

ORIGINAL

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NUCLEAR REGULATORY COMMISSION

In the matter of:

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

Subcommittee on the Safety Research Program

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Advisory Committee on Reactor Safeguards
Subcommittee on the Safety Research Program

Room 1046
1717 H Street, Northwest
Washington, D.C.
Wednesday, June 5, 1985

The Subcommittee on the Safety Research Program
convened, pursuant to notice, at 8:45 o'clock, a.m., Chester
P. Siess, Chairman of the Subcommittee, presiding.

PRESENT:

Chester P. Siess, Chairman
Carlisle Michelson, Member
Charles A. Wylie, Member
Forrest Remick, Member
Carson Mark, Member
William Kerr, Member
Dade Moeller, Member
David Okrent, Member

ALSO PRESENT:

Sam Duraiswamy, Designated Federal Employee

PARTICIPANTS:

- 1
- 2 Denny Ross
- 3 Gail Marcus
- 4 Marty Hayes
- 5 Zoltan Rosztoczy
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P R O C E E D I N G S

(8:45 a.m.)

MR. SIESS: The meeting will come to order. This is the ACRS Subcommittee on the Safety Research Program. I am Chester Siess, Chairman of the Subcommittee.

At least for the moment, the other members of ACRS in attendance are Carson Mark on my left, Bill Kerr, Forrest Remick, Dave Moeller, Charlie Wylie, and Carl Michelson. We expect other members before the day is out -- Ward, Shuman, Okrent, and Carbon.

The focus of this meeting is to discuss the most recent information we have on the proposed NRC Safety Research Program and budget for Fiscal Year 1987, and following the receipt of that information, to prepare a draft of an ACRS report to the Commission on the budget program.

The cognizant ACRS Staff Engineer for the meeting is Sam Duraiswamy, sitting on my right.

All of the meeting will be open, won't it?

MR. ROSS: Yes.

MR. SIESS: The rules of participation have been announced as part of the notice in the Federal Register that was published on May the 10th. A transcript of the meeting is being kept and will be made available as stated in the Federal Register notice.

Everybody that is at the table has a microphone.

1 Anybody that is not at the table that speaks should get to a
2 microphone, so they will be on the record, and identify
3 themselves.

4 Do we want to keep the whole thing on the
5 transcript, Sam, even when we are through with the Staff and
6 trying to draft stuff? Sometime we may decide to let the
7 reporter go, because if we get to the point where everybody is
8 talking at once, she has a little problem.

9 We received no written comments or requests for time
10 to make oral comments, oral statements, from members of the
11 public.

12 The Research Staff is prepared to tell us where they
13 stand right now. I guess nothing is very final. You can
14 bring us up to date, Denny, and tell us what the next steps
15 are.

16 MR. ROSS: Okay.

17 MR. SIESS: The Commission is going to get something
18 from us about this, and I don't know where it fits into the
19 schedule.

20 MR. ROSS: Let me cover a number of connected
21 items.

22 First, there exists a current schedule for the
23 internal review of NRC's Fiscal '87 budget. This schedule is
24 dated May 31st. It is from the Office of Resource Management,
25 NRC, and it has dates beginning on this May 17th, and it ends

1 on September 3rd with the NRC budget going to OMB.

2 Where it shows where we are today, which is June
3 5th, the Budget Review Group is still meeting. It has had
4 some initial reactions with the program offices, and we will
5 discuss that today. Tomorrow and Friday are opportunities for
6 the program offices to have -- it's not really a reclama, but
7 it is a reaction to the BRG's initial reaction, and we're
8 supposed to have a BRG mark on June 12th, a week from today.

9 MR. SIESS: Now the BRG now, and I think last year,
10 is the EDO. I mean, there is not another step in there, is
11 there?

12 MR. ROSS: I think -- of course, they will provide
13 some guidance to the EDO. He doesn't have to accept what they
14 do.

15 MR. SIESS: But it's not a separate -- is it a
16 completely separate set-up?

17 MR. ROSS: The EDO is drawn up from various EDO
18 level offices.

19 MR. SIESS: Who is on the BRG?

20 MR. ROSS: Jack Roe, Jim Sniezek.

21 MR. SIESS: They are all EDO offices?

22 MR. ROSS: All EDO offices, but not program office
23 representatives.

24 MR. SIESS: Okay.

25 MR. ROSS: I think -- well, let's see, --

1 MR. SIESS: There's a step in there that says the
2 BRG submits something to the EDO.

3 MR. ROSS: Yes, that's what I was going down.

4 MR. SIESS: Okay.

5 MR. ROSS: So they provided a mark to the Office
6 Directors on June 12th, and then there is opportunity for
7 reclama built in. The draft budget with the planned
8 accomplishments goes to the EDO on June 20th. Now at that
9 point, Mr. Dircks could -- in the first place, they may go in
10 with some unresolved things. It may give him some options.
11 He may not like what they do. But that would be a personal
12 thing with him. It wouldn't be a final review committee. And
13 then the final EDO budget is supposed to start showing up down
14 here with the Commission in late June.

15 MR. SIESS: Okay. So it goes to the full
16 Commission, or does it go to Joe?

17 MR. ROSS: I think the answer is yes to both. It
18 goes to the Chairman first, and then it goes to Joe --

19 MR. SIESS: But when does it --

20 MR. ROSS: Now, let me look at the -- there are some
21 individual Commissioner briefings in early July, and then
22 there's a Chairman's mark on July 12th.

23 The Chairman submits his budget and planned
24 accomplishments to the Commission on July 22nd. We hope to
25 get Commission approval on July 29th, and then the whole month

1 of August is doing the boilerplate and getting the OMB
2 presentation.

3 The Commission again reviews the OMB's --

4 MR. SIESS: Okay. That's far enough.

5 MR. ROSS: Okay.

6 MR. SIESS: Because we're going to be through with
7 it at this meeting. But if we are writing a letter, a report
8 to the Commission in July, it seems to me that July would
9 still be in time for the Chairman to get it, wouldn't it?

10 MR. ROSS: That's correct. Suppose on July 15th,
11 he opened his mail and got your letter, probably better July
12 12th --

13 MR. SIESS: That's about the same time he's getting
14 --

15 MR. ROSS: July 12th, he gives his mark to the
16 offices. If you could get it, you know, like July 11th, then
17 that would be the most helpful to him, or as early as
18 possible.

19 You meet on the 12th, do you?

20 MR. SIESS: When does the Chairman get the budget?
21 When does he first see it?

22 MR. ROSS: The draft is late June.

23 MR. SIESS: Okay, late June. That's all right.

24 MR. ROSS: June 24th.

25 MR. SIESS: That's why he wants a report from us in

1 June. We're going to write it in June, there's no question.

2 MR. ROSS: Some other boilerplate items. There's
3 always a strong connection between consecutive years, and so
4 we may want to spend a little time on Fiscal '86.

5 The Comptroller announced the other day that there
6 is the likelihood that we will enter Fiscal '86 on a
7 continuing resolution that's alarmingly high, and we're in the
8 situation right now of having a committee report from each
9 House of the Congress that differs as far as research is
10 concerned by \$16 million, which is over ten percent of our
11 budget. And in addition, the phrasing of the conference
12 report gives some guidance as to where some of that money
13 ought to be reoriented.

14 If Fiscal '86 were a reality in the House terms,
15 then our budget would go from 121 down to 108, and that's only
16 \$13 million, but an additional \$3 million gets taken out of
17 Pocket A and put into --

18 MR. SIESS: Now wait a minute. The House bill
19 actually took a certain amount of money out of research, but
20 it also gave you a reallocation that you have to --

21 MR. ROSS: The best way to look at it --

22 MR. SIESS: I thought that came to about \$16
23 million.

24 MR. ROSS: Now here's the best way to look at it.

25 MR. SIESS: And the Senate gave you what you asked

1 for and restored the five percent cut.

2 MR. ROSS: To the agency. The best way to look at
3 the House version is take the 121, subtract 16, you get 105,
4 and then add 3.8 back in for high-level waste and low-level
5 waste, 2 for high-level, 1.8 for low-level.

6 MR. SIESS: The other areas have to be cut about \$16
7 million to make that come out.

8 MR. ROSS: Right. We have given, by formal
9 Commission transmission, a letter to Udall saying the general
10 areas that we would cut if their proposal came true. But the
11 language of the Udall report doesn't give any House guidance
12 as to what they think about what we said.

13 So I would say, the agency is sort of moderately
14 unfettered as to the areas it would have to cut.

15 MR. SIESS: Full committee markup is the same as
16 Udall's subcommittee?

17 MR. HAYES: Yes.

18 MR. ROSS: Marty says yes.

19 MR. SIESS: Now the Senate didn't go along with any
20 of those changes.

21 MR. ROSS: That's right.

22 MR. SIESS: It said they should take care of meeting
23 generic items and ISAP by reallocations or within NRR.

24 MR. ROSS: They just said other places.

25 MR. SIESS: They just said, "Don't touch research."

1 MR. ROSS: Yes.

2 MR. SIESS: The House/Senate conference bill or
3 whatever the compromise would probably be somewhere in
4 between.

5 MR. ROSS: That's a fair summary.

6 MR. SIESS: It's possible the House would go along
7 with the Senate version, but I don't know.

8 MR. ROSS: When last I checked, they thought they
9 might go to conference in July, but I don't know if that's
10 still true.

11 MR. SIESS: I would think that it's better -- a lot
12 better than 50/50 that there will be a compromise. I don't
13 think they'll go all the way with the Senate.

14 What about this adding the payout back in? Is that
15 a realistic type thing?

16 MR. ROSS: I have no idea.

17 MR. SIESS: The House bill is based on a payout?

18 MR. ROSS: That's correct. \$429 million for the
19 agency.

20 MR. SIESS: But the payout is already in there.

21 MR. ROSS: Right.

22 MR. SIESS: You said on a continuing resolution,
23 that would be at the current level?

24 MR. ROSS: We'll have to get it -- I believe we'll
25 get OMB guidance. When you're on CR -- when the committees

1 have made reports, you may be bound by the language of the
2 report at the lowest level.

3 So we might have to spend at a rate of 108.

4 MR. SIESS: How did you get down to 108?

5 MR. ROSS: I took the 16 off of the 121 and added in
6 the high-level waste. I think the exact guidance is -- I
7 think the facts are that we would have to -- see, 121 million
8 is 10 million a month. We might have to spend at 9 million a
9 month on a CR to be in conformance with the House guidance,
10 and that would be a de facto -- I think the main thing, the
11 technical aspect is, if we have reason to believe by a CR or
12 if the thing actually gets enacted in the House, we'll have to
13 make some '86 program cuts which would domino into '87. Maybe
14 some would be revived, and maybe some wouldn't.

15 I can't be any more specific at this time.

16 MR. SIESS: There's no way realistically you are
17 going to figure that you will make up the '86 cuts in '87.

18 MR. ROSS: That's correct.

19 MR. SIESS: We'll be cutting programs on continuing
20 stretchout.

21 MR. ROSS: The realities are, for five years, we
22 would be monotonically decreasing. I think it would be
23 foolish to expect we'll get more in '87 than '86.

24 MR. SIESS: How long can you continue to stretch out
25 programs? It seems to me at some point in time, the budget is

1 going to go down and down, and you've got to start whacking

2 MR. ROSS: As we told Congress, and we really meant
3 it, if we get cut, we will not stretch out; we will just
4 cancel, and that will be it for all time.

5 In other words, we're there now.

6 MR. SIESS: I think you are. Any questions on this?

7 MR. ROSS: I have another background thing I want to
8 get into when we're through here.

9 MR. SIESS: We're talking right now numbers that are
10 moving around in the range of \$128 million plus or minus for
11 an '87 budget. And looking at that, we have to be thinking
12 about an '86 budget that is in the range of 121 down. And
13 there is no sentiment whatsoever that you can see in the
14 Congress that that's going to go up.

15 MR. ROSS: That's right.

16 MR. SIESS: I think it's a triumph of hope over
17 reason to think that you will end up with more next year than
18 you got this year. I think there's some reason to hope that
19 you might end up in '86 with 121, but it's not a great big
20 strong hope.

21 MR. ROSS: No.

22 Another background item we've had some --

23 MR. SIESS: You ain't going to know for a long time.

24 MR. ROSS: I'm afraid so.

25 MR. SIESS: Because the Congress is going to be busy

1 with a lot of other things.

2 MR. ROSS: We will probably -- see, we're sending
3 out program letters this month, and we're telling people, the
4 contractors -- I don't have the exact phraseology; maybe Marty
5 does -- that we're planning as if we've got 121, which is high
6 uncertainty, and we really don't know.

7 We met with the ACRS two or three times on the
8 theory of continuing some research at some kind of stable
9 level. We got a report from the full Committee a couple of
10 months ago, and I think the Committee is aware of several
11 things that are going on. I wanted to give you a progress
12 report.

13 First, it started last November and is expected to
14 conclude this November, an ad hoc CS&I group on light water
15 safety research. The exact title of it is an Ad Hoc Group on
16 CS&I and the Priority of Future Light Water Safety Research.

17 The membership of the group -- I'm a member for
18 NRC. Dr. Sato is --

19 MR. SIESS: I think everybody got your last report.

20 MR. ROSS: There's another development. Dr. Sato's
21 report came in about two days ago. The assignments were that
22 he and I, independently of each other, were to write a
23 strawman Chapter 2. I sent the committee my Chapter 2; I just
24 got Dr. Sato's Chapter 2. You might be interested in reading
25 it.

1 MR. SIESS: Did we get it?

2 MR. ROSS: I sent it out, Sam. Did you get it?

3 MR. SIESS: I haven't seen it.

4 MR. ROSS: Fine. There here is both.

5 The interesting thing is, we worked entirely
6 independently, but both of our reports -- in the first place,
7 they're both in English, for which we are eternally grateful,
8 and they're both nine pages long, and it looks like one of us
9 wrote both reports. But honestly, we didn't rehearse it.

10 MR. SIESS: What happens if you're both wrong?

11 MR. ROSS: We could be. We are meeting again on
12 July 1st and 2nd and the 3rd, if necessary. We plan for that
13 to be our last meeting. We'll try to iron out things.

14 I think this is the meat of the report. The rest of
15 it is just going to be some boilerplate assembly and
16 descriptions of programs in place.

17 MR. SIESS: Denny, on this question of a stable
18 level of funding that we went through, I don't know whether
19 the message came through as clear as it should.

20 That report we reviewed, there was some confusion
21 between what I'll call a base level of funding and a base
22 program. There is a distinction.

23 What we look at as a base program is an ongoing
24 area, whether you call centers of excellence, areas of
25 expertise, places where you're pretty sure you're going to

1 have questions, and you'd like to get answers in advance, or
2 be able to get them very quickly.

3 Now what level that base program should be, I don't
4 know, at what level of funding. But a base level of funding
5 for a research program at NRC ought to be something higher
6 than the level of funding for a base program, because there
7 will always be -- I won't call them ad hoc issues coming up,
8 but other issues coming up that will be superimposed on a base
9 program.

10 So the idea of a base program as being the argument
11 for a base level, we didn't find that helpful, because even if
12 you can define it, your level of funding over and beyond that
13 --

14 MR. ROSS: I agree. We didn't get it right the
15 first time. Here's what we really had in mind.

16 We called it a hybrid. I define a hybrid research
17 program in any given area, you ought to retain your
18 expertise. Let's suppose it's material, ferritic vessel
19 materials, and you want to keep that on the order of thirty or
20 forty people plus a laboratory or two going full time.

21 Maybe it will cost you \$6 million a year. That's a
22 base. You don't really want to dip below that base, because
23 if you do, you've got to shut the lab down. You've got a
24 critical mass of people. You don't have a fully complementary
25 work unit.

1 Now here comes a concern over low-nickel,
2 high-copper or something like that, and you have on top of
3 this, you superimpose a \$2 million program for two and a half
4 years. You get in and get back. You go back down to your
5 base level. That's a hybrid. That's what we really meant.
6 We just didn't come across that way.

7 MR. SIESS: That was written using a base program
8 as an argument for a base funding level. A stable funding
9 level ought to be somewhat higher than what you need, simply
10 for the continuing base program, and that didn't come
11 through. And of course, there was no basis for arriving at
12 the number of dollars in terms of it.

13 MR. ROSS: All right. We're working on that.

14 Also, since last we met, we have executed a contract
15 with the National Research Council. I guess the subcommittee
16 is fully familiar with that.

17 MR. SIESS: We say the letter and their response,
18 and that's all.

19 MR. ROSS: Since then, we have signed a contract
20 that we will proceed.

21 MR. SIESS: Did you get the time shortened on it?

22 MR. ROSS: I think it's nine to twelve months.

23 MR. SIESS: We suggested that it might be a little
24 less time. They were talking twelve months, and we thought if
25 it came in a little early --

1 MR. ROSS: It would, but I think they have one base,
2 and that's it.

3 MR. SIESS: Right.

4 MR. ROSS: It may be there's a formative meeting
5 next week, I believe.

6 MR. SIESS: Have they formed a committee?

7 MR. ROSS: That's what the meeting is for. They
8 have not, as far as I know. They may have a panel. But you
9 know how these things go. We kind of have to let them do it
10 themselves. We don't pick and choose. We'd be glad to, but I
11 think they have some different ideas.

12 MR. SIESS: If it's going to be independent, they've
13 got to do it.

14 MR. ROSS: I think that's all of the background
15 stuff.

16 MR. SIESS: What are you going to do next?

17 Will you introduce the lady on your left?

18 MR. ROSS: I'm sorry. Dr. Gail Marcus is recently
19 -- recently, being last week -- I'm trying to think. Was it
20 this week? Time does fly when you're having fun -- Staff
21 Director for Research for the Policy, Planning, and Control
22 Staff.

23 MR. SIESS: For your information, that's what Frank
24 Gillespie used to be doing.

25 MR. ROSS: Right.

1 MR. SIESS: And Enrico Conti was doing for awhile.
2 What is Enrico doing now?

3 MR. ROSS: He's back to being Deputy Director for
4 Carl Goller, Waste Management and Radiology. He's also
5 leaving Friday for Japan for our first annual technical
6 exchange meeting on waste management research.

7 MR. SIESS: Now are you going to --

8 MR. ROSS: I'd like to discuss a little bit of a
9 table, copies of which have been passed out. It's got a whole
10 bunch of numbers on it, and it's entitled at the top, "Nuclear
11 Regulatory Research, FY '87 Budget, Dollars in Millions." The
12 date is 6/4/85.

13 MR. SIESS: Has everybody got it? It's the only
14 handout you got this morning.

15 MR. ROSS: As you are well aware, your subcommittee
16 review is contemporaneous with the BRG review, which means you
17 get maybe a lot more numbers than you really wanted.

18 So let me explain the columns first. '86 speaks for
19 itself, except it still adds up to 121.

20 MR. SIESS: That's a maximum.

21 MR. ROSS: Right. When we put together our request,
22 you might want to put at the top the words "Research
23 Request." That was our considered opinion of what we should
24 do.

25 As you know, the Energy Reorganization Act tells the

1 Research Office Director that his duties are to recommend to
2 the Commission needed research, confirmatory. That's what he
3 recommended.

4 We had an informal target -- and I don't want to
5 call it a mark -- from BRG that was not based on review of
6 programs. It was just based on the perception of reality of
7 130. So about the middle of May, we arrived at a line-by-line
8 allocation that added up to 130. But we warned them at that
9 time that NRR had not had a chance to review the 130, so we
10 reserved the right to modify it, based on NRR review.

11 MR. SIESS: Now that column headed "Research
12 Request" is what we were looking at a month ago.

13 MR. ROSS: Yes.

14 MR. SIESS: That was the one where you had flagged
15 the major ones over the 130, and we discussed them.

16 MR. ROSS: We called them hard calls. I think the
17 hard costs were 23. The sensitivity study could have gone as
18 low as 120 and as high as 143.

19 MR. SIESS: The hard calls were the excess over 130?

20 MR. ROSS: They added up to be more than \$13
21 million. They added up to be \$23 million.

22 MR. SIESS: I've got a table that just shows the
23 difference between that.

24 MR. ROSS: And NRR had a document in late May, which
25 I believe you have a copy of --

1 MR. SIESS: I think only the Subcommittee Chairman
2 got copies. Everybody has it now, but the people that were
3 responsible for portions of our report got copies last week or
4 two weeks ago.

5 MR. ROSS: I see Zoltan is here, and I think at
6 some time this morning, you may not only want him to discuss
7 the letter, but to discuss developments since the letter. I
8 think that's more important than the letter, which speaks for
9 itself.

10 Okay. As you can see, the NRR total up there is
11 124.6. What we did was to submit a new column marked "6/3
12 BRG."

13 Pardon me. I'm getting ahead of myself.

14 We prepared a response which was sent jointly to NRR
15 and BRG that said, in part, we would accept some of the NRR
16 advice and, in part, we didn't.

17 Okay. In discussions -- let me stop there a
18 minute. I wonder if the subcommittee has got that. What we
19 did was, we had sort of a line-by-line technical response --

20 MR. SIESS: No, we have not gotten that.

21 MR. ROSS: Understand, at this point in the budgetary process
22 -- and this is what I call technical ebb-and-flow -- they
23 propose, we react, they think about what we did, we think
24 about what they did. We aren't fully converged.

25 And then in discussions with the BRG monday, and

1 Gail and Marty were there, it appeared, the way they
2 characterize it, a figure of 128.5 million where it wasn't a
3 mark. It was sort of characterized in concrete that had not
4 set yet, but it was setting fast. They said "solidified."
5 But Dr. Siess will prefer "concrete" to "set-up."

6 [Laughter.]

7 MR. ROSS: What is it you don't put in concrete if
8 you don't want it to set quickly?

9 MR. SIESS: Sugar will help. It won't set at all.

10 [Laughter.]

11 MR. ROSS: That we didn't get.

12 There are two columns for which there is little --
13 one column for which there is no information, "Research
14 Final," which is handwritten. There were some numbers that we
15 thought about yesterday in reaction to the BRG, and I'll
16 discuss those.

17 The BRG mark is what we expect to get on June 12th.
18 Between now and June 12th, what I think will happen is, there
19 will be need for some more discussions with NRR to make sure
20 that we are in full understanding. I think NRR now will
21 probably take the BRG 128.5, and within that framework, they
22 might alter their comments slightly

23 That's just a quick picture of the table.

24 MR. SIESS: Let me explore for just a few minutes
25 with you the NRR versus Research, and I'm looking at the

1 "Target" column, the "NRR" column, and then back to the "BRG"
2 column.

3 Now NRR disagreed -- well, they proposed about 19
4 million out of your budget, out of the 143.

5 MR. ROSS: Yes.

6 MR. SIESS: And there were basically three or four
7 areas. One thing on severe accident, including the
8 containment -- the severe accident risk, they proposed
9 significant cuts in the severe accident type research. In
10 thermal hydraulic transients, they proposed significant cuts
11 in most of the code work, but they wanted --

12 MR. HAYES: Integral testing.

13 MR. SIESS: The integral testing.

14 MR. ROSS: They wanted to continue that testing.

15 MR. SIESS: They wanted that continued and other
16 things cut, right? Code validation, et cetera, code
17 assessment, a bunch of stuff. That was another area.

18 They proposed a significant cut in aging, and then
19 some minor cuts in stretchout and seismic margins and things
20 of that sort. These were the major areas.

21 Now taking them up currently, you have restored the
22 integral testing item.

23 MR. HAYES: Yes.

24 MR. ROSS: That's correct.

25 MR. SIESS: To what extent have the other cuts in

1 thermal hydraulic transients -- have they recommended? Have
2 you reached some agreement?

3 I see your figures running fairly close to theirs,
4 all the way down on thermal hydraulic -- is that correct?

5 MR. ROSS: We had a little bit of guidance. Let's
6 look at the list row by row.

7 MR. SIESS: Okay.

8 MR. ROSS: On integral facilities -- let's see --
9 which column did you want to compare with which?

10 MR. SIESS: Well, I guess I was sort of looking at
11 NRR versus BRG, plus some stuff you've got written out there,
12 that "Final."

13 MR. ROSS: Look at the first subset under integral
14 facilities.

15 MR. SIESS: There's no disagreement across there.

16 MR. ROSS: Except the BRG. What the BRG told us
17 convinced the other partners in the program to put in a
18 million bucks.

19 MR. SIESS: Can we just stick to you and NRR for a
20 moment. There, there was no disagreement. 2D/3D, there was
21 essentially no disagreement.

22 MR. ROSS: In ROSA-IV, we accepted their cut.

23 MR. SIESS: You accepted theirs on ROSA-IV?

24 MR. ROSS: That's correct.

25 MR. SIESS: On integral testing, you accepted their

1 recommendation to put money back in?

2 MR. ROSS: We really need to discuss that for a
3 minute.

4 What NRR wanted was to retain integral testing
5 capability of some sort, and it didn't want to semiscale in
6 the eviscerator until some decision had been made.

7 Now what were planning for the next two or three
8 years is just to leave it like that, integral testing, and
9 make no commitment to semiscale or anything else, realizing
10 that we had to decide mighty quick so the OMB budget can be
11 shortened up.

12 There are some options -- see, our general feeling
13 is, semiscale is a valuable facility in that it's approaching
14 the end of its useful life for two reasons. They are probably
15 beginning to run, at least certain by '87, the same tests that
16 we've run before, and the modern integral facilities that can
17 be constructed have been constructed, that I think produce
18 superior information.

19 When I last month went to the MIST facility, I was
20 very much attracted by its modernization, the way they can
21 rapidly pre- and post-test calibrate their instruments. They
22 can run the thing with just two people. They had superior
23 electronics. It's really time, if we want to keep facilities
24 like semiscale, to make a major upgrade in the facility. It's
25 nearly twenty years old. Of course, it's been refurbished

1 from time to time.

2 What we have to do in the next two or three months
3 is be much more definite as to what we want to do. We had
4 some preliminary discussions with the GE people about would it
5 make technical sense for them to -- for a dollar, in essence,
6 donate their FIST facility, move it to Idaho and run it there.

7 The NRC owns the MIST components. We have the right
8 at the end of that program to relocate the whole facility in
9 Idaho. We're considering whether we should, in effect, have a
10 farm, an integral testing farm, where you may run one one year
11 and another the next year and so on.

12 These are all options that need further
13 exploration. We're just not ready now.

14 If you embrace the \$4 million and give or take a
15 bit, at this point all you are embracing is a concept. That's
16 the best we can do.

17 MR. SIESS: Now they had a number of other things
18 cut in thermal hydraulic transients. I had a number of items
19 that added up to 3.2. One of those was up to 4.

20 How do we come out on those? One of them is
21 separate effects. I don't see that much change.

22 MR. ROSS: I think there's been some minor tuning,
23 but I don't believe there's been -- if you add the last two
24 rows under thermal hydraulic transients, except for some minor
25 tuning, you get the same numbers.

1 MR. SIESS: Yes. That's where I'm getting a little
2 mixed up.

3 MR. ROSZTOCZY: Dr. Siess, if you're looking at the
4 2.2 million, you have to compare it again the so-called
5 "Request" column. Then you will see the difference. It's the
6 "Final" thermal hydraulics budget, is pretty much the same on
7 research recommendations.

8 MR. SIESS: So the specific comments on visual loops
9 and code assessment, analyzer relap maintenance, those things
10 you more or less agree to with Research, with NRR?

11 MR. ROSS: What we noted was that we can take from
12 the request, we would take the 2.8 million reduction. We have
13 to work out the specificity to a degree we haven't done yet.

14 MR. SIESS: What came through to me was a feeling
15 that NRR thought a lot of the codes were good enough to use.
16 Let's get on with using them and quit messing with them. And
17 Research seems to think they all needed a lot more work.

18 Is that an oversimplification?

19 MR. ROSS: I think so, yes. What we have done is,
20 we have frozen in the international code assessments program,
21 we've frozen codes for the next two and a half years for
22 assessment. Otherwise, they'd be assessing a moving target.

23 MR. SIESS: When I read Catton's report from the
24 meeting in Bethesda -- what was it?

25 MR. ROSS: The ICAP meeting in late April?

1 MR. SIESS: Yes.

2 MR. ROSS: That's the first meeting of the code
3 assessment program.

4 MR. SIESS: He had some concerns about freezing,
5 apparently concerns expressed there about freezing codes.

6 MR. ROSS: As a practical matter, they have to be
7 frozen. Otherwise, you can't assess them. I think people
8 misunderstood. If you find an error where the FORTRAN
9 statements had a minus instead of a plus, certainly you have
10 to fix the error. They didn't want to put in another super
11 return to the nuclear boiling model, just because it's more
12 attractive. Otherwise, you wouldn't know how to assess the
13 code.

14 MR. SIESS: Dave Ward is not here yet. But one of
15 the concerns that Catton expressed was that it looked like all
16 the code validation was going to be done by foreign countries,
17 and that we wouldn't be doing any of it. His concern was that
18 the people who use the codes ought to be more involved in
19 this, because it takes a great deal of knowledge and
20 experience to use the codes correctly.

21 MR. ROSS: We're driving the program.

22 MR. SIESS: That was the point. You are chairing
23 it, but everybody else is doing the work.

24 MR. ROSS: I haven't -- that's too oversimplified.
25 It's not quite that way.

1 MR. SIESS: We'll maybe come back to that when Ward
2 is here and ask him. He's knowledgeable on it. But that was
3 just an impression I got.

4 Ivan does make them strong. I won't argue with
5 that.

6 Okay. So you and NRR are in some form of agreement
7 in the thermal hydraulics area and the 14.4 million for the
8 integral facilities sort of concept. It's a need, but just
9 how it's going to be met is not clear.

10 MR. ROSS: That's correct.

11 MR. SIESS: Now another major area recommendation
12 from NRR had to do with the severe accident program, including
13 the part of it that's in reactor operations and risk, which is
14 headed "Severe Accident Risk," and they proposed an 11.4
15 million reduction.

16 MR. ROSS: Under "Accident Evaluation," look at the
17 second line marked "Severe Accident Analysis," the SASA
18 program. We agreed with them.

19 I would like to note that this is a transitional
20 program where codes are being used for specific plant
21 applications. We could have made a reasonable argument that a
22 lot of that work was NRR technical assistance type work
23 anyway.

24 So to the extent that NRR wants to continue the
25 program above our 2 million, they may do it, but we have taken

1 that cut.

2 MR. SIESS: I thought they thought a lot of that
3 should be finished in '86.

4 MR. ROSS: Well, presumably 3.5 million of it will
5 be done in '86. I don't know if they'll be finished or not.

6 MR. SIESS: '86 is cut? That would be --

7 MR. ROSS: If '86 is cut, I would expect SASA to be
8 one of the items to get cut down, probably to the 2 million
9 level in '86. This program, SASA, is a program that is
10 amendable to stretchout, because it's pure analysis.

11 MR. SIESS: What about containment loading? You
12 bought part of that, but not all of it.

13 MR. ROSS: Well, their figure was 5.3. You see
14 under "Research Final" where it is 6.6. So we are a bit apart
15 on that still.

16 MR. SIESS: That's something that will probably be
17 addressed today.

18 MR. ROSS: There are four elements of this. I don't
19 think we'll be through in '86. The four elements in
20 containment loading: hydrogen, fuel coolant interaction,
21 direct heating, and core concrete. At present, we plan to
22 complete the hydrogen portion of containment loading in Fiscal
23 '86, given that we stay at 1.81. And that's not the type of
24 program we stretch out, because it's an experimental program,
25 and the experimenters just can't go sell apples or something

1 while they're waiting for '87 money.

2 We're running, I believe, about a 1.1 million fuel
3 coolant interaction in '86. We promised at least ourselves,
4 and when we look at some of --

5 MR. SIESS: That's under what? "Damaged fuel?"

6 MR. ROSS: That's under "Containment Loading." It's
7 the so-called steam explosion. Depending on how the
8 experiments look next spring, we may decide that we need to
9 continue experiments in '87. It's just premature to suppose
10 that portion of containment loading will be done in '86.

11 The same with poured concrete. I don't know how the
12 research is going to turn out. If it turns out in a certain
13 direction, we may well have to run some more and different
14 tests.

15 MR. SIESS: There is a major item under code
16 development, 3 million difference.

17 Let's take up first ACRR. Where is that in this
18 table? Damaged fuel?

19 MR. ROSS: That is damaged fuel. We have got some
20 guidance, which we agree with, from BRG, that we should do --
21 continue our efforts to expand, and continue the fuel and
22 damage partners program, with the understanding that if we
23 can't get additional foreign support in '87, then we will cut
24 back on ours, also. And we accepted that.

25 So, you see it coming down to 6.3.

1 MR. SIESS: There was a \$3 million difference
2 between the request and NRR. 2 million of that was ACRR.
3 What was the other million?

4 MR. HAYES: Code development.

5 MR. SIESS: Code development. Okay.

6 MR. ROSS: What we need to do now -- in the first
7 place we don't have a good definitive statement from the
8 office as to what I would call the severe accident final code
9 position we would like to be in. But, it goes something like
10 this:

11 The integrated severe accident analyses that will be
12 done -- and by this I mean for a given plant from incipient
13 core damage all the way through to containment release
14 fractions -- will be done with what we call the Battelle
15 Source Term Code Package. It is not all prepared by
16 Battelle-Columbus, but they are assembling it. It also has
17 codes from Sandia, Oak Ridge, PNL. We will probably use that
18 code package for the next 24 months for any plant that we need
19 to analyze a turncase severe accident analysis.

20 There is two parallel codes, code structures or code
21 packages being developed. One, of course, is MELCOR. I think
22 the committee is familiar with that. When MELCOR is
23 available, the Battelle package will be retired. It also is a
24 turnkey. It even has a public risk model built in it. It is
25 a replacement for CRAC, it is the so-called MACCS package. It

1 is part of MELCOR.

2 In parallel there is some separate more detailed
3 codes that are being developed that will certainly be the
4 indexing of the checking code, because they have a lot more
5 of the physics in it than either MELCOR, or the Battelle
6 package. This is contained in MELPROG. The in-vessel
7 coupling, would track to do natural circulation and severe
8 accident and so on.

9 The way we are progressing is that we need both of
10 these parallel tracks. We need much more detailed severe
11 accident analysis models to index to data and to give some
12 belief that MELCOR is telling an approximate version of the
13 truth.

14 What I have just described to you is not written
15 down anywhere, and I think that accounts in part for the NRR's
16 puzzlement and reluctance to get on board the train as it
17 pulls out.

18 MR. KERR: I should add that there is the same
19 puzzlement on the part of the Class 9 Subcommittee and its
20 consultants. There does not seem to us to be very much
21 relationship between MELPROG and MELCOR.

22 MR. ROSS: Okay. There should be, and I think there
23 is. And to that extent we haven't done our job describing
24 it. Just take it as an IOU. We owe it to you.

25 MR. SIESS: What you have been talking about is a

1 combination of code development -- well, you covered ACRR?

2 MR. ROSS: Well, it is covered on a severe accident
3 risk under reactor operations and risk also, the MELCOR part.

4 MR. SIESS: All right. Now --

5 MR. ROSS: And the fission product source term --
6 let's see, where is MELPROG. You will find codes different
7 places. SCADAP is under damaged fuel, and MELPROG -- Marty
8 has a chart with a whole bunch of names, and I am not sure it
9 is worthwhile reading them into the record.

10 What we are working on is to continue the dialogue.
11 I read a draft of it yesterday. There is a bit more narrative
12 on this where are we going and why do we have a two-track
13 system.

14 The underlying feeling behind all of this is that
15 the NRC will be doing severe accident analysis on an audit
16 basis for reactors for the foreseeable future. And it is not
17 over in '87. Some other issue will come up and people will
18 say, I wish I had MELCOR. I wish it were validated against
19 more detailed -- because I have got to run a sample case for
20 Shoreham, or Comanche Peak, or maybe even Carroll County.

21 MR. KERR: One of our problems, for example, is that
22 we were told by the developer of MELPROG that that code would
23 probably never be validated.

24 MR. ROSS: I'm sorry, about the MELCOR?

25 MR. KERR: No, MELPROG.

1 MR. ROSS: In some cases, because --

2 MR. KERR: And hence, to use it to validate MELCOR

3 -- well --

4 MR. ROSS: There are some aspects of MELCOR that
5 cannot be validated, that's correct.

6 MR. KERR: MELPROG.

7 MR. ROSS: MELPROG, I'm sorry. You are talking
8 about what is happening in the lower plenum of a large
9 pressure vessel. We can't do an experiment like that. L

10 MR. KERR: My point was that we were puzzled that
11 one would use a code that could not be validated to validate
12 another code. That is a shorthand description of some of the
13 difficulties that we are having. And, we are willing to
14 listen further.

15 You have say that you voiced more, but up to now at
16 least we don't have enough to be enthusiastic about MELPROG.

17 MR. ROSS: I think, Dr. Kerr, what we are seeing now
18 is an evolution of sorts in Sandia. They are getting very
19 clever at taking what they thought was a very detailed model,
20 which put in MELPROG and they are speeding up the numerics.

21 They can take in many cases, these models, and put
22 them right in MELCOR.

23 The distinction between the two codes is getting
24 narrower. And it could be if you get enough physics in MELCOR
25 you can throw the other one away. That is just, I think, an

1 evolution in research that is nice and --

2 MR. KERR: Indeed, I don't disagree entirely.

3 Although the impression we got was that in a number of cases
4 the MELCOR developers looked at MELPROG and decided that the
5 approach being taken there couldn't work at all, and hence
6 they did an independent development on their own.

7 I mean, for good or ill that seemed to be what was
8 going on in many cases.

9 MR. ROSS: I think we can discuss this and explore
10 it in more detail the next time we meet with the Class 9
11 Subcommittee.

12 MR. SIESS: Let me take a look now at reactor
13 engineering. NRR one major proposed reduction there in the
14 aging, which cut the 10.8 down to 7.3.

15 You accepted all but a half million of that,
16 apparently.

17 MS. MARCUS: We had previously come down.

18 MR. SIESS: Yes, the target had come down. And then
19 you left it at the target. There was just a minor difference
20 there, and I don't consider that very substantive. You had
21 cut back considerable in aging.

22 Now in the other areas where they --

23 MR. OKRENT: Excuse me, can I offer a comment
24 there. I am looking at the NRR memo of May 29, 1985 on the
25 top of page 2, that first full sentence says, "Furthermore, we

1 would like to see by the end of FY 1986 a summary report which
2 presents the results of this study of whether and where
3 equipment aging is a safety problem."

4 It seems to me that is, at a minimum, an
5 incompletely defined statement.

6 At a maximum, it is a request for the impossible.

7 I am not trying to defend any particular budget, but
8 at the moment I can't tell whether NRR's comment is based on,
9 A, they don't think aging is a problem, going to be a problem,
10 therefore we don't have to do any research, or, B, there may
11 be a problem but what research is doing isn't clearly the way
12 to go, or, C, D, E, you fill them in.

13 I'm unable to tell.

14 MR. SIESS: Dave, the beginning of that paragraph
15 says the original question we wanted the research to answer,
16 that is NRR, is whether equipment is a safety problem. And
17 that is what the 1986 -- 1985-86 program is supposed to be
18 addressing. Am I correct?

19 MR. OKRENT: I am saying that is just an impossible
20 request to get answered in 1985 and 1986. If NRR thinks it
21 can be, they are naive.

22 MR. ROSS: Dr. Okrent, what we responded to was as
23 requested. Another memo we will give them at the end of 1986,
24 a summary report based on our initial research. Whatever we
25 know we will tell them.

1 MR. OKRENT: One can always give a summary report
2 based on the research. No argument.

3 MR. ROSS: The problem we had, if you go back to the
4 beginning of that paragraph, the second sentence, the reading,
5 we would like an answer to that question before we commit to a
6 large program, is essentially not possible to do. It is
7 asking the results of the research before you do the
8 research. We just couldn't do that.

9 MR. SIESS: Then you cut your budget.

10 MR. MICHELSON: I have a little difficulty also,
11 because for some reason or other -- and we commented on this
12 before -- research has elected to put a whole lot of cats and
13 dogs in and call it aging, which are little or not at all
14 related to aging. So now I don't know whether it is the cats
15 and dogs you are throwing out, or the good stuff, or what.

16 I think we need a better definition -- 3.5 million
17 is, of course, a lot of money -- of exactly what they intend
18 to cut out.

19 MR. ROSS: Let me tell you --

20 MR. SIESS: Has somebody supplied you with a list of
21 projects?

22 MR. MICHELSON: Not in terms of this \$3.5 million
23 cut. I have a list of all of the projects being worked on,
24 what I thought were being worked on, yes.

25 MR. SIESS: What, 1985?

1 MR. MICHELSON: 1987 -- well, for 1986.

2 MR. ROSS: Carl, what we told them, we would stretch
3 out -- and this is amenable to stretch out -- the in situ
4 monitoring and testing at operating plants.

5 MR. MICHELSON: In situ testing of valves, I assume
6 that means?

7 MR. ROSS: You probably heard from Jed Bore and
8 Billy Morris trying to get prefailure signatures.

9 MR. MICHELSON: Yes, that is probably the most
10 important single piece of work. That is already being
11 stretched out from 1986. Now you are stretching it out
12 beyond --

13 MR. ROSS: Then the subcommittee can comment.

14 MR. MICHELSON: You will never get to it.

15 MR. OKRENT: How are you supposed to get these
16 prefailure signatures?

17 MR. ROSS: Dr. Okrent, I read a description on how
18 they did it.

19 MR. OKRENT: They, who?

20 MR. ROSS: I can only give you a partial answer.

21 Maybe you look at time to stroke for a valve. You
22 see, is gradual degradation as a sign of incipient failure.
23 But, you have to attach, if you would, an instrument
24 stethoscope that can see things as they should work, and then
25 as they shouldn't work.

1 Remember, OR used to put in noise diagnostics for
2 incipient failure like an in core vibration. I don't know how
3 much noise analysis is involved here, but I would think they
4 would be using that also.

5 I don't have any details on it.

6 MR. MICHELSON: This is not noise analysis, this is
7 primarily using a piece of equipment that has already been
8 developed and now they are going out into the plants and
9 finding out how some of these valves perform.

10 Also, of course, they are trying to validate the
11 equipment that was developed, to see whether it really works.

12 MR. OKRENT: What I am curious about is why there
13 doesn't seem to be in the U.S., a program like that being
14 pursued at I think what are relatively modest terms, compared
15 to \$6 million, in West Germany on trying to get signatures
16 using both acoustic and, I'll call it electronic and tronic
17 needs originally, and then as the plant progresses.

18 Now, that doesn't pick up all kinds of aging, but it
19 picks up certain kinds of changes in a rotational pattern or
20 vibrations and so forth.

21 And I don't see any sign of anything like that.

22 MR. ROSS: If you recall -- in fact, it was sort of
23 a -- it wasn't really an armtwisting, but sort of coincident
24 with Sequoyah's getting an operating license, they agreed to
25 put in an experimental device on their plant for a couple of

1 years, which we sort of hooked up -- it was strictly a noise
2 analysis pattern, or something.

3 See, at startup -- the first couple of years of
4 running the plant, you could get failure patterns; and then
5 you do some cross correlations say of reactor pressure with
6 neutron noise and that sort of thing.

7 But I believe that instrument was taken out. It was
8 a one-time deal. It is the kind of thing I think every
9 operating plant would benefit from having. But it just didn't
10 turn out that way.

11 MR. OKRENT: I think you are answering a research
12 questions.

13 MR. SIESS: I think we are having a very fine
14 discussion that would be the basis for a good reactor research
15 letter on the aging program.

16 But, I would like to hear from Zoltan to respond to
17 either Okrent or on the question of what they would like to
18 get.

19 MR. ROSZTOCZY: Zoltan Rosztoczy, NRR.

20 As was mentioned earlier, our original question was
21 to the aging program, was to see whether aging is a safety
22 question; which areas is it a safety question. And then, what
23 can be done, what can be learned about it through research
24 programs.

25 As a result of this an aging program was

1 started. And, as Mr. Michelson mentioned, it is used as a
2 rather broad name for covering different types of programs.

3 In the first year basically they studied what can be
4 done, or what kind of a program is needed. And then they
5 developed a larger program. Not a lot has been accomplished
6 yet. But the projection is that the program is going to
7 grow. And from 1986 to 1987 we will go up a large amount
8 again.

9 The 1987 program, to a large extent is not
10 established in detail yet, so people don't know yet exactly
11 what they will be doing.

12 Now, our main thinking is that we would like to have
13 an answer to the original question, under what circumstances
14 is aging a safety problem appropriate for the government to
15 worry about?

16 It is our expectation that for the equipment which
17 is basically in mild environments, the environment does not
18 change as a result of accident, it stays the same, for those
19 aging is probably not a safety problem.

20 The failure of individual items, random failure of
21 individual equipment is going on during the operation of the
22 plant. That is something. If one piece of equipment fails,
23 then it gets replaced. And it probably does not represent a
24 safety problem, so there is need for government-supported
25 research in that area.

1 On the other hand, the equipment which is in the
2 harsh environment, it might be appropriate to conduct an aging
3 research program in that area.

4 However, the work that needs to be done for that
5 type of equipment is different than the work we would do for
6 the other one, which is in the mild environment.

7 So, until we have an answer to the first question,
8 it would be difficult to focus on the problem that needs to be
9 resolved. And that is why we are trying to force some kind of
10 response. The problem is probably not as simple as I just
11 described it. It is probably more complex.

12 There will be exceptions, there will be some
13 equipment even in the mild which maybe needs to be looked at.
14 And, maybe not everything needs to be looked at in the harsh.
15 But, nevertheless, by addressing the question hopefully we can
16 develop a good program that would be useful, and that would be
17 helpful to us in the future.

18 We think that the presently projected in the latest
19 column, the presently projected expenditures should be over 7
20 million for this in 1987 -- it is still significantly higher
21 than in any previous years -- would be appropriate for that
22 purpose.

23 MR. SIESS: Gentlemen, aging is budgeted at 5.6
24 million for 1986, and in the Staff's optimistic request, they
25 proposed almost doubling that to 10.8. They cut that back to

1 7.8, which is still 30 or 40 percent increase over 1986, and
2 that is where it stands now.

3 If we don't think that is adequate for what might
4 come up in a year and a half from now, we can certainly tell
5 the Commission that. They should be planning to spend 10
6 million or more in 1987 instead of 7.8.

7 If we do want to make such a statement, we have to
8 think in terms of priorities, because in my opinion, the
9 bottom line of 128 million is not realistic, and we have got
10 to be prepared to tell what to take it from.

11 MR. MICHELSON: I would like to strongly recommend
12 that they break down this plant aging into what it really
13 consists of, and only a portion of that program is what I
14 think Zoltan is talking as aging.

15 And yet, research repeatedly refuses to break this
16 thing down. Rather they keep adding programs which, in many
17 respects, are not at all related to the problem.

18 MR. SIESS: Well, we can make all kinds of comments
19 to the Commission. One can relate to the level of funding for
20 1987, the other can relate to what they do with that level of
21 funding.

22 MR. MICHELSON: A major element, in my opinion at
23 least, and what has been put into this program, is what I call
24 a reliability assurance, which is not necessarily aging
25 effects, although aging does have an effect on reliability.

1 MR. SIESS: At this point, what do you think about
2 the budget level?

3 See, we can say the budget level is adequate, but
4 they ought to be doing something different.

5 MR. MICHELSON: No, I don't -- this 3.5 million cut
6 may even be acceptable, depending on where it is coming from.
7 It is not at all clear what it is coming out of.

8 MR. SIESS: Before 3:30 Saturday, we have got to
9 come up with some words. And there are two areas we can
10 comment on.

11 One is the level of funding, and the other is what
12 they do with the budget in the program. And they are not
13 unrelated. But, it is probably easier to focus on the program
14 aspects than the money this far in advance. So, be thinking
15 about --

16 MR. MICHELSON: For instance, I think over \$1
17 million of that is tied up in this examination of the
18 metallurgy of cast stainless steel out of Shippingport and
19 perhaps other places.

20 But you know, that -- it is an aging effect,
21 certainly, but it is an entirely different effect than what
22 happens to valves when they are maladjusted and whatever.

23 MR. ROSS: I'm going to ask a procedural question.
24 If you like -- and I am getting a feeling you would -- a
25 little more discussion on the content; in other words,

1 suppose you asked Arlotto, the gift he just gave you, the 7.8
2 million for 1987 in plant aging, what are you going to do with
3 the money?

4 Do you want that -- because I can get somebody down
5 here early afternoon.

6 MR. SIESS: I have a better suggestion. If you can
7 get somebody down here that can take the list of some kind and
8 go over it with Carl -- Not the whole committee.

9 MR. ROSS: When, Carl?

10 MR. MICHELSON: Any time. I am only here for this
11 first discussion. So, any time today I will be available.
12 What has happened here --

13 MR. WYLIE: We reviewed their total program before
14 the \$3 million cut.

15 MR. SIESS: You reviewed the program. You have some
16 ideas on it. If they know what the 3 million cut is, they can
17 tell you. If you think it is wrong --

18 MR. ROSS: Okay, fine.

19 MR. SIESS: I'd rather do it at that level, because
20 most of the expertise is over there. Taking into account what
21 Okrent said, it is awful hard to reach a decision in a year,
22 but it is really -- you know, planning a program two years
23 in advance, the main object of the game as far as these guys
24 are concerned, is to see that there is going to be some money
25 available.

1 MR. WYLIE: I might also comment -- Zoltan might
2 want to expand on this -- but it is a question Dr. Okrent
3 asked about the German programs.

4 It is my understanding that once the need had been
5 identified, that they had requested, NRR had requested in the
6 safety issues, then the next step in the future was to
7 determine a means of monitoring and detecting the failures as
8 the German program apparently is aimed at.

9 MR. OKRENT: I don't know what NRR is requesting.
10 But, there is a small group of, I think three or four people
11 in the research lab at Garmisch, Germany, that are working on a
12 few different methods of trying to detect, if you will,
13 changes in behavior.

14 And they are doing various kinds of correlations as
15 well as trying to get direct measurement by a noise
16 detector. You know, that is the simplest one.

17 And they gave a few examples of a prefailure of a
18 pump and so forth that they, in fact, were able to detect and
19 so that the licensee knew where to go in the next shutdown to
20 do some real preventative maintenance kind of stuff.

21 That is one kind of aging prevention. I am not
22 proposing that instead of looking at how cast stainless steel
23 ages. That is a different thing and you have to look at that
24 differently.

25 MR. ROSS: It was my understanding that the

1 long-range objective was, once the safety issues had been
2 identified as to which ones affect safety, then they were to
3 look at means of detecting anticipatory failures.

4 MR. OKRENT: That definition of which one affects
5 safety, that is a -- any transient, you could argue, is a
6 safety threat.

7 MR. ROSS: Well, for example, cables. Just the
8 aging of cables, how do you detect those?

9 MR. OKRENT: They will age in what is called a mild
10 environment, as far as I know. You only need oxygen.

11 MR. ROSS: Sure.

12 MR. MICHELSON: As the budget has been protected,
13 yet, the kind of work you are describing, Dr. Okrent, was
14 intended at least for motor-operated valves.

15 The work on pumps is where noise analysis becomes
16 much more of a valuable technique, is I think further down the
17 road.

18 The valve work is the part we are trying to protect
19 first as being one of the more important problems. And I want
20 to make sure that it is still protected, or if not, why not.

21 MR. OKRENT: I wasn't trying to propose any
22 priorities. I just had a problem with this rather cryptic
23 sentence in the NRR review. I tried to indicate why.

24 MR. SIESS: All right, now, other areas under
25 reactor engineering.

1 NRR had proposed two areas to stretch out. And
2 apparently you have been able to avoid those stretchouts for
3 staying within the BRG mark.

4 Is that the way you look at it, Denny?

5 Seismic margins are set to be cut a half million
6 dollars, and the other, reactor vessels and NDE, six-tenths in
7 one case, and four-tenths in the other. And what is left
8 would be at target level.

9 Those were just proposed stretches, they weren't
10 disagreements on the --

11 MR. OKRENT: Can I ask a question?

12 MR. SIESS: Go ahead.

13 MR. OKRENT: What is there about reactor vessel
14 behavior that makes the NRC safety research group think they
15 still need to spend \$8- or \$9 million a year indefinitely?

16 MR. ROSS: I think the so-called HSST program -- the
17 line item on reactor vessels is \$8- to \$9 million. I think it
18 is about \$5- or \$6 million at Oak Ridge with the successor of
19 the HSST program.

20 They are still -- we are still gathering data on the
21 initial flaw characterization, preservice flaw. There are
22 some assumptions that went into the vessel failure
23 calculations about flaw density.

24 We are only recently, in the last month or two,
25 beginning to get some thick Beltline specimens of vessels that

1 were ordered but never used, like Hope Creek Unit 2. And
2 Combustions had some vessel they built and they had no use
3 for.

4 Initial flaw characterization is one. There is a
5 concern on loss of upper shelf toughness, for which additional
6 regulation may be necessary. And they are still gathering data
7 on that.

8 MR. OKRENT: Excuse me, that seems to me to have to
9 be specific to the -- it is almost a plant-by-plant,
10 weld-by-weld question, isn't it?

11 MR. ROSS: I think this is -- I don't know if it is
12 that specific or not. They have -- I keep saying "they."
13 When I say "they," I am referring to Oak Ridge and a company
14 called MBA.

15 MR. OKRENT: Well, different plants have different
16 compositions in their welds, and different welds have
17 different fluences and so forth. And we don't know very well
18 the composition in the weld. It is inferred, and in some
19 cases we don't even have -- it is doubly or blindly inferred,
20 or whatever you want to say.

21 MR. ROSS: Agreed. And some plants are beginning
22 now, on the basis of their own surveillance testing, to
23 approach the magic figure of 50 foot pounds upper shelf
24 toughness.

25 And when you get below that, you have got to do some

1 work that is not well described in regulatory specs. You have
2 got to do some detailed elastic plastic fracture analyses, and
3 the agency may well have to develop a new Regulatory Guide on
4 how to do this. They may have to review and approve methods
5 that aren't yet in existence.

6 There would be an opportunity to explore this, I
7 guess with Professor Shimon's committee in more detail
8 sometime this summer, because we are coming down with Rev 2 to
9 Reg Guide 199, which gets half of the problem. It gets the
10 shift in MBT because of the high copper. It does not all
11 address the problem that is just now surfacing with loss of
12 upper shelf toughness.

13 Some of our research needs to be continued in that
14 area on what it means in terms of safety.

15 MR. OKRENT: Well, it would seem to me that that is
16 a problem that some owners' group really needs to address with
17 their money.

18 MR. ROSS: It could almost make a statement about --

19 MR. OKRENT: Seriously.

20 MR. ROSS: You know, that is a generic type concern
21 about a lot of things we do. I think in terms of equipment
22 qualification you might make the same observation. Of course,
23 they do some -- I mean in terms of aging. And, even in terms
24 of plant life extension, you could make an argument that maybe
25 the NRC doesn't need to do anything.

1 But I think the facts are in this area, that the NRC
2 is -- historically the AEC has been the technical leader. If
3 someone else did the work then we probably would do less.

4 MR. OKRENT: In fact, one of the problems is the
5 NRC, you say, is the technical leader instead of the critical
6 evaluator.

7 MR. SIESS: They wouldn't have any ability to
8 critically evaluate if they didn't have --

9 MR. OKRENT: What they are really saying, on PTS
10 they set a proposed standard, and I think -- in any event, I
11 am finding it rather blurry as to how you decide that a
12 problem belongs to the licensee or to the licensee.

13 MR. SIESS: So what else is new, Dave?

14 MR. ROSS: Wait a minute. I think there is some
15 information. Remember, when we started the meeting I
16 mentioned that Dr. Sato and I each had philosophical papers on
17 this very point. And it may be that if Dr. Okrent has a
18 chance to look at these two, the dialogue can continue
19 somewhere else.

20 MR. SIESS: It will continue.

21 MR. ROSS: Because, we certainly addressed that very
22 point.

23 MR. SIESS: Let me make a point that has been made.

24 The HSST program has been cited as probably the
25 best example of a base program that has paid off in the sense

1 that it has provided answers to questions, sometimes before
2 they have even been raised.

3 Now, the arguments for that says, by having the
4 answers we were able to continue operating plants and not have
5 to shut them down while we got the answers. Which I think you
6 could use as an argument for the industry supporting the HSST
7 program, because they benefit by not being shut down.

8 Of course, that makes the public also benefit by not
9 being shut down, but not from a safety point of view.

10 I guess one problem is whether the industry would
11 support the HSST program if the NRC didn't, and then they
12 would have to be shut down.

13 But, you know, it is a legitimate question, what
14 should NRC do, what should the industry do?

15 MR. ROSS: So long as you throw in DOE, then I will
16 agree.

17 MR. SIESS: Well, DOE ought to be doing, but again
18 that is an old story.

19 MR. ROSS: Well, I am perfectly willing to --

20 MR. SIESS: The NRC does not support everything that
21 is being done in that area. There is a lot of fracture
22 mechanics type work that is being done in universities,
23 probably supported by NSF or other places. HSST is one
24 program that goes beyond the nuclear field and draws heavily
25 on a lot of academic research, good stuff that is out there.

1 But the question of who should be doing it, we could
2 go right down the list. If NRC can ask the right questions
3 and somebody else can get the answers, then NRC has to do
4 something to believe them. NRC has to do something to know
5 what questions to ask and to know when they get a good
6 answer. And it is awfully hard to draw the line between what
7 they have to do to accomplish those two things, and what
8 somebody else has to do to get the answers.

9 That's what makes it complicated.

10 MR. OKRENT: It seems to me that just developing a
11 research program such that they can write a Regulatory Guide,
12 which is different from developing a research program so you
13 know what questions to ask and so that you can evaluate a
14 proposed resolution.

15 MR. ROSS: I didn't give you a complete list of what
16 we would do for the 8.9 million, mainly because I don't know
17 what it is. I don't have it with me.

18 MR. OKRENT: I am probably more familiar with it,
19 than you are.

20 I am just teasing you a little bit.

21 MR. ROSS: It is good work.

22 MR. OKRENT: I'm making a joke, if you understand.

23 MR. SIESS: We are not challenging the work. I
24 think it is good work.

25 Okay. Now we are still talking a little bit about

1 NRR. Did you get any feedback from NMSS?

2 MR. ROSS: No. I think they are going to comment
3 when they meet with the BRG.

4 MR. SIESS: Now NRR had something they wanted added
5 to the division of everything else. What was it?

6 MR. ROSZTOCZY: Health effects.

7 MR. SIESS: Half a million dollars for something.

8 MR. ROSZTOCZY: Yes, it was a half a million dollars
9 on that. Waste management, earth science and health effects.
10 It is under the subheading of health effects.

11 MR. SIESS: NRR asked for a half million dollars
12 more in health effects. And the BRG mark put in 200,000 more.
13 And then somewhere it went back down.

14 Dr. Moeller would be interested in the history of
15 that, I think.

16 MR. ROSS: Okay. What we think we need to do is
17 discuss more with NRR what we are doing in this area. And
18 then, the expectation is that if the work really needs to be
19 done, and it may not be true regulatory research. So it has
20 gone back down to the column marked "target" and the dialogue
21 will now have to take place in the next few days. It is
22 between the specialty branches in each office.

23 MR. SIESS: Just to understand the process, the last
24 column, typed column, 6/3 BRG was what you got back from BRG?

25 MR. ROSS: Informally, yes.

1 MR. SIESS: So they told you to increase it by
2 200,000 over what you had requested?

3 Was that in response to NRR?

4 MS. MARCUS: Yes.

5 MR. HAYES: Yes.

6 MR. SIESS: And the handwritten column is some
7 adjustments you are making --

8 MR. ROSS: The meeting that we may tell NRR through
9 discussions, either the answers and what they are looking for,
10 or if it is not there is a better way to get it that doesn't
11 involve NRC looking at it.

12 MR. SIESS: Now we have been looking at the NRR
13 comments and your responses.

14 At this point would you like to summarize where you
15 stand with NRR and then let us hear from Zoltan, and then let
16 the members comment or question either one of you. Would that
17 be a satisfactory procedure?

18 MR. ROSS: What we have to do in the next few days
19 with NRR is -- they will have in hand the composite of the 6/3
20 BRG column and the research final column. What we will do is,
21 we will make one column out of that. So, we will tell NRR
22 that this is what we want to go back to BRG with.

23 And in light of the 128.5 million mark, which is a
24 quasi mark, if you would, what are NRR's final comments on how
25 we have resolved the differences.

1 We need to have this discussion in the next three or
2 four days.

3 I think there will probably be two or three major
4 areas where we need to sharpen our discussion. I don't think
5 we have differences on integral testing, but we have to write
6 out what it is we are going to do. That is one area we have
7 to focus on.

8 MR. SIESS: Do the handwritten figures bear on the
9 discussion between you and NRR?

10 MS. MARCUS: Yes.

11 MR. ROSS: Yes, sure.

12 MR. SIESS: Then you have got to mention what they
13 mean.

14 MR. ROSS: If we go down to the first one --

15 MR. SIESS: Essentially you have gone back up to
16 their full figure?

17 MR. ROSS: -- MIST, BRG said try to get
18 participation. We will have to describe to what extent we can
19 or cannot do that. And this will depend on the optimism of
20 the viewer.

21 MR. SIESS: And you write a budget on the assumption
22 that you can't.

23 MR. ROSS: That we cannot. Remaining moderately
24 optimistic that we can.

25 So, we have to write that up. We will have to tell

1 them, although there is no technical difference, what we are
2 going to do in the next three months on integral testing.
3 That is not a handwritten note, but I want to call that out as
4 needing further NRR coordination, because the different
5 options --

6 MR. SIESS: Okay.

7 MR. ROSS: Okay. If you go to the next one, damaged
8 fuel, you are only a million dollars apart, and it is sort of
9 a compromise amongst all the parties. And it has to do with
10 getting foreign participation.

11 I don't think we will have any difficulty, but we
12 have got to broker that one.

13 MR. SIESS: BRG in effect said to take a million out
14 of that, not three million. And you have taken another
15 million below what they told you to take --

16 MR. ROSS: And it is based on --

17 MR. SIESS: -- to what, to counter the MIST figure?

18 MR. ROSS: On aggressive foreign settlement. A more
19 aggressive posture that if we can't get foreign participation
20 we just wouldn't do it.

21 MR. SIESS: Is that million reduction there to
22 offset the million increase in MIST, or was it arrived at
23 separately?

24 MS. MARCUS: It was arrived at separately.

25 MR. KERR: That particular item also includes

1 funding for a good bit of code development, doesn't it if I
2 interpret NRR's comments correctly?

3 MR. ROSS: Yes. The code. It is the experimental
4 work in ACRR. If we can't aggressively get foreign funding,
5 we will just not do it. We will not do as much.

6 MR. KERR: But the 3 million cut that NRR proposed
7 on page 4 of their comments, as I understand, to which there
8 is tied a recommendation of a 3 million cut, discussed
9 the relationship between MELPROG and MELCOR.

10 MR. ROSS: That's the other area, Dr. Kerr, that we
11 have got to settle with.

12 MR. SIESS: Is it this line?

13 MR. ROSS: Damaged fuel, source term and severe
14 accident risk. All three of those lines is the same common
15 code theory and we have got to get that settled in the next
16 few days.

17 I don't think there is enough on containment loading
18 -- well, I guess -- I think we are going to have to have sub
19 sub units on containment loading and tell NRR what are the
20 four major projects that we would do for the 6.6 million.

21 So we can break out what areas they think are less
22 important. I don't think we have done enough of that.

23 In some cases, the FIN numbers that they listed, I
24 think, weren't quite congruent with what we had in mind, so
25 some more detail work has got to be done.

1 MR. OKRENT: If I wanted to look into the research
2 program and say which of the FINs, if they are done, with
3 provide the information that would enable the Staff to develop
4 a containment performance criterion, could I find such FINs?

5 MR. SIESS: Containment integrity?

6 MR. OKRENT: Performance given a severe accident --

7 MR. SIESS: I understand the question. That is
8 under containment integrity, Dave.

9 MR. OKRENT: I know there's work on containment
10 integrity, but that wasn't my question.

11 MR. SIESS: You asked which FINs and I think you
12 would find them under --

13 MR. OKRENT: They are inadequate to do the whole
14 job. They are only part of the question.

15 MR. KERR: They are really not aimed primarily at
16 developing criteria. They are aimed at understanding
17 performance of existing containment.

18 MR. SIESS: Wouldn't that be the first step, then,
19 in developing criteria?

20 MR. KERR: Not necessarily.

21 MR. ROSS: I think the qualifications of electrical
22 penetration should be part of the answer. Given a severe
23 accident, will electrical penetration blow out or what?

24 MR. KERR: I agree, you need that information to
25 know whether they can meet criteria, but I don't think you

1 need to understand in detail how all containments perform
2 before you develop a containment criteria.

3 MR. ROSS: I think the answer -- it would be
4 difficult --

5 MR. SIESS: Unless you are willing to shut down
6 three-fourths of the plants, I think you'd want to be able to
7 develop criteria capable of being --

8 MR. ROSS: I don't think we can do in a
9 semi-automatic way like a keyword search.

10 MR. OKRENT: What bothers me is I doubt very much if
11 anyone said, let's say that one of the goals of our research
12 program -- to generate the information that would enable us to
13 develop a containment performance criteria, should the
14 Commissioners want one. And if we do these things, we will
15 have it. Because we are told now that they don't have quite
16 enough or nearly enough or whatever is the right adverb,
17 information to establish such a criterion.

18 MR. SIESS: Are you talking about what Tom Murley
19 told us?

20 MR. OKRENT: Yes.

21 MR. SIESS: He was saying we don't have enough
22 information about performance.

23 MR. OKRENT: Sure he was. Of course. But
24 performance under what conditions? You have to go back a step
25 in order to define performance, you have to know what

1 challenges and so forth. So it is a somewhat complex
2 undertaking. At the moment I am trying to see, in fact, if
3 NRR Office of Research has a program where this is a question
4 to be answered.

5 MR. SIESS: I am trying to understand you, Dave. I
6 know Denny is. That paper by the New York Power Authority, I
7 think you've got a copy of it that you sent out after the last
8 I&E that looks at consequences from some of the severe
9 accidents, assuming various size leak rates in containments.
10 That comes up with a conclusion that if you can provide
11 assurance of 10 to the minus 3 level that you won't have a
12 large leak, that something probably greater than 25 percent in
13 volume per day, that consequences of the severe accident,
14 would they be the same or should they become negligible?

15 This, to me, is an attempt to attain a performance
16 criteria in terms of a leakage.

17 MR. OKRENT: It's only one aspect.

18 MR. SIESS: It is, but is that the kind of thing you
19 are talking about?

20 MR. OKRENT: It's one aspect.

21 MR. SIESS: Give me an example of another aspect.

22 MR. OKRENT: Well, you take your list of scenarios
23 that lead to severe core damage or core melt, because either
24 can threaten containment integrity, and going up or down to
25 some frequency cutoff which is a pretty low frequency cutoff,

1 and then you examine containment performance in terms of each
2 of these scenarios and now 99 percent or 95 percent of the
3 time you release hardly anything more than the noble gases.
4 That would be a containment performance criteria.

5 MR. SIESS: But you'd have to have containment
6 performance data. You'd have to know something about --

7 MR. ROSS: Let me respond in part --

8 MR. KERR: No, you would not have to have
9 containment performance data to set that as a criterion. It
10 might not make sense to do it.

11 MR. SIESS: Dave says you go through a scenario and
12 see what's released. How do you know what's released?

13 MR. KERR: What's released into containment.

14 MR. SIESS: Oh, in the containment.

15 MR. KERR: That's what the loading is.

16 MR. ROSS: Let me at least describe in part what we
17 are doing. I think a fair summary is we don't have an
18 integrated task to do what you just said. We have, if you'll
19 pardon the expression, bits and pieces. We are looking at
20 five reference plants at about five to 10 sequences per plant,
21 the containment event trees for each sequence.

22 So suppose you say it's Surry in a station blackout,
23 we're producing one table for that sequence for that plant,
24 and it has as columns, pessimistic, central and optimistic,
25 and roles, containment failure modes.

1 MR. SIESS: Leak rates.

2 MR. ROSS: No, no, conditional probability of a
3 stipulated containment failure mode.

4 MR. SIESS: What do you mean by containment failure?

5 MR. ROSS: The roles in this, the first one is it
6 doesn't fail at all. That's a nonfailure. It means a leak
7 anywhere from zero to very big, and top and bottom and
8 containment bypass.

9 MR. SIESS: Do you put that in at various times,
10 various places, various temperatures?

11 MR. ROSS: Yes. Now with each one of these failure
12 modes, there's an associated range of probabilities.

13 Furthermore, for each failure mode, there is a group
14 by group containment available for release from containment
15 fraction of the core inventory in isotopes bent.

16 So that sort of evaluates containment performance in
17 a variety of ways for a group of reference plants. What it
18 does not do, and it's something we have been doing in
19 connection with Appendix J, is try to come up with some
20 acceptance criteria for which of these failure modes are
21 acceptable and why.

22 MR. SIESS: Okay.

23 MR. ROSS: This is basic information. One could
24 derive a containment performance from it, but we don't have a
25 task leader that says your job is to develop a containment

1 performance criteria, what do you need, what are you tools.

2 MR. SIESS: You ought to, because everything you
3 write about severe accidents says the consequence of a severe
4 accident is highly dependent on the behavior of containment.

5 MR. ROSS: Yes.

6 MR. SIESS: So there ought to be somebody looking at
7 everything you are doing and saying what does this mean in
8 terms of containment.

9 MR. ROSS: That we are doing, but what's the speed
10 limit? See, we're coming up with information. Now from that
11 one could say, well, I'm going to stipulate now a speed limit
12 that 1 percent of the time or .1 percent of the time I don't
13 kill anybody or something. I think that's really what you're
14 looking for.

15 MR. SIESS: You're not saying it, though.

16 MR. ROSZTOCZY: We do have a program which
17 eventually is supposed to provide that information as part of
18 the implementation, severe accident implementation program.
19 Research program will provide the plant evaluation, as Denny
20 described, and based on those plant evaluations, based on a
21 similar set of plant evaluation from each core from the
22 industry, and based on the industry's evaluation of what kind
23 of requirements should be placed both on prevention and
24 protection, we are going to give guidelines along the lines
25 that have been described by Mr. Okrent and yourself.

1 MR. ROSS: Zoltan, is that what you are going to
2 describe to the subcommittee on August 2?

3 MR. ROSZTOCZY: That's correct, there is a
4 subcommittee set up and it will be described in some details
5 what they are planning to do.

6 DR. SIESS: Subcommittee meeting on August 2?
7 Professor Kerr. Okay.

8 MR. OKRENT: This statement is interesting, but what
9 I haven't heard is whether the research program is being
10 focused on that information relevant to trying to establish
11 such a criterion, is consciously being identified, and efforts
12 are being made to gather it. Because what you cited were
13 certain parts of the program, but you didn't say these are the
14 necessary and sufficient parts.

15 Now if you want to tell me that those are the
16 necessary and sufficient parts, I can choose to challenge or
17 not your statement, but you haven't made that statement.

18 MR. ROSS: Dr. Okrent, why don't you take an IOU?
19 Let us search our FIN list and make such an assertion. Then
20 you can challenge it from a list we have to give you.

21 MR. ROSZTOCZY: Dr. Okrent, you are correct. That
22 part hasn't been done yet and we are, I think, approaching
23 that point.

24 One of the next steps, what we will see in the near
25 future, is that research is going to spell out what

1 information will be presented in the reports, in the final
2 reports on the individual plants, and we will look at that
3 carefully to see if all the information that would be needed
4 for this effort will be in those reports.

5 If it appears that some is missing, that will be
6 identified in the relatively near future, like within the next
7 three or four months, and then hopefully the program will be
8 adjusted for that.

9 MR. SIESS: It seems to me this is especially
10 important because these programs may show you some of the
11 uncertainties of the source term are not important. We are
12 spending a lot more money on the uncertainties of the source
13 term than you are at looking at what the containment ought to
14 do.

15 Bill, is that meeting August 1 or August 2?

16 MR. KERR: I think it was recently changed to August
17 2.

18 MR. SIESS: Forrest, you want to change the one in
19 August from July 30th?

20 Have you finished your discussion on how you stand?
21 I think you stand with NRR, right?

22 MR. ROSS: Dr. Marcus reminds me apparently we don't
23 have any severe problem or maybe don't even have a minor
24 problem with NMSS.

25 MR. SIESS: Zoltan, would you like to add something

1 to this discussion?

2 MR. ROSZTOCZY: Yes, Mr. Chairman, I would like to
3 make a general comment and then sum up where we stand with RES
4 right now.

5 Our general comment is that the budget we have
6 received for review was over the EDO guidance, was I think 14
7 million over. So we were asked to look carefully at the
8 budget and identify areas where this 14 million cut can be
9 possibly taken.

10 We went out to our divisions, we asked them to look
11 carefully at every part of the research program, and identify
12 any item that is either not necessary or can be delayed or
13 some other recommendation can be made instead, so it can be
14 removed from the budget.

15 When we got back the responses and we put it
16 together, it ended up to be more than the 14 million. I think
17 it was more like 19 million instead of the 14 million. We
18 provided all these comments for research, not with the idea
19 that it has to be cut down to the 124 level, but more of
20 identifying the lower priority items where possible cuts can
21 be taken.

22 So the fact that some of this has been added back,
23 that's perfectly agreeable to us. It was not the intent to
24 keep it at that lower level. If we look at the individual
25 areas that by now I think we are in agreement with research in

1 all but three areas, there are only three items left where
2 some further discussion is needed, and everything else has
3 been resolved.

4 The three items are -- I think you already hit on
5 two of them and there is one more. One of them is the health
6 effects where we have asked for this half million which is
7 physically two small programs that we feel we need and should
8 be accomplished.

9 The budget committee put back money for one of them
10 and indicated that we should work with research and see if
11 within the existing budget the second one might be
12 accomplished, too. So we intend to talk to research and see
13 what can be done on those two small items. The two together
14 was only half a million. So we are not talking about large
15 money. The hand mark on today's sheet shows 2.2, which will
16 make it a little bit harder to accommodate, but let us work
17 with research, and we too would like to see both of those
18 tests done.

19 The second area is an item which has not been
20 discussed with research yet. I think you have to look at
21 probably a different -- no, you can see it on this sheet.
22 It's under earth sciences. The Budget Committee number is 5.5
23 million, and ours is 6.2 million. There have been 0.7 million
24 cut in this area that research recommended, and the Budget
25 Committee went along with that 0.7 million cut.

1 This was again for two tests, but what we have asked
2 for previously, it was in the original budget that we
3 reviewed. We would like to reinstate this 0.7 million. It's
4 one for hydrology and one for metallurgy. The hydrology
5 relates to flooding, flooding types of events and flooding.

6 The metallurgy relates to the release of
7 nonradioactive gases, accidental release of nonradioactive
8 gases.

9 Both of them are needed in support of our licensing
10 effort, as well as risk evaluation. So we would like that .7
11 back. That's the second area that we intend to discuss with
12 research.

13 MR. OKRENT: Can I ask a question? Is there flood
14 probability analysis anywhere in the research budget as
15 research is proposing it?

16 MR. ROSS: I don't think so, Dr. Okrent.

17 MR. SIESS: No.

18 Gentlemen, thank you very much.

19 MR. ROSZTOCZY: I still have a third one. These
20 were two on it, and there's a third one.

21 The third one you have already discussed. It was
22 the codes related to the severe accidents. As Denny
23 described, the research plan is to develop and -- to continue
24 to develop and verify two sets of codes.

25 Our understanding was after an initial period that

1 we are in right now, eventually it would be a single code or
2 single set of codes that we would be working with that would
3 be sufficient to verify and develop further only that single
4 set.

5 So our comments went in that direction, and the
6 difference was 3 million. We still feel that some can be
7 saved in that area and we certainly would like to discuss with
8 research the need for developing two sets of severe accident
9 type of codes in the long run.

10 MR. MOELLER: Would you say again, Zoltan, in health
11 effects what it is you want?

12 MR. SIESS: It's in the report.

13 MR. MOELLER: Okay, I'll look at it.

14 MR. ROSZTOCZY: You can find it in our comments.
15 There are two items. One was related to a data system for the
16 information coming in from the operating plants, so we can
17 differentiate and recognize, for example, if a given function
18 -- this relates to the ALARA principle -- if a given function
19 like a maintenance function in a given plant is done with a
20 certain amount of irradiation, and the same plant accomplishes
21 the same thing, maybe 10 times as much, then it would be
22 obvious from the system that that type of data is coming in.

23 The second one was related to discussion associated
24 with the use of respirators.

25 MR. MOELLER: Thank you.

1 MR. SIESS: Gentlemen, what we haven't done, and
2 what I propose to do next, last month what we were looking at
3 was the second column -- that is, the first column under '87.
4 That number has been reduced now from 143.7 down to 128.6. We
5 have been looking at the NRR inspired changes. But there are
6 significant changes between what we looked at last month and
7 what we are looking at this month in a number of areas.

8 One, a not very large one, but a significant one, is
9 the flood research. There were a lot of other changes that
10 were made getting from 143 down.

11 Now cuts have been made in the areas that were
12 discussed a lot last month, the hard items. I propose we take
13 a break, then we come back and talk about the major changes
14 between the 143 and the 128.

15 MR. HAYES: That research did.

16 MR. SIESS: How you got from the first column to the
17 last column, from NRR-inspired, some NRR agrees with, some
18 they don't.

19 [Recess.]

20 MR. SIESS: What I would like to do, gentlemen and
21 ladies, is have the Staff tell us how they got from last month
22 to this month, and if there are any questions before that --
23 do you have a question on that subject?

24 MR. OKRENT: I have a general question of the
25 committee.

1 MR. SIESS: General question? Go ahead.

2 MR. OKRENT: And to the Staff, I suppose.

3 It seems that FY '86 is 121 million.

4 MR. SIESS: Maximum.

5 MR. OKRENT: Maximum. What is the reason for
6 optimism that a larger number would be approved in '87?

7 MR. SIESS: On whose part?

8 MR. OKRENT: That's to the Staff. The committee,
9 should we be recommending a number larger than 121?

10 MR. SIESS: Dave, you know that's an interesting
11 question, because if the Commission thinks, as a matter of
12 strategy, that they should ask for more than they expect to
13 get, I don't know whether we should tell them not to. I think
14 you were not here at the very beginning when Denny was
15 explaining the situation on '86, and it was sort of agreed
16 that it's not very optimistic to assume you're going to get
17 more in '87 than you got in '86.

18 And right now it's optimistic to believe that you're
19 going to get 121 million in '86.

20 But should we recommend a lower budget to be more
21 realistic, or should we let the Commission go along with
22 whatever strategy it has in mind of making its '87 request?

23 MR. ROSS: I can give you a partial answer,
24 Dr. Okrent.

25 If you recall, the agency had intended at one time

1 in '86 to go in at about 460 million. The as-submitted
2 request was 429. I think the general theory was that the 200
3 billion deficit, maybe agencies should take a five percent
4 cut. I believe the '87 theory is that the agency would go
5 back to a \$460 million request. Then when the allocations
6 were being discussed in the preliminary sense, the 130 seemed
7 to be a reasonable allocation if the agency got a \$460 million
8 budget.

9 Now you may have to decide in the context of what
10 agency budget do you want to make, what research budget.
11 That's your business.

12 MR. SIESS: Congress in '86 gave the agency what it
13 asked for.

14 MR. ROSS: '85?

15 MR. SIESS: '86. The reauthorization bill.

16 MR. HAYES: Proposed authorization.

17 MR. ROSS: Remember, the Senate had an extra 8
18 million.

19 MR. SIESS: The House cut back to five percent.
20 Your problem isn't Congress; it's OMB.

21 MR. HAYES: Also the Appropriations Committee.
22 That's another function of Congress.

23 MR. SIESS: That's another story. But at the
24 authorization level, both -- essentially both the House and
25 Senate have given the agency what it asked for. The Senate

1 put 8 million back in for a five percent salary cut.

2 MR. ROSS: Yes, that's right.

3 MR. SIESS: The problem is what OMB is proposing.
4 Last year, OMB cut you back considerably, the agency.

5 MR. HAYES: Yes.

6 MR. SIESS: It's not Congress we're worried about.
7 It's the agency and OMB.

8 MR. HAYES: The year before that, it was House
9 Appropriations that cut us.

10 MR. SIESS: But the 128.6 is based on a certain
11 agency level.

12 MR. ROSS: That's correct.

13 MR. SIESS: The Commission is asking OMB for more
14 than they're going to get. That's sort of their strategy
15 question. We have never addressed in any detail the research
16 budget in terms of the agency budget.

17 MR. ROSS: Right.

18 MR. SIESS: We've said it should be higher or it
19 should be lower. I guess we've never said it should be lower
20 in a letter to the Congress. I think last year, in a letter
21 to the Commission, at one point where we were dealing with the
22 budget request before it got cut by EDO, we decided to lower
23 value would be realistic. We put it down at the EDO level.

24 I think at this stage of the game, it's an
25 interesting question, Dave. I don't know. I don't think we

1 accomplish anything by doing it.

2 Sam was talking about the '87 authorization. They
3 cut it. But then nobody pays any attention to them. Next
4 year will be '87/'88, so that the two-year authorization is
5 meaningless. They don't even look back to what they've cut
6 down in previous years.

7 MR. MICHELSON: It's certainly very difficult,
8 though, to comment on the total agency budget, for instance in
9 human factors where research is zeroed out. But there is a
10 great deal of activity, apparently, still going on in NRR, but
11 we don't survey or study that activity enough to comment on
12 it.

13 MR. SIESS: That's not strictly true, because in
14 Congress -- I keep reminding this committee, it's a report on
15 the NRC research program, not on the Office of Nuclear
16 Regulatory research program.

17 They're supposed to cover and take into
18 consideration research wherever it's being done, whether it's
19 under technical assistance or not, and we do take that into
20 consideration. We have done it in connection with waste
21 management when we looked at how much -- NMMSS has more
22 money than Research has for program support.

23 They're not supposed to be doing research outside of
24 Research, but they are, and all of the research money is not
25 research. Some of it was standard support, a small percent.

1 MR. MICHELSON: I'm not convinced that we have
2 really looked at the human factors budget in NRR from this
3 viewpoint. Perhaps we have, I'm not aware of it.

4 MR. SIESS: I don't know. We asked them what it is,
5 and we've reviewed the human factors program, which is more
6 than just research. It's everything. Presumably when they
7 reviewed the human factors -- I don't recall -- the human
8 factors program plan, that involved NRR as well as Research.
9 They're supposed to know about it.

10 Again, gentleman, I'm going to say it, I think if we
11 wanted to write a separate report, a human factors report,
12 another one on aging, we could concentrate the effort a lot
13 more than when we are trying to get out the whole cockeyed
14 thing.

15 Whether it's any more effective, I don't know.
16 We've written several letters on the severe accident program
17 with various levels and various degrees of failures.

18 Denny, tell us how you got 15 million out of there?

19 MR. ROSS: Let me refer you to two things. One
20 document you have, and one you don't. I think the one you
21 don't, you don't need. But we can see.

22 The one that you have is a May 21, 1985 memo from
23 Conti to Len Barry. We had prepared a detailed document that
24 we called our planned accomplishments. And these planned
25 accomplishments were written at the 143 level -- excuse me --

1 the 130 level.

2 We will now have to finetune these, consistent with
3 the final BRG mark.

4 MR. SIESS: The difference between the 130 and the
5 128 --

6 MR. ROSS: We've already talked about that.

7 If we look at plant aging, if you notice, that is
8 from the Column 2 marked "Request" to Column 3 marked
9 "Target," that's the \$3 million.

10 What we did, we adopted a common style here. What
11 would we have done with the money at the 10.8 level? What
12 will we do now, and what's the safety impact?

13 I think technically we have already talked about
14 that, but what we did agree is, Billy Morris and Jed Bore
15 will be down here early in the afternoon for more detail
16 with Carl on the side, 1:00 or 1:30.

17 MR. SIESS: Have you got that, Carl?

18 MR. MICHELSON: Yes. Charlie and I will talk to
19 them.

20 MR. SIESS: Look at that half a page on plant
21 aging.

22 MR. MICHELSON: That's right.

23 MR. ROSS: The second half of this page is no longer
24 operative, because we restored it.

25 If we turn to the top of page 2, this is a \$2

1 million cut, transient models and codes. I think we discussed
2 that. If we look at -- it's about halfway down the sheet --
3 you'll see we went up a little bit. NRR said, "Go up a little
4 bit," and we're still at the 5.8. The sum of the two -- that
5 is, the sum of separate effects and transient models and codes
6 -- is the same.

7 I believe the impact is reasonably well described
8 here.

9 MR. SIESS: Does anybody have any questions about
10 what has been done with that \$2 million reduction?

11 MR. MICHELSON: Just for clarification, since David
12 is not here, I'll try to speak to this a wee bit.

13 This \$1 million that you are looking toward industry
14 to provide on MIST -- and I gather that's what you're
15 suggesting -- is that industry should kick in another million
16 --

17 MR. SIESS: Just a minute. Are we through with the
18 transient models and codes?

19 MR. MICHELSON: I thought that's what we were on.

20 MR. SIESS: No. MIST was up under "Integral
21 Facilities."

22 MR. MICHELSON: You passed over that, and you got
23 down here --

24 MR. SIESS: We can go back to that.

25 MR. MICHELSON: Fine.

1 MR. SIESS: Does anybody have any questions about
2 that?

3 [No response.]

4 MR. SIESS: Okay, we'll go back up to MIST.

5 MR. MICHELSON: My question is, from the experience
6 we've had so far on MIST, it's been pretty good, but I thought
7 we were kind of near the upper limit of what industry would be
8 willing to support.

9 Is it realistic to support another -- to expect
10 another million dollar contribution on their part?

11 MR. ROSS: The thing is, with the program running
12 in its present mode, we neither are asking for nor need any
13 additional industry participation. The facilities are in very
14 good shape. They'll be commissioning it this summer, running
15 tests this fall, getting data next spring.

16 MR. SIESS: As it stands now, there's no change in
17 MIST.

18 MR. ROSS: I think the point is, the money in '87
19 will be used for the upgrade, the power upgrade.

20 MR. MICHELSON: That's for the follow-on program,
21 then.

22 MR. ROSS: In formal discussions with B&W, they
23 noted that they were optimistic about getting some
24 participation. Now it seems like if we're willing to put in
25 some, and the power upgrade really is of interest, we're not

1 asking that much. We have three parties -- B&W, the owners,
2 and EPRI. It's not that much spread out.

3 MR. MICHELSON: Okay. You're saying it's on the
4 upgrade part of it. That's probably more realistic.

5 MR. OKRENT: I have a question to the Regulatory
6 Staff which relates to their recommendation that several
7 million dollars additional be allocated for thermal hydraulic
8 experiments. That's correct, isn't it?

9 MR. ROSZTOCZY: Yes. Yes, Dr. Okrent, we have asked
10 to have several million dollars be available to continue
11 integral testing in the areas wherever it's needed.

12 MR. OKRENT: At the same time, it seems to me, if I
13 read or remember what I read correctly, that the Regulatory
14 Staff seems to feel that by the end of FY '86, if not sooner,
15 all the needed information on behavior of reactors, LWRs, in
16 severe accident conditions will pretty much have been
17 achieved.

18 Am I misreading what you are recommending?

19 MR. ROSZTOCZY: I'm sorry. I'm not sure if I
20 understood this. This was for thermal hydraulic tests,
21 integral tests not related to severe accident.

22 MR. OKRENT: You're perfectly right. I'm just
23 saying, there's another part of your recommendation which
24 seems to suggest that the NRR feels that by the end of '86, if
25 not sooner, essentially all the needed information concerning

1 the behavior of LWRs in severe accidents will be in hand.

2 MR. ROSZTOCZY: No, that part is not correct. We
3 expect the continuation of the severe accident research
4 program for many years to come.

5 MR. OKRENT: Aside from source term?

6 MR. ROSZTOCZY: The way we see the continuation of
7 the severe accident research program is, instead of the
8 current program that was trying to establish a better
9 knowledge in practically every aspect of severe accidents, we
10 expect the continuation beyond '87 would be focused for some
11 specific areas where the need exists.

12 For example, if curium/concrete interaction is one
13 area that we feel additional research is needed, that will be
14 an area that will be pursued beyond '87. Our expectation is
15 that we have a number of these. We are not at a point where
16 we could identify all of them.

17 MR. OKRENT: How about severe accident analysis and
18 risk reduction analysis and this kind of thing?

19 MR. ROSZTOCZY: In terms of severe accident
20 analysis, the expectation is, after the phase that is now just
21 starting, the implementation phase, NRC will put forth some
22 guidance for individual utilities on what is the minimum they
23 have to do in reviewing their own plants.

24 So in the '87/'88 type of timeframe, we believe it
25 will be in the phase when the utilities will be reviewing

1 their own plants. NRC will somehow oversee this, either in
2 terms of auditing or checking on it in one form or another, so
3 we expect some audit calculations be performed on NRC's behalf
4 during this timeframe -- some analysis, not a very large
5 amount, in terms of -- what was your other? Analysis and
6 something else?

7 MR. OKRENT: In case it's not clear what I'm trying
8 to ascertain, it's the basis for your recommendation, which at
9 the moment is a very general recommendation, that a
10 substantial amount of money be set aside in '87 and continuing
11 years, obviously, for thermal hydraulic transients, and at the
12 same time your recommendation that studies of severe accidents
13 means reducing either their probability or their consequence,
14 be essentially -- I won't say zeroed out, but brought to a
15 very small value, except for what you call auditing of what
16 utilities may be doing.

17 MR. ROSZTOCZY: That was a core question.

18 MR. OKRENT: That's a correct interpretation of the
19 trends NRC is suggesting?

20 MR. ROSZTOCZY: I don't think so. Let me give you
21 some numbers.

22 In the 1987 budget that we are discussing now, there
23 are \$43 million for severe accidents, and we are asking for \$4
24 million for the integral tests -- \$4 million in addition to
25 whatever is being finished up on MIST and the foreign test.

1 So the \$45 million, we feel, for '87 was more than the minimum
2 that is necessary to conduct the severe accident program.

3 Therefore, if some cut has to be taken, some cut can
4 be taken out of the \$45, but we are recommending, even with
5 the largest cut, we are recommending approximately a \$30
6 million severe accident program in 1987, and we will be
7 recommending probably less than \$30 million beyond that, like
8 in '88.

9 In terms of the thermal hydraulic test facilities,
10 one by one, each is being closed out. If you look at '87, you
11 will still see MIST running, and there's still, I think, 4.5
12 million for MIST.

13 MR. OKRENT: Excuse me. I need to interject one
14 point.

15 I am also keeping on the table your comments
16 concerning what is done under the risk and operations effort.

17 MR. ROSZTOCZY: Yes.

18 MR. OKRENT: Where I think you were suggesting only,
19 in effect, support of NRR studies, what you called an
20 implementation program; am I correct?

21 MR. ROSZTOCZY: You are correct. There was one task
22 under the research program which would be duplicating the
23 effort that is now planned to be done on that implementation,
24 and we recommended that that can be terminated. Based on the
25 Budget Committee's recommendation, they cut it to about half,

1 so it would be continuing, but with half of the originally
2 planned effort, and there would be additional discussion
3 between Research and NRR to be sure that that money is spent
4 in a positive manner.

5 So the basic point that we were saying is that the
6 severe accident program, which was the most -- by far the
7 largest program for the last two or three years -- that we
8 would expect that it will start to phase down by '87 from the
9 current \$45 million or so level to maybe down to more in the
10 low 30s. And we would expect after that, it probably will go
11 a little further.

12 MR. OKRENT: Excuse me, if I may interrupt you
13 again. It is really the effort in understanding risk and in
14 understanding ways of reducing risk. It's that part of the
15 program that I'm trying to understand NRR's point of view. It
16 is that area where you are suggesting less research, not that
17 the Office of Research has been putting heavy money in here --
18 they've been putting it in severe accidents, as you have
19 noted.

20 So let me ask a few points. One is, if you don't
21 know enough to set up a containment performance criterion, how
22 can we -- why is it we can reduce this kind of thing?

23 Two, if the Italians and the English and the Germans
24 and the French effectively are in -- certainly in future
25 plants and some in current plants -- are including features to

1 reduce risk, either by prevention or by mitigation, on what
2 basis does the NRC feel it has sufficient information now not
3 to examine in greater detail this sort of thing?

4 And thirdly, on what basis do you think you have
5 enough information about the U.S. reactors in view of the
6 differences even within the Mark-III that can be significant,
7 let alone the differences among all the different styles of
8 reactors we have?

9 I'm trying to understand NRR's position, that in
10 this one area things can be -- which have been going at what I
11 would call an inadequate rate -- can be much further reduced,
12 whereas for thermal hydraulics, where at the moment I'm not
13 aware of anything that risk studies have identified as a
14 high-risk contributor that can be solved by research, where
15 you have not identified specific experimental needs that need
16 to be done in the future, you are recommending an increase.

17 I'm not saying, you know, something may not come up
18 where such a facility might be handy. I'm just trying to look
19 at your approaches on these two issues and to try to
20 understand them.

21 MR. ROSZTOCZY: You mentioned three areas -- thermal
22 hydraulics, severe accident, and risk.

23 Keeping in mind that the budget we reviewed was
24 above the limit and had to be cut, so we're looking at four
25 cuts in some areas, our recommendation was a sizeable cut in

1 the thermal hydraulics area, an even larger cut in severe
2 accident, and not cut whatsoever in the risk area. If
3 anything, we recommended kind of indirectly some increase in
4 the risk area.

5 The part that you are quoting under the risk
6 divisions is really part of the severe accident program, and
7 those calculations, the equivalent of those calculations, will
8 be done either by NRR or by the utilities.

9 Originally when that task was postulated, then the
10 assumption was that NRC would perform calculations for each of
11 the plants, not only the referenced plants. We believe that
12 one is not necessary. That type of calculation will be done
13 by the industry if it's needed.

14 MR. OKRENT: You're talking about MELCOR
15 calculations for individual plants or what?

16 MR. ROSZTOCZY: The methodology of what needs to be
17 done for an individual plant is being developed right now. It
18 will be spelled out to you in the August 2nd meeting, the
19 present status of it. And we hope for some plant types, where
20 there's relatively little question, those analyses which have
21 to be done will be probably rather limited.

22 For other plant types, when there are questions
23 about early containment failure, the analysis might be more
24 extensive, and you will see some examples of what is being
25 considered at the present time.

1 But in risk, we did not recommend any cuts.

2 MR. OKRENT: I see a 17.1 and a 15.7, but you're
3 saying this is primarily application of codes that you think
4 need not be done, if I understand correctly.

5 MR. ROSZTOCZY: Need not be done under the research
6 program.

7 MR. OKRENT: I might even agree with that. But you
8 haven't told me --

9 MR. KERR: Are you sure?

10 [Laughter.]

11 MR. OKRENT: Indeed, yes, because I don't think that
12 is what Research should be doing with their money. I think
13 you heard me say that last time.

14 MR. ROSS: We don't think so either, Dr. Okrent.

15 MR. OKRENT: I shuddered when I heard it last time.
16 But you haven't told me why you think the existing research
17 and the past research has been adequate, if you can't get
18 specified containment performance criteria. And in my
19 opinion, you have not really in-depth analyzed, for example,
20 what is being asked of the Sizewell B reactor. At least the
21 report you put out was too shallow to be called an in-depth
22 analysis.

23 And I don't know that you have in-depth analyzed
24 what other groups are doing, in-depth what the NII is
25 concerned about, even on Sizewell and so forth, and yet you

1 seem to be satisfied the risk reduction program as it has
2 been.

3 MR. ROSZTOCZY: No. We have expressed definite
4 dissatisfaction with the present state of the PRA
5 methodology. We have asked for improvement in specific areas
6 on PRAs, and these are being done. They are in the program,
7 and we fully support them. And we certainly expect to see
8 more along those lines. So I think the risk methodology
9 development is an important part of the program, and we would
10 like to see more.

11 Coming back to your point on not being able to put
12 forth containment guidelines at this time, first we have to
13 get the results on the table, detailed analysis for the
14 so-called reference plants, which are plants that represent
15 different types, like boiling water reactors with different
16 containments, PWRs with different containments. That
17 reference plant analysis is ongoing now.

18 A fair portion of it has been done, but it's not
19 finished yet. So we are waiting for the completion of that
20 work, and as soon as it's on the table, we're going to look at
21 it very carefully. They will play an important part in
22 developing these guidelines.

23 Are they going to be sufficient? Are we going to
24 get all the information that one would like to have for
25 development of the guidelines?

1 Well, I think past experience would tell us that
2 every time you finally have all the information on the table,
3 you find out something is missing. So there will be some of
4 those. We will be asking for some additional work, and we
5 hope it will be provided in some reasonable time schedule.

6 MR. OKRENT: And you think the way to do this is to
7 just step-by-step sort of, rather than try to at one initial
8 point identify what might be all the important bits of
9 information and see if you're getting it?

10 MR. ROSZTOCZY: The way we intend to do it now is to
11 take one plant at a time. We selected as the first one the
12 BWR with the Mark-I containment, because that's one of them
13 where we expect to see some complications and some problems.
14 So we're going to look at that plant.

15 Based on the review of that one single plant, we
16 probably will be able to specify certain information that we
17 need, including some that is in the program and some which may
18 be not in the program. So that will be the first time we can
19 come forth and say we think the following additional
20 information is needed before we can put together the
21 containment guidelines.

22 Once we've progressed to the next plant, if we find
23 some additional information is needed, we will spell it out
24 again.

25 MR. OKRENT: I return the floor to you,

1 Mr. Chairman.

2 MR. SIESS: Okay.

3 MR. ROSS: That brings up accident evaluation. At
4 the bottom of page 2 --

5 MR. KERR: Of what, Denny?

6 MR. ROSS: -- we talk about a cut in severe accident
7 analysis. If you look at the '86 level of 3.5 million and
8 then the target was 3.5 million 130, what we noted was an
9 impact of reduction from what we had of 4.2.

10 Now you can read this, but this now is dated,
11 because the pencil think takes it down to 2 million. We will
12 have to update this. We have not done so.

13 MR. SIESS: Severe -- you have cut severe accident
14 analysis a lot more than you originally proposed.

15 MR. ROSS: That's right. But we'll have to generate
16 new impact.

17 MR. SIESS: Much of that is in response to NRR.

18 MR. ROSS: And the perception that NRR will find it
19 expedient, if not mandatory, for them to conduct the 1 or 2
20 million SASA work on their own with Tech TA money. I think
21 the work will be done. They will just have to pay for
22 it.

23 MR. SIESS: EDO is going to give them the money
24 they've taken away from them?

25 MR. ROSS: I don't know. I'm just reading the

1 entries and trying to guess what will happen in the year.

2 MR. SIESS: The same thing happened in containment
3 loading.

4 MR. ROSS: This impact should be up-to-date, 6.6,
5 total 6.6.

6 MR. SIESS: In addition to those, do you now have a
7 significant cut of \$2 million in damaged fuel.

8 MR. ROSS: That's true, although I think the idea is
9 for us to address the market and get the counterpart money
10 from abroad.

11 MR. SIESS: Are you proposing a \$2 million cut as
12 NRC's contribution, but no cut for research?

13 MR. ROSS: To extrapolate what we'll be able to do,
14 I think the reasonable expectation is that we will get the
15 money.

16 MR. SIESS: Now you had nothing in that document on
17 reactor operation and risk. That has been cut by 3.4 million.

18 MR. ROSS: From 19 to 15.6.

19 MR. SIESS: And 1.6 million on data and
20 uncertainties and 1.8 for severe accident risk?

21 MR. ROSS: I'm sorry. Let's compare columns. For
22 the whole decision unit we have reviewed, a 19 million level,
23 and we had three rolling cuts. The last one was 15.6.

24 MR. SIESS: I'm sorry. Sam says it's --

25 MR. ROSS: We've given you a 1.9 million assessment

1 somewhere.

2 MR. SIESS: Part of that is transferred to the EOD.

3 MR. ROSS: Yes.

4 MARCUS: 1.6 on data and uncertainties.

5 MR. SIESS: That document says severe accident risk,
6 essentially funded at the proposed level. And that has now
7 been cut 1.8.

8 The last line, page 2 of the letter, the May 21
9 document, the memo to Leonard W. Barry.

10 MR. ROSS: Okay, now we're in business.

11 MR. SIESS: It's a letter that has two pages --
12 three pages of tables, and then three pages at the end. Up to
13 now, we've been looking at the pages at the end. We're now
14 looking at page 2 of the letter. It's got the signature at
15 the bottom.

16 Reactor operations and risk, you reduced that --
17 data and uncertainties was reduced 1.6 by transfer to EOD.

18 MR. ROSS: There's general agreement.

19 MR. SIESS: Severe accident risk, which NRR wanted
20 to reduce from 5.2 down to 1.9, you have reduced from 5.2 down
21 to 3.4.

22 MR. ROSS: Yes. For that, we're going to have to
23 generate an impact statement. If you look at our plan -- you
24 can't look at it, if you don't have it, but I have a copy of
25 planned accomplishments for the severe accident risk subunit.

1 There are three bullets in here.

2 The first one relates to what Zoltan was just
3 saying. It's an '86 accomplishment. It's put in here for
4 reference.

5 I see Mr. Gillespie is here. He can certainly
6 elaborate on it. It completes the five reference plants. It
7 completes the risk profile, the updated source term, the front
8 end, the accident sequence probability, with an update on what
9 is going on at the plants, remodeling of plants.

10 The '87 and '88 work has to do with an integrated
11 and completion MELCOR, combining the accident sequence
12 likelihood with the rest of the studies, and in general tuning
13 up MELCOR as the replacement code for the Battelle source term
14 code package.

15 Frank, the general question here, we had in the
16 subunit, we had requested 5.2 million. We were going to
17 reduce it to 3.4, so we were willing to cut 1.8. We don't
18 have in the text yet on impact of what we can't do if we
19 reduce 1.8. I'm not sure you've got it scoped out either.

20 MR. GILLESPIE: That was contingent upon us not
21 being as successful as we might be on the mid-'86 document.
22 When we talked to the BRG the last time I was here, it was
23 money that we thought we were going to need to use
24 deterministic codes to benchmark anomalies that would come up
25 in risk calculations that we might need to actually -- the

1 risk, people might have to have some MELPROG runs or CONTAIN
2 runs or BMI-2104 runs for exceptions.

3 Basically, where we're going is to try to compare
4 all the plants or set up a mechanism between us or IDCOR to
5 compare the plants in the countries to the plants we know the
6 most about, which are going to be the five that we have kind
7 of studied to death over the last several years.

8 We just think there's going to be some anomalies in
9 that comparison. There's going to be things that have not
10 been considered. That's what that was for. That's what we're
11 giving up. We're giving up the opportunity for the
12 differences.

13 MR. ROSS: The mainframe of MELCOR studies.

14 MR. GILLESPIE: The mainframe of MELCOR is entirely
15 funded; that's right.

16 MR. SIESS: Are you going to meet with Okrent today?

17 MR. GILLESPIE: In about fifteen minutes.

18 MR. SIESS: Okay. Dave will know more about it
19 after lunch, right?

20 MR. GILLESPIE: About that 1.5 million?

21 MR. SIESS: All about what you're planning to do.

22 MR. GILLESPIE: I hope he knows after several hours
23 more about what's in and out, yes.

24 MR. SIESS: We've only got two hours scheduled.

25 MR. MICHELSON: Just for clarification, reactor

1 operation risk is a data and uncertainties item, which you
2 said was transferred to AEOD.

3 MR. SIESS: Part of it.

4 MR. MICHELSON: Why did NRR recommend 2.7? Were
5 they recommending before the idea of transferring a part of it
6 to AEOD?

7 MR. SIESS: Yes.

8 MR. MICHELSON: So they're in agreement, I assume.

9 MR. ROSZTOCZY: That's correct.

10 MR. MICHELSON: One more clarification. What
11 exactly is that 1.1 or 1.6 that's being transferred to AEOD?

12 MR. GILLESPIE: That ends up being the remainder of
13 the final report of the precursor program, which right now in
14 our budget is not really adequately funded to just do it and
15 get it done. So it's dollar-limited right now through '86.

16 The methods portion of the precursor program, a lot
17 of deficiencies that were found in the last few years, we've
18 got enough money to fix those. That's about a half million
19 dollars.

20 MR. MICHELSON: This is a finish-up.

21 MR. GILLESPIE: This is a finish-up. It should go
22 away after this. The IPRDS system is in there. We've been
23 going out on the average, I guess, doing about one and a half
24 plants a year. We've started computerizing and cataloging
25 that information so we can draw on it. In the ARMF program,

1 we can ask questions of that information now of certain kinds
2 of valves in Mark-IIIs. There's a couple of Mark-IIIs that we
3 can get information back. It's approached the point where
4 it's become routine. It's no longer a research function. We
5 found it to be useful, and we think it's time to turn it over
6 to the people who keep up the routine databases for us in
7 operational data.

8 MR. OKRENT: The precursor program?

9 MR. GILLESPIE: That's a one-time -- there's one
10 more precursor report that we owe, and that will string out
11 into '87.

12 MR. OKRENT: After that, you wouldn't expect like a
13 biannual estimate of whatever you want to call it -- the
14 conditional risk?

15 MR. GILLESPIE: Okay. Some kind of update. I would
16 expect AEOD would do that.

17 MR. OKRENT: They haven't been doing that.

18 MR. GILLESPIE: That's a discussion we need to have
19 with AEOD.

20 MR. MICHELSON: They haven't the precursor program
21 either.

22 MR. GILLESPIE: They haven't. It's a new function
23 that would be transferred from us to them.

24 MR. MICHELSON: What they do with it, we don't know
25 yet.

1 MR. GILLESPIE: I would hope there would be some
2 kind of annual or someone to go in and look at the additional
3 reports that have come in and would tack them onto what we've
4 already done. I can't commit that. To get done right now,
5 we've got to negotiate that out with AEOD about what the
6 program will be in '87 and '88.

7 MR. MICHELSON: One of these days, we need to have
8 an update on what AEOD intends to do. This would be a good
9 question to ask, then, along with several others relating to
10 the trends and patterns, programs, and so forth.

11 MR. OKRENT: Up to now, they have mostly shied away
12 from trying to assign absolute risks. I think they got burned
13 one or two times early on maybe. But that's certainly not one
14 of the places where they try to build strength.

15 MR. MICHELSON: Right. And it hasn't been their
16 responsibility necessarily, although I gather the
17 responsibility goes with the money.

18 MR. GILLESPIE: Yes. The programs also go with the
19 money. We're not just -- we're giving the funds or saying
20 that these funds should be there in the expectation that the
21 work will be done there. And they are also right now, at
22 least as I understand it, they've hired at least one person in
23 with some PRA expertise, and they are trying to strengthen
24 themselves in that area. I would not at this time want to
25 give them a vote that says they just can't do it. We're being

1 more optimistic and thinking they can do it, can take it over.

2 MR. ROSS: Dr. Siess, this last area we're supposed

3 to discuss is the 700,000 waste management, earth sciences, ,

4 meteorology, and hydrology -- what would have been done, what

5 will we do now, and what is the impact -- is as stated on page

6 3 in this report.

7 The meteorology was \$450,000, and the hydrology is

8 \$250,000. I think it was in the program because we thought it

9 was a good idea, but so is everything else, and we had to come

10 down 14 million.

11 Other than what's printed on your report, I don't

12 have anything further to say.

13 MR. SIESS: Any questions?

14 MR. OKRENT: What is the probability of exceeding

15 the maximum flood at any ten sites you pick at random?

16 MR. ROSS: I presume it's a rhetorical question. It

17 is, to me, because you know I don't know the answer.

18 MR. OKRENT: Then I don't understand why there was

19 zero research on the question.

20 MR. SIESS: Some people are convinced that no

21 research is going to give them the answer either.

22 MR. ROSS: Or that research would not reduce the

23 flood.

24 MR. OKRENT: I used to hear that about some other

25 areas, too.

1 MR. ROSS: Dr. Okrent, just a minute. I was
2 involved in the original construction permit licensing at
3 TMI-1. This goes back now close to twenty years. There was a
4 lot of discussion then amongst the meteorologists about what
5 the probable maximum flood was for the Susquehanna there.
6 They looked at floods of record, and people said, "Gee,
7 there's almost no way could it exceed 1.1 million cfs." Then
8 along came Hurricane Agnes, and it just about did.

9 It's clear to me, when we go to a site and establish
10 pmfs, that they're not a figment of somebody's imagination.
11 Occasionally hurricanes or rains falling on frozen ground,
12 like in March of 1836, which was the previously flood of
13 record, certainly we are not trying to dismiss it. It was in
14 the program. Now it's out. We don't have all the money.

15 My guess is, when we get to this '87 appropriation,
16 a lot more good stuff is not going to be there.

17 What do you want us to do?

18 MR. OKRENT: I can think of a lot of other things
19 that you still have in the program which are, at best, adding
20 on little bits of information where you already have
21 information or would certainly by the Risk Division's
22 methodology of evaluating whether this is research related to
23 a high-risk area or low-risk area would say no.

24 In fact, the whole steam generator tube rupture
25 thing, I saw a resolution saying it's a low-risk problem. So

1 why the hell are you looking at \$5 million worth of steam
2 generator tubes each year, you know.

3 You can ask a lot of questions. You don't know
4 whether floods are a low risk.

5 MR. KERR: Do you think you would after more
6 research?

7 MR. OKRENT: I think they should try. Indeed, I
8 think they should try.

9 MR. KERR: In your view at this point, do you think
10 that for a certain program that it is likely to reduce the
11 uncertainty significance.

12 MR. OKRENT: I think there's a fair chance, yes.

13 MR. KERR: All right.

14 MR. OKRENT: Furthermore, I think they will find
15 that they don't -- they'll certainly learn that they don't
16 have uniform ranges of probabilities achieved by their present
17 mode of calculation. That, in itself, will be of some
18 interest to know.

19 MR. MOELLER: When Zoltan spoke earlier, you would
20 restore the meteorology and the hydrology?

21 MR. ROSZTOCZY: Yes, both of these items.

22 MR. MOELLER: Where would you cut, or do you need to
23 cut somewhere else in order to restore them?

24 MR. ROSZTOCZY: We would cut in the third area that
25 I mentioned, which was the development of the second set of

1 codes for the severe accident.

2 MR. SIESS: Gentlemen, is there anything else you
3 want to hear from the Staff at this stage?

4 [No response.]

5 MR. SIESS: Who is going to be able to stick around
6 to answer questions?

7 MR. ROSS: Marty.

8 MR. SIESS: The next step, then, is to look at what
9 we might include in a report to the Commission to be prepared
10 and approved by the full Committee during the meetings in the
11 next three days.

12 I have received tentative comments of one form or
13 another from two people. Dade Moeller has given me some. I
14 don't know whether those have been supplied to everybody, but
15 we can get them out rather quickly. They are in the status
16 report.

17 Bill Kerr provided some yesterday that are not in
18 the status report. He's getting it retyped. It was
19 qualitative rather than quantitative. I assumed it may be
20 more quantitative.

21 I have been running through the budget figures that
22 we have, and I would like to summarize what I think I see as
23 the things we might want to comment on. One will be the total
24 budget, and we can address that as an individual item after we
25 look at it as an accumulated item.

1 As I look at reactor engineering decisions, the '87
2 budget calls for about a ten percent increase over the '86
3 budget. It is not entirely uniform through the program there,
4 either no change or modest increases in most places, offset by
5 a fairly significant decrease in aging, cutting aging. Aging
6 would still be quite a bit more than '86, but it would be less
7 than we saw originally. So even aging increases, and the only
8 thing that was dropped was chemical engineering, as we were
9 told last time.

10 I would think if we have any comments there,
11 although other people aren't all present, it might be on the
12 aging program and perhaps on the aging budget, and Carl will
13 develop some of that this afternoon and decide what he wants
14 to recommend on that.

15 MR. MICHELSON: Part of that, by the way, I would
16 like to emphasize again, the increase is not due to an
17 increase in a given area of work, but rather throwing some
18 cats and dogs into that area that brought a lot of that
19 increase up.

20 MR. SIESS: Looking at dollars, it's more money.
21 But if it's not being on appropriate things, that should be
22 addressed.

23 I don't have any problem with the structural stuff,
24 the containment integrity or what I know about seismic
25 margins.

1 Dave, did you have any questions about the seismic
2 margins part, the increase over '86? It's at a pretty good
3 level.

4 MR. OKRENT: I don't have any comments.

5 MR. SIESS: Charlie has been looking at electrical
6 equipment qualifications. Again in terms of dollars, it's
7 down a little bit from '86, but it hasn't been changed since
8 we looked at it.

9 Have you looked at the program or have any comments
10 on that? I know you've been looking at it.

11 MR. WYLIE: The subcommittee looked at it and was
12 satisfied with the proposal.

13 MR. SIESS: Okay. Last year, we only commented on
14 those things we didn't like. I think we've got some
15 obligation to at least say we're satisfied with things, with
16 things that we are satisfied with. People thought it was sort
17 of negative last year.

18 Thermal hydraulic transients, I can't speak for Dave
19 Ward. I would comment that it is an increase in the total
20 budget over the '86 level, at least the proposed '86 level.
21 And the major change there is the integral facility, integral
22 testing, which has been up and down and up and down, and I
23 think we will want to say something about that. We've said
24 something about it every time, and it is still with us.

25 There have been some decreases from what we saw last

1 time, and there's a decrease from '86 in the transient models
2 and codes, which we'll have to hear from Dave Ward on, on
3 that.

4 Accident evaluation, about an eight percent decrease
5 in the program, pretty much concentrated in -- well, it's not
6 too concentrated.

7 Severe accident analysis, of course that's a program
8 we've been commenting on every other month, it seems forever.

9 Reactor operation and risk is Dave's area. There's
10 been a decrease overall in that, although the actual decrease
11 mostly comes from that AEOD transfer. The net decrease from
12 '86 is less than that, but there have been some changes.

13 Now in the division of everything else, earth
14 sciences includes the hydrology, and if we want to talk about
15 that flood thing, that's the place to put something in. That
16 program is up from '86, but that also includes the \$1 million
17 to USGS to buy equipment. It's a million dollars each of the
18 next what? -- two or three years -- to build up the network,
19 and that USGS will take it over. I think that's not changed
20 from what we discussed last time, and we generally thought it
21 was a good idea.

22 High- and low-level wastes, of course, are quite a
23 bit up from what was proposed in '86, but they are probably at
24 about the level that they will be done in '86, depending on
25 what Congress comes up with.

1 Health effects is down a little bit from '86, and
2 then radiation protection was dropped completely. Dade has
3 several things proposed that we'll have to talk about.

4 Now those are the areas that I would think we would
5 cover in our report, and what I said will be based on the
6 bottom line, based on the 128.5 estimates.

7 One I omitted, because it is omitted, was human
8 factors, and Dave will have some comments on that, Dave Ward.

9 Now Dave Okrent raised the question about looking at
10 a \$128 million budget, which is six percent over '86 maximum,
11 and probably not realistic.

12 I suspect we're going to get some recommendations
13 from various people for increases. Moeller has got some
14 things he would like to see added. Ward wants human factors
15 added. Flooding research will be an addition. Carlyle may or
16 may not want to recommend more money for aging, maybe just
17 different research within the same funds.

18 We need to think about where cuts could be made.
19 I'm convinced that if we recommend increases without
20 corresponding cuts, the probability of getting the increases
21 is smaller.

22 MR. HAYES: Dr. Siess, could I interrupt for a
23 moment?

24 MR. SIESS: Sure.

25 MR. HAYES: On your recap, one item was overlooked

1 in our discussions. It's a non-programmatic item, and it's
2 under "Accident Evaluation." It's the first line, called "PBF
3 surveillance."

4 In there, we have an estimate for \$2 million in '87,
5 which we thought would be a buyout and that decontamination
6 and disassembly of this facility. More recently, we've gotten
7 word from Idaho that the estimate should be somewhere around
8 \$14 million, back to the old school of thought of completely
9 tearing the facility down and mothballing it.

10 Right now, the item is unresolved, so we do have
11 somewhere around a \$10 million impact to our program that
12 probably won't be resolved until we get to OMB.

13 It's a point of interest that really doesn't affect
14 the program.

15 MR. OKRENT: Take it out of human factors.

16 [Laughter.]

17 MR. SIESS: It's a possibility. It could end up
18 like LOFT did, OMB assigning it to DOE.

19 MR. HAYES: That's the brightest road we can
20 pursue. But right now, we don't have that answer.

21 MR. SIESS: We may have to come up with the money.
22 I doubt if OMB will take it out of research unless they want
23 to really whack something. We have the precedent of LOFT,
24 don't we?

25 MR. ROSS: Yes, but there we had some money up front

1 to go into a consortium program, and it became more palatable.

2 MR. SIESS: I think we will ignore that for the time
3 being. It will come to a head next year or later this year.

4 Gentlemen, would you like to retire and prepare some
5 drafts?

6 If there are any questions of the Staff that you
7 think the Staff can answer, now is the time to do it. Carl is
8 going to get together individually. Dave is getting together
9 with Frank. If anybody feels that they need more information
10 down at the FIN level or project level, we can arrange to get
11 somebody and get you on the telephone.

12 I propose we simply collect up all the comments that
13 people have and go over them the first session that we have
14 with the full Committee, which is two hours scheduled sometime
15 tomorrow -- 1:45 to 3:45. That will leave you the rest of the
16 afternoon and the morning.

17 As that goes along, I will try to prepare some
18 initial paragraphs for the letter, and then Friday, we will
19 look at sort of a second draft and maybe pull it together.
20 What we'll do Thursday is look at individual comments by
21 areas.

22 If Shewmon is not here, I will try to substitute for
23 him on that chapter. We will look at the individual,
24 critical-type comments. Mark Shewmon is coming here when?

25 MR. MICHELSON: He said he'd be here at noon.

1 MR. SIESS: I'll talk to him then. We'll see what
2 we can do with that. I'll try to get them together for Friday
3 into letter form, those comments incorporated with some
4 introductory or whatever material, and we'll go over that
5 Friday.

6 Is that satisfactory? I think it will work.

7 MR. MICHELSON: We probably would like to have Paul
8 in our meeting this afternoon also, since aging is also
9 involved in the stainless steel casting problem, a fairly
10 substantial amount of money. So just remind him.

11 Apparently 1:00 to 1:30. I don't know where. We
12 can meet wherever. We can use this room, I guess. Is this
13 room going to be used?

14 MR. SIESS: This room is available for
15 sub-subcommittee meetings, let's say.

16 MR. MICHELSON: We'll use this room.

17 MR. MOELLER: One item, with the Staff members still
18 here, let me just comment and see if you have any response.

19 One item in the draft material that I had given to
20 Dr. Siess pertained to the total occupational health program
21 at operating nuclear power plants, meaning more than just rad
22 protection, but health and safety across the board.

23 MR. SIESS: OSHA type.

24 MR. MOELLER: OSHA type stuff or subjects, which I
25 realize are not the responsibility of the NRC, and they are

1 the responsibility of OSHA. But OSHA is certainly -- in fact,
2 I spent a week with twenty -- with the Radiation Protection
3 Managers from twenty different operating plants. I spent a
4 week with them in May, and they, you know, to listen to them,
5 they say the occupational health and safety problems are far
6 more important than their current radiation protection
7 problems, occupational radiation protection problems.

8 MR. SIESS: Is this operation, or does it include
9 construction?

10 MR. MOELLER: These were all at operating plants.

11 MR. SIESS: Would there be maintenance type stuff?

12 MR. MOELLER: Yes.

13 MR. SIESS: People falling off of platforms,
14 breaking legs --

15 MR. MOELLER: Right, plus being exposed to all kinds
16 of toxic chemicals and so forth and very little monitoring and
17 so forth.

18 One thing I was proposing or going to propose to the
19 committee for the letter would be a paragraph not saying you
20 should spend a million dollars or a hundred dollars on this,
21 but just that somebody looking ahead ought to be giving this
22 some attention.

23 MR. MARK: Dade, does OSHA regard the nuclear plants
24 as even part of their responsibility, or do they just think
25 the NRC looks after that?

1 MR. MOELLER: My understanding from these men and
2 women was that they do know that they have the
3 responsibilities, but they are unable to exercise them.

4 MR. SIESS: OSHA is putting their effort on the
5 higher-risk areas, like construction and things like that.

6 MR. MICHELSON: Does OSHA recognize that they have
7 the radiological aspects as their responsibility?

8 MR. SIESS: No, they don't.

9 MR. MOELLER: NRC has that. It's an uncovered
10 problem or an unaddressed problem.

11 MR. SIESS: It's covered by the law. It's just that
12 OSHA is not looking at this area.

13 MR. MOELLER: You've said it.

14 MR. MICHELSON: Unfortunately, there's a lot of
15 mixed bag here, too, because a lot of time the radiological
16 and the human protection aspects are all intermixed.

17 MR. MOELLER: Absolutely.

18 MR. MICHELSON: It's not clear whose responsibility
19 it is.

20 MR. KERR: Why is this a research problem? I don't
21 understand. I don't think it is.

22 MR. SIESS: Dade, most industrial outfits, whether
23 it's a nuclear power plant or a fossil plant, must have a
24 safety program other than radiological safety.

25 Do the nuclear plants have an ordinary occupational

1 safety program, safety engineers?

2 MR. MOELLER: A few of the plant reps who were at
3 this week-long session said yes, they do. But very few. I'd
4 say it wasn't more than ten percent, say two out of the
5 twenty.

6 MR. SIESS: Do you have one, Charlie?

7 MR. KERR: That's incredible, because they surely
8 must have them at the fossil plants, so I can't imagine why
9 they wouldn't have them at a nuclear plant.

10 MR. WYLIE: They do.

11 MR. REMICK: Dade, I know this is something that
12 INPD has an indicator developed on this, and is considering
13 putting out a call to reduce that for all nuclear plants. You
14 probably would be interested in that. But, they are
15 monitoring that, thinking about putting out quarterly
16 indicators of how your plant compares with the industry and so
17 forth, and thinking about establishing a goal to reach reduced
18 --

19 MR. SIESS: Insurance coverage drives a lot of
20 people in this, if they have got insurance.

21 MR. MOELLER: Bill Kerr is correct in that it is not
22 a research --

23 MR. SIESS: I don't think it is any of our business,
24 frankly. But you have got some other things in there. Why
25 don't you consolidate that?

1 MR. MOELLER: Right, I will. And I will back Zoltan
2 up on his suggestion.

3 MR. KERR: I don't think it is inappropriate for us
4 to call this to the attention of somebody in the Commission.

5 MR. MOELLER: In a separate letter.

6 MR. KERR: Yes.

7 MR. SIESS: Actually, some of the things you have
8 got -- you make your recommendations sort of mild. Some
9 people make them real strong, and you are always sort of
10 mild. Maybe that influences what I am thinking. When they are
11 that mild, I wonder whether they should be in this budget
12 letter, or in another letter suggesting that this is something
13 the NRC ought to be doing outside the framework of this
14 budget.

15 And again, some of them are small enough in scope
16 that it is hardly worth bringing them up at this stage, two
17 years in advance. It could easily be factored in.

18 As I say, that may be because you are so modest
19 about the way you make them, that you are not screaming loud
20 enough.

21 MR. MOELLER: That is helpful. I will do it.

22 MR. SIESS: Also, if there are some little things we
23 wanted to add in, we can tack those on in another paragraph.
24 But these are things that should be considered within whatever
25 leeway you have got. Because, when you get down to 100-, 200k

1 projects, there will be changes much bigger than that between
2 now and the time they start working on FY 1987.

3 MR. MOELLER: Well, certainly again this group I was
4 with backed up the respirator, the need there.

5 MR. SIESS: I am really surprised that plants don't
6 have just an ordinary safety program.

7 MR. MOELLER: About two out of the 20. Duke --

8 MR. SIESS: Are you sure these people knew what they
9 have? They have to know.

10 MR. MOELLER: These were the top guys.

11 MR. SIESS: A good safety program is visible. We
12 always see in reports of somebody falling off a platform, or
13 stepping back to admire his work --

14 MR. MICHELSON: Having a safety program doesn't
15 necessarily prevent that, but hopefully it reduces the
16 frequency.

17 MR. SIESS: I thought they had a safety program,
18 because the frequency isn't all that high.

19 MR. MICHELSON: It is a lot of factors.

20 MR. SIESS: You know, falls are the most common
21 cause of accidents, and I see maybe in PNOs, seven or eight a
22 year. With eighty plants out there, that is not a very high
23 accident rate at all on that.

24 Of course, they only make it in the PNO when he was
25 in a contaminated area. I guess that is part of it, too.

1 MR. MOELLER: We have been trying to get one of the
2 fellows who is working on this, and it is tough to get hold of
3 the numbers.

4 MR. SIESS: Protective equipment probably doesn't
5 contribute a bit to that kind of safety.

6 MR. MOELLER: Like OSHA apparently does not require
7 a major injury to be reported, unless at least five people
8 were injured.

9 MR. SIESS: These guys going around in protective
10 equipment, where they can't see where they are walking. They
11 have got booties on, a few other things, I'm surprised there
12 is not more.

13 MR. MOELLER: This heat shock to these people, plus
14 when they come out they have been in this refrigerator. They
15 were ice packs, they are in a refrigerated suit, they come
16 out, take it off and walk in the normal environment. And the
17 body has been accustomed to this ice around it. And the
18 shock, they say these people go into shock and so forth.

19 MR. SIESS: When a guy is in protective equipment,
20 does he have a hard hat on?

21 MR. MICHELSON: Not necessarily.

22 MR. MOELLER: The protective clothing would be an
23 area where there is a need for some research.

24 MR. MARK: Dade, when you said at least five people,
25 is this per plant per year?

1 MR. MOELLER: Per accident.

2 John Ficht has five or more employees must be
3 hospitalized as a result of a single accident.

4 MR. SIESS: Before it is reported to OSHA.

5 MR. MOELLER: For it to be reported to OSHA. A
6 single fatality will be reported.

7 MR. SIESS: Are you looking for data?

8 Don't these companies carry insurance?

9 MR. MOELLER: He says the data -- the Bureau of
10 Labor Statistics, he says, collect data which would be of
11 interest. But, it is not publicly available.

12 MR. WYLIE: I think most of the utilities are self
13 insured.

14 MR. SIESS: They are self insured, no worker's
15 compensation?

16 MR. WYLIE: They have workman's comp.

17 MR. SIESS: That is where BLS gets data, from
18 workman's compensation claims, I'll bet you.

19 MR. REMICK: Dade, there is something inconsistent,
20 because I have seen data for nuclear plants, in which if a
21 person has lost time over 24 hours, that is counted in
22 statistics. The information I have seen, if I recall, shows
23 that the nuclear industry is about comparable to other
24 equivalent industry. Not as good as duPont, for example, but
25 it is about comparable.

1 So, I guess I don't understand why statistics are
2 note available.

3 MR. MOELLER: I am going to get you to talk to John
4 Fight, because he is working very hard on this. And, he has
5 talked to a number of people. I think he has done a good job.

6 MR. SIESS: INPO or EPRI should have it.

7 MR. REMICK: INPO is compiling it.

8 MR. SIESS: Gentlemen, Sam says your comments must
9 be due no later than 9 o'clock tomorrow morning. If they are
10 handwritten, it would be better to give them this afternoon,
11 so he can get a typed copy back to you to review.

12 MR. MICHELSON: What total length of letter do you
13 envision as an approximation?

14 MR. SIESS: What was it last year?

15 MR. MICHELSON: Five pages, wasn't it? Do you
16 envision that much this year necessary?

17 Of course, it depends on how much is turned in. You
18 want to keep this fairly brief.

19 MR. SIESS: On aging, I would want a paragraph.

20 MR. MICHELSON: Or two at most.

21 MR. SIESS: You ought to be able to say it in half a
22 page.

23 MR. MICHELSON: I may not have to say anything,
24 depending on what I find out.

25 (Whereupon, at 11:45 a.m., the recorded portion of

1 the meeting was concluded.)

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1 CERTIFICATE OF OFFICIAL REPORTER

2
3
4
5 This is to certify that the attached proceedings
6 before the United States Nuclear Regulatory Commission in the
7 matter of: ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

8
9 Name of Proceeding: Subcommittee on the Safety Research Program

10
11 Docket No.:

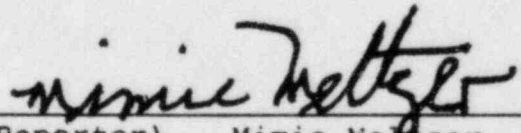
12 Place: Washington, D. C.

13 Date: Wednesday, June 5, 1985

14
15 were held as herein appears and that this is the original
16 transcript thereof for the file of the United States Nuclear
17 Regulatory Commission.

18
19 (Signature)

(Typed Name of Reporter)


Mimie Meltzer

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21
22
23 Ann Riley & Associates, Ltd.
24
25



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

MAY 31 1985

MEMORANDUM FOR: Jack W. Roe, Chairman, BRG

FROM: Robert B. Minogue, Director, Office of Nuclear Regulatory
Research

SUBJECT: NRR'S COMMENTS ON THE RES BUDGET

Consistent with RES responsibility to identify research needed to deal with safety information needs of the Agency, this Office presented detailed information to both the ACRS Subcommittee on Research and the BRG on recommended work for FY 1987. In response to the EDO mark and prior to receiving final comments from NRR, RES submitted a proposed FY 1987 budget of \$130M as well as statements of impact for the programs which were not proposed to be funded.

We have carefully considered the comments received from NRR in terms of clarification of their technical needs for regulation as well as their schedule for applying that technical information. On the basis of NRR's comments, we have made selected adjustments in our research plan in order to improve responsiveness to NRR's stated needs. We have also remained sensitive to the need to maintain certain research activities that support other agency needs or that maintain our readiness to respond to longer-term agency requirements. At the \$130M allocation for research, our proposed research plan already incorporated all efficiency measures possible consistent with a viable research program (including program stretchouts and cutbacks, improved management, etc.), and identifying further efficiencies at this stage of the budget process would be inappropriate.

Attached is our modification of the content and proposed funding for each program area based on these considerations.

A handwritten signature in dark ink, appearing to read "R. B. Minogue", is written over the typed name and title.

Robert B. Minogue, Director
Office of Nuclear Regulatory Research

Enclosure:
As stated

5/31/85

SUMMARY DATA

RES RESPONSE TO NRR 5/29/85 REVIEW

(DOLLARS IN MILLIONS)

	<u>FY 1986</u>	<u>FY 1987</u>	<u>5/30</u>	<u>NRR VS</u>	
		<u>RES*</u>	<u>RES</u>	<u>RES</u>	
ACCIDENT EVALUATION	30.7	30.9	24.1	30.9	6.8
REACTOR OPNS & RISK	16.5	17.1	15.7	17.1	1.4
REACTOR ENGINEERING	\$ 40.3	\$ 44.6	\$ 42.6	\$ 44.6	\$ 2.0
THERMAL HYDRAULIC TRANS	21.7	19.8	23.4	23.4	
WASTE MGMT, EARTH SCIENCES & HEALTH	11.8	17.6	18.8	18.1	-0.7
TOTAL	<u>\$121.0</u>	<u>\$130.0</u>	<u>\$124.6</u>	<u>\$134.1</u>	<u>\$ 9.5</u>

*RES REQUEST WITHIN EDO GUIDANCE

(In Millions)

SEVERE ACCIDENT PROGRAM

\$ 6.8

Severe Accident Codes

3.0

Detailed mechanistic severe accident codes such as MELPROG and CONTAIN provide the scientific basis for the integrated codes such as the Source Term Code Package (STCP, as modified from the BMI-2104 suite) and MELCOR. The detailed mechanistic codes, or the scientific principles within them are utilized in improving and correcting the simplified models in the integrated codes. A large effort on code assessment and validation will still be required in FY 1987 using the large amount of data generated in FY 1986 and FY 1987 from ACRR, NRU, core/concrete and core/coolant interaction, and the containment heating experiments. This will lead to modeling changes which will then have to be addressed in the integrated codes. Reduction and resolution of major uncertainties identified by the APS and other peer reviewers in our source term assessment can only be realized by the use of such mechanistic codes. A reduction of \$3.0 million at the point of completion of the validation of the severe accident mechanistic codes would deny NRC the benefits of important experimental data in application to resolving uncertainties needed to implement NRC severe accident policy.

ACRR Test Program

2.0

The ACRR tests are essential to model validation by obtaining realistic fission product release rates under high temperature melt progression and

other conditions not attainable in PBF or out-of-pile tests. Current estimates of foreign support for ACRR in FY 1987 is about \$1.0 million. We can not confirm this until about 6-9 months from now. If such support is forthcoming we would recommend a \$1.0 million reduction from the \$4.2 million level for ACRR to compensate for the foreign funds. Without U.S. funding, no foreign funds can be attracted.

Severe Accident Analysis - Containment Loading

1.8

A major cut in these elements would stretch out beyond 1987 efforts to complete deterministic analysis in support of the Implementation Program. Major results from experimental programs in hydrogen, core/concrete, severe fuel damage and fission product release will be available to permit the evaluation of plant specific differences with new improved codes. These analyses are essential to evaluate the generic applicability of severe accident policy and its implementation. We have already proposed a cut of \$0.7M from our original request. An additional cut of \$1.5M would jeopardize this essential work.

REACTOR OPERATIONS AND RISK

\$ 1.4

Severe Accidents Risk

The budget reduction suggested by NRR of \$3.0 million would foreclose any RES option to conduct confirmatory testing of recently developed/completed risk codes or to modify these codes to meet programmatic requirements identified as

NRR goes forward in implementing the Commission's Severe Accident Policy. Unanticipated plant-to-plant variations will inevitably surface as the process of comparing the risks of the population of operating reactors with that determined for several surrogate plants goes forward. This will require that detailed deterministic analysis be performed to validate simplified computer code comparisons and to confirm regulatory decisions based on engineering judgments. For these reasons, the proposed reduction in the Severe Accident Risk Program is not acceptable or prudent in FY 1987.

ENGINEERING TECHNOLOGY

\$ 2.0

Reactor Engineering

The NRR memorandum suggests a reduction of \$2.0 million beyond the RES reduction of \$3.0 million; one of these reductions would be \$0.5 million in seismic margins research through tighter program control or delay of projects. RES/DET staff have worked closely with NRR to finalize a seismic margins research program plan. Our proposed funding level is consistent with that program plan and already represents our best judgment of the minimum costs realistically attainable. Our proposed funding level is consistent with that program plan. Because of the high priority of seismic margins research vis-a-vis other research programs and the uncertainties regarding possible contributions from HDR and Todatsu, we believe that no reduction should be taken at this time.

A reduction of \$1.0 million was recommended in the primary system integrity program, to be taken from the efforts on pressure vessel integrity and NDE for life extension. While we recognize NRR's position that they could tolerate a stretchout of this program, we feel that this cut would result in unacceptable scope reductions and delays to programs needed to meet other agency reviews. The HSST program was substantially reduced in FY 1986 to eliminate research, including the PTSE-3 pressurized thermal shock experiment, that would have evaluated the effectiveness of cladding to inhibit pressure vessel failure. At the Chairman's request, we restored some funds for separate effects studies on clad vessels. The surveillance dosimetry program is another task that has been delayed because of earlier budget cuts and which should now be completed. Regarding nondestructive examination for life extension, we conclude that FY 1987 is not too early to start this program. The ASME Code, Section XI, Committee is already setting up a new group to look at inservice inspection standards for relicensing, and the Atomic Industrial Forum is also looking into the issue. If we are to support NRR by providing bases that can be applied to relicensing decisions that may have to be made in the early 1990's, a delay in this work beyond 1987 would be risky.

A reduction in the equipment aging program of \$3.5 million was also recommended. We had proposed a major expansion of this program to allow for in-situ monitoring and testing of systems and equipment at a number of operating plants. We agree that the scale-up of this program can be stretched out and had already proposed a \$3.0 million cut. We feel that a greater cut beyond that taken by RES on May 17, 1985, would not be justified at this time. We plan to provide by the end of FY 1986, as requested in your memorandum, a summary report based on our initial research identifying "whether and where equipment aging is a safety problem."

THERMAL HYDRAULIC TRANSIENTS

\$ 3.6

Advanced Test Facility

4.0

NRR comment - The ability to do continuing, independent research in a dedicated test facility generally similar to Semiscale or MIST is a desirable element of the NRC program. Either existing facilities, or modifications to one of the existing facilities, or a new facility could fulfill this goal. The Semiscale program should not be terminated until a decision is made on the dedicated facility and financing is assured for this facility. The \$4 million allocation in the budget in FY 1987 to support thermal hydraulic testing in addition to the international programs is appropriate for this purpose.

RES agrees with the need to supply capability for continuing integral testing. Because of other research priorities, funding for this should be in addition to the \$130M already identified. RES is evaluating various options for FY 1987 and will provide these, for NRR concurrence, by the end of 1985.

ROSA IV

-0.4

RES agrees to eliminate RELAP5 analysis of ROSA IV tests and to only use TRAC-PWR for such analyses, resulting in a savings of \$0.4M.

Other Thermal Hydraulic Activities

0

RES agrees with the \$2.8 million reduction for the balance of the thermal hydraulic activities. However, the specificity of this reduction will have to be worked out over the next 18 months. In particular, discussions on routine

acquisitions of data for the Nuclear Plant Data bank and improvements to the plant analyzer for comparative problem analyses on a mainframe vis-a-vis a micro computer.

Additionally, RES would like to note that the 2D/3D comment by NRR has been resolved.

WASTE MANAGEMENT, EARTH SCIENCES & HEALTH

\$ 0.5

RES endorses the NRR request for a radiation protection program data base and a study of the net risk of using respirators.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

May 21, 1985

MEMORANDUM FOR: Learned W. Barry, Director, Office of Resource Management
FROM: Enrico F. Conti, Acting Director, Policy, Planning and
Control Staff, Office of Nuclear Regulatory Research
SUBJECT: ANALYSIS OF "HARD CALL" PROGRAMS IN THE RES FY 1987 BUDGET
ALLOCATION

This memo supplements and expands the May 17 memorandum, copy attached, from me to the RES Division Directors on this subject.

For the "hard call" cases, we have developed information on what we would have done, what we will do now, and the safety related impact. These statements are attached for each program area. In addition, statements of the impact for maintaining a FY 1986 funding level into FY 1987 for Separate Effects, Severe Accident Analysis, and Containment Loading are included.

A handwritten signature in cursive script, reading "Enrico F. Conti", is positioned above the typed name.

Enrico F. Conti, Acting Director
Policy, Planning and Control Staff
Office of Nuclear Regulatory Research

Enclosures:
As stated

cc: RMinogue
DRoss
CKeiber
RES Division Directors
SDuraiswamy, ACRS
ZRosztoczy, NRR
RBrown, NMSS
JBlaha, IE
JMate, RM



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

MAY 17 1985

MEMORANDUM FOR: RES Division Directors

FROM: Enrico F. Conti, Acting Director, Policy, Planning and
Control Staff, RES

SUBJECT: CONSIDERATIONS RELATED TO THE FY 1987 ALLOCATION TO THE \$130M
EDO MARK

RES identified a number of "hard call" programs for discussion with ACRS and the BRG. The FY 1987 allocation to the EDO mark of \$130M is shown on the attached table. Specific considerations in making this mark are:

Reactor Engineering

1. Nondestructive Examination - Maintain the proposed funding.
2. Plant Aging - reduce proposed funding :
 - a. Increase support @ INEL from \$700K in FY 1986 to about \$2M in FY 1987 to strengthen technical integration.
 - b. The extent of material and component examination will be somewhat limited and at a slower pace than proposed (i.e., will do in-situ monitoring of safety systems to maintain core cooling and evaluate current bases for determining equipment residual lifetime; but will not do specific tests to verify methods for determining equipment residual lifetime and tests and examinations of some components from Shippingport and Operating Facilities will be deferred.

Thermal Hydraulic Transients

1. Advanced Test Facility
 - a. Delete proposed funding.
 - b. Rely on other integral facilities for test information.
2. Separate Effects - Maintain at the FY 1986 level.
3. Transient Models and Codes - Funding restriction requires limiting resources. Assumes funding TRAC and freezing RELAP5 with user cost recovery for maintenance.

Accident Evaluation

1. PBF Surveillance - Necessary to maintain.
2. Severe Accident Analysis and Containment Loading -
Funding restriction requires limiting resources to FY 1986 level.

MAY 17 1985

Reactor Operations and Risk

1. Data and Uncertainties - Reduction based on transfer of data acquisition and retrieval programs to AEOD.
2. Severe Accident Risk - Essentially fund at the proposed level.

Waste Management

1. Earth Sciences - Delete proposed programs in meteorology and hydrology while maintaining seismic increase for transferring eastern networks to USGS.
2. Waste Management - Fund at the proposed level.

E. F. Conti / mh

Enrico F. Conti, Acting Director
Policy, Planning and Control Staff
Office of Nuclear Regulatory Research

cc: R. Minogue
D. Ross
Z. Rostoczy, NRP
R. Brown, NMSS
J. Blaha, IE
R. Scroggins, RNI

FY 1987 BUDGET

(DOLLARS IN MILLIONS)

	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987</u>
<u>REACTOR ENGINEERING</u>	\$ <u>39.1</u>	\$ <u>40.3</u>	\$ <u>44.6</u>
MECHANICAL/STRUCTURAL ENGINEERING	<u>12.5</u>	<u>13.5</u>	<u>15.0</u>
CONTAINMENT INTEGRITY	4.5	4.4	4.6
SEISMIC MARGINS	5.5	6.3	7.6
MECHANICAL EQUIP QUALIFICATION	2.5	2.8	2.8
PRIMARY SYSTEM INTEGRITY	<u>17.6</u>	<u>17.2</u>	<u>18.5</u>
REACTOR VESSELS	9.0	8.4	8.9
PIPING - STEAM GENERATORS	5.6	6.5	5.8
NONDESTRUCTIVE EXAMINATION	3.0	2.3	3.8
EQUIPMENT OPERABILITY & INTEGRITY	<u>9.0</u>	<u>9.6</u>	<u>11.1</u>
PLANT AGING	4.4	5.6	7.8
ELECTRICAL EQUIPMENT QUALIFICATION	3.2	3.6	3.3
CHEMICAL ENGINEERING	1.4	0.4	0
<u>THERMAL HYDRAULIC TRANSIENTS</u>	<u>23.8</u>	<u>21.7</u>	<u>19.8</u>
INTEGRAL FACILITIES	<u>16.3</u>	<u>12.0</u>	<u>10.8</u>
SEMISCALE	4.6	3.4	0.5
FIST	0.7	0.3	0.2
MIST	5.3	3.4	4.5
2D/3D	4.6	3.2	3.6
ROSA-IV	1.1	1.7	2.0
SEPARATE EFFECTS	<u>2.3</u>	<u>3.2</u>	<u>3.2</u>
TRANSIENT MODELS AND CODES	<u>5.2</u>	<u>6.5</u>	<u>5.8</u>
<u>ACCIDENT EVALUATION</u>	<u>40.1</u>	<u>30.7</u>	<u>30.9</u>
PBF- SURVEILLANCE	0	0.5	2.0
SEVERE ACCIDENT ANALYSIS	5.3	3.5	3.5
DAMAGED FUEL	12.2	9.1	8.3
CONTAINMENT LOADING	8.8	6.6	6.6
FISSION PRODUCT SOURCE TERM	11.5	11.0	10.5
ADVANCED REACTORS	2.3	0	0

5/17/85

NUCLEAR REGULATORY RESEARCH
FY 1987-1988 BUDGET
(DOLLARS IN MILLIONS)

	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987</u>
<u>REACTOR OPERATIONS AND RISK</u>	<u>17.0</u>	<u>16.5</u>	<u>17.1</u>
RELIABILITY AND RISK METHODOLOGY	3.8	4.0	3.2
DATA AND UNCERTAINTIES	1.4	2.1	1.1
REGULATORY & INSPECTION APPLICATIONS	8.4	6.9	7.9
SEVERE ACCIDENT RISK	3.4	3.5	4.9
 <u>WASTE MGMT, EARTH SCIENCES & HEALTH</u>	 <u>13.3</u>	 <u>11.8</u>	 <u>17.6</u>
EARTH SCIENCES	4.5	4.5	5.5
HEALTH EFFECTS	2.2	2.5	2.2
HIGH LEVEL WASTE MANAGEMENT	5.0	3.0	6.8
LOW LEVEL WASTE MANAGEMENT	1.6	1.8	3.1
 TOTAL	 <u>\$133.3</u>	 <u>\$121.0</u>	 <u>\$130.0</u>

Reactor Engineering

Plant Aging

Reduce funding from \$10.8M to \$7.8M.

- (1) What would we have done?
 - Specific tests to verify methods for determining equipment residual lifetime and tests and examinations of some components from Shippingport and Operating Facilities will be deferred.
- (2) What will we do now?
 - Increase support at INEL from \$700K in FY 1986 to about \$2M in FY 1987 to strengthen technical integration.
 - In-situ monitoring of safety systems to maintain core cooling and evaluate current bases for determining equipment residual lifetime.
- (3) What is the impact?
 - Delay our ability to identify the weak links with regard to vulnerability to aging degradation for certain safety systems so that corrective action can be taken to improve overall safety.
 - Limit our ability to evaluate potential for common mode failure based on engineering studies, examinations, and tests of aged components removed from Shippingport and operating reactors.

Thermal Hydraulic Transients

Advanced Test Facility

Reduce funding from \$4M to 0.

- (1) What would we have done?
 - Designed and started construction of a new test facility based on a detailed concept developed during FY 1986. Potential concepts include: (1) small, low pressure facility(ies), and (2) moving existing facilities to INEL.
 - Implemented technical integration center at INEL using team for analysis and experiments.
- (2) What will we do now?
 - Continue to refine facility concept under FIN A6038, "INEL Integral Testing," in order to maintain minimum effort to support NRR needs in this area.
- (3) What is the impact?
 - With the planned closing of all major thermal hydraulic test facilities (FIST-1985, LOFT-1985, SEMISCALE-1986, 2D/3D-1987, and ROSA IV-1988), no thermal hydraulic test facility will be available over the next decade to meet anticipated regulatory requirements.
 - The team of thermal hydraulic experts at INEL will not be available to assist NRC in resolving regulatory issues as they have in the past (e.g., PTS, ECCS Rule change, TMI SBLOCA issues, SG tube rupture).

Transient Models and Codes

Reduce funding from \$7.8M to \$5.8

- (1) What would we have done?
 - Maintain RELAP5 and implement improvement as identified by international assessment program. Distribute new frozen version of RELAP5.
 - Interface new version of RELAP5 with plant analyzer and plant data base.
 - Assess RELAP5 accuracy for SBLOCA and other transients in a B&W geometry.
 - Provide RELAP5 support for domestic NRC (NRR and RES contractors) Users and international code assessment program.
 - Complete plant data bank and develop input decks.
- (2) What will we do now?
 - Minimal maintenance of existing version of RELAP5.
 - No further RELAP5 assessment or user support.
 - Stop plant data bank maintenance and no plant deck development.
- (3) What is the impact?
 - Existing unassessed RELAP5 MOD2 (frozen version) will be the last version of RELAP5.
 - Improvements required by NRR or other NRC Users will not be implemented.
 - No support for RELAP5 users under international assessment program and no improvements identified under this program. Will require renegotiation of some international agreements.
 - No support for NRC contractors using RELAP5. May make use of RELAP5 by NRC impractical.
 - Code accuracy would not be assessed.
 - Utility of Plant Analyzer/codes severely decreased due to limited plant decks. Utility of plant data bank questionable.

Separate Effects (Limited funding to FY 1986 level.)

The \$0.8M reduction will require delaying development of mini-centers of thermal hydraulic safety analysis capability at universities.

Accident Evaluation

Severe Accident Analysis (Limited funding to FY 1986 level.)

The cut of \$0.7M in Severe Accident Analysis will cripple efforts to complete deterministic plant specific analysis in support of the implementation of severe accident policy and the review of industry's response. Major results from experimental programs in hydrogen core/concrete, fuel behavior and fission product release will be available to permit the evaluation of plant specific differences with codes which have been assessed/validated against this data. These analyses are needed to evaluate the generic applicability of severe accident policy and its implementation.

Containment Loading (Limited funding to FY 1986 level.)

The cut of \$0.6M in Containment Loading will directly impact our capability to provide closure to issues raised in the APS review of the source term. The release of refractory fission products from the interactions of core debris and concrete remains a major uncertainty in the threat of severe accidents to the public. A two year experimental program (FY 1986-87) is planned to resolve the issue and this cut will prevent completion of these experiments in FY 1987 and closure of the issue.

Waste Management, Earth Sciences & Health

Earth Sciences

Reduce funding from \$6.2M to \$5.5M. Reduction eliminates programs in:

Meteorology	\$0.45M
Hydrology	0.25M

Meteorology

- (1) What would have been done?
 - Assess available plume rise methods and dispersion models for hazardous radioactive and toxic gaseous releases using existing data;
 - Conduct field test to obtain or confirm washout coefficients based on NRC work done at INEL and improve quantification of uncertainties in tornado hazard curves through analysis of known sources of error.
- (2) What will we do now?
 - Licensing decisions will continue to be based on inadequate, uncertain, or unvalidated data and assumptions.
- (3) What is the impact?
 - IE and NRR staffs will lack information concerning the validity and reliability of real-time models for atmospheric dispersion of radioactive and toxic gases and the fraction of radionuclide plumes brought down to the surface by rainfall which are critical concerns during the course of an accident. Large uncertainties in assessing the adequacy of licensee projections will continue to exist which could adversely affect emergency response.
 - Staff licensing decisions concerning the probabilistic assessments of the hazard to NPPs from tornadoes will continue to be based on information derived from inferred wind speeds using a methodology that has not been adequately verified or qualified by error bands.

Hydrology

- (1) What would we have done?
 - Determine the feasibility of adapting existing Canadian and other approaches to the development of relationships between deterministic data and flood possibilities.
- (2) What will we do now?
 - Flood hazard evaluations will continue to be done utilizing deterministic methods which are not compatible with probabilistic risk assessments, leaving NRC flood hazard assessments open to criticism concerning their technical merit.
- (3) What is the impact?
 - NRR staff currently does not have a capability for performing probabilistic risk assessments concerning external flood events and cannot reliably determine the safety margins for the flood hazard evaluations now being done by deterministic methods. NRR flood hazard evaluations are thus open to criticism and their conclusions may be considered suspect if challenged.

NUCLEAR REGULATORY RESEARCH
FY 1987 BUDGET
(DOLLARS IN MILLIONS)

6/4/85

	FY 1986	FY 1987			6/3 BRG	RES FINAL	BRG MARK
		REQUEST	TARGET	NRR			
<u>REACTOR ENGINEERING</u>	<u>\$ 40.3</u>	<u>\$ 47.6</u>	<u>\$ 44.6</u>	<u>\$ 42.6</u>	<u>\$ 44.6</u>		
MECH/STRUCTURAL ENGR	13.5	15.0	15.0	14.5	15.0		
CONTAIN INT	4.4	4.6	4.6	4.6	4.6		
SEISMIC MARGINS	6.3	7.6	7.6	7.1	7.6		
MECH EQ QUALIFICATION	2.8	2.8	2.8	2.8	2.8		
PRIMARY SYSTEM INTEGRITY	17.2	18.5	18.5	17.5	18.5		
REACTOR VESSELS	8.4	8.9	8.9	8.3	8.9		
PIPING-STEAM GEN	6.5	5.8	5.8	5.8	5.8		
NDE	2.3	3.8	3.8	3.4	3.8		
EQUIP OPER & INTEGRITY	9.6	14.1	11.1	10.6	11.1		
PLANT AGING	5.6	10.8	7.8	7.3	7.8		
ELECT EQ QUAL	3.6	3.3	3.3	3.3	3.3		
CHEMICAL ENGINEERING	0.4	0	0	0	0		
<u>THERMAL HYD TRANSIENTS</u>	<u>21.7</u>	<u>26.6</u>	<u>19.8</u>	<u>23.4</u>	<u>22.4</u>		
INTEGRAL FACILITIES	12.0	14.8	10.8	14.4	13.4	4.5	
MIST	3.4	4.5	4.5	4.5	3.5		
2D/3D	3.2	3.6	3.6	3.6	3.6		
ROSA-IV	1.7	2.0	2.0	1.6	1.6		
FIST	0.3	0.2	0.2	0.2	0.2		
INTEGRAL TESTING	3.4	4.5	0.5	4.5	4.5		
SEPARATE EFFECTS	3.2	4.0	3.2	2.9	3.2		
TRANS MODELS & CODES	6.5	7.8	5.8	6.1	5.8		
<u>ACCIDENT EVALUATION</u>	<u>30.7</u>	<u>32.2</u>	<u>30.9</u>	<u>24.1</u>	<u>28.1</u>		
PBF- SURVEILLANCE	0.5	2.0	2.0	2.0	2.0		
SEVERE ACCIDENT ANALYSIS	3.5	4.2	3.5	2.0	2.0		
DAMAGED FUEL	9.1	8.3	8.3	5.3	7.3	6.3	
CONTAINMENT LOADING	6.6	7.2	6.6	5.3	6.3	6.6	
FISSION PROD SOURCE TERM	11.0	10.5	10.5	9.5	10.5		
<u>REACTOR OPER AND RISK</u>	<u>16.5</u>	<u>19.0</u>	<u>17.1</u>	<u>15.7</u>	<u>15.6</u>		
REL & RISK METHODOLOGY	4.0	3.2	3.2	3.2	3.2		
DATA AND UNCERTAINTIES	2.1	2.7	1.1	2.7	1.1		
REG & INSPECTION APPLS	6.9	7.9	7.9	7.9	7.9		
SEVERE ACCIDENT RISK	3.5	5.2	4.9	1.9	3.4		
<u>WASTE MGMT, EARTH SCIENCES & HEALTH</u>	<u>11.8</u>	<u>18.3</u>	<u>17.6</u>	<u>18.8</u>	<u>17.8</u>		
EARTH SCIENCES	4.5	6.2	5.5	6.2	5.5		
HEALTH EFFECTS	2.5	2.2	2.2	2.7	2.4	2.2	
HIGH LEVEL WASTE	3.0	6.8	6.8	6.8	6.8		
LOW LEVEL WASTE	1.8	3.1	3.1	3.1	3.1		
TOTAL	\$121.0	\$143.7	\$130.0	\$124.6	\$128.5	\$128.6	