematic evaluation plan to  
4 see if there are things that aren't there that should be,  
5 and we're going to look at the content of technical  
6 specifications.

7 Slide 20, which I think is a very interesting  
8 slide --

9 (Viewgraph.)

10 -- shows you the most recent exercise we conducted  
11 as a result of Three Mile Island. We were asked by NRR to  
12 review the 24 different, or 25 on this slide. 25 different  
13 auxiliary feedwater designs in PWR reactors which would  
14 represent all of the operating PWRs. And we did this job in  
15 two weeks with two of our people, four from a contractor,  
16 six from NRR, and a bunch of industry people to feed in input  
17 information.

18 This work was done in two weeks and we looked at the  
19 main feedwater probability of loss on demand, three different  
20 conditions. And you can see the wide variability in the  
21 reliability of those systems. And you know --

22 By the way, the upper bound, the high end of the  
23 upper end is about 10 to the minus 5 and the lower end is about  
24 10 to the minus 2.

25 And you know from your consideration of trend of

gsh 1 accident sequences involving the system, they need a highly  
2 reliable system.

3 Action can now be taken to improve the reliability  
4 of these systems. And we made the necessary recommendation  
5 to NRR about what needs to be done from this exercise.

6 We found out, for instance, that in some plants,  
7 the tech specs allow the operator to operate without any  
8 requirement on auxiliary feedwater. You could dismantle the  
9 system and remove it from the reactor, or leave it inoperable  
10 for a month at a time..

11 So that is easily fixed by a change in tech specs,  
12 but there are other things that have to be done, too. It  
13 just shows the power of these techniques.

14 COMMISSIONER GILINSKY: Say that again.

15 MR. LEVINE: There are some plants where there are  
16 no limiting conditions for operation of auxiliary feedwater  
17 as a prerequisite to operating the reactor.

18 That means that you can dismantle the system or have  
19 it down for maintenance for six months and still operate the  
20 reactor. And that is not a tolerable situation.

21 COMMISSIONER BRADFORD: That would actually say  
22 having the valves shut off, as they were at TMI.

23 MR. LEVINE: It would not be a violation. You could,  
24 in fact, have pumps removed and dismantled.

25 COMMISSIONER GILINSKY: Are these older plants?

gsh 1 MR. LEVINE: I don't know which they are. I can get  
2 you that information. These have all been communicated to  
3 NRR and they are writing a report of some kind. This work  
4 was done about a month ago.

5 COMMISSIONER GILINSKY: And they are dealing with it  
6 now?

7 MR. LEVINE: Yes.

8 MR. BUDNITZ: These two trends, and the third one that  
9 is very different is kind of a startling thing.

10 MR. LEVINE: A loss of main feedwater is a highly  
11 probable event. On the other hand, on the right-hand column,  
12 the loss of all AC power, is a fairly low probability event.

13 So for that condition, the system need not be as  
14 reliable, except you do want it to work. And some of them  
15 don't work at all because they are all electrically driven  
16 pumps.

17 Well, these kinds of things just fall right out of  
18 this kind of a look that can be done quickly and easily by  
19 experienced people.

20 MR. BUDNITZ: There are two points to this. The  
21 first is that the data show a scatter, which is even striking  
22 to the eye. And the second is that this analysis was done  
23 in a couple of weeks of very hard work by people from not  
24 only our place in NRR but contractors. And we were able to  
25 mobilize that effort on short notice because we had established

gsh 1 an expertise on this.

2 COMMISSIONER AHEARNE: Did you end up producing a  
3 letter report?

4 MR. LEVINE: I believe that we have written a memo.

5 VOICE: A memo was transmitted to NRR with results  
6 and recommendations.

7 MR. LEVINE: This thing — would you like copies?

8 COMMISSIONER AHEARNE: Yes.

9 MR. LEVINE: I would just like now to go on to one  
10 more slide on this area, improved safety research slide, 21.

11 (Viewgraph.)

12 MR. LEVINE: I just want to remind you about the  
13 background of this exercise, where we were asked by the  
14 Congress to prepare a plan. And this simply indicates how the  
15 plant was prepared and how we selected the research topics  
16 that had the maximum potential and benefit value impact, that  
17 we looked at the degree of support in the technical community,  
18 the risk reduction potential, the applicability to number  
19 of plants, and the implementation cost and made some judgments  
20 about which of 16 areas seemed most reasonable to explore.

21 And this is a problem now between ourselves and DOE  
22 in that OMB gave us less money than we asked for and gave more  
23 money to DOE. And we're going to have to work something out.

24 COMMISSIONER AHEARNE: What is the last thing?

25 MR. LEVINE: Environmental Quality Labs wrote a

gsh 1 pretty good report on what kind of improvements need to be  
2 made in reactor safety. It is a Cal Tech organization.

3 COMMISSIONER AHEARNE: Since you raised that OMB-DOE  
4 issue, one of the things that I thought the ACRS had raised  
5 in their letter to us is that since OMB has said that there  
6 ought to be a coordination, they were encouraging us to  
7 take some steps to provide that guidance to the DOE.

8 Have we done that?

9 MR. LEVINE: Not yet, but I've written you a memo  
10 which you approved in the last week, and we are going to do  
11 that. However, you should also note the ACRS says that you  
12 should fund more work in this area.

13 COMMISSIONER AHEARNE: I understand that.

14 CHAIRMAN HENDRIE: But John, with regard to the DOE  
15 and NRC split on improved safety research, we went down to  
16 visit with our friends in the department the other day and  
17 succeeded in pointing out that, while they may have  
18 substantial reactor safety or lightwater reactor support in  
19 the budget and still a good chunk of that for safety, what  
20 we are interested in is that piece down in the corner of the  
21 latter category, which was, in effect, cut out of our carefully  
22 considered program developed here and with consultation with  
23 them and the ACRS and everybody else, cut out by OMB and put  
24 down in DOE.

25 And what we've said is for that piece. Our

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gsh 1 understanding with OMB when it went over was that we would  
2 control the program content. And we've made the point.

3 So from that standpoint, I think that there will  
4 always be a few rough spots in the implementation down the  
5 line. But I think in principle, at least, we have that  
6 in reasonable shape, considering that the OMB cut continues  
7 to stand.

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1           Now, I think for fiscal '81 that we ought to go back  
2 in with what we think is an appropriate level for the improved  
3 safety research program. It is here, at \$6.6 million; the  
4 ACRS thinks it ought to be higher. We can consider that as we  
5 come to it, but I think we ought to go in in our budget once  
6 again with the full amount rather than sort of prerolling over  
7 to a cut.

8           And I think if, once again, OMB wants to export a  
9 piece of that to DOE, why we will have to negotiate an argue  
10 as best we can.

11           MR. LEVINE: Mr. Chairman, we're also asking for an  
12 increase in our '80 supplemental, which would then -- if we  
13 got that, I think that would free up whatever DOE wants to do  
14 for themselves. It is \$3.4 million.

15           CHAIRMAN HENDRIE: As I noticed the '80 supplement,  
16 it had an astonishing resemblance to the piece that was exported  
17 to DOE.

18           MR. LEVINE: Some of the emphasis has changed, but  
19 the amount of money is the same.

20           COMMISSIONER GILINSKY: What kind of a program does  
21 DOE have in reactor safety?

22           MR. LEVINE: There are \$4 million in '79, \$10 million  
23 or so in '80, and going much larger in '81, but I don't have the  
24 '81 number yet.

25           COMMISSIONER AHEARNE: The question I would have,

1 particularly with respect to '81, while I certainly agree that  
2 we ought to decide what has to be done or what ought to be done,  
3 then the question is where should it be located. And that is  
4 why I come back to what extent have we coordinated the develop-  
5 ment with DOE? Have we had any process of providing guidance  
6 to them in what they put in in '81?

7 MR. LEVINE: We have two DOE members on the Research  
8 Review Group that developed our plan. They were in on all the  
9 meetings.

10 Now, beyond this, we have had informal meetings with  
11 them. We are now planning to establish a formalized mechanism.

12 COMMISSIONER AHEARNE: I remember that. What I'm  
13 really still trying to push on is that DOE, just like we, are  
14 in those stages of pulling their budget together. And they've  
15 been spending the summer, just like we, putting together pieces  
16 that will come up through their process.

17 Have we worked with them, given them any guidance in  
18 that, in their '81 budget, they ought to have these pieces?

19 MR. LEVINE: I'm sure we've told them what our ideas  
20 are; yes.

21 COMMISSIONER AHEARNE: But not some explicit --

22 MR. LEVINE: I think we have been waiting --

23 CHAIRMAN HENDRIE: Certainly not to the extent of  
24 looking at year 2 of the three-year improved safety research  
25 program and saying, "Now, DOE, why don't you put items 1 through

1 7 in your budget, or we won't put it in ours."

2 I think, clearly -- not that I don't know what they  
3 will do, by way of their budget --

4 MR. LEVINE: I would like to say that I don't share --  
5 in fact, I disagree with DOE's -- or OMB's view of the matter  
6 of where the research should be done. I think they have a  
7 different view than the reality will be. We do not intend to  
8 get involved in conflict of interest situations where we  
9 design systems. We are only looking at system concepts enough  
10 to generate safety requirements where experiments are needed,  
11 except perhaps for the PPCCS, where we will ask them to do it.  
12 I think it is a perfectly workable situation.

13 I think that OMB overreacted.

14 COMMISSIONER AHEARNE: What did Congress -- where did  
15 Congress end up coming out on improved safety?

16 CHAIRMAN HENDRIE: The Authorization Committee came  
17 down the line for us, four square, both the House and Senate.  
18 The Appropriations Committee, I believe, followed the OMB.

19 MR. BARRY: The Appropriation Committee simply  
20 supported what we asked for in the budget. We asked for a  
21 million, and they gave us a million.

22 And, as Saul says, they didn't address the issue as to  
23 whether there should have been more or less.

24 COMMISSIONER AHEARNE: Nor then did they address the  
25 authorization.

1 MR. BARRY: That's right. They did not address the  
2 issue.

3 CHAIRMAN HENDRIE: I daresay we will have a good  
4 discussion about that next February.

5 MR. BARRY: You ought to make clear to the Commission,  
6 too, that at least in your report to us, in the supplemental  
7 for improved safety, the small and direct support of TMI. It  
8 relates to TMI.

9 MR. BUDNITZ: On the other hand, it was generally  
10 what was in the report of a year and a half ago. And the Three  
11 Mile Island incident just has some sort of different light on  
12 that. That stuff was in there. We had operator stuff in there.  
13 We had all of these things.

14 MR. LEVINE: All of these things we talked about to  
15 improve operator capability, they were in there.

16 MR. BARRY: That is a little different cast than  
17 you reflected to us.

18 MR. BUDNITZ: That is not a response to Three Mile  
19 Island, but it is in the areas that Three Mile Island told us  
20 to work in.

21 MR. BARRY: You're saying it is essentially the same  
22 program?

23 MR. BUDNITZ: It was there before. It is a little  
24 different.

25 MR. BARRY: That ought to be made clear though. I

1 don't think that was clear.

2 MR. BUDNITZ: Is that clear?

3 CHAIRMAN HENDRIE: I understood it.

4 MR. LEVINE: Slide 23, please.

5 (Viewgraph.)

6 This is the slide that just recaps the personnel  
7 requirements which, again, will be covered in detail by the  
8 division directors, except for one, the last one on program  
9 direction and support, the last line.

10 We are asking for four more people, and I think the  
11 situation that -- is that Bob and I are just totally overloaded  
12 because of lack of people to support us. We need two people in  
13 our Program Support Branch that works essentially directly for  
14 me, and we need a person in Contracts and one in Budget. And  
15 we need these people very badly to be responsive to all the  
16 requests we get from the Controller and the EDO and to get our  
17 contracts out and process our mail.

18 Slide 24 --

19 (Viewgraph.)

20 -- just summarizes the equipment. And again, here  
21 this will all be covered by the division directors.

22 MR. BUDNITZ: Could I make one point? I think it is  
23 worth pointing out that NRR has been specially designated to do  
24 what they are up to. I&E has just established an office. We  
25 did not establish a special task force, and hence we have not

1 got a Lessons Learned report to give you, except that this is  
2 our Lessons Learned report and the Staff report, which embodies  
3 in some detail what this is.

4           What we did, in terms of learning lessons from Three  
5 Mile Island, was to reorient, redirect, and where needed, seek  
6 more support for areas that are embodied in this budget. It is  
7 important that you realize that has been going on in the office  
8 -- and, of course, it should be clear since the accident,  
9 besides assisting in all the other activities, has been a  
10 substantial redirection of the ongoing work. And what we seek  
11 here is to do the things we think are still needed.

12           Now, that's not the only thing that is in here. There  
13 is seismic stuff in here, which would have been in here, Three  
14 Mile Island or not. There is risk assessment stuff, stuff that  
15 would have been in here, Three Mile Island or not. And the  
16 Lewis Commission told the Commission and the Staff to do this,  
17 but in a very real sense, this is our Lessons Learned, as well  
18 as all the other things that are involved.

19           And the only other point that I need to make is that,  
20 to me, I think the other thing that has happened here is this  
21 budget takes to heart the Lewis Committee's recommendation that the  
22 risk assessment effort be used to assist in the guidance of the  
23 whole program in arranging priorities and understanding the  
24 safety significance.

25           Indeed, in the Three Mile Island-related area, that

1 is, this intermediate area, what is going to be going on is the  
2 drawing of these event trees in order to enable the research  
3 program to explore those accidents which are found to be of  
4 interest or importance and assign them the lower priorities to  
5 those that aren't.

6 The guidance, using the methodology, is something  
7 which would not have been possible, say, five years ago, and,  
8 in fact, did not underlie the establishment of the large LOCA  
9 program which still dominates the budget. It did not underlie  
10 that, but it is going to underlie this area. I think that is a  
11 major conceptual advance in the way a sizable part of this was  
12 put together --, not all of it, because a lot of it isn't of  
13 this kind. I think that is a major breakthrough.

14 COMMISSIONER AHEARNE: Would it be appropriate at  
15 some stage to see what would happen to the current budget if  
16 you did attempt to underlie it with that kind of approach?

17 MR. BUDNITZ: Well, what you would find is the FY '79  
18 budget, the budget that our contractors are working with, have  
19 less working transients and small LOCAs than the risk assessment  
20 techniques tell us they should and had less work in some of the  
21 fuel chemistry, fuel behavior areas that, in fact, we are trying  
22 to remedy with exactly the new approaches here.

23 COMMISSIONER AHEARNE: But the same amount of money  
24 would have led you to conclude that at least in some areas you  
25 had more.

1 MR. BUDNITZ: Relatively. That is a fair statement.

2 Now, it is also fair to say that this isn't completely  
3 balanced yet, even in '81, because you just can't develop things  
4 all at once. You have to begin by developing event trees and  
5 a better understanding of these things and then learn whether  
6 other research is required, some of which we won't know until  
7 we have done the scoping work.

8 MR. LEVINE: We are going to run out of time pretty  
9 soon.

10 Should we go on to RSR, please?

11 MR. MURLEY: Could I have C zero, please?

12 (Slide.)

13 Just to remind you where we were last year, this is  
14 a slide taken from last year's presentation. The LOCA program  
15 was trending downward. The fuel program was downward. The  
16 site and primary system were upwards, but they were small.

17 COMMISSIONER AHEARNE: You are including DOE on here.  
18 Are the dollars really dominated by DOE?

19 MR. MURLEY: In the '78 and '79 budgets, there were  
20 some LOFT dollars. It makes it smoother.

21 Now, I might point out that we took this seriously  
22 in the sense that I informed the lab and our contractors and  
23 DOE that we were going to do this. And, in fact, the Chairman  
24 has got some letters from some lab directors asking how come  
25 we were doing this.

1           COMMISSIONER AHEARNE: Well, how come you're doing  
2 this? And besides, you've got all these great people trying  
3 to do something else.

4           MR. MURLEY: But we were on that path, as a matter of  
5 fact.

6           Now, could I have C-25?

7           (Slide.)

8           This shows the revised program for light water safety  
9 on the top, and it reflects two things, but primarily the  
10 Three Mile Island-related research that we believe is needed  
11 because of safety questions that we weren't addressing in our  
12 old program.

13           What we've done on the lower chart is we are really  
14 ramping down the large LOCA program faster than we had planned  
15 last year, the small LOCA and transients. We had intended to  
16 increase it, but at nowhere near the rate and nowhere near the  
17 level that we are doing it, in fact, so that in '79 you see an  
18 increase up to about \$10 million. That comes about from  
19 reorienting already some semi-scale and LOFT research and some  
20 code development work.

21           And then in '81 and '82, these small LOCA and trans-  
22 ient work really predominates over large LOCA, what has changed  
23 since last year, not only Three Mile Island, but we've got two  
24 successful LOFT tests built.

25           MR. LEVINE: That has changed our whole perception

1 about the number of large LOCA tests we can use.

2 MR. MURLEY: That is by way of background. Then, for  
3 each program element -- now, we have eight program elements in  
4 reactor safety.

5 I will describe, briefly, what is in each program,  
6 and each one has a package: program description, the ACRS  
7 comments are behind it. There is a breakdown for each one of  
8 how much is ongoing work, how much is TMI-related, and how much  
9 is new starts in fiscal '81.

10 And there is a further breakdown of the Three Mile  
11 Island work, and then, finally, for each program element there  
12 is a decline -- I won't have time to go into all of these.  
13 I will concentrate on the five areas where we are appealing the  
14 EDO cuts; and there are two or three major areas where we  
15 disagree with the ACRS, and I will concentrate on those as well.

16 Number 25, please.

17 (Viewgraph.)

18 Okay, in the seismic area, as Saul mentioned, we are  
19 projecting some large growths here. The EDO --

20 COMMISSIONER AHEARNE: Just so that I don't lose my-  
21 self in confusion, your breakdown does or does not track to the  
22 way the PRG and EDO folks put it together?

23 MR. LEVINE: It is slightly out of order.

24 CHAIRMAN HENDRIE: But is the seismic engineering  
25 and safety program -- is that the same?

1 MR. MURLEY: Yes.

2 This, I guess, is our biggest appeal. We are asking  
3 for \$6 million more than the EDO mark, or \$19.9 million. This  
4 is a new organization last year. It was formed -- if you will  
5 recall, last summer it was headed up Larry Shiao, The structur-  
6 al engineering and mechanical engineering are relatively new  
7 programs, and they are getting a firm foundation in '79 and '80.  
8 And there is some big growth needed, we believe, in '81. That  
9 is why you see the large increases.

10 We think they are able to absorb the growth, primarily  
11 because it involves some new experiments and supportive analysis  
12 that we're doing in the seismic area, and the piping and  
13 structural area.

14 COMMISSIONER AHEARNE: The PRG has a question of  
15 whether you could efficiently handle that size of a program  
16 growth.

17 MR. MURLEY: We think we can, and the reason is it is  
18 a fairly broad challenge, broad challenged program. There are  
19 a number of small tasks.

20 MR. ENGLEHARDT: The PRG looked at this particular  
21 decision unit in terms of its current program support numbers  
22 of \$8.4 million and carried it through to their office request  
23 of an increase to \$19.9, and we felt that that degree of growth  
24 over that short period of time would be difficult for them to  
25 absorb. So what we did was essentially scale it so that in

1 fiscal '83 they would be up the requested level. We just didn't  
2 see that they could absorb that particular substantial growth  
3 during that period of time.

4 MR. MURLEY: Okay. As I mentioned --

5 COMMISSIONER AHEARNE: But you think we can?

6 MR. MURLEY: We think we can, yes.

7 MR. BUDNITZ: It is for just the reason cited. There  
8 are a lot of things going on that have to go into in much more  
9 detail and specificity than we are doing.

10 MR. MURLEY: I would point two growths that are kind  
11 of built into the program. One is in seismic safety -- research  
12 program, called SSMRP. It is to assess the margins or lack of  
13 margins in seismic design of plants today. We really don't know  
14 what they are. And that's why, when we come with an error in  
15 the computer codes, we find out we have to shut plants down.

16 Whereas, in the LOCA research area, we find errors  
17 in codes all the time, in the vendor's codes. But we know we've  
18 got substantial margins. And they don't have to shut the plants  
19 down until they can find out where these errors are.

20 In my judgment, we are about 10 years behind the LOCA  
21 -- ACS codes -- in these size codes, and we at NRC have really  
22 no independent capability at all in this area. And there is a  
23 large part of the growth in mechanical engineering budget, which  
24 is aimed at improving our capability in this area.

25 Could I have 26, please?

1 (Slide.)

2 Briefly, the ACRS supported the program. They  
3 suggested a level of about \$17 million for fiscal '81. One  
4 area that I should mention that they didn't agree with us on  
5 is the so-called atmosphere transport and diffusion. It may  
6 be a bid of a misunderstanding here.

7 Let me tell you what we would like to do, what we  
8 think is needed. Partly as a result of Three Mile Island, I  
9 think we see the plants are probably going to need more radia-  
10 tion monitors. And anticipating this, we believe that there  
11 are some tests that are needed to figure out what is the  
12 density of monitors and how far out should these monitors go  
13 in terms of two miles, five miles, 10 miles. So there are some  
14 tests needed, we believe, to look at different terrains, differ-  
15 ent weather conditions, and what kind of plumes might arise so  
16 that we can place the monitors and would not miss the radiation  
17 plumes?

18 Could I have 27, please?

19 (Slide.)

20 Here the point is that about \$16.5 million is  
21 continuation of endorsed programs, and it reflects the fact  
22 that this is growth in ongoing programs. 2 million is new; it  
23 is Three Mile Island-related. And of the new starts, there is  
24 only about \$1.4 million.

1 that you've asked for, does that also then -- the 28.1 and the  
2 32 in the outyears are again what you would be asking?

3 MR. MURLEY: Yes.

4 Could I have 28, please?

5 (Viewgraph.)

6 This is our Reclama. We're asking for 6 million in  
7 program support above the EDO mark. The point -- the key point  
8 to make, I think, is that this decision unit, at the 13.9 level,  
9 is well below our minimum level we believe, considering that we  
10 are starting some work in fiscal '80 as part of the supplement-  
11 al. So, as a result, at 13.9 -- in fact, I probably would not  
12 even start it if that's the only level we could get.

13 If there are no questions --

14 COMMISSIONER AHEARNE: You have 18 people now?

15 MR. MURLEY: We have 19 people, and we are asking for  
16 four, primarily in the structural area and seismology. We have  
17 a large number of seismology programs, small programs.

18 29, please.

19 (Viewgraph.)

20 The ACRS suggested \$17 million. Again, we would ask  
21 for the full 19.9, because there is some work that we couldn't  
22 get started, even at the 17 million level. The 17 is close to  
23 what we would call our current level. And it would not allow  
24 starts of these new programs with the ACRS mark.

25 COMMISSIONER AHEARNE: What is your definition of  
"current"?

1 MR. MURLEY: It turns out in this program there are  
2 some built-in growths. As I mentioned, the seismic margins  
3 program, some of the piping benchmark programs that we intended  
4 to start in '80, need to grow to do them properly. It is  
5 similar to our LOCA code development. It just takes money to  
6 do them right.

7 COMMISSIONER AHEARNE: I was just trying to get a  
8 working definition of what "current" means.

9 MR. MURLEY: "Current" means no new starts, the  
10 ongoing program with inherent growth, planned growth.

11 MR. BUDNITZ: Whatever was planned two years ago.

12 MR. MURLEY: Let's turn to systems engineering, 30.  
13 (Viewgraph.)

14 Generally, here there is a 10 percent overall decrease  
15 in fiscal '80. We are phasing out the ECC bypass, for example.  
16 That is zero.

17 You will notice there is almost a \$6 million decrease  
18 in the 3D flow distribution. The blowdown/reflood heat transfer  
19 program is decreased.

20 There are two issues, one of which we have a disagree-  
21 ment the ACRS on semiscale; and the other is a reclama on  
22 operational safety with the EDO.

23 And let's go to the next viewgraph.

24 (Viewgraph.)

25 The ACRS said that the systems, the semiscale

1 program should not really be viewed as an integral systems  
2 test, and that some reduction from our request could be made  
3 in this program. Now, we, I guess, disagree with this. We  
4 have--we think there is a strong need to understand PWR systems  
5 and this is really the only program we can do this in outside  
6 of LOFT.

7 We intend to add some hardware to study secondary  
8 system effects. Right now there is no secondary system, so we  
9 can't understand things like feedwater transients, the effect  
10 of steam generator cooling, and so forth.

11 COMMISSIONER AHEARNE: Isn't the ACRS question  
12 whether or not you can do a valid extrapolation?

13 MR. LEVINE: Let me tell you what I think it is.  
14 That is part of it, but it is slightly different also, I think.  
15 Plesset especially thinks we should not be advertising this as  
16 an integral system test, because it is so atypical, just so  
17 small that it has got to be atypical. And that's fine with  
18 us. We I think have made an error in that regard.

19 In the past we have made a mistake in advertising it  
20 as an integral test facility, and I think what we really should  
21 say is that this facility has been extremely useful in allowing  
22 us to do all kind of experiments with great flexibility that  
23 give us insights into phenomena that help us plan our larger-  
24 scale programs and our codes.

25 For instance, the codes that did very well at

1 predicting LOFT were developed and tested on semiscale and  
2 did very well on LOFT. We could not have done that without  
3 semiscale. And so I don't care whether you call it an integral  
4 facility or a special facility or whatever it is; it has been  
5 extremely useful for us. And in the same sense, it will be  
6 extremely useful to us in giving us an opportunity to run  
7 multitudinous tests with small LOCAs and see the secondary  
8 system impacts.

9 Plus, he said he was very disturbed that the upper  
10 head injection test that we tried to do on semiscale did not  
11 come out very well. The boards were notified and it created  
12 a furor among the boards. And I think if we had not been  
13 advertising it as an integral facility, it would not have  
14 required --

15 MR. MURLEY: It was a different test, really. But  
16 that's the problem in the kind of goldfish bowl we live in.  
17 We did a test where the insulation -- we put new insulation in  
18 one of the vessels and it was not as good as we thought. As a  
19 result, there was more heat transfer into the coolant than we  
20 thought. So we got some anomalous results. And normally in  
21 the course of things we sit down and think about these and  
22 analyze them, and it takes a month or two.

23 But in this atmosphere we're in, we had to notify  
24 the boards and that caused a lot of confusion, and I think  
25 there was -- this caused some people to be upset, because what

1 are you supposed to do with this if you haven't had time to  
2 figure it out? And we would prefer to sit down and think of  
3 it ourselves.

4 But we know its limitations, we think we do, and  
5 we think we can compensate for it.

6 Also, I might add there are some high-risk tests  
7 that are being proposed for LOFT that I would not at all be  
8 comfortable doing unless we could run some tests on semiscale,  
9 like what is called a reflux boiler mode, where we boil in the  
10 core and condense in the steam generator. I'm not thrilled at  
11 doing that in LOFT.

12 MR. LEVINE: We're thinking about it, but we certainly  
13 want to know more about it than we do now. We might do it,  
14 for instance, when a core is near the end of its life.

15 MR. BUDNITZ: It is not the kind of thing we're  
16 that eager to try right away.

17 MR. MURLEY: Could we skip to 35.

18 COMMISSIONER AHEARNE: If you could go back to 30  
19 just for a minute. I'm going to ask a question to see if I  
20 can understand it.

21 The '80, including the supplemental, which is 42.3 --  
22 your change is minus 4 from '81. What significance are you  
23 asking us to get from that?

24 MR. MURLEY: Okay. The fiscal '80 President's  
25 budget was 34.8. So we're asking about -- I guess it is a

1 \$7.5 million supplement in '80, and then from that the '81  
2 budget is decreased by \$4 million.

3 COMMISSIONER AHEARNE: I wasn't sure whether you  
4 were trying to make a point that you were coming down in some  
5 areas or what significance to draw from that.

6 MR. LEVINE: Just a factual report.

7 MR. MURLEY: You had asked where are some areas  
8 where we are cutting work out.

9 COMMISSIONER AHEARNE: I would not interpret that  
10 so much as coming down. If you get the supplement, you will  
11 be going substantially up, and then you will be coming back  
12 down, more to where it is still up above what it would have been  
13 without the supplement.

14 MR. MURLEY: You're right.

15 Okay, 35, please.

16 (Viewgraph.)

17 The -- there is a reclama in fiscal 1980 of  
18 \$1 million for operational safety, three items we would like to  
19 start.

20 One is valve testing. We think NRR is going to  
21 request the industry to do some tests on relief valves and  
22 safety valves, and we think and NRR thinks we should jointly  
23 participate in that program. So this, in fiscal '80, we would  
24 start test planning and specifying instruments and analysis  
25 measurements for such tests.

1           \$300,000 is for the post mortem. Here we intend to  
2 look at cable connectors and some of the equipment and instru-  
3 ments inside the containment that either failed or didn't fail,  
4 and we would like to find out why they did or didn't.

5           '81 -- could I have 36, please.

6           (Viewgraph.)

7           The reclama is more or less a continuation of those  
8 same programs, valve testing and a new program of support for  
9 I&E and looking at transmission links and emergency response  
10 type of requirements.

11           COMMISSIONER AHEARNE: Now, the ACRS had raised  
12 questions about some of that, saying that they didn't think  
13 it was going to be done soon enough.

14           MR. MURLEY: Yes, and we tend to agree that we  
15 probably won't be in the containment building pulling stuff  
16 out, at least not until late fiscal '80. What this money is  
17 for in '80 is to start getting the shipping casks and shipping  
18 containers ready to send them, the hot cells, and also getting  
19 any hot cells built, because we know it is pretty highly  
20 radioactive with cesium. So it is a fairly modest program on  
21 post mortem.

22           MR. BUDNITZ: I guess we felt if we were stuck  
23 waiting until '81 we would be a little behind.

24           MR. MURLEY: Yes.

25           COMMISSIONER GILINSKY: Could I just take you back

1 to the semiscale? You were talking about the usefulness of  
2 it, and what you want to do is not just to continue it but  
3 upgrade the facility in some way.

4 MR. LEVINE: We want to put a secondary system on  
5 it.

6 COMMISSIONER GILINSKY: Isn't that what is at issue?

7 MR. LEVINE: I guess it's not that we want to put a  
8 secondary system on it; it's the whole question of the utility  
9 of the facility per se.

10 COMMISSIONER GILINSKY: Is the ACRS in effect saying  
11 that they don't think it is worth spending money to make this  
12 into a more elaborate facility?

13 MR. BUDNITZ: That is more or less what they are  
14 saying.

15 MR. LEVINE: We don't agree with them. NRR doesn't  
16 agree with them and EDO doesn't agree with them.

17 MR. BUDNITZ: It's even stronger than that. As part  
18 of an international effort to understand the kind of transients  
19 and small LOCAs that we are now beginning to pursue, there has  
20 been an international meeting or two in which all of the  
21 several facilities around the world have been looked at to  
22 see which each can do. There is a failed facility in Germany  
23 and there is a facility in Japan and so on. And it turns out  
24 that semiscale has some attributes that are unique that nobody  
25 else has, that complement facilities elsewhere around the

1 world, which, used together, can provide a series of experi-  
2 ments over the next two or three or four years, that would  
3 give us a lot of insight into these things. And if semiscale  
4 were part of it, the picture would be much more complete.

5 COMMISSIONER GILINSKY: Semiscale or upgraded  
6 semiscale?

7 MR. BUDNITZ: Upgraded semiscale.

8 MR. MURLEY: I don't think we disagree with them on  
9 the limitations. We know the limitations, they know the  
10 limitations. And it is a question of judgment. In spite of  
11 those, can we get useful results? And we really think you can.  
12 There is a lot to be learned from it.

13 MR. BUDNITZ: For example, when one goes from  
14 semiscale to LOFT, there is a significant scaling effort, and  
15 we can't scale up from LOFT in any experimental facility. We  
16 can scale down and we can understand some of the volume effects.  
17 On the other hand, it's got some serious problems. It is one  
18 dimensional.

19 MR. MURLEY: These are drawn to scale. LOFT and  
20 semiscale were both patterned after the Westinghouse PWR.  
21 I've got similar components in red and pumps in yellow and so  
22 forth. Semiscale is off to the right. You see, it's just  
23 one-dimensional. It's a tiny little thing.

24 But it does have some features, like full height  
25 steam generators, full height core, that allow you to do

1 tests where gravity and size effects are important, like  
2 natural circulation and like small LOCAs. So we think there  
3 is -- again, to reiterate -- a lot to be learned from this.

4 Okay, I will move on to LOFT, if that's okay. 43.

5 (Viewgraph.)

6 There are no real issues with the LOFT. I just make  
7 the point that there is some exciting work going on. It is an  
8 excellent group up there and LOFT is more than just a large  
9 LOCA facility.

10 For example, it, as you know, was designed to survive  
11 many accidents. As a result, they have put some features into  
12 the plant which maybe we could learn from on full-size commer-  
13 cial plants. They have vent valves in the high points of the  
14 system to vent condensible gases, for example.

15 I have started a task out there to look at these  
16 kinds of safety features in LOFT to see if there might be some  
17 that are exportable to other commercial plants. We have  
18 started some work to install a diagnostic computer, diagnostic  
19 system in the control room of LOFT, that will be a model, an  
20 improvement, and perhaps could be used, if it works out at  
21 LOFT, could be used in commercial plants.

22 There are many more things like this: improved  
23 instrumentation we can look at in LOFT, in-service inspection  
24 techniques and so forth.

25 37, please.

1 COMMISSIONER AHEARNE: What about the budget?

2 MR. MURLEY: There is no disagreement with the EDO  
3 mark on the budget, a \$3.1 million increase from fiscal '80  
4 to '81.

5 MR. LEVINE: This is an area where we accepted the  
6 EDO cut, even though the ACRS asked us not to.

7 MR. MURLEY: Yes, the ACRS supported the \$44.9 million.  
8 The increase is primarily inflation, plus this diagnostic  
9 equipment that I mentioned is about \$2 million. And this year  
10 and '81, we start up full operation of the hot cells and hot  
11 shops, which is \$1.5 million. So that accounts for most of the  
12 increase.

13 Okay, I will switch to code development now. That  
14 is number 44.

15 (Viewgraph.)

16 For system codes and component codes, it is generally  
17 level funding, the first two items. But we are shifting away  
18 from the LOCA codes to transient codes. Where the big  
19 increase is found is in the TRAC assessment and also applying  
20 TRAC to operating reactors. We get into a mode of applications  
21 -- and I might point out that we are projecting over 16,000  
22 hours of computer time in this budget. That works out to be  
23 about over \$11 million. And of the 15.2 that is for  
24 computation time, we have a breakdown lab by lab.

25 At INEL, for example, it is 4600 hours at \$800 an

1 hour average. At Los Alamos, it is 6450 hours at about  
2 \$550 an hour, both of which come up to be about \$3.5 million.  
3 When you look at our other labs as well, it comes out to be  
4 \$11 million.

5 MR. BARRY: Can't you put it all in the cheaper  
6 computer, the 500 versus the 800?

7 MR. MURLEY: No. I wish we could get some more of  
8 that \$500 an hour time. That is equivalent to about two  
9 full-time CDC 7600s.

10 MR. BUDNITZ: We are totally dependent on our  
11 colleagues in the DOE labs for the efficiency of their systems.

12 MR. MURLEY: 45, please.

13 (Viewgraph.)

14 The ACRS, we have kind of a disagreement here with  
15 them. It is a minor one, but also with the EDO. And I will  
16 talk about it here. And it has to do with the data bank.  
17 The ACRS said this data bank could be deferred in favor of  
18 some higher priority matters. We disagreed.

19 Let me tell you briefly what the data bank is. It  
20 is a place where we can store and retrieve all of the informa-  
21 tion needed to make a safety analysis for each operating  
22 reactor.

23 MR. LEVINE: Not a complete safety analysis, but to  
24 run the codes.

25 MR. MURLEY: That's right, a computer analysis.

1 There are probably a half a dozen codes that we would want to  
2 run -- RELAP and TRAC and some of the other system codes.  
3 There are two needs for this. One is to do a routine audit  
4 calculation in support of NRR. But second is also to be able  
5 to respond in emergency situations, like at Three Mile Island.  
6 There were some calculations made in the week after the  
7 accident on whether we could get into natural circulation or  
8 not. It turned out we were lucky. They had done a deck, an  
9 input deck of the coding plant which happened to be very, very  
10 similar to Three Mile Island.

11 If they had not had such a deck, we would still be  
12 preparing it today. It takes three to six months to prepare  
13 an input deck to run a systems code like RELAP, and it's just  
14 a massive amount of data, to find out what the steam generator  
15 looks like and how the pipes are connected and so forth. We  
16 think that should be stored in a data bank for all plants.

17 MR. BUDNITZ: I don't believe that, either, but I  
18 have been told it is so. It just seems you ought to be able  
19 to do something.

20 MR. LEVINE: It is thousands of pieces of data.

21 COMMISSIONER AHEARNE: You're saying it takes three  
22 to six months to prepare the RELAP data bank?

23 MR. LEVINE: The input deck of cards.

24 MR. MURLEY: It is about a half a man-year per plant  
25 on the average.

1                   COMMISSIONER AHEARNE: When would you expect this  
2 to be completed, then?

3                   MR. MURLEY: It wouldn't be completed for a year or  
4 two.

5                   MR. LEVINE: We're not going to collect the data.  
6 We're going to get questionnaires and ask the industry to  
7 provide the data, and we will simply store it in the computer,  
8 which will be designed to punch out the decks we need.

9                   COMMISSIONER AHEARNE: When you say it takes half a  
10 man-year to prepare that data for one plant, the deck for one  
11 plant, you mean half a man-year in Idaho or half a man-year  
12 by the company and a tenth of a man-year in Idaho?

13                   MR. MURLEY: It takes about a half a man-year in  
14 Idaho and depending upon what type of cooperation he can get  
15 from the plant vendor, it takes three to six months to do that.

16                   So once we have done our Westinghouse four-loop  
17 plant, for example, the next one is easier. But the first one  
18 probably would take six months.

19                   COMMISSIONER AHEARNE: So for all of the plants that  
20 we have in either operation or close to getting operating  
21 licenses, what is the total amount of man-years required to get  
22 that?

23                   MR. BUDNITZ: We have \$1.4 million between '80 and  
24 '81.

25                   COMMISSIONER AHEARNE: I know, but what I'm really

1 trying to find out is, do you estimate that is going to end  
2 it or whether that would get, say, seven plants?

3 MR. BUDNITZ: Oh, no. The \$1.4 million is supposed  
4 to do all of them.

5 COMMISSIONER AHEARNE: All of the 70 plants?

6 MR. MURLEY: Let me be careful. It won't have all  
7 70, because some are twins and very, very close.

8 MR. BUDNITZ: Similar enough.

9 MR. MURLEY: Like coding at Three Mile Island, we  
10 wouldn't necessarily have to do the same deck.

11 COMMISSIONER AHEARNE: Are you confident the  
12 similarities are sufficient?

13 MR. MURLEY: I can't tell you that now.

14 MR. LEVINE: It is more than just collecting the  
15 data. It is making a program to store it and to print it out.

16 MR. BUDNITZ: This is not just simply every plant,  
17 the same thing. There is some economy of scale.

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gsh 1           COMMISSIONER AHEARNE: I'm sitting here with the  
2 sense that to get all of those plants done, it may be four  
3 or five years. So I'm thinking that perhaps there is beyond  
4 '81.

5           MR. MURLEY: There may be. What we've scoped out,  
6 Commissioner, in the first two years, '80 and '81, is we're  
7 going to look at 7 generic-type of plants to make sure at least  
8 we've got a Westinghouse 2-, 3-, and 4-loop plant, the BWRs  
9 and the B&W plants and the GEs. That is close enough that  
10 we think that e could cover anything in an emergency. But  
11 when you get into the secondary system, I'm sure you know you  
12 find out that no two plants are alike.

13           And if that becomes important, then we will have to  
14 expand it to put every single plant into the data bank.

15           MR. BUDNITZ: I guess we thought that for most things  
16 you could think of, that it was going to cover it.

17           Is that a fair statement?

18           MR. LEVINE: I think it has to be regarded as phase 1  
19 with a high likelihood that it will cover the primary part of  
20 all plants.

21           MR. MURLEY: Yes.

22           MR. LEVINE: What the secondary implications are I'm  
23 not sure.

24           MR. MURLEY: Let's move on to 48, please.

25

gsh

1 MR. BUDNIFZ: That was taken out of the EDO, Mark,  
2 and we think that it is important to do it.

3 MR. MURLEY: Yes. There is a \$2 million Reclama  
4 in Fiscal '81 and \$400,000 in Fiscal '80.

5 (Viewgraph.)

6 It has to do with the data bank and application of  
7 the codes. And we're also Reclama-ing one person, mainly  
8 to follow the TRAC assessment. 49, please.

9 (Viewgraph.)

10 Fuel behavior. There are really no major issues  
11 here. The program goes down a little bit in '81, again,  
12 as a result of a large increase in '80, I should point out,  
13 because of the supplemental.

14 The President's budget in '80 was \$23.1 million.  
15 There is \$5.6 in supplement. It takes it up to \$28.7 and  
16 then we're down to \$27.9 in '81.

17 Largely here, the increase is for operational  
18 transient fuel tests of the kind that the ACRS requested and  
19 we agreed with.

20 COMMISSIONER AHEARNE: The ACRS had criticized what --

21 MR. LEVINE: The RIA test. And we had a debate  
22 with them and NRR. We and NRR think it is needed, although I  
23 think the ACRS view is that since the RIA tests were conceived  
24 many years ago, plant designs have changed such that the  
25 likelihood of occurrence is much smaller than they used to be.

gsh 1 I think we simply have to throw this out. But by  
2 the same token, the ACRS said, whatever you can divert from  
3 RIA ought to go into fuel-melting studies.

4 COMMISSIONER AHEARNE: The ACRS, though, did claim  
5 that NRR feels that the information that you're going to get  
6 is inadequate, or am I misreading that?

7 MR. MURLEY: Put on 50. I guess we didn't discuss  
8 it much on the Viewgraph.

9 (Viewgraph.)

10 MR. MURLEY: Their point is that they don't think  
11 the reactivity-initiated accidents are very likely, so why  
12 should we be spending all of this time on it?

13 Now the problem is that the reviewer down at NRR  
14 said that it's a design basis accident, as far as he is  
15 concerned, and the probability is 1.

16 So if he's got to review it, he just feels that he  
17 needs more information and more data.

18 It is that simple.

19 MR. BUDNITZ: So ACRS wrote that NRR should not  
20 re-evaluate whether it really needs the data.

21 Now we and NRR and ACRS are all going to have to  
22 talk together in the next several months, I guess.

23 MR. MURLEY: Skip to 53, please.

24 (Viewgraph.)

25 MR. MURLEY: The only Reclama we have is in people in

gsh 1 this one, and I guess that I will use this opportunity to say  
2 that we really are hurting for staff. This person that we  
3 need here is a coolant chemist, and in Fiscal '80, we really  
4 need to get that program started.

5 And the agency is short. Of the 60 professional  
6 staff that I have at branch chief and below positions, 25  
7 percent of those are either on loan to somebody or another,  
8 or vacant right now.

9 So we are struggling along right now trying to manage  
10 this \$150 million program, and we don't have a lot of depth.

11 MR. LEVINE: We have a lot of people on loan to the  
12 investigation. We have several people on loan to NRR. We  
13 have a lot of NRR tasks that we are doing for them. And we  
14 are suffering.

15 MR. MURLEY: Okay. 55, please.

16 (Viewgraph.)

17 MR. MURLEY: Primary system integrity. There are no  
18 issues here with either the ACRS or the EDO, but there is a  
19 sizable growth and I will take just a minute to tell you what  
20 that is.

21 Partly, it comes about as a result of Three Mile  
22 Island. There is an item under fractional mechanics called  
23 "Pressurized Thermal Shock." We have done thermal shock tests  
24 in our heavy section steel program at Oak Ridge, but these  
25 were all assuming a large LOCA, where the system depressurizes

gsh

1 and you dump cold water on it.

2 At Three Mile Island, the system was pressure-less  
3 and we dumped cold water on it. Fortunately, it was a fresh  
4 vessel. It was not irradiated. But we believe that there is  
5 some work needed just to reassure that the 30-year old vessel  
6 would have held together, as well as the Three Mile Island  
7 accident.

8 There is a program on stress corrosion cracking in  
9 piping under operating effects, which is a large growth in  
10 Fiscal '81. We are doing essentially no work in this area  
11 right now. And we believe, and the ACRS strongly supports  
12 us, that we should get started in this area.

13 COMMISSIONER KENNEDY: There is a lot of work being  
14 done on stress corrosion cracking. Isn't EPRI doing something?

15 MR. MURLEY: EPRI is doing something. The industry is  
16 doing something. My understanding is that it's in the  
17 multi-million dollars a year.

18 But what we're proposing here is not to duplicate  
19 that. It is to look into areas that they are not, but also  
20 to give the agency some independent capability because what  
21 happens as a result of the EPRI and the industry program is  
22 that they propose a fix for pipe cracking and they come in  
23 with this. And the staff, the NRR staff either has to accept  
24 it or not, and they have to have some basis for it.

25 COMMISSIONER KENNEDY: Aren't you in a position to

gsh 1 review their research, A, the nature of the research itself,  
2 and B, the results?

3 MR. MURLEY: Not without expertise. It is like  
4 coolant chemistry, in a way.

5 MR. BUDNITZ: The answer is not yet.

6 MR. LEVINE: And generally, not without being a  
7 part of the program in some cases where you could influence  
8 what ought to be done by contributing some money, as opposed  
9 to letting them do what they want to do.

10 COMMISSIONER KENNEDY: You can evaluate what has been  
11 done, whether you had a part in formulating it or not.

12 MR. MURLEY: Yes.

13 COMMISSIONER KENNEDY: You can do that much. And you  
14 can demand that of them if they're going to come to you with  
15 a proposed fix. As a basis for your conclusion as to whether  
16 you accept it, you are going to ask for all the data on which  
17 it is based and then evaluate it. But not if you don't have  
18 the people to do it.

19 MR. MURLEY: That's right.

20 COMMISSIONER AHEARNE: On the system integrity,  
21 somewhere here in these many pieces of paper, there was at  
22 some point questioning the wisdom of going ahead with  
23 destructive examination.

24 MR. MURLEY: Yes, 56, please.

25 (Viewgraph.)

gsh

1 MR. MURLEY: The ACRS, at this point, said that  
2 we ought to limit the steam generator program to the following;  
3 namely, just examine the tubes and correlate between the  
4 eddy current indications and the actual measurement of tube  
5 integrity.

6 For the time being, I guess, we agree with that now.  
7 But in any case, it doesn't affect the Fiscal '81 program. It  
8 is a matter of, do we follow on in '82 and '83?

9 And our position is, we will discuss this with the  
10 ACRS over the next year in detail, and if it affects our  
11 '82 program, then we will come to you then.

12 COMMISSIONER AHEARNE: Is part of the program that  
13 you had envisioned the destructive --

14 MR. LEVINE: In the out years.

15 COMMISSIONER AHEARNE: Is this one of the generators  
16 coming out of Surry?

17 MR. LEVINE: Yes.

18 MR. MURLEY: Okay. 60?

19 This program, by the way, came before the commission  
20 last year and was approved. There was a question as to the  
21 size of it and whether we would make it a big multi-year  
22 thing. And we've got it scoped so we can stop it just after  
23 the tube test program and it would be disposed of at the  
24 site.

25 COMMISSIONER AHEARNE: Where is the test program going

gsh 1 to be held?

2 MR. MURLEY: Richland, at the Pacific Northwest lab.  
3 The utility has a vault built right now and they are putting  
4 three other steam generators into it. Plus, instead of  
5 burying it, we're going to take it and ship it via the canal  
6 and so forth, but then we are responsible for it.

7 CHAIRMAN HENDRIE: We will talk again about whether  
8 the program ought to be curtailed and so on. But I will point  
9 out that every time we take the view that this is an industry  
10 problem and that is an industry problem, they ought to look  
11 into it and understand what's going on and then tell us some  
12 years down the line.

13 We start research programs of our own years behind  
14 the power curve and struggle frantically to catch up. If  
15 the first time that we run into stretch corrosion cracking  
16 was — I don't know, even as recently as the late '60s, I  
17 can remember spending a lot of time in a motel outside  
18 Chicago at O'Hare Airport in ACRS meetings on stress corrosion  
19 cracking in plants.

20 And at that time, if we could have convinced the  
21 AEC to settle down and get serious about it, about a research  
22 program, I think we might be rather better situated than we  
23 are.

24 The industrial companies do their work and that's  
25 fine. They ought to do that. They have responsibilities to

gsh

1 do that.

2 I think the government commands a range of resources  
3 and a point of view of coming at things that we don't get in  
4 industrial laboratories.

5 I would hate to give up on the steam generator thing  
6 until I was quite sure that we were never going to have to  
7 know more about the phenomenon at that Surry generator;  
8 especially once you get the thing out there.

9 MR. BUDNITZ: That is just what the ACRS was worried  
10 about, that once we got it out there, that we would pour  
11 money that they didn't want us to pour, at it.

12 MR. LEVINE: They were afraid we were going to do  
13 too much on it, and it is a reasonable viewpoint. We ought to  
14 reach agreement.

15 MR. MURLEY: It is an old design using coolant  
16 chemistry that is no longer used and so forth. Harold  
17 Etherington said, what are we going to learn from it, and  
18 Larry Schiao replied that it may be an old design, but the  
19 fact is there is about 20 or 30 plants that have still got  
20 that design. And everyone is going to dent and the staff is  
21 going to have to decide whether to let the plant operate or  
22 not.

23 And this is to give them a basis for letting them  
24 make a decision.

25 I think it is an important program.

gsh

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CHAIRMAN HENDRIE: Upward and onward.

2

MR. MURLEY: I'm just about done.

3

Sol talked about the need, of whether we need breeder research or not, and that is a policy decision. I would only talk about the level if we do need a program. There are two reasons why I think we need this kind of growth from \$13.7 to \$22 million.

3

First of all, as you know, we laid a program out about 4 or 5 years ago and we have cut it back successively. And we are to the point now where we have really cut all the fat and all of the delay out of the facilities that we can.

12

13

There are about three or four facilities that are now ready.

14

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COMMISSIONER GILINSKY: What do you mean, all of the delay?

16

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MR. MURLEY: If I can make an analogy. It's like you set out to build a house that is large enough to meet your needs and you run into a few months of a cash flow problem like we've done in this program.

20

21

22

23

You can cut back deliveries and so forth. But there comes a point when the guy calls up and says, the air conditioner is here. The furnace is here. The refrigerator is here. You've either got to pay for it and do it.

24

COMMISSIONER GILINSKY: Do you mean we've put off?

25

MR. MURLEY: We have put off large test programs.

gsh

1 For example, there is a large fuel melt facility that  
2 is capable of running 200 kilogram or 500 kilogram fuel  
3 meltdowns. It has been built at Sandia. We slowed it down  
4 and slowed it down and now it is ready.

5 But it takes money to operate it.

6 There is a large aerosol test facility --

7 MR. LEVINE: That is an area that the ACRS has  
8 emphasized to get more and more into fuel meltdowns.

9 MR. BUDNITZ: We found in the days just after Three  
10 Mile Island, that a very large amount of expertise relative  
11 to Three Mile Island itself resided in our LMFBR staff and  
12 their contractors, which is no surprise since LMFBRs have  
13 been working in that for a long period of time.

14 COMMISSIONER GILINSKY: I'm not sure which way that  
15 cuts.

16 MR. BUDNITZ: It cuts both ways.

17 MR. MURLEY: That is the reason for a large part of  
18 what I call inherent growth. These programs, once you get  
19 them started, you expect them to grow. And if they don't, it  
20 is best to stop them and let them live alone.

21 COMMISSIONER AHEARNE: Let me ask a question which  
22 relates to what Vic just asked.

23 If you had to give up \$22 million out of your  
24 research budget, now the way that the Reclama seems to be put  
25 together, there was about 15 percent of the research budget

gsh

1 which was taken out of the mark where the Reclamas are put  
2 together, or each individual item are Reclamaed. Rather than  
3 saying if you're going to take out that much amount of money,  
4 here is a redoing of the whole thing.

5 Now would I interpret correctly that you would say  
6 that if we, for some reason, had to find -- had to get more  
7 dollars out of the research budget, it would be just as  
8 appropriate as any other way to take this whole thing?

9 MR. LEVINE: I think that you ought to ask us.

10 COMMISSIONER GILINSKY: Well, you seem to be saying  
11 if you cut back to the \$13.7 level, you might as well go all  
12 the way. Isn't that what you're saying?

13 MR. LEVINE: Almost.

14 MR. MURLEY: The EDO mark was 15. The inherent  
15 growth --

16 COMMISSIONER GILINSKY: What do you mean it's  
17 marginal? There are some things that just don't get done  
18 between \$15 and \$22. I don't understand the argument about  
19 everything falling apart.

20 MR. BUDNITZ: It is worse than that. When you have  
21 serious morale problems in the contractors' and most of our  
22 own staff, and you're having difficulty keeping the program  
23 together, and DOE is going ahead with \$500 million a year,  
24 or whatever, and people are saying, golly, they might not want  
25 to continue with ours because each year it is being cut back,

gsh 1 that is below a minimum number. It is a very serious problem.

2 COMMISSIONER GILINSKY: But you're saying that that  
3 \$15 million, is that sort of a number that morale is bad?

4 MR. LEVINE: Yes.

5 COMMISSIONER GILINSKY: Do you need another \$7  
6 million to cheer them up?

7 What about my morale?

8 MR. BUDNITZ: I'm not sure that it is a fair  
9 comparison. But I can relate to you an experience that  
10 happened in Berkeley about 10 years ago in which one division  
11 of the Lawrence Berkeley laboratory went to pieces in five  
12 years. It just fell about. It was the Donner Laboratory?

13 Why? It came below the critical mass and then it  
14 just fell apart. All the good people left.

15 Now that hasn't happened here yet, but we are seeing  
16 various signs that the thing might just fall apart and then  
17 we're going to have a hell of a job building it up.

18 MR. MURLEY: I'm not asking for this to cheer up  
19 people in the labs.

20 MR. BUDNITZ: We're trying to do some quality work  
21 for the agency.

22 MR. MURLEY: There is a coherent body of work that  
23 is embodied in these five areas. And they are at the stage  
24 now where \$13.7 million won't do it.

25 So I'm going to have to just cut something out. I

gsh

1 can run a program for \$13.7.

2 COMMISSIONER AHEARNE: That is probably a similar  
3 facet of the question I asked, that if you really believe that  
4 you had to live with the \$13.7 mark, the way it is approached  
5 here is a little bit out of here, a little bit out of here,  
6 a little bit is Reclama-ed here, and a little bit there; as  
7 opposed to what would fit more with the thrust of your remark,  
8 that if you're going to take that substantial amount of  
9 money out of the research budget, then perhaps there ought to  
10 be just a reshifting of the resources.

11 MR. LEVINE: The purpose of this exercise was to  
12 explain to you why we think we need what we're asking for.

13 MR. MURLEY: There were two reasons. The second  
14 reason for the growth is that the ACRS is kind of telling us  
15 that we also, in the breeder area, ought to learn some lessons  
16 from TMI and look at accidents other than the worst case.

17 In this case, it is a core disruptive accident. So  
18 they want us to broaden our research program.

19 Now as a rule of thumb, it is about, we think about  
20 \$18 million is the planned growth in the ongoing program, and  
21 the rest, the other \$4 million, is about to do what the ACRS  
22 tells to do to broaden our program.

23 COMMISSIONER AHEARNE: You would really see that  
24 program on your recommendations as just continuing to grow out  
25 through the out-years? Is that correct? Because you had 22,

gsh 1 32, 38.

2 MR. BUDNITZ: Yes.

3 MR. MURLEY: That makes some assumptions. That  
4 assumes that the country make some decisions in Fiscal '81 to  
5 go ahead. If we were going to delay another year, then I  
6 think at this level, the \$22 million level, that we could  
7 sustain our meaningful program for another year or two.

8 But there were some assumptions behind that, and  
9 that is that the country moves ahead and we have an application  
10 about '82 or '83.

11 MR. LEVINE: I think the emphases of talking about  
12 the decision on a prototype plant or something in March of  
13 '81 --

14 COMMISSIONER GILINSKY: Is that what it is?

15 MR. LEVINE: I think that those are the U.S. plans,  
16 a decision by '81.

17 COMMISSIONER GILINSKY: Oh, a decision by '81.

18 COMMISSIONER AHEARNE: That is sort of consistent  
19 with the philosophy of the Congressional discussion.

20 MR. MURLEY: That concludes my presentation. The  
21 gas program is either a yes or a no. It is \$3.9 million.

22 CHAIRMAN HENDRIE: On the gas program, let's see,  
23 it is \$3.7 in '79. Do you know what level you would set in  
24 '80, assuming flexibility, but a mandate in the statute to not  
25 do it until then?

gsh 1 MR. MURLEY: Somewhere around a million and a half,  
2 I would think, or \$2 million.

3 There is some work that we really ought to keep  
4 going at Fort St. Vrain, some graphite oxidation in the lab  
5 and some high temperature materials.

6 COMMISSIONER KENNEDY: You're showing this at about  
7 \$3.9.

8 MR. MURLEY: The question was what would be the  
9 minimum to get by with in '80?

10 CHAIRMAN HENDRIE: Because in '80, there are  
11 no funds directly appropriated for gas work. The House  
12 Appropriations Committee, however, said, do \$3.9 or \$3.7  
13 worth of research in gas. You're going to have to eat \$3.7.

14 We got the Senate to give us a little flexibility  
15 and it just says, do something. But you are not hung at \$3.7.

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1 Now, in considering what an '81 level ought to be,  
2 considering what kinds of pressures are likely to generate, to  
3 maintain some sort of minimum program, I want to know what the  
4 '80 level is likely to be in response to the mandate that we  
5 know is in the law, or essentially in the law, now. That is,  
6 the '81 level of 3.9 might be the right place, but it also  
7 might not be the right place.

8 MR. BUDNITZ; This was developed in the last few days,  
9 and if we can get back to you in a few days we might be able  
10 to give you some more information.

11 MR. MURLEY: I think it might be lower.

12 CHAIRMAN HENDRIE: And once again it may very well  
13 get struck by OMB or the authorization committees for something  
14 like that and stuck back in as an edict item, by the time all  
15 the laws are finally passed for '81.

16 COMMISSIONER AHEARNE: I notice the ACRS had some  
17 study requests in. That tracks closely with what the DOE has  
18 been talking about.

19 CHAIRMAN HENDRLE: All right.

20 MR. LEVINE: We will start risk assessment now, which  
21 is slide 72.

22 (Viewgraph.)

23 I don't know how many of you have met Frank Rowsome.  
24 He is deputy director of our analysis staff, whom we've hired  
25 in the last three weeks.

1 CHAIRMAN HENDRIE: Welcome to the table.

2 MR. ROWSOME: I am pleased to meet you all. This is  
3 the first time I have met any one of you.

4 MR. LEVINE: Frank was one of a number of people who  
5 testified before the Lewis Committee and gave perhaps one of  
6 the most cogent and thoughtful presentations.

7 MR. ROWSOME: I wish we had more time to discuss the  
8 risk assessment and improved safety program in more detail.  
9 But in light of the hour, I would go over it very quickly.

10 Slide 72 shows an outline of the risk assessment  
11 program. There are a number of program elements within this  
12 and the numbers refer to the requested levels. The methodology  
13 development entails the development of the tools for reliability  
14 data analysis, system reliability prediction, human reliability  
15 prediction, and risk assessment.

16 The second item, reactor systems and licensing sup-  
17 port, entails the analysis and accident sequences, system  
18 reliability analysis, and risk assessment as needed for applica-  
19 tions for line office work. This is the program element that  
20 includes our efforts to develop a picture of the accident  
21 sequences leading to core damage, and it is from this unit, the  
22 work on auxiliary feedwater systems work was done that Saul  
23 described at first.

24 It found some apparent safety weak spots. We want to  
25 expand that effort, because it is becoming increasingly clear

1 that the risk picture may vary significantly from plant to plant.  
2 So, we want to develop models for the whole spectrum of operat-  
3 ing plants.

4 MR. LEVINE: It's also in this area that those five  
5 items that I showed you that Harold and I agreed ought to be  
6 done.

7 COMMISSIONER AHEARNE: Just so I don't sit here try-  
8 ing to be more confused than usual, where are the rest of the  
9 people? Are they already on board? The FY '80. You've got  
10 the supplemental up to 30.

11 MR. ROWSOME: We are requesting 30.

12 COMMISSIONER AHEARNE: How many do you now have?

13 MR. ROWSOME: There are 23 in the '80 congressional  
14 budget. There are 26 at the EDO mark, and we are asking for 30.  
15 Nuclear fuel cycle risk is perhaps a poor name for the next  
16 unit, because the great bulk of the work is involved in waste  
17 disposal. The principal elements there are to develop models  
18 to determine the key ingredients in waste disposal risks, what  
19 factors really govern how much the risk is, to develop a  
20 methodology, to evaluate waste repository safety, and to assist  
21 in the formulation of regulatory requirements.

22 This work is being done in close coordination with  
23 NMSS and Standards Development.

24 A small item in this risk assessment decision unit  
25 is training. For some years we have been conducting a brief

1 introductory course for line office personnel in probabilistic  
2 system reliability analysis and risk assessment. The ACRS  
3 urges us to greatly expand this, to develop a four- to six-week  
4 course. It would surprise me if Harold Denton wanted to part  
5 with his people for four to six weeks, but we do think this  
6 course can be and should be improved, and that is why this  
7 element is in here.

8 The next element is another big one. It is the  
9 reliability data analysis. This entails the collection and  
10 analysis of data on human error rates, based on LERs, plant  
11 logs, interviews, simulator experience, and the like.

12 CHAIRMAN HENDRIE: I have got a notion that I know  
13 why this would go out for contractor management.

14 MR. ROWSOME: Also, of course, in the data is equip-  
15 ment failure data, and our membership in the UK systems relia-  
16 bility service and data exchange service.

17 The next item within risk assessment is work upon an  
18 acceptable risk criteria.

19 COMMISSIONER GILINSKY: Can I just take you back to  
20 this other one. Where do we stand with this NPRS?

21 MR. LEVINE: We're not involved in that in the sense  
22 of deciding how it should be used. We are analyzing LERs and  
23 NPRDS data. We're taking data from all sources to try to  
24 analyze it.

25 COMMISSIONER GILINSKY: And does a decision on that

1 affect what type of requirements we might put on utilities?

2 MR. LEVINE: We are simply collecting data and ana-  
3 lyzing it to get the data base for risk assessment purposes.  
4 Now, I have said in the past and still believe this to be true,  
5 that we need one data collection system, and you decide how that  
6 has to be designed by deciding what you want to use the output  
7 of it for, and then you can decide what kind of data you want  
8 to collect. And we have yet to do this.

9 MR. BUDNITZ: But the operational evaluation function  
10 that is going to be established is going to do that as part of  
11 their main effort over the next year or so, to figure out  
12 whether the data --

13 MR. LEVINE: To keep the satellite offices out of  
14 their way.

15 MR. BUDNITZ: In fact, the task force that looked into  
16 that, of which I was on, in conversations with Lee, we decided  
17 that we would think about that function, then figure out what  
18 to do with NPDS and LERS.

19 COMMISSIONER GILINSKY: When does their office get  
20 going?

21 MR. GOSSICK: This month.

22 COMMISSIONER GILINSKY: That will report to you?

23 MR. GOSSICK: Yes, sir. If memory serves me, we have  
24 committed to the NPRDS's future and rulemaking as well.

25 MR. BUDNITZ: If that group is going to look into data

1 collection for their purposes, we're going to have our input  
2 for our purposes.

3 COMMISSIONER GILINSKY: It's amazing how long every-  
4 thing takes.

5 CHAIRMAN HENDRIE: Well, some things that aren't  
6 necessarily such great ideas, you know, slowness to implement  
7 bad ideas might be a good policy.

8 MR. ROWSOME: As you know, the ACRS has recently  
9 joined forces with EPA and the industry in requesting that we  
10 adopt criteria for acceptable risk. This is a very small budget  
11 exercise, as you can see here, to develop the spectrum of  
12 possibilities for the basis for such a criterion.

13 COMMISSIONER BRADFORD: How are the criteria stated?  
14 Is it a legal search, a numerical search?

15 MR. ROWSOME: That is the open issue. What we are  
16 hoping to do with this research is to develop essentially an  
17 option paper for NRR, the line offices, and you all, that says  
18 we could do it this way but there would be advantages and dis-  
19 advantages or we could do it that way.

20 There are a whole spectrum of possibilities of how to  
21 tackle this.

22 COMMISSIONER GILINSKY: When is this going to get  
23 done?

24 MR. LEVINE: In the next year or two. The work is  
25 already ongoing. What is going to take a while -- we have

1 joined with the National Science Foundation in trying to spon-  
2 sor an acceptable risk criteria seminar, where we will have all  
3 the people in the country who have been working in this field  
4 come and present their ideas, and this will undoubtedly result  
5 in submissions for some proposals for research, which they will  
6 fund most of it and we will fund some of.

7 And then, in about a year or so, we will collect all  
8 this and put it together.

9 COMMISSIONER GILINSKY: You must have something very  
10 much more elaborate in mind than I would.

11 MR. LEVINE: There are two ways to go about this:  
12 One way is to take a pragmatic approach and say what are the  
13 risks in the world already -- and this is fairly easily done,  
14 by the way -- and say where should nuclear power fit into those  
15 accident risks. That is a pragmatic approach.

16 COMMISSIONER GILINSKY: How might you express a  
17 standard? I wouldn't think this is something that takes a year  
18 or two.

19 MR. LEVINE: If you want to decide what the risk level  
20 ought to be independently of almost everything, there is some  
21 value, say, in weighing benefits versus risks. That is a very  
22 difficult proposition, in fact.

23 COMMISSIONER GILINSKY: Well, if you're going to have  
24 something to use, it's going to have to be a very simple sort of  
25 statement.

1 MR. LEVINE: I think you will find the problem is  
2 trying to develop a statement which you feel you can defend  
3 technically. That is one approach. Another approach is to  
4 take a pragmatic approach and simply try to define something  
5 quite simple and publish it for reaction. That would go much  
6 faster.

7 COMMISSIONER GILINSKY: This just seems kind of odd  
8 to be having symposia and requests for proposals just to get a  
9 statement on risks.

10 MR. LEVINE: It will be better technically founded.

11 COMMISSIONER GILINSKY: It's just another way of put-  
12 ting it off forever; that's the way I look at it.

13 MR. LEVINE: It's your pleasure. If you want it done  
14 faster, we can take a pragmatic approach.

15 COMMISSIONER GILINSKY: I certainly would.

16 CHAIRMAN HENDRIE: I think if you've got the univer-  
17 sity community contributing and the National Science Foundation  
18 lined up and people at EPA probably interested in this and  
19 proferssors writing papers, one good way to sort of develop a  
20 peer attitude and a consensus is to give them the chance to  
21 have their conferences and talk to each other and see how it  
22 all seems to shake down, and a good way to get them all mad as  
23 ticks so anything you suggest will be subject to scathing  
24 criticism, is to go ahead and plunge on.

25 I think you ought to go ahead, for \$200,000 in '80 and

1 \$300,000 in '81, and sort of go along with this group that seems  
2 determined to have their seminars.

3 COMMISSIONER GILINSKY: Well, you know --

4 CHAIRMAN HENDRIE: If you would like a quick defini-  
5 tion of "acceptable risk," I will refer you to testimony I gave  
6 on, what was it, the 27th of February of this year.

7 COMMISSIONER BRADFORD: That's the problem.

8 CHAIRMAN HENDRIE: Well, it was fast.

9 COMMISSIONER GILINSKY: One could put out several  
10 alternatives and see what stands up to scathing criticism.  
11 Here it is just a way of playing the risk-assessment community  
12 and keeping people occupied without ever facing the issue.

13 I mean, if that's what we want to do --

14 MR. LEVINE: Well, could I ask just one question?  
15 Suppose we publish something pragmatic and simple and the ques-  
16 tion comes up, "Well, why didn't you try to do an assessment  
17 which would weigh the benefits involved in generating electri-  
18 city by nuclear power versus the risks," how would you answer  
19 that question?

20 I would answer it right now on a judgmental basis that  
21 I don't know how to evaluate the benefits quantitatively, and  
22 I would like to know whether the community that works in this  
23 area believes that or doesn't, before I say that. It's my  
24 opinion, but I haven't done enough work to substantiate it.

25 COMMISSIONER GILINSKY: I would guess that a year from

1 now you won't be any closer, even with all of these contracts,  
2 to resolving any of these questions than you are today.

3 MR. LEVINE: We could answer more questions about  
4 why we didn't take certain courses as opposed to others.

5 COMMISSIONER GILINSKY: It is just a way of putting  
6 off awkward questions -- and they are awkward and they're not  
7 easy to deal with; I am not suggesting that they are. But,  
8 you know, we deal with a lot of problems that way, and kind of  
9 have the labs do some work.

10 MR. BUDNITZ: If you have any guidance, we would be  
11 happy to receive it.

12 COMMISSIONER BRADFORD: Let me ask it this way: Once  
13 one articulates acceptable risk criteria, in order to do any-  
14 thing with them, I assume you have to be prepared to put them  
15 into individual licensing.

16 MR. LEVINE: Or in a rulemaking.

17 COMMISSIONER BRADFORD: That was what I was interested  
18 in. What would be interesting to see is this done in a sort of  
19 a process that might lead to a rulemaking.

20 MR. LEVINE: I would think it would be a rulemaking.

21 COMMISSIONER BRADFORD: But preferably, it looks as  
22 though the way you have it set up, the rulemaking would not be  
23 likely to come before the end of FY '81.

24 MR. LEVINE: Probably a year or so beyond that.

25 COMMISSIONER BRADFORD: It would seem more interesting

1 to someone who won't be here much beyond the end of that.

2 The big question would be developing these criteria  
3 as part of a context that would also get them out, at least for  
4 the public comment part of the rulemaking, with an eye toward  
5 possibly looking toward wrapping the whole process up by the end  
6 of '81, instead of just studying it.

7 MR. ROWSOME: Personally, I think you're quite right.  
8 If we want to be responsive to the ACRS, we should stop studying  
9 the problem and start hypothesizing solutions to the problem and  
10 looking at them. And if that is your consensus, we would be  
11 happy to do that.

12 COMMISSIONER KENNEDY: That's not -- I am not prepared  
13 to suggest that is my view. It seems to me we're talking about  
14 the philosophic questions that have been with the human race for  
15 the last three or four thousand years, and I don't think another  
16 year will be all that much to resolve it. And I think it is  
17 that kind of question that ought to be taken deliberately, and I  
18 think it is a great idea that somebody is finally facing up to  
19 try to do it. I am not at all confident it is going to get done.

20 MR. BUDNITZ: I would suggest maybe we ought to have  
21 another meeting just on this, at your pleasure.

22 COMMISSIONER KENNEDY: I would like to have that meet-  
23 ing after you have done about a year's work and see how you come  
24 out.

25 COMMISSIONER GILINSKY: This reminds me of graduate

1 school. The first time I came to Cal Tech, I went down to the  
2 basement and asked one of the guys working in the low-temperature  
3 lab how many years he'd been there. He looked at me and he says  
4 he's found that the year is not a practical unit of time.

5 (Laughter.)

6 MR. LEVINE: Would you like us to prepare a paper on  
7 these proposals?

8 COMMISSIONER GILINSKY: I would.

9 MR. LEVINE: We will prepare a paper which we can  
10 discuss in another session. But in any event, we will need some  
11 money, whichever course we take.

12 (Laughter.)

13 CHAIRMAN HENDRIE: Good. Onward.

14 COMMISSIONER AHEARNE: Could I ask a question? Sol,  
15 do I gather correctly that in the risk assessment area, unlike  
16 much of your other programs, most or a large part of your work  
17 is done by your staff and a smaller amount done by contract?

18 MR. LEVINE: Oh, no. In fact, it was more that way  
19 earlier on where we were doing a lot of the work in-house, but  
20 it is getting to be more and more now that we are deliberately  
21 trying to get more laboratories and companies and experts.

22 COMMISSIONER AHEARNE: I am not saying with respect to  
23 before. I am saying if you look at this area of your office as  
24 opposed to the other.

25 MR. LEVINE: We're not doing any. We're like

1 \$11 million worth of work in-house.

2 MR. BUDNITZ: But it is a fair statement. In this  
3 area significant work is done in-house, and that's not true in  
4 the other areas.

5 MR. LEVINE: And in fact, mostly in response to NRR  
6 urgent needs, we do as much of that -- most of that is done in-  
7 house.

8 COMMISSIONER AHEARNE: So you have more in-house  
9 experts in this area.

10 MR. BUDNITZ: In fact, we have in-house more experts  
11 than the rest of the country may have. Not quite more, but we  
12 have a sizeable fraction of them.

13 COMMISSIONER AHEARNE: That would then lead to the  
14 question that is perhaps your planned growth rate exceeding  
15 the availability of supply and experts outside.

16 MR. BUDNITZ: We don't think so.

17 MR. LEVINE: That is just backwards. As a matter of  
18 fact, we need more money to develop more expertise outside and  
19 more people inside to develop more internal experts. And we  
20 would like very much to educate other people in the agency as  
21 much as we can, and as our nucleus of experts grows we will be  
22 glad to interchange.

23 MR. BUDNITZ: In fact, that issue was debated at great  
24 length with the ACRS who felt that, if anything, this growth  
25 rate was insufficient, considering what they thought were your

1 concerns. And, of course, it's obvious, it almost goes without  
2 saying that much of what we are pushing on here is the stuff  
3 that the Lewis Committee said was of real urgency.

4 MR. ROWSOME: I am grabbing the floor back again. If  
5 I could look at 73 --

6 (Viewgraph.)

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end#6

1           This slide concludes the summary overview. There is  
2 one other element for PAS, the Probabilistic Analysis Staff,  
3 in this budget. That is a very small effort to improve  
4 WASH-1400. It is not our desire or intent to do that reactor  
5 safety study over again in the near future, but we are on  
6 record as promising to incorporate improved data and methods  
7 into that study from time to time, and this is the budget  
8 item to do that.

9           That gives a subtotal for research of \$8.5 million  
10 in program support in fiscal '80, 11.4 in '81.

11           There is another item in this budget that is not  
12 intended for ourselves, and that is an item that is earmarked  
13 for the new Operations Evaluation Group that is to report  
14 directly to EDO. We wanted to make sure that they got some  
15 program support in the '80-'81 budget and we put it in here,  
16 but it is not intended that this go to research.

17           MR. LEVINE: We think the agency needs it, wherever  
18 the group will be, and we have an agreement with the controller  
19 to put it in our budget so that it wouldn't get lost. When  
20 we made the budget for this year, we didn't know where it was  
21 going to be.

22           MR. GOSSICK: Why did the BRG chop it out?

23           MR. LEVINE: You will have to ask the BRG that  
24 question.

25           MR. ROWSOME: Now let's turn to the reclamation, to

1 establish the issues here, and then we will come back to the  
2 '80 slide, come back to the ACRS comments for additional  
3 perspective.

4 (Viewgraph.)

5 In 1980 the EDO mark agrees with our requested level  
6 on program support, so clearly we have no objection there.  
7 There is a difference in personnel and this could become  
8 quite a significant problem for us. The EDO gave us an  
9 increase of three over the President's budget for '80, all of  
10 which is earmarked for the satellite operations evaluation  
11 group in research, the group that sustains liaison with the  
12 principal operations evaluation group that will report to EDO.  
13 Thus the Probabilistic Analysis Staff gets no increase above  
14 the initial FY '80 budget, and only one above the '79 number  
15 of people, at the same time that TMI concerns have resulted  
16 in virtually doubling the program support over 1971, adding  
17 again about half as much as the initial '80 budget, at a time  
18 when we are getting more requests from the line offices for  
19 reliability studies and risk assessment perspective reviews,  
20 and at a time when, as we have mentioned before, risk assess-  
21 ment applications are constrained by the number of practi-  
22 tioners.

23 So that I think we really quite urgently need more  
24 personnel in the Probabilistic Analysis Staff in this area, to  
25 properly address the program support and the many endeavors we

1 have going.

2 Slide 81 is the reclama for 1981.

3 (Viewgraph.)

4 There is both a program support issue of \$3.6 million,  
5 and again the people issue. From my point of view, I think  
6 the people issue is the larger of the two. I think it is very  
7 important to us that we get those slots to accommodate the  
8 work we want to do to understand small LOCAs, transients,  
9 develop the models, the reliability models and accident  
10 sequences for the operating plants, for the waste isolation  
11 studies which are tied -- whose schedule is tied to a coordina-  
12 tion with NMSS and their needs and so forth.

13 Of the \$3.6 million, 1.2 is that part earmarked for  
14 the Operations Evaluation Group, the parent group. And we are  
15 requesting 2.6 for ourselves -- excuse me, 2.4 for ourselves.  
16 In the absence of that extra funding, there would be some  
17 slippage in the development of the reliability models for the  
18 operating plants, not so much because that is one of our lower  
19 priorities, but because it is manpower intensive and it is kind  
20 of at the end of the line, end of model development and so  
21 forth. It is an applications thing which would have to get  
22 pushed down the pike if funding came up short.

23 We do a little trimming in equipment failure data  
24 analysis, in the waste isolation studies, some trimming on the  
25 acceptable risk criteria in research, and some improvements to

1 WASH-1400 at the EDO level, if at the EDO level for support  
2 personnel we would have to make those cuts.

3 (Viewgraph.)

4 Slide 82 summarizes the reclama.

5 MR. BUDNITZ: There is perhaps only one other point  
6 to make here, and that is that a part of the cut that we would  
7 sustain in the EDO mark is in the high-level waste area, where  
8 in conjunction with NMSS, we are developing a model that's  
9 going to be one of the important parts of their overall  
10 thing, and we're in there for about 2 million. We have their  
11 full endorsement on that thing and we think it is important.

12 MR. ROWSOME: On a prior slide I won't call, our  
13 list of issues -- they are in our ACRS letter to you, and in  
14 the slide. For the most part we are in complete agreement with  
15 ACRS, and the only exception is the one Bob just mentioned,  
16 that they endorse the waste disposal work that is suggested  
17 as something that could be slipped in a budget pinch, and we  
18 are concerned that doing so would interrupt the schedule of  
19 the coordinated efforts with Standards Development and NMSS.

20 We have already discussed improved safety. That  
21 came up in the beginning of this meeting. So let's jump  
22 directly to the reclama sheet, which is Slide 86.

23 (Viewgraph.)

24 This is a set-aside issue based upon OMB concerns  
25 that the NRC is plunging into research and development that

1 belongs more properly with the Department of Energy or with  
2 the industry. I think this has been an artifact of a failure  
3 to communicate on our part, because the program as we envision  
4 it really is not developmental, it is not engineering. It  
5 entails very little experimentation. It is not designing new  
6 hardware. It is really the kind of research we would do in any  
7 situation in which we were contemplating new regulatory  
8 requirements: value impact studies, feasibility studies, what  
9 are the implications of the direction in which we think we  
10 want to go.

11 That kind of study is what is involved here, as the  
12 other slides in your handout would indicate.

13 COMMISSIONER AHEARNE: I guess my question, when I  
14 was looking through it, was why the \$6.6 million. And I  
15 recognize I haven't got the background and the battles that  
16 have been fought, but it appeared to me to be very small.

17 MR. ROWSOME: The ACRS commented on that, too. They  
18 think it is too little as well. On the other hand, if you  
19 recognize that these are really the scoping studies, simply  
20 the theoretical --

21 COMMISSIONER AHEARNE: If I look on your list, are  
22 you saying that what you call scoping studies, as a broad  
23 general title, and all the rest are really scoping studies?

24 MR. ROWSOME: Right. This is Slide 83. You are  
25 quite right. The scoping studies are in what is listed here

1 as scoping studies, is a search for avenues and the initial  
2 evaluation of other avenues to improve light water reactor  
3 safety. Where we have already identified alternative designs  
4 or alternative concepts that might improve safety, we are doing  
5 the conceptual studies that would say: Are there competing  
6 failures that might be made worse if you move in this direction;  
7 what kind of value impact are you dealing with; what kind of  
8 risk reduction effectiveness does this initiative have? That's  
9 the kind of study we're doing in the other program.

10 MR. LEVINE: I think we may be a little low here.  
11 I must say I was the one who principally prepared the plan.  
12 I kept the plan as frugal as we possibly could, and we budgeted  
13 as frugally as we possibly can. All the estimates have been  
14 downside estimates.

15 CHAIRMAN HENDRIE: The 6.6 is in fact the number  
16 which came out of a three-year approved reactor safety program  
17 that got worked out last year in connection with the direction  
18 from the authorization committees, and our own belief that it  
19 was an appropriate way to go. The funding level for the  
20 three-year program, which totals out at about -- it runs  
21 4.4, 6.6, and then about 6.7, something like that -- was a  
22 sort of a middle ground between doing really very little work  
23 other than some brainstorming and then calling up DOE and  
24 saying, think about this, on the one hand, and developing a  
25 fairly husky program with contractor commitments, ongoing

1 commitments, on the other, at \$4.4 million this first year, and  
2 6 the second and 6 the third.

3 It is not what I would call trivial efforts. Those  
4 are, after all, millions of dollars.

5 MR. BUDNITZ: There is not much experimental work  
6 in it.

7 CHAIRMAN HENDRIE: It's obviously not a big program,  
8 judged on the scale of a \$48 million per year LOFT experiment  
9 in the research budget. One could argue whether it is high or  
10 low, John. I think that is fair. But the 6.6 proposed at  
11 least has the merit of having been a previously considered  
12 part of a consistent and I think fairly well shaken down plan.  
13 I think the way of deciding what ought to be attacked in this  
14 program was good.

15 I think there was a pretty good method of shaking out  
16 how far it ought to go, so it didn't go too far, but on the  
17 other hand was not just hand-waving. So the 6.6 probably is  
18 good, all things considered. It is probably one of the most  
19 well considered numbers in our budget.

20 MR. LEVINE: I would not want to double that number,  
21 for instance.

22 CHAIRMAN HENDRIE: Let me say one more thing about  
23 the dollar level. I won't be surprised if OMB once again  
24 feels it appropriate to cut our budget number and to export a  
25 chunk of this to DOE. In fact, I will be surprised if they

1 don't. And I guess one of the reasons I perhaps have less  
2 enthusiasm for looking at any very substantial increases in it  
3 is that it seems to me it only encourages that tendency. On  
4 the other hand, there may be some modest increases that ought  
5 to be considered.

6 COMMISSIONER AHEARNE: Or if they are not increases  
7 in our budget, perhaps there ought to be some specifics that  
8 we ought to be asking DOE to incorporate into their budget.

9 CHAIRMAN HENDRIE: Okay. Where from here, Frank?

10 MR. ROWSOME: That covers Probabilistic Analysis.

11 MR. LEVINE: It is almost 5:30. Would you like to  
12 go on?

13 CHAIRMAN HENDRIE: In view of the hour, I am inclined  
14 to meet again. Let's see what would be handy for a return, to  
15 pick up safeguards. Why don't you come in at 9:30?

16 (Whereupon, at 5:30 p.m., the meeting was adjourned.)  
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