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**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

In the matter of:

241ST GENERAL MEETING OF THE
ADVISORY COMMITTEE ON REACTOR
SAFEGUARDS

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5 Room 1046
6 1717 H Street, N.W.
7 Washington, D.C.

8 Friday, May 2, 1980

9 The 241st General Meeting of the Advisory Committee
10 on Reactor Safeguards convened, pursuant to notice, at 8:30
11 a.m., Mr. Milton S. Plesset, Chairman of the Committee,
12 presiding.

13 PRESENT:

14 Dr. J. Carson Mark, Vice-Chairman

15 Dr. Chester P. Siess

Mr. Jeremiah J. Ray

16 Dr. Stephen Lawroski

Mr. James M. Jacobs

17 Mr. Myer Bender

Mr. Raymond F. Fraley

18 Mr. Dade W. Moeller

Mr. Blair Hager

19 Professor William Kerr

Mr. Harold Denton

20 Mr. Max W. Carbon

Mr. Edward Howard

21 Mr. Harold Etherington

Mr. W. Kane

22 Mr. William M. Mathis

Mr. D. F. Ross

23 Mr. Jesse C. Ebersole

24 Mr. Harold W. Lewis

25 Dr. Dade Okrent

P R O C E E D I N G S

1
2 CHAIRMAN PLESSET: Let's reconvene. The meeting
3 will come to order. This is the second day of the 241st
4 Meeting of the Advisory Committee on Reactor Safeguards.

5 Today, the Committee meets to consider reactor
6 plants and matters relating to near-term construction program.
7 And we will also take up the consideration of the report that
8 was scheduled for yesterday, regarding the policy of licensing.

9 (Pause.)

10 (Brief conference.)

11 We don't need a transcript for this part of the
12 session. It is an executive session.

13 (Executive session for approximately 30 minutes.)

14 CHAIRMAN PLESSET: So this will go on the record.
15 We had a, copies on that.

16 (Pause for distributions.)

17 DR. OKRENT: In Part 7.1 there's a short three-page
18 memorandum by Rich Major that summarizes the situation. If
19 you haven't read it, I suggest you scan quickly.

20 There was a short Subcommittee meeting of --

21 PROFESSOR KERR: Excuse me. Would mind further
22 identifying what you referred to.

23 CHAIRMAN PLESSET: Well, let me hold this --

24 PROFESSOR KERR: Loose piece?

25 DR. OKRENT: The loose piece was outside.

1 CHAIRMAN PLESSET: And then there's 7.1.

2 DR. OKRENT: Does the short Subcommittee meeting
3 have April 9, 1980? Really, I guess, in response to a
4 question of fact. At the Subcommittee meeting they indicated
5 their then thinking as to how they would proceed on the NTCP.

6 It appeared that the rules that the group who were
7 trying to get this moving for the Staff, the rules are the
8 following:

9 We're to look at the NTOL list and see what was the
10 protocol to the NTCPs and how. That has stayed a central
11 question that arose at the meeting twofold: one was the
12 following:

13 Was the NTOL list paired with any case in mind?
14 Were there other questions that were appropriate?

15 And if so, what can be done?

16 The second was one phrased by both Subcommittee
17 members and representatives of the plan, namely that there
18 could be changes in what the NRC required for plants just
19 beginning construction, which really is quite different by the
20 time they're in NTOL stage. There are several things currently
21 identified on the NTOL list -- like rulemaking on degraded
22 cores and so forth -- and other things like what do you do,
23 in addition to the --

24 And so it appears to both the Subcommittee and to
25 the utility that there was a need for policy guidance. And I

1 think at the end of the Subcommittee meeting it was left that
2 way.

3 Now, the core melt, for those of you who may not be
4 able to remember all the letters that were written last month --
5 in fact, there was a brief paragraph in the letter on the
6 action plan that said that people at the Commission needed to
7 advise policy rather than to be, in fact, also for plants
8 further away.

9 So it intended to give them any, the line recommenda-
10 tion --

11 I have no other comment except to note that if you
12 look down the list of the NTOL requirement, the things of this
13 sort that are, would fall in the policy guidance area that are
14 already on the NTOL list, they're identified as things for the
15 NRC Staff to do. And so it's not quite clear, you know, what
16 it would mean to say, "Well, okay, you can have your --
17 but we're going to tell you sometime in the future, after
18 rulemaking or whatever what you need to do with regard to the --

19 But it seems like an unsettled question to me that,
20 let's say, requires proper attention to the Commission with
21 reference to policy guidance.

22 DR. SIESS: Dade, what's the relation to the handout?
23 Do we replace Enclosure 2 with the handout list, the categori-
24 zation?

25 DR. OKRENT: I, I think we've gotten some kind of an

1 updated list, but it's -- I don't -- I think the differences
2 are in detail, and my opinion is the questions we should save
3 are somewhat broad in nature. But that's my own opinion.

4 CHAIRMAN PLESSET: Dade, do you want to follow me
5 and ask any members if they have anything to add?

6 DR. OKRENT: Yes. Please call on them --

7 (Pause.)

8 CHAIRMAN PLESSET: Evidently not.

9 DR. SIESS: One other question of Dade:

10 In the status report there's a list of items,
11 beginning at the bottom of page 2 and continuing to the top of
12 page 3.

13 Am I correct that those items are not in the plan?
14 These are items that you pulled out of the plan that you think
15 occur --

16 DR. OKRENT: Let's see. I would say these items are
17 not well spelt-out in the plan. They're certainly not
18 resolved in the plan, and some of them may not be in the plan.

19 But at this stage, if I were an NTCP owner, I
20 wouldn't know what to do with regard to any of these items.

21 (Pause.)

22 CHAIRMAN PLESSET: Yes, Dade.

23 MR. MOELLER: One thought in looking at this and
24 apart from both the Subcommittee and the Staff, we've listed
25 six NTCPs. However, the Committee has also been involved in

1 recent months in looking at the nuclear plant.

2 And I wondered if any consideration was being given
3 to how these changes find that particular facility.

4 SPEAKER: (Inaudible.)

5 MR. MOELLER: It's a little different. That's why
6 I wondered if, if they had given any thought to it.

7 DR. OKRENT: "They" is who?

8 MR. MOELLER: Either the Subcommittee or the Staff.

9 DR. OKRENT: Well, let's see it's my impression
10 we have not concluded our review of FMT. Am I right? There
11 are one or two items --

12 I think similar questions exist for FMT, in addition
13 to anything that's unique there --

14 The fact that it's a manufacturing license isn't
15 radically different from the CP, because you're trying to
16 settle everything but the breakwater kind of thing and the --

17 But it's, it's not on the Staff's list in that
18 regard. I would assume some of the decisions will abate.
19 None of these, I believe, are ice condensers on this list, so
20 that makes the FMT different from, in that regard.

21 Any other comments? -- before we go to the Staff.

22 Harold, do you want to take over, please?

23 (Pause.)

24 MR. DENTON: Well, there is a need for policy
25 guidance in this area. The -- we and you have essentially

1 completed our review of these pending applications before TMI
2 occurred. We've spent no effort on these applications in
3 terms of substantive review, up till fairly recently.

4 Guidance is being sought from the Commission. I
5 had hoped to get the advice of the Committee in order to have
6 that available when the Commission makes the decision about
7 whether to go forward for these pending CPs and manufacturing
8 licenses.

9 And if to go forward, how to go forward.

10 What I want to do today is briefly outline the
11 approach that we have in mind, and then have the Staff walk
12 through some of the details of the approach. But the ques-
13 tions of whether to go forward or not, I think, I view as --
14 view as being a settled issue.

15 Now, it may not in truth be, by, by the parties that
16 make these decisions. But we are letting those CPs holders,
17 who have very little construction under way, continue construc-
18 tion, for example. Congress did vote not to have a moratorium.

19 So in essence we are letting plants that have CPs
20 build them. Now, there might be views that we shouldn't add
21 to that population until waste questions are settled or
22 safety issues are settled. But that's a, that's a decision
23 to be made by the, by the Commission.

24 The proposal I'm putting forward is that to go
25 forward on these, based on a triad of considerations. First

1 off, I want to apply the action plan to these CPs and manu-
2 facturing licenses. Some of the action plan items have to be
3 met prior to issuance of a CP. The other can be met during
4 construction, and others can be postponed till very late in
5 the process; but I would completely apply the action plan
6 items to these plans.

7 Secondly, we'll take a second look at the sites to
8 see if the residual risk to the population surrounding these
9 sites warrants a new and novel approach, somewhat along the
10 Zion-Indian Point line, Zion-Indian Point line perhaps.

11 So we will take another look, hard look, at the
12 proposed sites for these pending applications to see how the
13 residual risk compare to those of the average plants, for
14 example.

15 And thirdly, we'll take a look at the plant designs
16 themselves with regard to their ability to cope with what I'd
17 call class 9 events or events beyond design basis to see if by
18 permitting to go forward we'll foreclose the ability to make
19 an important change.

20 Now, the kind of area that I have in mind in that
21 regard is in containment strengths, for example. Some of
22 these CPs are, have BWR Mark-3 containments that have limited
23 capability to cope with hydrogen problems.

24 I think in that area I want to be sure I'm not fore-
25 closing an ability to cope with that problem. I think that's

1 about the only one that the Staff has identified so far in
2 looking in these that, that would not, that would represent
3 an irreversible sort of conclusion if we go forward. If we
4 go forward with these designs and decide to change things like
5 DC batteries or other issues, they can be changed at any point
6 along the design, including a plant in operation.

7 But I want to be sure that I don't, I don't set in
8 motion an action which locks the Commission in to a posture it
9 doesn't want to be in.

10 So I think at this point the, the two kinds of
11 things that are important to keep in mind is we can't change
12 the site after construction gets started, and there are
13 certain design considerations that can't be changed either,
14 such as the plate thickness for the containment.

15 We may find some others in a harder look, but they
16 would be the, basically the three components on which we would
17 resume review of these plants proposed to the Commission to
18 resume review of these plants; that is, a look at, take a
19 second hard look at the siting issues and emergency planning
20 capabilities around those sites; take a second hard look at
21 the plant design and see if we can identify now what we expect
22 to be some of the fallout from the class-9 rulemaking, such as
23 ability to cope with hydrogen and make those changes that
24 appear appropriate; and third, apply the action plan in a
25 phased program, applying those things that must be applied

1 prior to CP issuance or in getting commitments for those
2 things that must be done after CP issuance.

3 And if I could get the Commission's advice in this
4 area, I would, it would be my intent to forward the final
5 recommendations to the Commission and get their guidance on
6 how to proceed.

7 MR. BENDER: As I understand it, you have a position
8 that there are one or two plants, maybe more, that need some-
9 thing to mitigate the consequences of core melt. Would you
10 envision that as being the kind of thing that might need
11 review during the reexamination of the sites?

12 MR. DENTON: Yes, and we're going that even for some
13 CP holders, for example.

14 MR. BENDER: Thank you.

15 MR. DENTON: There are, there are --

16 PROFESSOR KERR: Harold, excuse me.

17 As I recall one and two, those are the BWRs. They're
18 the only ones on that list. Am I right?

19 CHAIRMAN PLESSET: No, I think there are three --

20 PROFESSOR KERR: I know there are.

21 MR. DENTON: Yes, sir.

22 SPEAKER: Allan's Creek and Black Box.

23 PROFESSOR KERR: There are three. So there's Skagit,
24 Black Box, and -- what was the other one?

25 SPEAKER: Allan's Creek.

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PROFESSOR KERR: Allan's Creek.

MR. BENDER: Now, what I'd, what I want to foreclose in that area is, is -- I want to moot the issue of whether inerting is, at least for these plants, and moot the issue of whether inerting is unsafe -- and the Staff's concern about not coping with hydrogen is unsafe -- I think I can moot that issue in these containments by requiring a proper design pressure for these containments to cope with a very large amount of hydrogen.

So -- and if I don't take that opportunity here, I'll be faced with that issue somewhere down the road, if construction were to proceed.

I guess the one other point I want to make on this --

DR. SIESS: Harold.

MR. BENDER: Excuse me.

DR. SIESS: If you can decide on the, what that proper design pressure is in the -- you can settle the other issues.

MR. BENDER: Well, I, I, I can start with having them design for a hundred percent hydrogen burn -- put them in the same class as a dry containment. So that, that to me would, would moot the issue.

DR. OKRENT: A deflagration?

Not an explosion, but a deflagration.

MR. BENDER: Yes.

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CHAIRMAN PLESSET: Harold.

MR. ETHERINGTON: Mr. Chairman, the Three Mile Island Two action plan is directed primarily to operate in reactors. The velocity that we would have to live with what we've got, subject to such changes as could reasonably be, be made, it seems to me if we used that same document for construction permits which have not yet been issued, we are perpetuating a problem.

And I wonder whether Denton has considered the usefulness of another Three Mile Island directed to future reactors, with such requirements as we feel are necessary, not just those that we feel we can expediently improvise. This would mean perhaps another three-month delay while the plan was being developed.

MR. DENTON: We, we, we formed a new group: division of safety technology, to look forward and to just think about such things. And ideally, why, the things I wanted to think about are coping with core meltdowns.

In other words, if we could find a design criteria so the plants could cope with core meltdowns, you know, that, that would be no bind, of course. At the moment I'm not putting much effort into coming up with criteria for brand-new designs, because I don't see any, any motion out in the industry to apply for construction permit applications.

MR. ETHERINGTON: I wasn't speaking of brand-new

1 designs, but you might, for example, require that all contain-
2 ments be capable of standing a maximum hydrogen burn -- for
3 example. I, I don't --

4 MR. DENTON: Well, well, we're moving, we're moving
5 to rulemaking on the hydrogen issue, is what I've recommended
6 to the Commission. I've recommended that they inert Marks 1
7 and 2's and have rulemaking for all other containments.

8 And because of the sensitivity of that issue, for
9 these plants at the CP stage, I want to take a hard look at
10 the ability of those containments to cope with the hydroger
11 problem and attempt to moot the hydrogen issue to the extent
12 I can in their design.

13 MR. ETHERINGTON: Well, I was merely suggesting that
14 we wait until we define what we need, rather than proceed with,
15 on the present basis and perhaps get into a bind later and
16 finding that we can't get what we need.

17 MR. DENTON: Well, I, I don't, I don't think in this
18 case you, we have a, I'm, I don't have many resources to put
19 into developing brand-new requirements per se. These plants
20 were standard plants. They incorporated a lot of safety
21 features that some of our plants in operation don't have.

22 I, I think if we're unable to define for this class
23 of plants in a fairly soon time horizon what's required,
24 they'll make other choices, which is, you know, their, which
25 they shculd do. They are, they are very interested in having

1 here a, at this juncture, a definition of what the requirements
2 are; and there are policy questions, and there are technical
3 questions. And I think we need to, to put the issue to the
4 Commission, so it can decide whether it can issue these
5 requirements, some set of requirements or not, so that the
6 utilities can make choices as they see fit.

7 Now, some day we can, you know, we can develop up a,
8 a new set of requirements; but it sure can't be done soon. My
9 resources are strained to the limit, just hoping with the
10 plants in operation and the plants are already finished con-
11 struction.

12 So I'm putting very little effort into this review,
13 not say I'm sliding it; and I think our approach, one, of, of
14 fully meeting the action plan requirements, taking a second
15 look at the site, and taking a second look at those design
16 features that we know are potentially going to be impacted by
17 the class-9 rulemaking provide an adequate basis for moving on
18 the small additional handful of plants.

19 But I am not purporting to make that decision. I
20 wanted to put forward a proposal to the Commission so they can
21 make the decision, and I think it'd be most valuable if you'd
22 add your advice to the table so that they can, can make this
23 decision.

24 I think if we don't give the Commission a proposal
25 to act on, the decision will be made by default.

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(Pause.)

CHAIRMAN PLESSET: Dave.

DR. OKRENT: In the area of degraded cores, the only question on the table before the Commission, clearly, is not just -- since, in fact, we have a request right now to comment on other aspects of core.

And I've seen that there's a plan in a future environmental impact statement to talk about plants on accident. So it's not clear to me that were I an NTCP owner, even --

MR. DENTON: Aspirant. Aspirant, I think, is the right term. Aspirant, as opposed to holder.

DR. OKRENT: Aspirant, that's right. Thank you. Aspirant. Thank you.

I'm not sure they're aspirants.

(Laughter.)

Anyway. Applicant.

But I would think that, that issue has been settled by vents. Part of it. But I think the questions really are broader than the ones you have identified. I think I've mentioned specifically a concern about controlling design, but I would expect that in what you might call the area of reliability or design for reliability or so forth, we will see a considerable change in NRC requirements, but they -- between what it was in February 1979 and what it will be in February 1989, which is before these plants could be finished.

1 And we are well aware that people are looking toward
2 backfitting old plants.

3 Now, actually, it's not obvious to me that one can't
4 provide certain kinds of quality guidance if you set your mind
5 to it in the area of what I've called the reliability part of
6 it. I don't think that means you give prescription to the
7 fact -- I'm not sure you should give prescriptions.

8 But there might be some broader guidance that could
9 develop. In other words, I'm following up on Etherington's
10 suggestion that it might in fact be worthwhile trying to see
11 can one develop policy guidance that one thinks is reasonable
12 that goes far enough that the aspirant can hope for some
13 stability in the situation and, in fact, not be faced with
14 being able to proceed now and knowing very well you're going
15 to have to use delays in the middle, which I think is much
16 worse.

17 The situation, I think it's better to have the, the
18 thing delay now and, in fact, that's likely to be a shorter
19 delay if there's stability there.

20 And I think the --

21 MR. DENTON: Well, you know I -- but, Dave, I don't
22 think we can develop criteria any faster in any area than
23 we're doing today. The action plan lays out a very ambitious
24 schedule to improve our reviews in all areas. We've got
25 resources assigned to improving all these areas, and as the

1 requirements come forth, we'll intend to backfit and frontfit
2 to anybody that has a license or a CP or an application pend-
3 ing.

4 We are going to take a hard look at utility manage-
5 ment, for construction, to make sure they beef up their capa-
6 bilities to build a reliable product. And I don't see that
7 we'd be foreclosing an ability to backfit to anybody, whether
8 they are at the CP stage or just finishing or in operation.

9 But I, I have no, no way to speed control room
10 design reviews in development of criteria over what I'm doing
11 it. In other words, every, every available person in Dallas
12 available for that area is now, is now moving. So it's, it's
13 not as though I had a, you know, a cornucopia that I could
14 pull out of and do something special here.

15 The main bulk of our efforts are to, are to develop
16 criteria for all plants. And the subclass I would intend to
17 have to make those changes as they're identified for the
18 broader class.

19 MR. ETHERINGTON: Well, on a particular item, would
20 you come up with different criteria for operating plants and
21 plants which are not yet proved in construction?

22 MR. DENTON: I, I think in some areas you certainly
23 would, like control room design. But once we can define a
24 safety vector that should be in all control rooms, that comple-
25 ment of signals that really allow you to sense the safety of

1 the plant. We'd, it'd be a lot easier to get them into a
2 class of plants like --

3 MR. ETHERINGTON: That's a rather obvious one. But
4 there might be others which are not simple.

5 MR. DENTON: Well, I agree it's not a perfect solu-
6 tion. I, it's, it's in, to, to go forward, the, the option is
7 to, to decide purposely not to go forward until all these have
8 been defined. Some of --

9 But if you take things like emergency planning, even
10 though there's the rulemaking on emergency, is, won't be com-
11 pleted for some time, I think the fact that the Staff has been
12 looking at emergency plans over the past year and, and know
13 the elements in the emergency rulemaking hearings, give us an
14 ability to distinguish whether or not they're going to be
15 problems in the emergency planning area at these proposed
16 sites.

17 So I don't think I have to await the final completion
18 of the rulemaking on emergency planning to be able to dis-
19 tinguish good sites from bad sites with regard to -- or
20 problem sites -- with regard to emergency planning.

21 And I'm not prejudging how these applications now
22 pending for us will turn out, when looked upon in the action
23 plan light and the site and the plant design.

24 If they have problems in those areas, we won't go
25 go forward. So I'm not proposing a blind go-forward in these.

End Tape 1
27 minutes
Tape 2:

1 But I'm trying to lay down the principles by which we would --

2 In emergency planning or in the design of a plant
3 that we think must properly wait completion of rulemaking or
4 new criteria, we'll just hold up on that application.

5 But, but --

6 DR. SIESS: Well, this is on emergency planning.

7 CHAIRMAN PLESSET: Well -- go ahead, Bill.

8 PROFESSOR KERR: In describing the site review, you
9 used the term "residual." What is the significance of the
10 term "residual"?

11 MR. DENTON: It's the -- I use it in the same sense
12 that I discussed it with you in Zion and Indian Point case,
13 that, that if accidents happen and releases occur beyond those
14 for which the plan has been designed, what is the acute health
15 effects, latent health effects, property damage, and so forth
16 resulting from a major release from this plant -- versus the,
17 the same effects at other plants?

18 So I am right now looking down the list of all
19 plants which hold either OLs or CPs. And we will be moving
20 along the Indian Point-Zion line for any plan which we con-
21 sider has a, a disproportionate share of societal's risk.

22 Now, we've already told people that, that Limerick,
23 for example, is another plant that, if you look at the
24 relative risk of the plant versus the population of plants, it
25 deserves the same sort of hard look.

1 PROFESSOR KERR: No, I was curious about the signifi-
2 cance of the term "residual." I, you, you almost could use
3 the term --

4 MR. DENTON: "Risk."

5 PROFESSOR KERR: "Risk."

6 MR. DENTON: Yes.

7 PROFESSOR KERR: To populations --

8 MR. DENTON: Yes. Yes, sir.

9 PROFESSOR KERR: Are you going to do it to calculate
10 release probabilities? Are you going to use them on some
11 typical plant? Or a specific plant proposed for that site?

12 MR. DENTON: Well, in order to decide whether or not
13 they trip, a concern in this area, I'll use a benchmark plant;
14 in other words, assume the same way we, we've approached it in
15 the past -- let's assume the same plant at all the sites.

16 And then, finding ones that seem to be out of line,
17 go back and ask that applicant to do a more detailed risk
18 assessment that looks at both the plants and the site-related
19 features, to see if it's compensated.

20 PROFESSOR KERR: Thank you.

21 CHAIRMAN PLESSET: Chet.

22 DR. SIESS: You must have some feel now for the
23 site, don't you? I mean, Skagit can take on any field work.
24 Or they just decided to move it.

25 I'm sure you could be a lot of help in telling them

1 where to put it. But what about -- are any of these bare
2 sites?

3 MR. DENTON: Well, I --

4 DR. SIESS: Possibly pilgrims, which is within our --
5 capacity?

6 MR. DENTON: Well, you already know that none of
7 these sites trip what's in the, the siting document.

8 Anyone remember the number of that 05 --

9 Remember the --

10 SPEAKER: 0625.

11 MR. DENTON: 0625. I had some criteria proposed.
12 None of these trip that. But now, both --

13 DR. SIESS: Those were area-based average populations.

14 MR. DENTON: Yes. But I want to go beyond that and,
15 and take a look at these. And I think what we'll find is that
16 Pilgrim would be the highest of them. I know some of them are
17 very low sites, whereas among this population of CPs are
18 probably sites in the lowest 10 percent of population density.

19 So they have a range, and I -- we've not, we've not
20 completed the look at all of them. But from previous looks, I,
21 I know that they tend to fall well below the Zion-Indian Point
22 level. And even the maximum one like Pilgrim falls well below
23 a number of other sites. And some of the CPs fall very near
24 the bottom.

25 (Pause.)

1 MR. BENDER: I want to go back -- I'd like to go
2 back to Mr. Etherington's approach, which suggested that there
3 were some things that might warrant change, and I suppose I
4 was somewhat surprised to hear you say, "Well, some of these
5 plants are standard plants, and they already have the useful"
6 maybe that's the wrong term, but -- "but they already have a
7 lot of safety improvements in them."

8 I, I'm not really taken with the idea that the
9 standard plants have so much more than what exists in other
10 plants. And I do recognize that things like electrical
11 distribution systems and like the single-failure criterion
12 have not been looked at in great detail in many of those
13 plants.

14 How, how would you plan to cope with that particular
15 matter?

16 MR. DENTON: Well, I, I approached it this way:

17 None, we are not, by issuing a CP, we're not fore-
18 closing an ability to improve those kinds of things. That
19 was, that was my main criterion that if we take one like DC
20 batteries, which we've relooked at, if we find that that down
21 the road it's needed to change that system, I have not fore-
22 closed it by letting them pour concrete.

23 In fact, I don't think I've foreclosed that in any
24 plant.

25 So I agree we're going to relook at single failures,

1 and we're starting down even with plants which are under con-
2 struction and are just filing. We're beginning to do system-
3 oriented reviews. Palo Verde, we've started to review, look
4 at its DC battery-system reliability, just that system.

5 And yet it's in here three years before operation,
6 and I think that's plenty of time if we need to make changes
7 in that system to make it.

8 So I, I'm not saying they're unimportant issues; I'm
9 saying their, their resolution, I don't think, has to be
10 decided in this time frame. But --

11 MR. BENDER: Well, that's just one approach. And
12 not foreclosing is, applies very well to a mortgage that's
13 overdue. I'm not sure that I think that the timeliness of, of
14 providing a mortgage nowadays could be based on whether you
15 could foreclose or not.

16 MR. DENTON: Well --

17 MR. BENDER: It seems to me that maybe Mr. Ethering-
18 ton's point sounded good, but there ought to be some period of
19 time to see whether improvements in the new plants could be
20 made and not lead people down what is becoming a primrose
21 path.

22 MR. DENTON: Well, that's only one option; and that's
23 what we're struggling to, what, what I wanted to do is not let
24 the issue dawdle, you know, for x number or more months. I
25 want to get a proposal and some options to the Commission, so

1 they can either decide they want an entirely new or some
2 modified licensing review framework generated, or whether they
3 want to proceed with this group as being the last of the old
4 batch, or the -- whether the first of the new group. And, and
5 in essence, I think it's incumbent on the Staff at least to
6 put forward some proposals.

7 So we've, we've put forward one. Obviously, that's
8 a lot of policy judgment in, in which way they're handled.
9 And the, it, it's not my decision to make. I think it's the
10 Commission's.

11 MR. BENDER: Would an additional three-month -- and
12 I know that was an arbitrary number that Mr. Etherington threw
13 out. Would that be adequate time to take a look at whether
14 any additional requirements might be exemplified?

15 And it's not what kind of timeframe would you suggest
16 as an alternative?

17 MR. DENTON: Three years?

18 I don't think we're going to do anything in three
19 months. We, we, we, we've just --

20 MR. BENDER: Okay. I think --

21 MR. DENTON: We've just got the entire Staff tied up
22 on every action plan development item there is. There's very
23 little staff to devote to this effort. And if, if we really
24 had to make a major change, it would take a long time to, to
25 do it.

1 MR. BENDER: Well, now, let's, let's, let's carry it,
2 the argument, a little bit further and say if it's going to
3 take three years, what's granting the operating the operating
4 license to do at the end of three years?

5 MR. DENTON: It allows them to pour concrete.

6 MR. BENDER: I mean the --

7 MR. DENTON: Pour concrete, provide the space, while
8 we thrash out what kind of systems go in that space -- provided
9 we haven't, as I said, foreclosed a major option.

10 Now, what you're foreclosing is a design that would
11 really cope with a core meltdown. Now, we keep looking and we
12 keep listening to people who think they've got designs that
13 might really cope with a core meltdown. But that's sufficiently
14 still on the horizon that I, I don't see that I can move in
15 that direction quite yet.

16 But possibly, by three years from now, maybe someone
17 will have devised a system that would pretty much ensure
18 containment of a complete meltdown. Now, that's, that's where
19 I'd really like to end up if we could get that close. But I'm
20 doubtful.

21 MR. BENDER: Have you tried to figure out how many
22 resources are needed during the three-year period?

23 MR. DENTON: No.

24 With regard to resources, you should really under-
25 stand: we are, we are very strained to even meet the commit-

1 ments that are in the action plan, on those operating plants
2 and the construction schedule. We are mortgaged ourselves
3 quite heavily, and we're using, trying to use dollars where
4 possible to get work done outside.

5 But in terms of developing new criteria for potential
6 CP is, you know, is my last priority. I've got, I've got
7 problems with operating plants.

8 MR. BENDER: I guess my point is that your, your
9 resources are foreclosing the opportunity to do anything.

10 MR. DENTON: Yes.

11 MR. BENDER: And that's what it sounds like to me.

12 MR. DENTON: That's right.

13 MR. BENDER: Not just in three months, but ever.
14 Because you are forever working on TMI.

15 MR. DENTON: Well, until we work over the, the next
16 couple of years, that's right. Where the action plan is a
17 big, big effort to revise those plants which are in operation.
18 Or about to be in operation.

19 MR. BENDER: Okay.

20 MR. ETHERINGTON: Well, with an understanding that
21 people working on the action plan looked at two things
22 separately, one of them: what do we have to do to operating
23 reactors? And the other is: what would, what would we do if
24 we had, if we were starting from scratch and had free rein?

25 I think if this double look were recommended, it

1 wouldn't take so much more effort, and it might accomplish the
2 kind of thing that I have in mind.

3 MR. DENTON: Well, if it were all that simple to
4 develop a new list of requirements, we would have done it a
5 long time ago.

6 I said: if we could develop in three months a list
7 of the ideal, quote, "perfect" plant, we would have done that
8 before now. I, I just don't think it can be done in three
9 months.

10 MR. ETHERINGTON: In other words, you think that the
11 items are not included in the action plan.

12 MR. DENTON: Not for, not for a perfect plant. But
13 there are a lot of, you know --

14 PROFESSOR KERR: Harold, I don't think that any of
15 us are as aware as you are of the difficulties you are having,
16 but you certainly aren't aware that you attract --

17 An alternate way is for a perfect plant. You your-
18 self gave an example earlier of the sort of thing that one
19 might do when you said that you wanted to have a containment
20 designed so that you could take care of a hydrogen burn.

21 It seems to me in a sense that's what Mr. Ethering-
22 ton is talking about: where you're looking at a particular
23 item of containment, if it's already in place, well, we can't
24 do much about it.

25 But if it's not in place, maybe there's some things

1 you can do about it -- you're suggesting.

2 It's, it's not an empty -- but a perfect plant.

3 It's just, but it's included one by looking at items that may
4 fall in the category of plants not, the ultraplants that are
5 on their way along.

6 MR. DENTON: Well, obviously, improved plants would
7 be ones that, that have satisfactorily resolved all the out-
8 standing unresolved safety issues, like ATWS, for example.

9 PROFESSOR KERR: Yes, but an improved plant would
10 be that has resolved the one issue.

11 MR. DENTON: Well, we intend we've got a lot of
12 people devoted to unresolved safety issues. We've issued
13 about four of those, and they will be backfitted in these
14 plants, I'm sure, long before these plants ever approach
15 operation.

16 CHAIRMAN PLESSET: Question?

17 MR. DENTON: They're even starting today. Suppose I
18 had completed a review of these plants today, against the, the
19 kind of criteria I'm proposing. We're probably a year before
20 getting a decision out of, out of the Board, even if the Com-
21 mission were to bless this kind of area.

22 You know, the, the, the system is not one that turns
23 around in a day.

24 We have to develop criteria. I've got to get the
25 Commission to approve the type of approach we're taking. I've

1 got to then review the plants against those criteria. We've
2 got to go forth and adjudicate those matters. The Board has
3 to render a decision, and the Commission then renders a
4 decision at the end of the process.

5 So, in, in order for the, the utilities to expect
6 even a decision, you know, within a year, you don't have a
7 lot of time to, to do this.

8 CHAIRMAN PLESSET: Dave, you had a question.

9 DR. OKRENT: Specific question in the siting area.
10 The siting document mentions now that the plants look at the
11 hydrology question as such, presumably in connection with core
12 melt accidents.

13 Of course, that could be affected by whether or not
14 you try to retain the core inside or so forth.

15 But if you don't look at that now, and you don't
16 take the measures, and then a few years from now you say, "But
17 we have this siting document in mind. I'm not sure where you
18 are after you poured concrete."

19 In other words, this is a policy question -- is what
20 I'm saying.

21 MR. DENTON: Well, I think the answer is we'd take a
22 scan at hydrology, to see if the sites are really -- the, the
23 question is: how fine is the mesh?

24 I am admittedly talking about a rather coarse mesh
25 to pick up things that are, but if you talk about a fine mesh

1 to make fine distinctions, that's what I don't propose to do.

2 DR. OKRENT: That's coarse, indeed. But the trouble
3 is, it's, it's quite coarse today; but we know it will become
4 finer and finer inevitably.

5 And the -- it certainly is a difficult position for
6 the person aspiring for the construction permit. And, and I
7 guess it's not clear to me that, if I consider the national
8 interest, that your current allocation of resources, including
9 some of the detailed allocation, is necessarily correct if you
10 are unable, and have been unable in fact for the last several
11 months to put effort in the theria.

12 In other words, I'm not saying that the people aren't
13 all busy. I'm not convinced that they're necessarily all
14 working on things as important as this.

15 CHAIRMAN PLESSET: Go ahead, Carson.

16 VICE-CHAIRMAN MARK: Harold, do you take a nominal
17 plant and it will have what Bill referred to as residual risk,
18 if the population density is higher than the average, there's
19 no way you can possibly reduce that except to move the plant.

20 MR. DENTON: Right.

21 VICE-CHAIRMAN MARK: And then allocation which
22 yesterday was all right will today become long because it's
23 now higher than the average. So you'll have to revoke that.

24 It wasn't clear from what you said, and I don't
25 think it would be worthwhile to go into it, because it's very

1 difficult, I know -- to say what allowance or in what way you
2 will say this plant has a higher demographic strength than
3 that one, but it is also tougher. And therefore, I'm prepared
4 to regard it as equivalent and acceptable. And that is going
5 to be impossible for at least a year or so until one has
6 decided what the standard complement of fixes or equivalents
7 must be.

8 It isn't a hydrology problem, then, as was just
9 mentioned -- going to be approached in the same way? Or is
10 hydrology absolute?

11 MR. DENTON: I don't, I don't -- the hydrology is
12 not as serious a problem as the airborne problem.

13 VICE-CHAIRMAN MARK: True. But it's also demo-
14 graphic.

15 MR. DENTON: Yes. And we've, we've flagged it as an
16 issue we intend to get into. And obviously, what, what, what
17 I guess from a philosophic sense troubles me is that, is the
18 notion somehow that I don't know how to pick good sites or to
19 tell good sites from bad sites and good plants from bad
20 plants, when, when I am sitting here today authorizing 70
21 plants to one.

22 And, and, you know, 90 plants are under construction.

23 VICE-CHAIRMAN MARK: You know how to make the milers
24 rather strongly persuaded them that you couldn't quantify the
25 differences.

1 MR. DENTON: Not very well. But the Commission has
2 asked me to adopt the Indian Point-Zion-type look, see, at
3 plants which were in the very early stages of construction.

4 I had proposed to the Commission that on the next
5 final environmental impact statement to, to be produced that
6 we would revise our treatment in the environmental impact
7 statement of class-9 accidents, which we formerly dealt with
8 mainly by dismissal, to go into a lot of detail as to what
9 the reactor risks were from, from accidents involving a breach
10 of containment.

11 They concurred in that view, and they said, "Start
12 putting in your environmental impact statements a more com-
13 plete discussion of the potential consequences of, of acci-
14 dents beyond design basis. But go back and look at those
15 plants which are under construction and may require the OPS-
16 type fix, like a core ladle, or those kinds of things and
17 identify them early so that you can get them implemented
18 before a plant gets very long in construction.

19 And so I am in the process of identifying those
20 plants now, and I would propose to sweep into that list all
21 these pending CPs and treat them in the same vein, so that
22 we'd take a hard look at the, the unusual risk posed by, by
23 long evacuation times or large numbers of people or whatever
24 pathways to those there were.

25 And if it seemed to be an unusual case, stop and

1 try to fix it.

2 PROFESSOR KERR: And the goal is to reduce the risk
3 to, say, some average.

4 MR. DENTON: Well, no, it's not an easily quantifi-
5 able goal. We know that some plants are, are, carry a much
6 larger share of society's risk than others.

7 PROFESSOR KERR: I'm not trying to be critical; I
8 just want to understand, to see if I understand what, what the
9 next step is, once you've discovered that a plant is an out-
10 lier or whatever, you then do something --

11 MR. DENTON: Well, what, what the first thing I'll
12 do and this, this screening is admittedly using a benchmark
13 plant. It doesn't reflect the real plant. So Indian Point
14 and Zion are trying to convince us that their plant has com-
15 pensating safety measures. We will be moving to Limerick on
16 the same sort of basis, which is a boiler. And we'll be asking
17 them to say, "What are the differences between your design and
18 Peach Bottom that tend, that would compensate or attempt to
19 compensate for the differences in your site and the Peach
20 Bottom site, for example."

21 And so we make the applicant do the work in the
22 first instance of trying to demonstrate the differences.

23 PROFESSOR KERR: And their goal is to demonstrate
24 that they are not worse than, say, Peach Bottom.

25 MR. DENTON: Well, I, our, our goal would be ulti-

1 mately to achieve a design site combination that, that, that
2 gets it certainly down toward the middle, the average-sort of
3 looking plant site combination, rather than being an extreme
4 outlier.

5 (Pause.)

6 But I, I don't think we're going to get much forward
7 motion on this until, I don't think the Commission would want
8 to make a decision without the advice of the ACRS. But I
9 think the Commission would like to have whatever you could,
10 you could give them on this issue of whether to go forward
11 now, whether to pause and develop new criteria, or, or whatever
12 approach you thought was warranted.

13 But it is a situation where there's been really no
14 action from the, in terms of the licensing review, for a long
15 time. And, and I just feel that we need to, to set in motion
16 a process for these, these remaining CP applicants, can, can,
17 can know what might be forthcoming or not as they make deci-
18 sions.

19 CHAIRMAN PLESSET: Well, that is a reasonable
20 request. I think the Committee could make a real effort to
21 give this type of advice. We essentially can.

22 But I don't think we'll try to do that, Harold.

23 MR. DENTON: We can go in this morning in a lot more
24 detail about the application of the action plan and which
25 items have to be done before we'd issue a CP and which must

1 be done at staged intervals and which could wait to the OL.
2 If you wanted to get into that detail -- but I really think
3 that's a subset of issues over this bigger set as a, as the
4 policy consideration.

5 CHAIRMAN PLESSET: Yes, Jerry.

6 MR. RAY: Mr. Denton, looking over this list that
7 has just been sent to us on a revised basis, and proposed
8 requirement category assignments, TMI-2 action plan and
9 implementation for near-term CP applications, it looks like
10 you've already renewed it and decided by way of the comments
11 that are on this list which elements on this list that NRC is
12 going to develop something on criteria for it.

13 And I just wondered: does this mean that having
14 done this, nothing else will be done from the viewpoint of
15 availability of resources?

16 Is it now going to go into limbo?

17 MR. DENTON: No, our, our intent would be if, if, if
18 you concurred in, in, and the Commission concurred in the type
19 of approach, we would then take this, this list and I've, I've
20 allocated a few, a small amount of resources. Then we would
21 review each application against those, those ones that have to
22 be done before CP issuance or get commitments.

23 So I would propose to reinitiate the reviews of all
24 the pending CPs and the ML license. I, using that kind of
25 breakdown as which issues we do now and which we just get

1 commitments in and which we want detailed designs in and begin
2 the review process.

3 MR. RAY: For instance, if I may take a look at one,
4 page 7 under action item 112E1, auxiliary feedwater system
5 evaluation, and it says that NRC's to develop supplemental
6 criteria for CP applicants.

7 Are, are your people now going ahead with such a
8 development on, for, for evaluating feedwater systems in these
9 CPs?

10 MR. DENTON: Let me ask the people who put the list
11 together to respond on that issue.

12 (Pause.)

13 MR. KANE: William Kane.

14 For each of the category 3, 4, and 5 items which
15 require some sort of information prior to the CP, we've gone
16 back and looked at the, at the action plan and tried to
17 extract from it just exactly what would be required by the CP
18 applicant, what he would have to commit to, what information
19 he would have to give us; the matter that Harold mentioned
20 earlier about the foreclosure of options is one area that we
21 would have to supplement, provide a supplement to the action
22 plan to, to explain exactly what we would require from the CP
23 applicants.

24 MR. RAY: So you already have in progress then work
25 in the area of reviewing CPs --

1 CHAIRMAN PLESSET: Well, Jerry, let me interrupt. I
2 th that Harold Denton and Kane have planned a more consis-
3 tent presentation of how the reviews will be conducted. Maybe
4 we should go through that.

5 Would that be agreeable with you?

6 MR. RAY: Sure.

7 MR. DENTON: Yes. Then --

8 CHAIRMAN PLESSET: Is that -- go ahead.

9 (Pause.)

10 DR. SIESS: Harold, is there any way you can see of
11 doing this in stages like the Germans do? Say, a site
12 approval?

13 It seems to me there's even problems there, because
14 if somewhere down the line it's decided that people should
15 have a vented fork in containment, then they should also have
16 room on the site for several hundred thousand cubic feet
17 structure or something.

18 MR. DENTON: We, we --

19 DR. SIESS: Have you thought about what you could do
20 as far as saying, "Okay, the site is okay. You can start to
21 buying it or thinking about it or whatever. But you can't,
22 can't start building."

23 Would that --

24 MR. DENTON: Well, we had thought about a number of
25 conditions in the construction permit that required actions by

1 their part. We had not gone quite so formal as to say, "Go
2 just this far and no further."

3 You know, the question, that question is really
4 bigger than just CPs, because we've got CP holders who haven't
5 done very much construction either. So we really have a
6 spectrum of applicants from the broad view, from the plan
7 entirely built, the ones who are wanting to start. The ones
8 who got a CP 13 months ago but have just begun to build.

9 So I, I, I look at the entire spectrum; and what I,
10 I don't see the need for phased legal holdings, because I, as
11 soon as I develop requirements on, say, control room design or
12 any other area, I'll apply them to all plants.

13 Now, the implementation may be different for those
14 that just began, but I, I don't lose control over the applica-
15 tion just because they have a CP. And I think that's, that's
16 what we're doing on Limerick, for example, in, in terms of
17 protection.

18 DR. SIESS: Yes, of course, I was trying to see some
19 way of letting people get started if, if they know all these
20 these things are coming, then they'd decide they'd just want
21 to wait five years till you make up your mind.

22 I, I guess I don't see that the site could really be
23 a -- you couldn't build very far. If you think about an OPS-
24 type core ladle, that's one of the first things you build.

25 MR. DENTON: I'm not --

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DR. SIESS: Containment base --

MR. DENTON: Well, see, I, I -- well, rather than try to make that decision in the abstract, that's why I wanted to screen them against this coarse net to see if they're in the high populated areas anyway. If not, I don't -- I wouldn't lean toward a core ladle for them. I'd only take those extraordinary measures --

DR. SIESS: Do you know of provisions for handling core melts, degraded cores -- but I thought it had not been related to population density at all.

End Tape 2

1 MR. DENTON: They are in the OPS case to the
2 aquatic contamination.

3 DR. SIESS: But you'd like to put the whole thing
4 on residual risk basis, right?

5 MR. DENTON: I guess I'm --

6 DR. SIESS: It seems to go directly against that
7 last NUREG which says let's decouple the engineered safety
8 features from demographics.

9 MR. DENTON: Well, in the ideal world in the
10 future, I think we ought to try to move in that direction,
11 but the real life is 160 or 70 reactors at the moment
12 aren't all that decoupled.

13 DR. SIESS: No, but you're talking about the ones
14 that don't have construction permits.

15 MR. DENTON: But the reason I look at those in
16 a different class is that the applications have been on
17 review for years and years. I'm not talking about require-
18 ments that I would apply to a new CP applicant coming in.
19 I would ultimately to get a NUREG guide and a new format
20 and a new design criteria for any new application.

21 But, you know, some of these utilities have spent
22 considerable money and got all the design done, and they
23 aren't all that much different than the CP holder, I guess,
24 in my view except they don't legally possess a license.

25 CHAIRMAN PLESSET: Dave.

DR. OKRENT: From a procedural point of view

1 this morning before you heard a detailed presentation by
2 the Staff, and this is in my mind as well, I think you ought
3 to finish what I would call general discussion with Harold,
4 and then probably hear from the representative, the
5 utilities -- and then see where you are and see how much
6 time you want to spend further, and do you want to get
7 into the details on this time?

8 I think that would be a better way to proceed
9 because the detailed ones can become very time consuming,
10 and it may not be what you want to do at this meeting.

11 DR. SIESS: Well, it's not -- Harold doesn't
12 really -- he's not really asking us for comments on that
13 detail. He's asking for comments on a very broad question --

14 DR. OKRENT: Even if he asking us on the detailed
15 one, it seems to me that until we know where we stand on
16 the broad one --

17 DR. SIESS: Well, with his time schedule, there's
18 no hurry.

19 CHAIRMAN PLESSET: That's fine. But the general
20 -- discussion of general points, I think we should have a
21 cutoff time because we can go all day on that, too, I think,
22 and Harold wouldn't enjoy it, and neither would I.
23 So I think that we can very well continue with that.

24 We have allowed nearly an hour for presentation
25 by the NTCP owners so let's continue with the general
discussion, then, for a short time.

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MR. DENTON: I guess the one point I want to make on the general discussion is there are an awful lot of things in the action plan which would be required to be demonstrated before we'd issue the CP. In other words, I think there are some very important ones -- such as -- I mentioned the management qualifications to follow the design and so forth.

So -- I don't remember the numbers -- maybe one of the Staff can help me. Out of the action plan items, how many of them had to be reviewed and concurred in by the Staff? If you could just give us a crude breakdown, or if you had a slide that would maybe show those action -- just the numbers of action plan items that are deferred for future consideration versus those that must be looked at now.

DR. OKRENT: You can get the number, but sometimes numbers are not very representative because you could have 20 items, this wire and this valve, and so forth, all of which need to be resolved in one small item like what do we do for degraded core cooling.

MR. DENTON: But I don't want to belabor this point too much, but the fact is we're letting plants continue to build today, you know, who haven't even had this kind of look, you know --

DR. SIESS: What you're asking, I think, and correct me, is whether you should treat the near-term CP's

1 differently than the CP's that are further down the line,
2 and if so, what kind of screening should you subject them
3 to to put them in perspective of the six plants versus
4 70 operating versus 90 more that already have construction
5 permits, etc. Where do they fit?

6 MR. DENTON: My own -- I think the approach I'm
7 advocating would assure that their risk to society would be
8 in the bottom part of the risk curve compared to the other
9 plants that are already out there. Of course, that's
10 where I think the three --

11 DR. SIESS: Which would be consistent with the
12 philosophy that the newer they are, the better they should
13 be except, of course, they have no risk at all to the
14 public until they operate. You've got 70 already operating,
15 and you have to keep that in mind.

16 CHAIRMAN PLESSET: Any other question of Harold?
17 Yes. Jessie.

18 MR. EBERSOLE: Mr. Denton, I looked at this
19 long list; and I have looked at it a long time, and I have
20 some difficulty in finding what I'll call a thread of con-
21 tinuity toward better plants in the integral sense.

22 I can't quite separate them from the idea of a
23 fellow who has inherited a great big old three story house,
24 and he must run around and patch it up so he can survive
25 the winter. It's a great deal of piece-wise work, and it
keeps you so busy, I think you're like the man in the swamp

1 with the allegators. You can't drink it. Wherein do you
2 find the piece of effort that will be devoted toward really
3 optimizing LWR designs in the interest of both of economics
4 and safety?

5 And before you answer that, how are you going to
6 work around the process if all you ever do is review? You
7 do not conceive and present what would be ideal as concepts?

8 MR. DENTON: Well, I've invested a little capital.
9 I formed a division of safety technology who is by and large
10 out of the day to day review process, and we put a number
11 of people in there and really have taken them off what I
12 call operations and maintenance to do this forward kind of
13 thinking, and it's going to hinder my processing other work,
14 but I think it's necessary to do just that so I'm really look-
15 ing to that division to be the one to take a broader look
16 and integrate, and be sure that we've got a wholistic approach
17 to review and not just a piecemeal one.

18 MR. EBERSOLE: And then finally you'll get fewer
19 and fewer alligators, and you won't be so saturated as you
20 are now, I hope.

21 MR. DENTON: Yeah. They're like -- in terms of
22 saturation most of these action plant items that are in
23 Item -- Action Plan number 4 will after the next two years
24 will begin to free up a lot of the staff again. Of course,
25 we will have moved on past those issues.

MR. EBERSOLE: That's good. Thank you.

1 CHAIRMAN PLESSET: Mr. Mathis.

2 MR. MATHIS: Well, just one question, I guess,
3 Harold. From the discussion so far, I gather the opinion
4 and maybe it's just me that what you're really looking for
5 is a way to live with a degraded core, and that is one of
6 your objectives. Is there any equivalent thought being
7 given to prevention? This gets back to the fundamental
8 question, again, of how much attention to prevention versus
9 mitigation? And all I've heard is, I think, this morning
10 is your thinking in terms of mitigation.

11 MR. DENTON: Well, the action plan has a number of
12 different approaches. It approaches it from the operation
13 standpoint. I think things like the shift technical advisor,
14 onsite engineering group, management confidence, procedure
15 review -- all those things go to prevention.

16 But I think the Staff is beginning to have some
17 doubts about how much further the payoffs are in deeper and
18 deeper reviews of prevention. In other words, we may be
19 approaching a knee of the curve, and we are beginning to
20 swing back a bit at looking at what else can we do in the
21 way of mitigation.

22 But I'm only applying this mitigation concept of
23 filter containment venting and core catcher as to what I
24 perceive to be unique situations. And I'm not advocating
25 that we apply that across the Board.

MR. MATHIS: I guess what I'm thinking about is

3/7

1 are you giving consideration to additional sources of water
2 for cooling. Anything just that simple -- that hasn't come
3 up anyplace that I've heard? In other words, let's look
4 at the front end of the system, and not always at the back
5 end?

6 MR. DENTON: Not unless it's in the action plan
7 per se. Would you like to move from the general to the rest
8 of the agenda?

9 CHAIRMAN PLESSET: Yes. I think there was some
10 concurrence to the idea that you didn't need to go over a lot
11 of detail, but --

12 DR. SIESS: Why don't we hear from the owners and
13 stay on the general issue of relative safety of these plants
14 and others and timing.

15 CHAIRMAN PLESSET: I thought we could get to that
16 shortly. How long do you think you want for some of these
17 more specific items?

18 MR. DENTON: Can we have an estimate, Denny?

19 MR. ROSS: D. F. Ross, Staff. We could probably
20 go through our prepared remarks in 15 minutes. However, I
21 agree with Dr. Okrent. I think it would be more productive
22 use of the committee's time to hear at this time from the
23 utilities' side because ours is more a matter of a style
24 than substance. Given that you are going to do something,
25 we say here's how it's going to be done, and I think that's
more of a second order of interest right now.

1 CHAIRMAN PLESSET: I think that certainly seems
2 to be the picture that it's the second order. Well, then,
3 if that's the case, I think we should go to the NTCP owners
4 presentation, and Mr. Howard, would you come forward?

5 MR. HOWARD: Mr. Chairman, members of the Committee,
6 my name is Edward Howard. I'm Vice-president of the Nuclear
7 Boston Edison Company appearing today for the group of
8 utilities -- we've come to be known as the near-term construc-
9 tion permit applicants.

10 We're grateful for your prompt response in scheduling
11 a meeting concerning the application of the post-TMI require-
12 ments depending construction permits. This group includes
13 the applications of six utilities who are represented here
14 today: Boston Edison Company, Public Service Company of
15 Oklahoma, Houston Lighting and Power, Puget Sound Power and
16 Light Company, Duke Power Company, and the Portland General
17 Electric Company.

18 In fact, these applicants represent the last cases
19 in the NRC construction program permit pipeline. Our six
20 applications, however, we view as extremely significant.
21 They represent 11 units with some costs well in excess of
22 \$1 billion, and more than 13,000 megawatts of base load
23 capacity.

24 Little, if anything, has occurred in any of these
25 dockets since Three Mile accident owing in part to con-
straints in staff resources, uncertainty as to new regulatory

1 requirements in the general licensing policy of the NRC.
2 These utilities are urgently in need of guidance as to the
3 post-TMI licensing requirements which will be applicable to
4 plants in this class.

5 We need this guidance soon so that we can determine
6 whether in light of rapidly escalating costs and scheduled
7 delays, these plants can be counted upon in our generation
8 expansion plans and whether they are viable considering
9 present regulatory uncertainties.

10 As we mentioned to Dr. Okrent's subcommittee last
11 month, our six companies came together last February to
12 discuss ways of establishing post-TMI licensing requirements
13 and to see if the processing of CP applications could be
14 reinitiated.

15 We contacted Harold Denton and requested a meeting
16 which was held in March, and at that meeting we found to our
17 satisfaction that a small group under the leadership of Denny
18 Ross had begun the review of the various staff action plans
19 and to categorize their applicability to pending construction
20 permit applications.

21 That review is scheduled to be presented now after
22 us in whatever detail the Committee wishes. We pursued a
23 parallel effort and produced our own analysis, and while
24 some differences remain on the definitions of the individual
25 categories, we found with only a few exceptions that we
agreed with the Staff on the applicability of the task action

3/10

1 plans to these particular applications. We did, however,
2 identify critical areas where both we, the Staff, and the
3 Atomic Safety and Licensing Boards are in need of policy
4 guidance.

5 I refer here to the following policy issues. First,
6 siting. Second issue, degraded core conditions. Third,
7 emergency procedures. Fourth, control room design. Fifth,
8 management criteria for design and construction. Sixth,
9 reliability in risk assessment requirements.

10 At the urging of Dr. Okrent and his subcommittee,
11 we have reviewed these policy areas for the purpose of
12 establishing licensing positions that would be applicable
13 to near-term construction permit applications.

14 In pursuing our review, we have reached the
15 tentative conclusion that licensing requirements for improving
16 control room design and management criteria for design and
17 construction can probably be handled as part of the Staff's
18 normal review provided the Staff can develop early guidance
19 on these issues that we can work with.

20 We are particularly concerned with regard to the
21 level of attention now being given to the development of the
22 criteria for management for design and construction phase.

23 This task has been identified by the Staff as one that
24 must be satisfied prior to issuance of the construction
25 permit and timely decision making on CP applications cannot
occur until these criteria are established.

3/11

1 As to reliability and risk assessment, we are pre-
2 pared to undertake such studies as the Commission may direct
3 in each docket. The remaining areas: siting policy, emergency
4 planning, and measures to deal with degraded core conditions
5 are all closely coupled, and touch on the most fundamental
6 matters affecting the viabilities of our projects.

7 These applications cannot remain in limbo pending
8 the outcome of the extended rule making proceedings which are
9 anticipated in these areas. There is an interim rule making
10 proceeding on emergency planning that is now going forward.

11 However, rule makings on siting policy and degraded
12 core conditions are contemplated to take some time, and in
13 our view cannot be completed in less than two years. Ob-
14 viously our projects, if they are to move ahead, cannot await
15 the outcome of years of rule-making when you consider the
16 level of current investment and the nature of the continuing
17 costs that we incur while these projects sit in limbo.

18 In these circumstances it is essential that in
19 the interim a licensing basis on these matters be established
20 which has been approved by the Commissioners and is binding
21 on the licensing boards. Without the benefit of some
22 bounding of the issues in the hearing proceedings for these
23 applications, the near-term construction permit applications
24 cannot be processed efficiently and perhaps for that
25 matter may not be able to reach a final conclusion.

We agree with Dr. Okrent that we have responsibility

3/12 1 for helping to develop these licensing requirements. We are
2 very much aware of this Committee's emphasis that NUREG
3 requirements be established within the context of some over-
4 all regulatory philosophy and safety policies. We concur
5 that final rules need to be developed from that basis.

6 However, that will take some time and interim
7 guidance defining improvements to existing regulations is
8 needed if these near-term CP applications are to proceed on
9 a prompt schedule.

10 We are prepared to the ACRS and the Staff to
11 develop such guidance, and have retained Saul Levine of
12 NUS, Saul Levy and Ed Fuller of S. Levy, Incorporated to
13 help us in our deliberations on this effort.

14 Among other things it would be our objective to
15 explore reasonable and appropriate areas of risk reduction
16 through engineered safety systems, accident prevention
17 and methods for dealing with degraded core conditions.

18 In doing such evaluations, we recognize the
19 importance of taking advantage of existing design and
20 operating experience. We recognize the importance of looking
21 for improvements, but the need to maintain the level of
22 safety that has been attained in existing designs and the
23 care with which improvements must be defined if we're to
24 avoid loss in the benefits of the activities we have already
25 accomplished.

 We would intend to employ relevant guidance where

3/13

1 available, but we also intend to independently determine the
2 degree to which this guidance is useful. We expect to
3 complete our preliminary work in June. We would like to
4 discuss the results of our study with the Staff and
5 Dr. Okrent's subcommittee in mid-June, if possible, looking
6 toward the full committee meeting in July.

7 Finally, our group is gravely concerned with
8 regard to the level of effort which the NRC Staff will
9 allocate to NTCP matters. We have been advised that re-
10 sources are limited, but we do believe that the constraints
11 are such that necessary manpower cannot be devoted to these
12 few CP applications.

13 It is important to maintain the momentum in
14 continuity of the present Staff efforts and move that
15 product to completion. As a matter of national policy, we
16 believe it is important that resources be devoted to these
17 applications to demonstrated that the licensing process can
18 move forward and proceed with the issuance of construction
19 permits.

20 We would appreciate any reaction the Committee has
21 to these ideas, and we would note that the discussion between
22 the Committee and Mr. Denton this morning has been very
23 relevant, directed to the policy matters which need resolution.
24 And we would urge the committee to express its views, provide
25 its guidance to the Commission in deliberating on these
policy matters and would urge that the requirements applicable

3/14

1 to these last NTCP applications be resolved in a timely
2 manner.

3 CHAIRMAN PLESSET: I don't want to interrupt you,
4 but I think Mr. Ebersole wanted to --

5 MR. EBERSOLE: I was just going to ask you -- do
6 you feel that you are deterred from making significant inte-
7 gral improvements such as going to dedicated shutdown heat
8 removal systems because you, like Mr. Denton, are surrounded
9 by the alligators of regulatory detail, and have no time
10 to really develop and propose integral improvements of that
11 sort?

12 MR. HOWARD: No, I don't think we have a problem
13 of being surrounded by the alligators, but I think the --
14 our need is for resolution and issuance of construction
15 permits. We are sensitive to --

16 MR. EBERSOLE: Let me give you a case in point.

17 MR. HOWARD: Let me just bring, I think, the re-
18 sponse to your question. We would be sensitive to under-
19 taking or to the -- we would be sensitive to the need to
20 incorporate improvements in a way that will stand the test
21 of a hearing process and lead through the adjudicatory phase
22 to issuance of construction permits.

23 Our approach to that has been to say we need in-
24 terim policy guidance. To the extent, we and the staff
25 would decide on improvements in these designs, we must
build a framework in which those decisions can move forward

3/15

1 past the test of adjudicatory review. In the time frame of
2 the rule-making proceedings where many of these issues will
3 get more substantively aired very long, we would believe
4 that these plants could proceed. That one could evaluate
5 whether or not the designs precluded subsequent improvements,
6 and we would believe that they are capable of improvements,
7 and that we could move the process forward.

8 They will be much more time consuming if all the
9 improvements have to be resolved prior to the CP issuance.
10 That would be significant.

11 MR. EBERSOLE: The example that I think might be
12 effective was the flap that we had on fire protection.
13 That resulted in a prodigious effort to go throughout the
14 various plants and apply a patchwork protection to a vastly
15 dispersed vulnerability to fire of the various safety
16 components. It did not result in a cohesive effort to
17 provide integral fire protection at the outset of design
18 and separate the equipment so that you didn't have to go
19 into all that fierce detail. And I don't see that it has
20 in any significant sense produced any improvements up till
21 now in this aspect.

22 MR. HOWARD: Well, I guess I couldn't comment on
23 it. In our experience, for example -- in our company, we
24 have had constraints in implementation of fire protection
25 provisions in our operating unit, but I'm not aware -- I
would believe that in our present design of the unit that's

3/16

1 before the construction permit process that those constraints
2 have been substantively reduced because of differences in
3 layout that were initiated long before the fire protection
4 was looked at in that detail.

5 Many of these designs do represent improvements. They
6 are later in the pipeline. They have the benefit of the
7 incorporating the experience of the changing regulatory
8 requirements with time. I think that is an important fact
9 about these applications.

10 They have, however, been through a substantive
11 review, and unless one can focus on the essential elements
12 of improvement recognizing that we have not foreclosed the
13 finer tuned improvement letter, then they face long delays
14 and perhaps extinction.

15 DR. EBERSOLE: Thank you.

16 CHAIRMAN PLESSET: I think Mathis -- did you -
17 I think that Mike Bender wanted to make a comment and then
18 Mathis.

19 MR. BENDER: Just one point. I understood in
20 part of your early statement that you wanted some exemption
21 from future rule making -- of requirements of future rules.
22 Was that a misinterpretation?

23 MR. HOWARD: No, I'm saying we need interim policy
24 guidance. The basic framework for these applications to
25 proceed has to be a deliberate approach to building upon and
defining the extent of improvements required within the

3/17

1 existing regulatory framework. To the extent one believes
2 that you must resolve all these issues, then the rule-
3 making proceedings is another time frame. So while we're
4 not asking for exemption from the results of those rules,
5 we wouldn't have that protection on any of our existing
6 plants.

7 We would be asking for deliberate evaluation and
8 decision as to the nature of improvements that would be
9 judged adequate now to permit these applications to proceed.

10 MR. BENDER: Well, let me use as an illustration
11 just to have some physical way of dealing with the question,
12 if the regulatory staff were to say that one of the conditions
13 ought to be to be sure that you can retain radionuclides if
14 they melted through containment, would that be an acceptable
15 kind of condition for you?

16 MR. HOWARD: We would ask that a decision such as
17 that be made; we will have to evaluate the impact of that
18 decision that we need to have to the extent, as a matter of
19 policy, or that would be a conclusion that the regulatory
20 system defined. I am asking since that is an issue on the
21 table. It's clear. It's been out. It's known. It's been
22 identified, and to the extent it would be judged to be
23 relevant, and therefore, now, would be required and --

24 MR. BENDER: Would you be happy with something that
25 said we'll take three years to redefine the single failure
criterion?

1 MR. HOWARD: If that were judged appropriate
2 policy, let us know it, and we need to know. Those issues
3 sit here. We need some interim guidance on them. I would
4 not prejudge the implications of those policy issues, and
5 in fact, our effort would be anticipating, looking from
6 our perspective, at whether we thought that was valid.
7 For example, we might choose to argue the validity of that,
8 but we need the interim guidance on the policy issues that
9 are out -- you know -- one of the options as Mr. Denton
10 mentioned, is to decide that this group of plants is something
11 else and must await the outcome of rule-making, and, you know,
12 if that is a policy decision, it needs to be made and not left
13 in limbo.

14 We would not want to have to make decisions on
15 these units in the face of this uncertainty when the issues
16 are out being aired, and it's now time to look at biting
17 some of those bullets in terms of the interim actions. We
18 would believe that interim policy statements could be
19 formulated that would permit these units to go forward.

20 And we would be prepared to argue our views on some
21 of that, but I think the key message we would say is that
22 those things need to be decided. There needs to be a plan
23 to move to their prompt resolution, and that the rule
24 making plan of the task action plans is not sufficiently
25 timely to meet our needs. But we're prepared to undertake
to provide some of our views on that and to see if, in fact,

1 there can be some resolution of these matters for these
2 particular applications in an interim policy approach.

3 MR. BENDER: Well, would you be prepared to lay a
4 proposal on the table? Is that the nature of your suggestion?

5 MR. HOWARD: We have, in fact, retained consultants
6 to help us formulate our views on what we think appropriate
7 policies would be that would permit these units to go forward.

8 If I'm to get back to the Committee in July we
9 need some fairly prompt actions, and at least we have a
10 status report.

11 MR. BENDER: Thank you.

12 CHAIRMAN PLESSET: Carson.

13 DR. MARK: You mentioned 11 units, six applicants
14 They were Oklahoma, Portland, Arizona, I think, Washington
15 Public Power?

16 MR. HOWARD: No. Boston Edison, Public Service
17 of Oklahoma, Houston Lighting and Power.

18 DR. MARK: Houston. Yes.

19 MR. HOWARD: Puget Sound Power and Light.

20 DR. MARK: Puget, then, okay. I knew it was in
21 Washington somewhere.

22 MR. HOWARD: And Duke Power.

23 DR. MARK: Those plants -- can you tell us easily
24 where they fit in the spectrum of, let's say, demographically
25 and/or hydraulicologically spectrum of existing operating
plants? Some of them are much better than average or rather

4/20

1 pose less problems than average, and some may not.

2 MR. HOWARD: That's one of the things we are
3 planning to do by way of addressing the citing question
4 would be to begin to make those comparisons and provide that
5 information as part of our next meeting.

6 DR. MARK: You have not lined them up in that
7 respect?

8 MR. HOWARD: No, we are setting out to examine, and
9 we would see that as one of the approaches one might take
10 with these units to examine them relative to presently
11 licensed units, and as a way to decide upon whether the
12 siting issues -- whether these sites were acceptable.

13 DR. MARK: It seemed to me that there must be the
14 possibility that an extremely good site on which operating
15 plants now exist and will exist must be available for a
16 possible operating plant?

17 MR. HOWARD: One would hope that some of the operating
18 units would survive this process.

19 CHAIRMAN PLESSET: Chet.

20 MR. HOWARD: We would certainly hope that.

21 DR. SIESS: You recognize, I assume, that if you
22 got a construction permit either on the basis of existing
23 rules or on the basis of interim rules or policy that in
24 the next few years the Staff will be developing positions
25 that will be backfit on all construction permits -- not
just these, ll? That you-- I assume, have taken into --

4/21

1 MR. HOWARD: We are fully aware of the regulatory
2 process and its implications.

3 DR. SIESS: Okay. What you are looking for now
4 is something interim which would allow you to make a decision
5 to go ahead that would stabilize things for the next year or
6 two?

7 MR. HOWARD: One of the things that we have to decide
8 -- what has to be decided is whether there is sufficient
9 policy guidance for licensing boards to go ahead, for the
10 adjudicatory process to end, and we can -- we have our
11 assessment of our ability to technically resolve safety
12 issues in these designs.

13 I personally am not worried about that. I would
14 worry that we can put in place, if not a policy, sufficient
15 bases for the boards to complete the adjudicatory hearings
16 in what is heavily contested proceedings. These NTCP
17 applicants are where they are because they were already
18 being delayed in the hearing process before Three Mile
19 Island, and the need for interim policy guidance is to
20 permit boards and the adjudicatory process to understand
21 that there has been a sufficient basis for the lesson from
22 TMI reflected in these plants to permit them to proceed
23 with construction permits, recognizing as we all do that
24 the final deliberations will not be done for several years,
25 and that we will all be examining the nature of modifications
if those final -- if we have not successfully anticipated the

4/22

1 outcome of those resolutions in our own engineering process.

2 DR. SIESS: Now, when you say policy making you're
3 making a distinction between rule making and policy?

4 MR. HOWARD: One?

5 DR. SIESS: Do you consider the action plan once
6 it's approved by the Commissioners as being a policy that
7 the boards must take into consideration?

8 MR. HOWARD: I would not believe that the task
9 action plans had sufficient criteria level definition to
10 act to bound the issues in adjudicatory proceedings.

11 DR. SIESS: Are there any actions that have been
12 taken by the Commission in the last few months that you con-
13 sider in establishing policy that the boards must consider
14 in these construction permit applications?

15 MR. HOWARD: Well, Appendix B of Part 2 established
16 the whole range of burdens on boards with regard to examining
17 TMI related issues as they saw them.

18 DR. SIESS: Appendix B to Part 2?

19 MR. HOWARD: Well, yes. The answer is yes. There
20 have been actions which --

21 DR. SIESS: Can somebody tell me what Appendix B
22 referred to is?

23 MR. SCINTO: Would you like me to comment?

24 DR. SIESS: Yes.

25 MR. SCINTO: I'm Joe Scinto, staff counsel.

Appendix B to Part 2, Commission promulgated and indicated

1 that the Board should give adjudicatory action to matters
2 before them, give consideration to the matters that have
3 transpired as a result of Three Mile Island. In this con-
4 nection, it recognized the Board might find the need to
5 have policy guidance from the Commission with respect to
6 one or more elements that may be relevant to them in their
7 consideration and indicated that they should certify those
8 questions to the Commission for its guidance, for the
9 Board's guidance on how to handle those matters.

10 DR. SIESS: I give up.

11 MR. SCINTO: Well, it's a procedural tool to
12 provide that a mechanism for the Board to get guidance from
13 the Commission without going through the appeal process to
14 get up to the Commission.

15 MR. HOWARD: Basically we're suggesting that
16 rather than waiting until you get in hearings to the extent
17 that the interim policy guidance can be provided to the
18 boards in advance that will substantively permit the
19 actual hearing proceedings to move expeditiously. Put the
20 guidance in front of the hearings rather than wait and
21 seek it --

22 DR. SIESS: What can NRR do about that? I'm
23 addressing that -- is Harold still here?

24 MR. DENTON: Well, what we can do about this
25 question of policy guidance is the action I've proposed.
I've proposed to go to the Commission with the proposed

4/24 1 policy statement.

2 DR. SIESS: Which would replace the opened
3 Appendix B?

4 MR. DENTON: Well, it would hopefully establish
5 what the Commission wants the scope of the issues to be
6 decided by the Board are and set down the ground rules for
7 the Board to follow in reviewing this case. So that
8 is what the purpose of this meeting and seeking the Committee's
9 advice was intended to do. It would enable me to move to the
10 Commission with some proposals for a policy statement or
11 immediately effective rule or some legal instrument that
12 will define for the Boards which are already established
13 on all these cases to know the scope of the review that is
14 to be considered.

15 MR. HOWARD: Now, again, by way of my comment
16 on the alligator in the swamp -- go ahead. We can -- I'm
17 confident of our ability to reflect in our engineering
18 designs which will meet the needs of these rule making
19 proceedings when they are concluded.

20 I am not concerned personally about the nature of
21 that risk of our ability to reflect good technology in our
22 engineering, but that will not get us a construction permit.
23 A construction permit is issued based upon testing, your
24 compliance with regulations and Commission requirements.

25 And that -- whatever that test is today seems
rather vague, uncertain for all the reasons that were being

1 discussed between the Committee and Mr. Denton, and that
2 needs resolution if we're to be able to proceed.

3 CHAIRMAN PLESSET: Dave.

4 DR. OKRENT: Well, my own preference at the moment
5 would be to try to look at this question intensively in
6 the next three or four months with the various applicants
7 and hopefully with very active participation by the appropriate
8 parts of the Staff and their outside support as its
9 relevant.

10 In other words, my inclination is that we should
11 recommend to the Commission that they make resources avail-
12 able to look at this to see whether one can arrive at some
13 resolution of this issue. It might fail, but I think it's
14 worth an effort.

15 As an example of what I mean by outside resources,
16 we've heard illusion to the question of hydraulity of the
17 site. Well, they've had people looking at the existing site
18 -- I'm told. I can't get the report that gives me the re-
19 sultes of their look. All I get is the report that talks
20 about generic sites.

21 But I'm told, in fact, they've looked at specific
22 sites. If they have, they can also take a quick look at
23 these, and find out that they sit in what they would call
24 the good sites or bad sites. But they all sit -- in fact,
25 and what are the good sites from the point of view of
hydraulogy. That eases, in a sense, the issue of -- in

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1 my mind at least about the need for deciding on an ability
2 to hold a core in a downward direction because if you have
3 a good site that's something vital.

4 On the other hand, if the site is one where the
5 water runs to the nearest community in two hours, you know,
6 underground -- in the first place, you might ask yourself
7 do you want the site, but if you're going to use it then --

8 DR. SIESS: Well, Dave, if only one site has
9 that problem, the policy has to encompass all of it.

10 DR. OKRENT: Now, you can develop a general policy,
11 but I'm saying on the other hand, it may be that the issue
12 -- you ought to know if there's an issue and what the
13 nature of it is. So there are kinds of outside resources
14 that could be put to it, but the Staff might have to
15 contain it.

16 I'm giving that by way of example. There can be
17 others of this.

18 DR. SIESS: But the emphasis would be on trying
19 to develop a rationale or philosophy of policy on these 11
20 units in terms of -- I would assume -- residual risks,
21 societal risks, individual risks -- where they fit into the
22 picture of the operating plants and the others under
23 construction.

24 DR. OKRENT: Well, I guess that's part of it,
25 but I was trying to see whether -- from whatever perspective
the Staff brought -- the Applicants brought and the ACRS

4/27

1 brought and the legal people brought, if I'm going to separate
2 them -- legal people from all portions -- whether one could
3 develop an approach that seemed to make sense. I'd just
4 like to leave it that way. Myself, I think, it's worth the
5 effort, and furthermore I think the Commission should do it.

6 DR. SIESS: But you have to look some at what the
7 Staff may eventually do to the new plants completely and what
8 they do to existing plants under construction, but the
9 emphasis would be on where these limited number of plants
10 fit into that picture, and a reasonable way.

11 DR. OKRENT: I think we'd have to do that.

12 MR. DENTON: I would like to comment just a little
13 bit. The sense of drift is that there is no plan before the
14 Committee, and there is a plan. We're proposing a three-
15 pronged plan. One we are saying we are going to look at
16 each site in regard to radiological aspects and we'll take
17 action. That includes air and liquid.

18 We're going to look at each plant and see with
19 regard to Class 9 issues whether or not there are any
20 unique problems and we'll take action, and third, we'll
21 implement the action plan. But it's not as though there is
22 a policy. Now, I take it there is a policy that you don't
23 -- aren't prepared to agree with and need a longer time.

24 DR. SIESS: You're talking about action, not policy.
25 They're talking about a policy that will direct the Board.

DR. DENTON: Well, this is --

1 MR. HOWARD: Provide guidance to the actions.

2 MR. DENTON: Well, these three issues are the
3 ones that I would propose if you had concurred that the
4 Commission elucidate for the Board's guidance, and then we
5 could argue case by case. It almost sounds as though you
6 want to review each one and then to set the --

7 DR. SIESS: No. But your three issues were looking
8 at --

9 MR. DENTON: First the site.

10 DR. SIESS: The site.

11 MR. DENTON: We can look very tough at the site
12 to make sure we're not foreclosing something with regard to
13 the siting rule, to look very hard at the plant in terms of
14 its degraded core problems it gets into --

15 DR. SIESS: I can see how both of those can be set
16 in terms of a risk framework and a policy framework. Now,
17 the third one is the action plan.

18 MR. DENTON: And the third one is the action plan.

19 DR. SIESS: And how do you fit that into -- what
20 kind of policy would you recommend on implementation of the
21 action plan for these plants.

22 MR. DENTON: The same way we hope to implement the
23 action plan on OL instructions to the Board.

24 DR. SIESS: And what about -- I guess I understood
25 better if you said the same way you would implement it on the
other construction permits.

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1 MR. DENTON: Yeah.

2 DR. SIESS: That's what you meant -- other plants
3 under construction.

4 MR. DENTON: Well, I thought you has specific
5 reference to the adjudicatory process. There are problems,
6 even at the OL stage, and how does the Commission frame the
7 issues for a Board with regard to the action plan.

8 DR. SIESS: But by putting the action plan implementa-
9 tion at the OL stage, you would remove it from the CP
10 adjudication?

11 MR. DENTON: No, maybe I'm confusing. I'm saying
12 we're -- the OL applicants will have to show they meet the
13 action plan. The CP applicants will have to show they meet
14 applicable parts of the action plan, those parts which are
15 applicable to CP holders. But I wouldn't press them on
16 say, shift manning overtime until they get around to the OL
17 stage.

18 DR. SIESS: They would have to make suitable commit-
19 ments?

20 MR. DENTON: Yes.

21 DR. SIESS: And this will be spelled out in such
22 a way that the Board knew that's what was required. Okay.

23 MR. DENTON: Yes.

24 MR. BENDER: Could I ask the representative from
25 the utilities whether this approach that Mr. Denton is
describing is consistent with your views?

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MR. HOWARD: I think there are common elements.

I think we have a basis to be working together to try to define these policy issues. His framework is in an approach to dealing with this particularly -- with the licensing actions needed. So I do not see a big distinction.

MR. BENDER: You wouldn't expect a lot more than this then?

MR. HOWARD: Well, I have some views of the nature of those interim policy guidance, and we haven't had any dialogue on that so I'm not sure we'd be anticipating the same kind of an end product, but at least we would understand a need to work together on these matters, and we have not had meetings to see if we sense the kind of product in similar terms.

DR. SIESS: But you've indicated that what you really need is policy, and that you think that you can meet the requirements of any policy that are at least reasonable.

MR. HOWARD: I would be confident that our engineering designs would stand the tests of the ultimate determinations, and I might add that I think we would be quite active in those rule making proceedings because we'd intend to contribute to them.

DR. SIESS: Do you think that your discussions with the Staff and details of the policy will expedite the policy or delay it since you seem to be concerned with expediting?

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1 MR. HOWARD: I would expect it to expedite our
2 understanding of it, and I would hope that we could con-
3 tribute to its formation.

4 MR. EBERSOLE: I wanted to ask you how many vendor
5 designs does your group represent?

6 MR. HOWARD: General Electric --

7 MR. EBERSOLE: How many vendor designs does this
8 group represent?

9 CHAIRMAN PLESSET: There are three, I believe.

10 MR. HOWARD: Right. General Electric for the BWR's,
11 Combustion Engineering for the PWR's, and B&W on the pebble
12 springs units.

13 MR. EBERSOLE: In your process, do you have any way
14 of cross fertilization in viewing the engineering goodness or
15 badness of the designs you say?

16 MR. HOWARD: We have had a number of discussions
17 as we thought about these policy issues, and in the course
18 of those discussions have been comparing the various pieces
19 of our designs. That has not been a rigorous process yet,
20 but as we begin to formulate our understandings and how to
21 frame policies, there would be some of that taking place.

22 But beyond that, we are not trying to resolve
23 all of the engineering differences because that's -- some
24 of that will have to be done in the context of the ultimate
25 rule-making.

CHAIRMAN PLESSET: Any other questions or comments

1 for Mr. Howard?

2 MR. HOWARD: Thank you.

3 CHAIRMAN PLESSET: Thank you, Mr. Howard. I think
4 we can back to you, Harold. Do you want to wind this
5 thing up.

6 MR. DENTON: Let us give you just a brief summary
7 of the heterozation of the action plan items.

8 CHAIRMAN PLESSET: That would be good. Go ahead,
9 Bill.

10 MR. KANE: There is in your handout -- I'll skip
11 over the first several pages -- about halfway through you'll
12 see a first item identified, categories of action plan
13 requirements for CP plants and in category one -- there are
14 five categories in all.

15 The first one, of course, is those which are just
16 not applicable for any number of reasons. For example, it
17 could only be addressed in an OL application or by licensees.
18 It's something that is simply not directed at the utilities
19 or it is something that does not apply to the type of plants
20 that are covered in this list of NTCP applicants.

21 For example, those which may be just directed to
22 Westinghouse type of plants. It has been or will be super-
23 seded by a more restrictive requirement in the action plan
24 or it may have already been completed. The second category,
25 Category 2, we went through the action plan and determined
those that didn't really require any information from the

1 utilities other than a simple commitment. We felt that the
2 action plan was written clearly enough. The requirement was
3 well enough understood that a commitment to meet it was
4 acceptable.

5 An example that's given there is the NSSS vendor
6 review of emergency procedures. The third category is a little
7 bit different. It's a requirement to complete certain studies
8 prior to a specified date in advance of the FSAR. This is
9 what might commonly be called a post-CP item.

10 The requirement is, of course, applicable and will
11 require the submittal of certain information in advance of
12 the FSAR such that we can determine whether the facility should
13 be required to meet this requirement.

14 An example of that is one that you had a great deal
15 of interaction with given as the report on the overall
16 safety effect of the PORV isolation system on the PWR's.
17 As you know there's a study which has to be done, and then
18 if that study shows that, in fact, there should be an
19 automatic block valve, then that will become a requirement.

20 Category 4 items are those we felt that we needed
21 a commitment to implement these requirements prior to the OL
22 but one for which we didn't need necessarily the complete
23 level of detail that would normally be required at the CP
24 stage. The requirements -- the example that I've given is
25 the one with the electrical power for the PORV blocked valve
and level indication where we could accept the general approach

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1 without the need for a complete modification of the PSAR.

2 The category five's are those which we felt we
3 needed a complete explanation. There was really no way in
4 which we could issue a construction permit until we had a
5 full and complete understanding of these types of requirements.

6 The one I've given here is the dedicated penetrations
7 for the recombiners. Now, the next slide gives those
8 action items which we have classified as Implementation
9 Category 5 for a near-term construction permit applications
10 and just run them.

11 1B11 is management for operations, organization
12 and management, long-term improvements which is tied to 2J3
13 down the list there which is management for design and
14 construction organization and staffing. There are a number
15 of requirements that were coming out relating to the manage-
16 ment of utilities and those will both have to be satisfied.

17 2A1, of course, siting -- the siting policy rule-
18 making which was discussed earlier. 2B8, degraded or melted
19 cores which Harold has discussed. 3A11, 3A21, and 3A22 all
20 of which relate to emergency planning.

21 The next slide which I don't seem to have up here
22 -- as a summary, I believe, of the action plan items --
23 could I just borrow that for a second? There are some 280
24 action items in all, and we concluded that 143 of these
25 items in one way or another should be addressed by CP
applicants and reviewed by the Staff prior to the issuance

1 of the CP, and then I was giving a breakdown of how we
2 came out. We concluded that, of course, 137 did not apply.
3 69 were category two which required only commitments. There
4 were 20 in category three which required studies. 46
5 category four items, and eight category five items.

6 And what I was alluding to earlier -- we felt that
7 the category three, four and five items need some
8 supplemental writeup that we'll have to prepare to define
9 precisely what it is that a CP applicant must provide.

10 It's not -- it's not possible to go directly to the
11 action plan and interpret it as a category four item because
12 most of those will involve some explanation as to the fore-
13 closure of options which was discussed earlier, and their
14 general approach to meeting the requirement.

15 DR. KERR: Excuse me. Can you explain the
16 significance of the 143 action items which should be addressed
17 by the CP applicants and then the subsequent 280 items that
18 are categorized?

19 MR. KANE: Yes, the -- we concluded that 137 of
20 the items were just simply not applicable for one of the
21 reasons that I mentioned in the first slide. In other
22 words it's something that just --

23 DR. KERR: Only categories two through five are
24 applicable to construction permits?

25 MR. KANE: Yes.

DR. KERR: Thank you.

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MR. KANE: And then --

DR. SIESS: On that list of category five items, would you explain why the three emergency preparedness items are category five? These are things you normally don't even consider until the OL stage. The emergency plan -- is this because of their relationship to siting?

MR. KANE: As related to the CP. Emergency planning is something that must be reviewed at the CP stage as well as at the OL stage.

DR. SIESS: Did you review a detailed emergency plan at the CP stage?

MR. KANE: No, it's a preliminary plan.

DR. SIESS: And yet you put this in the most restrictive category where you must have detailed information at the CP stage. I don't quite understand.

MR. KANE: Okay. To the extent that there is something in the interim rule, I believe.

1 MR. KANE: To that extent is whether or not there is
2 something unique that would preclude adequate emergency planning
3 when the time came to have it in effect.

4 DR. SEISS: Okay, that explains it.

5 MR. KANE: Finally, the last thing I wanted to talk
6 about was, we did recently consider the manufacturing license
7 application and we have started to go through with offshore
8 power systems and at least taken a preliminary look at the
9 items that would apply to the manufacturing license application.
10 As you know, this application is still being considered by
11 ACRS, and I assume the approach would be that they would respond
12 to the items that we had identified and provide the information
13 that we had suggested. And then there would be a supplement
14 which would come back to the ACRS for review.

15 DR. OKRENT: Would you say that again?

16 MR. KANE: If this approach, this policy, is approved,
17 this is the one application that would be coming back to ACRS
18 for review, as I understand. ACRS has written letters on
19 all of the NTCP applications. So I guess the normal procedure
20 would be that they would address the requirements and then there
21 would be another supplement to the SER for the offshore power
22 systems application, which would come back to ACRS for review.

23 DR. OKRENT: Now, Mr. Denton mentioned a question on
24 the Mark 3's about containment pressure, and wanted to have that
25 at hand before the containment was built, I think. That may not

1 have been the exact phrase he used, but I think it's equivalent.

2 DR. DENTON: And we would apply the same sort of thing
3 to the ice condensor of the manufacturing license. In order to
4 moot the issue of being actually alerted or not, it would seem
5 we're talking about adopting equal to -- make sure it can stand
6 a considerable amount of --

7 DR. OKRENT: And when would this be done in this
8 review chain? After you have finished meeting with the ACRS
9 and as part of your SER? Or in your environmental impact state-
10 ment, or how?

11 DR. DENTON: This would be done in the manufacturing
12 license, as part of the SER.

13 DR. OKRENT: When?

14 DR. DENTON: Well, whenever it's approved. I can't do
15 any of these things till I get the Commission guidance as to
16 what I can do. If they were to approve it and bless it as the
17 approach I'd go, I'd get a supplement from the OPS addressing
18 the new design wall thickness being beefed up by a quarter of
19 an inch all around, and would write up an SER on it, and we'd
20 come down and get another opinion from the committee on whether
21 it can withstand whatever the pressure is, is the way I would
22 see that one going.

23 The only issues that I see that are really "closed"
24 by issuance of a manufacturing license at the moment are those
25 that sort of relate substances, structural hardware as the design

1 pressure is obtained. So that's really where, as I say,
2 I'm looking at the site plan and the accident plan. I'm looking
3 at the plant with regard to full closing of it.

4 DR. OKRENT: I really think that's an underestimate
5 of what you're foreclosing without some forward looking --
6 because --

7 DR. DENTON: Obviously, foreclosings makes anything
8 more difficult is a questionable myth.

9 DR. OKRENT: Well, in -- I'm talking about in a
10 practical sense, either practical mechanically or practical
11 economically. You can always tear out everything inside a
12 containment building, I suppose including part of the concrete,
13 and put something else in there. So you can say it's not
14 foreclosed. But then there are people who knock down buildings.
15 So, you know, I, myself, think that certainly is an important
16 question. I don't know that it's the only important question
17 on which it would be helpful to make a wise guess into the
18 future. That's the only thing I have in mind.

19 CHAIRMAN PLESSET: The gentleman over here wanted
20 to make a comment.

21 MR. HAGA: Blair Haga, Offshore Power Systems.
22 We've reviewed with you in the past a variety of approaches.
23 I think we have talked with you about the capability that we
24 have should a rulemaking dictate to provide a vented, filtered
25 containment. We have also demonstrated, I think, great strength

1 in the containment, a fairly easy approach to making it
2 considerably stronger in those few places that weren't quite
3 up to the bulk of the containment. I don't think you're going
4 to foreclose -- and as you well know, we've considered class
5 9 accidents and we already have a core label. So I don't
6 think you're going to foreclose very much at all. I think we
7 have great flexibility to accommodate fairly extensive rule,
8 should that be the way it comes out. And I'd just like to echo
9 Ed Howard's remarks. I think the technology is there, and our
10 engineering capability is there to do whatever has to be
11 done.

12 DR. OKRENT: I'm sorry, but --

13 MR. HAGA: That doesn't tell me anything.

14 DR. OKRENT: -- I was just involved last month in
15 a discussion on that, and the committee was reluctant to ask
16 a second relief valve be put on an existing plant, or even
17 a plant under construction. And that's not a major thing
18 compared to some of the kinds of changes that may look
19 desirable after one relooks at the single failure criteria, or
20 relooks at the role of control systems and so forth.

21 CHAIRMAN PLESSET: Chet?

22 DR. SIESS: I'm looking at table 1, categorization of
23 items, in TMI 2 action plan. And for all the category 4 and 5
24 items there's a statement, NRC to develop supplemental
25 criteria for CP applicants. For category 4 items, would this

1 mean simply defining the degree of commitment they have to
2 make at the CP stage?

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

4 DR. SEISS: Now, for the category of fallout items
5 it must involve a lot more than that. Does this involve
6 risk analysis, degraded core site, emergency preparedness,
7 etcetera, I assume?

8 MR. ROSS: Well, for example, the interim rule on
9 degraded cores should be labeled in draft form within a week.

10 DR. SEISS: Okay. I mean, it does involve the
11 interim rules under category 5.

12 MR. ROSS: Yes. And one treatment there would not
13 be developed as anything other than, say, here's the interim
14 rule, give us the progressive.

15 DR. SEISS: And these, when you're developing
16 supplemental criteria is where your effort is being devoted
17 now to the people you have.

18 DR. DENTON: The effort at the moment is not just
19 being put into defining those kinds of requirements in more
20 detail. We're not reviewing any application that's before us
21 specifically. So that it's only the sort of generic input
22 to define these requirements.

23 DR. SEISS: Okay.

24 CHAIRMAN PLESSET: Harold, do you want to make any
25 final remarks before we recess?

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2 DR. DENTON: No, I think I said all I could
3 usefully add.

4 CHAIRMAN PLESSET: Okay. Denny?

5 MR. ROSS: I pass.

6 CHAIRMAN PLESSET: Well, let's -- we'll recess
7 for ten minutes.

8 (Whereupon at 11:00 a.m. the proceedings recessed.)

9 CHAIRMAN PLESSET: Let's reconvene, and we're going
10 to consider the report on the status of the TMI 2 decontamina-
11 tion and recovery. I'll have to cut you off close to
12 2:25.

13 MR. COLLINS: Oh, I don't think we're going
14 to take that much.

15 DR. LAWROSKI: He's been on TV.

16 MR. COLLINS: What was that?

17 CHAIRMAN PLESSET: Don't pay any attention to that,
18 Mr. Collins. Some of these jokes are a little wild at times.

19 MR. COLLINS: Well, at least it's not as hostile
20 a group as I've spoken to over the last --

21 VOICE: Better wait and see.

22 (Laughter.)

23 MR. COLLINS: Before I get into the status of the
24 decontamination and cleanup, let me just briefly give you
25 the status of the condition of the reactor in the plant
itself. We are sill, of course, on natural circulation,

1 cyclic natural circulation. The highest incore thermal
2 couple as of this morning was about 180 degrees. The average
3 incore thermal couple is about 140 degrees.

4 We did start at the beginning of the week an
5 evolution to reduce the pressure in the RCS from where we
6 were last week at about 200 pounds. As of this morning
7 we're down to 135. We're going to hold at that plateau until
8 next Monday where we'll have another pressurized water sample
9 to take a look at the amount of gas in the system. And then
10 if everything appears okay, we'll bring her on down to about
11 100 pounds and maintain that in that mode, and then eventually,
12 about May 12 we anticipate that METED will initiate the
13 heat removal system.

14 The water level in the building maintains fairly
15 constant at about eight feet. The leak rate has not really
16 changed for the last six or seven months, running approximately
17 .1 to .2 gallons per minute. The temperature inside the
18 reactor building is approximately 80 degrees. We're still
19 maintaining about a half a pound negative pressure with
20 respect to the atmosphere.

21 The decontamination itself, as of this week, they've
22 processed about 225,000 gallons through epicore 2. That
23 water is being stored in the epicore 2 tank that is available.
24 There's approximately 220,000 gallons remaining to be
25 processed in the auxilliary building. Of course, there still

1 remains approximately 650,000 gallons of water remaining in
2 the reactor building, and approximately another 80 to 100,000
3 gallons of water in the primary system.

4 This past week Metropolitan Edison did submit
5 to us their technical evaluation for use of the submerged
6 demineralized system, which would be used to clean up the
7 water in the reactor building. The Staff has that under
8 review. We expect to submit back to METED round 1 questions
9 on that system early next week.

10 The shipment of rad waste, we did have a ban on
11 shipping because we were not satisfied with METED's
12 implementation of IE Bulletin 79-19. We've gone back, had
13 many discussions with them. They have implemented a program,
14 and as of yesterday afternoon I issued a letter to them
15 lifting the ban so that shipments of waste from TMI 2 would
16 begin hopefully today back. Those shipments are to
17 Richland, Washington.

18 DR. KERR: Can you describe 79-19 in just a few
19 words?

20 MR. COLLINS: Basically, ask the utilities to take
21 a look at programs that would assure the requirements of both
22 NRC requirements and DOT requirements were being met, packaging
23 requirements. And what it asks for was routine training of
24 all the people who were associated with packaging and trans-
25 portation of radioactive waste, orientation in those

1 regulations for people who are associated with handling of
2 the waste prior to shipping outside. And from our audits,
3 we were not satisfied with the way they had implemented that
4 program. We found deficiencies in it, both for TMI 1 and
5 TMI 2. Most of it had to do with the training of the
6 people who were actually handling the wastes, their knowledge
7 of NRC and DOT regulations. Since that time they have put
8 a program in place to read those.

9 DR. KERR: How well has the epicore 2 prophesy
10 worked?

11 MR. COLLINS: The epicore 2 has --

12 DR. KERR: Recently. I know it's had problems,
13 but --

14 MR. COLLINS: Recently it has been working very
15 well.

16 DR. KERR: This is not only affective, but the
17 capacities --

18 MR. COLLINS: The quality of the water coming out
19 is well within our regulations, and even close to EPA
20 drinking water standards, with the exception of course for
21 tritium. But it has been working very well. They did make
22 some changes in the first prefilter which increased the
23 decontamination factor for many of the isotopes, such as
24 seisium and strongium.

25 DR. LAWROSKI: What test leakage rate would

1 correspond with the observed type over so long a period?

2 MR. COLLINS: On what system, sir?

3 DR. LAWROSKI: No, I'm talking about the containment.
4 I'm sorry.

5 MR. COLLINS: What test?

6 DR. LAWROSKI: Well, you've maintained almost
7 incredible tightness. I know the pressure difference was
8 small, but what was that correspondence?

9 MR. COLLINS: It's been negative ever since the
10 accident, and it's being maintained negative because we've
11 been running the air cooling system inside.

12 DR. LAWROSKI: I understand that. But how tight
13 is the reactor. So they must be getting air inleakage,
14 even in that small --

15 MR. COLLINS: Into the containment building?

16 DR. LAWROSKI: Yes.

17 MR. COLLINS: I don't really have a handle on what
18 that air inleakage is. Do you have any idea?

19 MR. VOLLMER: Well, shortly after the accident
20 we did, and it was like a pound and a half negative, and it
21 was indicating away. We did look at that, and it appeared at
22 that time that you scale up with -- to the design pressures.
23 You're talking about leakage rates maybe a half or so of the
24 design leakage rate.

25 DR. LAWROSKI: Oh, it's as high as that.

VOICE: How high was that?

1 MR. VOLLMER: Well, it was a difficult thing to
2 do, because obviously your corrections for barometric
3 pressure temperature are very important at the low pressure
4 differentials. But it did appear that you smoothed it out
5 somehow, since you're talking about design leakage rates,
6 maybe a quarter to a half percent.

7 DR. SEISS: But that doesn't mean that we leave it
8 that way, because the longer reaction and the low pressure
9 that would receive a valve.

10 MR. VOLLMER: What I said was, if you scale up the
11 air leakage rates for that pressure up to a design pressure,
12 it would appear that it was maybe at a quarter to a half
13 of the original test leakage rate.

14 MR. COLLINS: Was it .2 percent, or 60 pounds of
15 pressure? Right.

16 DR. SEISS: You're holding that some atmospheric
17 just by keeping the temperature down, right?

18 MR. COLLINS: That's correct at the present time, yes.

19 DR. SEISS: What's the relation between the tempera-
20 ture and pressure? I mean, what temperature would be at
21 zero?

22 MR. COLLINS: About 100, 105.

23 DR. LAWROSKI: Have you got any measurements about
24 the constituents that are in the water that generally are
25 considered adverse to the --

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MR. COLLINS: In the reactor building water?

DR. LAWROSKI: Yes. Like chloride?

MR. COLLINS: Chloride's running less than about --
less than a part per million.

DR. MARK: You said what the design leakage was,
and I didn't catch it.

MR. COLLINS: It's .2 percent at 60 pounds.

DR. MARK: 60 pounds difference.

MR. COLLINS: 60 psi, yes. Right, 60 pounds
difference.

MR. ETHERINGTON: Of course, you've got a nice
headstart with that hydrogen.

MR. COLLINS: To answer your question, the major
constituents in the sump water are cesium 134, cesium 137,
strontium 89 and 90. Those are the principal constituents
-- and tritium. All the other major isotopes have --

DR. LAWROSKI: I was particularly interested --
you think light chloride might be impairing the --

MR. COLLINS: The chemical constituents -- in the
primary system, of course, the chloride has been maintained
very low, so that there's not -- at these temperatures, and
at the ph of the water, it does not appear to be a problem.
That was looked at very closely, both by our staff, and by
B&W, and by METED too.

DR. LAWROSKI: Are you obliged to put in the

1 hydrogen or anything?

2 MR. COLLINS: At this time we have not been adding
3 any hydrogen, no.

4 DR. MARK: Is there a complete inventory of
5 fission products for the containment and the auxilliary
6 buildings, atmosphere and water, at some time or other that
7 you could refer me to?

8 MR. COLLINS: Yes. The latest sample in the
9 containment atmosphere was a sample taken on 2/2, and we'd
10 be very happy to supply that information to you. And the
11 principal nuclide in the atmosphere is krypton 85. The other
12 isotopes are in the range of 10^{-10} , 10^{-11} microcuries per
13 cc, which are cesium 137 and strontium.

14 DR. MARK: I'm curious as to all of the places
15 where those things may have lodged. An earlier inventory
16 may say it better, but any thorough inventory --

17 MR. COLLINS: Well, with the containment atmosphere
18 that the licensee has been sampling approximately every week
19 over the last several months.

20 DR. MARK: I'm familiar with that.

21 MR. COLLINS: Okay. The water sampling -- there were
22 two samples taken. One in August and one in November. And
23 that information is certainly available. I'd be happy to
24 supply it to you.

25 DR. MARK: If you could get it for me --

1 MR. COLLINS: Well, I think the easiest thing for
2 us to do would be to just supply you the last analysis of
3 it. To my knowledge it has not really come out in any
4 formal document.

5 DR. MARK: I've looked for it in --

6 MR. COLLINS: No, we'd be --

7 DR. LAWROSKI: Then tend to come out in that
8 weekly --

9 MR. COLLINS: Well, not all the time, Steve.

10 DR. SEISS: But that would be the place to look
11 for them, because it's --

12 MR. COLLINS: The weekly status report we don't
13 really put out the analytical results in the sample that
14 we're taking.

15 VOICE: Well, I have seen some in there.

16 MR. COLLINS: YES, some. Right, but not as a
17 routine on the primary coolant.

18 CHAIRMAN PLESSET: Jerry?

19 MR. RAY: Have we had any significant failures of
20 electrical devices or circuitry within the containment?

21 MR. COLLINS: No, not for some time. METED did
22 this last week though send us a letter requesting they would
23 like to open up DHV 1 and DHV 171, which is the heat valve
24 and the bypass valve, because they're a little concerned that
25 the moisture, the environment in there -- they're losing

1 confidence in their megering program, which showed up early
2 enough. Since it's about a half a foot above the water
3 level, they're losing confidence, and they would like to
4 open up those valves.

5 We have some concern. Of course, once you do
6 DHB2, which is inside the containment is now open -- it
7 has been open and it's under water. So that now your DHV 3
8 is outside, so you've lost your double isolation. And,
9 you know, you could end up with the water level increased,
10 and end up with high activity water in that piping into the
11 auxilliary building. And we want to take a look at the
12 integrity of that valve and the valves downstream from
13 that. But other than that we have not lost any electrical
14 equipment.

15 MR. EBERSOLE: Do you still have to pressurize the
16 heaters?

17 MR. COLLINS: Yes, the pressurized heaters are
18 still on. They're being -- temperature is about 305 degrees.
19 When METED brings the reactor pressure down to 100 pounds,
20 they'll kick off those heaters, and they don't feel there's
21 a need to run those heaters. Actually, they're cycling on
22 and off now.

23 DF. SIESS: Are you going to talk about the plant's
24 damaged containment?

25 MR. COLLINS: Yes. As you know, we did grant them

1 permission to enter last week, and at the last moment it was
2 aborted because of the previous evening I received a call from
3 one of our staff people in Washington who had discussions with
4 representatives from NIOSH, who indicated to us that the
5 self-contained breathing unit that METED was proposing to
6 use -- or not proposing, was intending to use -- had been
7 modified by the manufacturer. And that modification, of
8 course, null and void the certification. I requested NIOSH
9 people to come up to the site and visibly take a look at
10 the self-contained units, which they did. They were modified.
11 The licensee was not aware, nor were we aware, that modifi-
12 cation had been made. The manufacturer had been giving
13 assurance to METED that those units were indeed certified
14 by the NIOSH people.

15 At that point, of course, the entry was aborted.
16 The plan is now to, of course, seek certification for those
17 units, or secure units that are already have been certified.
18 The big change that was made to the unit, there is a spring
19 inside of the regulator which regulates the amount of air
20 pressure into the face piece. The manufacturer, to
21 increase that pressure in the face piece, stretched the
22 spring from about inches up to about 11 and three-quarter
23 inches. That, of course, was a modification that had not
24 been reviewed by NIOSH, nor tested. It also -- by doing that
25 it also increased the breathing resistance from the allowable

1 two inches up to a possible four inches.

2 So the equipment is at NIOSH being tested. The
3 licensee has indicated that they are out seeking units that
4 had not been modified. If that's not -- they're unable to
5 secure that, their plan would be to revert to the mine
6 safety self-contained unit, which is, of course, very similar
7 to the Scott unit with a positive pressure system.

8 It does present some problems if they revert to
9 that unit, because the MSA unit and the Scott unit are 30
10 minute systems. The biopack system is the one they wanted to
11 use, was a 60 minute unit. It gave them a little longer
12 stay time in the reactor. For precautionary reasons, and
13 I certainly concur with METED on it, normally these things
14 are designed to last for 30 minutes. And that really depends
15 on the exertion and the amount of work that you do. Normally
16 those bottles will last for about 20 minutes. Being a little
17 on the safety side, they were limit stay time to 15. And
18 of course, that reduces the amount of work, what they had
19 hoped to accomplish by making the entry.

20 The -- so at this point we're kind of in a hold
21 pattern along with METED. They have tentatively set a
22 target date of trying to make that entry now about May 20,
23 but that's certainly not been firmed up.

24 DR. SIESS: I'm surprised they hadn't tried a walk-
25 through of unit 1 just to see how long they would last.

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MR. COLLINS: They did --

DR. SIESS: Particular people and the particular maneuver.

MR. COLLINS: Yes, they did. They did. There were several dry runs in unit 1 containment using all of the equipment. But recognize, you know, it's a little different situation. You don't have the same stress factor in a mockup as you do in a real thing, so that certainly would alter the breathing rate.

Their intent, of course, is to send the two people in. Prior to entering the airlock they will have to purge. There is a small amount of gas that has leaked in there. When they began the preparations for the airlock entry last week, they did purge approximately half of that gas, that amounts to about 7 millicures, with about three and a half millicures remaining. Then the two people would enter into the airlock, close the airlock door, and then make entry into the containment.

There would be two backup people outside the airlock already suited up and prepared to go in in case of an emergency. There's a communication system that is designed into the program that's operating through penetration 626. If for any reason, when the men enter the containment, that that communication system does not work, the whole thing is aborted.

DR. LAWRASKI: Could you tell us what constitutes

1
2 the degree of entry here?

3 MR. COLLINS: Actually, they're going in on a 305
4 level, and they'll be walking a distance approximately --
5 perhaps the longest distance would be about 90 feet, which
6 would be over to the fan coolers. Now all the way around.
7 The fan cooler sits in about a little more than halfway in. That
8 would be the last thing they'd do. The first thing they would
9 do would be to take some radiation readings, of course, right
10 in a direct area; take a look at what they can see. Of
11 course, it's dark in there. They do have miner's lights on
12 their helmets. I don't -- they will take some smear
13 samples.

13 DR. LAWROSKI: Photographs?

14 MR. COLLINS: They will be taking still photographs.
15 There is no TV camera going in with them. They will take
16 stills though. So I think it's important data that they
17 will be collecting. It will help determine, of course,
18 the type of surface contamination that exists in there, the
19 type of radiation levels in that immediate area. The other
20 thing they would hope to accomplish after that would be to go
21 over to the stairwell which leads down into the lower level
22 where a sump water level is right now and take some radiation
23 readings through that door to get a better handle on the
24 radiation level above the sump. Then the last thing would be
25

1 to take and observe the fan coolers. By that time they're
2 going to be out of time.

3 DR. SIESS: I thought the plan took them almost down
4 to the airlock.

5 MR. COLLINS: No, it doesn't go all the way around
6 on it, no. They had originally, you know, talked about
7 several maneuvers, but --

8 DR. SIESS: Area D --

9 MR. COLLINS: Pardon?

10 DR. SIESS: I forget which area it was. On the
11 plan it was pretty hard to read, but I thought it was
12 across the containment.

13 MR. COLLINS: No, they're not really -- it was not --
14 that's not our understanding of it at all. It's -- the
15 fan cooler's the farthest place that they will go, and then
16 they will egress from there. Their actual stay time is
17 about 20 minutes. Their estimated dose maximum is about 1
18 rem based on the radiation measurements that were taken above
19 the water level and also through penetration 626. So unless
20 barring anything else, that entry would be made about the
21 20th of May.

22 The other occurrence at the site has been, you know,
23 back in June, July of last year the Staff asked Metropolitan Edison
24 to drill a number of test wells around the reactor building
25 to at least assure us that we were not leaking water from the

1 containment building. Most of those wells were -- they
2 started drilling those wells in February and in March, and
3 a number of samples have been collected since that time.
4 One of the wells, well number 2, showed levels considerably
5 higher than the background level in that area. The other
6 wells essentially background. Background in that area is
7 running between 200 to 300 picocuries per liter. But well
8 number 2 showed 1600, and it increased to about 2500, and
9 it's back down now to about 1100.

10 As a result of those measurements we requested
11 METED to install additional wells. They are putting in
12 7 additional wells in various locations in closer to the
13 reactor building to identify the possible source. Most of us
14 believe that the contamination that we have seen to date
15 is a result of some leaks that have occurred in the storage
16 tank. And it's my opinion, after coming from the reactor
17 building, the level of tritium in those wells would be
18 considerably higher than what they are. They're running about
19 ten percent of EPA drinking water, so they're very low concen-
20 trations. If it were reactor building water at 1 microcurie
21 per cc would be considerably higher; and we would also see
22 other isotopes, which we have not seen.

23 There are some soil samples that are being collected,
24 and I think that during the coming week those wells will be in
25 place and we'll have additional samples, and perhaps we may be

1 able to get to the root of the contamination that was identified.

2 DR. LAWROSKI: Do you have any suspicions what the
3 source is of this?

4 MR. COLLINS: Well, as I say, I think there were
5 some known leaks in the boric acid water storage tank that
6 sits outside the auxilliary building in the past, and
7 through valve leakage. And I believe -- and I think METED
8 suspects too, that that's where it's coming from. But I
9 think it's essential that we narrow it down and assure our-
10 selves that the reactor building is not leaking. We have not
11 seen any drop of level in the reactor building at all,
12 although it's been maintaining a fairly constant level. But
13 recognize a change in that reactor building water level would
14 take an awful lot of water to increase the water, or even to
15 decrease it before you would notice it.

16 DR. LAWROSKI: Have you noticed anything unusual
17 about the -- any of the constituents as to the level in the--
18 you measured the elements in that containment, carbon
19 monoxide?

20 MR. COLLINS: No, we requested them to take
21 measurements for the hydrocarbons and for carbonmonozide,
22 carbon dioxide, because I was -- and one sample showed up
23 an oxygen deficient atmosphere in the containment, so we
24 requested them to go back and take samples for other materials
25 or toxic gases such as that. And no, they were well within

1 allowable limits for that. The oxygen content, after
2 numerous samples, turned out to be approximately 12.8 percent
3 oxygen, which is not in the life threatening, but it's
4 still a hazardous level. We would like to see it higher,
5 but certainly with the breathing equipment they have, there's
6 no concern.

7 DR. LAWROSKI: I didn't ask specifically for you
8 to state the reason why. But I was just wondering whether
9 there was any unusual amounts; even though they're well
10 within the allowable limits, but whether it would be
11 indicative of certain things going on.

12 MR. COLLINS: We really have not seen anything like
13 that. Yes?

14 DR. MARK: You spoke of the measurements of oxygen.
15 You gave us the three figures, which is very precise. I have
16 a list of measurements of the oxygen content from Fowksons,
17 and on the same day they read, 13.3, and 8.9.

18 MR. COLLINS: Yes.

19 DR. MARK: Was this 12.8 the average of all 40
20 samples?

21 MR. COLLINS: Well, first of all, those are METED's
22 numbers. I agree with you. The accuracy on them, you know,
23 I don't think we're accurate to 12.8 percent. But there were
24 a number of samples after that one that showed up the two that
25 you're talking about. There were a number of samples after

1 that, and it is the average of the number of samples.

2 DR. MARK: The problem that METED's having is in
3 what? In the analysis or in the sampling?

4 MR. COLLINS: I think it's both. I think it's
5 the -- recognize that you've got a large containment building,
6 and you're pulling the samples through a very small sample
7 line and a long sample line. And although, you know -- I think
8 that the atmosphere in there is well mixed. I'm not --
9 because -- and the reason I say that is, that the krypton
10 gas, or the samples that have been analyzed weekly for
11 krypton, have since January all been in the range of about
12 1.0 up to about 1.04. And I think that's fairly indicative
13 of a well-mixed atmosphere. Yes.

14 DR. MOELLER: What is the status of the venting?
15 Or do you class it?

16 MR. COLLINS: Well, I can just briefly tell you that
17 at the present time the Staff has recommended to the
18 commissioners that we extend the comment period to May 16.
19 The Governor Thornburg, of course, has requested an extention
20 of time to allow him to discuss with other knowledgable people
21 in this area. And he has engaged the Union of Concerned
22 Scientists who look at the alternatives that we looked at,
23 and any others that they could find that might be a viable
24 option.

25 The -- so at this point in time I would think that

1
2 the earliest we could probably see a decision would be
3 sometime following May 16. The other thing that has occurred
4 in the last several days is that the -- I had discussions
5 with Warren Sinclair, and he has indicated that Governor
6 Thornburg has requested NCRP to take a look at the venting
7 issue, more -- not from the mechanical standpoint, but more
8 from the health effect and the resulting doses. And he has
9 indicated that he's committed to have a report to Governor
10 Thornburg prior to May 16.

11 The other thing that the NCRP people are doing,
12 they are taking a look at the data that has been accumulated
13 since the issuance of NCRP 44, which was a specific
14 document discussing krypton 85, worldwide buildup, and also
15 potential health effects. And at our request they're taking
16 a look at what data may have been -- be available since
17 that time, and would it in any way alter the conclusions of
18 that report. Dr. Sinclair has indicated that they hope to
19 have that out, that report out to us, in the same time frame.
I think both of them will be very helpful.

20 So in the meantime, we're just -- we're receiving
21 public comments. I think at the present time we have received
22 on the order of -- what, Bernie, 400, 500 comments now?

23 MR. SNYDER: 614.

24 MR. EBERSOLE: Are there any promising options?

25 MR. COLLINS: The options, of course, were discussed

1 in detail in the Staff Environmental Assessment. And to
2 my knowledge, there are no other options that I'm aware of
3 that would be viable as the ones that were considered by
4 the Staff. Certainly we have received suggestions from many
5 people as to what can be done, anything from filling up
6 balloons, dirigibles, to hauling it out in the ocean, I
7 guess. And I think that-- you know, those are people who
8 are concerned, and we will certainly take a look at their
9 recommendations in that light. But to date, unless Bernie
10 has some thoughts --

11 MR. SNYDER: If I could make just a couple of
12 comments on that. In my new position we're going to be doing
13 most of this while John --

14 CHAIRMAN PLESSET: Talking to that thing doesn't do
15 any good unless you squeeze the handle.

16 MR. SNYDER: Sorry about that. I can just elaborate
17 slightly. John is going to be concentrating on the activities
18 at the site, and I'm going to be concentrating on the
19 environmental assessment. There have been a number of reason-
20 ably good suggestions that we're going to look into. Most of
21 them fall into the category of variations on the basic ones
22 that were originally looked at, combinations of them. For
23 example, us a trigenic system for part of it, and from a tail-
24 end of the exponential letback. We're going to give a real
25 good look at all these alternatives, and I think we'll see

1 in the final version of the environmental assessment an
2 expanded discussion of alternatives. We're looking very hard
3 also at the freon system we have, the ones at Oak Ridge that
4 we've been working on for a couple of years.

5 VOICE: What is the conclusion about that very low
6 oxygen? 12.8 percent, I think you said?

7 MR. COLLINS: Yes.

8 VOICE: Is oxygen being consumed somewhere?

9 MR. COLLINS: No, I --

10 MR. ETHERINGTON: After the hydrogen burn it was
11 about 18. wasn't it?

12 MR. COLLINS: I don't think we were up that high.
13 I thought it was more in the order, around 16, 15, in that
14 range at that time, after the burn.

15 MR. ETHERINGTON: My recollection may be wrong.

16 MR. COLLINS: Well, you see, the problem was
17 early into the accident, right after the accident there was
18 very little faith placed in the oxygen measurements that
19 were made, because they were pulling the samples out into
20 an evacuated bottle, and then they were not seeing properly,
21 and they were actually getting air inleakage into the sample.
22 So I'm not sure that we ever really had a good handle early
23 into -- after the accident on what the oxygen level was there.
24 We had the same problem with the hydrogen samples too.
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MR. ETHERINGTON: Well, let's put it another way. If you think of the amount of hydrogen, it corresponds to the efficiency, you come up with a prodigious number. Has that been indicated?

MR. COLLINS: No, it has not, to my knowledge.

MR. ETHERINGTON: It's far more the amount of hydrogen that was presumed to be released during the accident.

MR. COLLINS: Higher? I think we measured in the containment after the accident was -- before the recombiner was initiated -- was on the order of about 2.2 percent hydrogen. About 2.2 percent.

MR. ETHERINGTON: Yes, that's right. 2.2. This is much, much more --

MR. COLLINS: I really haven't -- I really haven't done that.

MR. ETHERINGTON; About ten percent is what you get.

MR. COLLINS: I certainly will take a look at that, and look at it in that way.

DR. MOELLER: Well, on the venting thing, then, if you wait until -- if the decision now is beyond the middle of May, then according to the reports which I've read, you're past the time of year of optimum meteorological conditions.

MR. COLLINS: Well, for the fast purge, but not for the slow purge. The slow purge could still be accomplished in that period of time. You might just have to release it at

1 a lower release rate and take maximum dispersion from that
2 thing.

3 DR. MOELLER: And if I interpret the calculations
4 correctly, I've seen the dose expressed in a variety of
5 ways. But I estimate that the whole body dose that would
6 result would be about -- and I guess this is to the maximum
7 individual -- this would be less than the natural background
8 that he or she would receive in one day's time.

9 MR. COLLINS: That's correct. The total body dose
10 is estimated between .1 to .2 milligrams, to the maximum
11 individual of the most restrictive site boundary.

12 DR. MOELLER: So it's half to a third of the
13 whole body dose you'd receive in one day.

14 MR. COLLINS: Natural background up there, you
15 would receive about .3 milligrams per day.

16 DR. MOELLER: Yes.

17 DR. SIESS: It's still hard to decide. You look at
18 all the options --

19 MR. COLLINS: Of course, you have to consider the
20 psychological impact it has on the residents in the area.

21 DR. KERR: There's a terrible psychological impact
22 because the people there don't believe the number, or because
23 they want it to be zero. Do you have a feel?

24 MR. COLLINS: Yes, having lived there and talked
25 to them every day, I think there are two groups. There are

1 individuals who want no more radiation released from the
2 plant. They were actually very surprised to find out that
3 nuclear power plants routinely emit radioactive material,
4 even though the information has been well documented. They
5 were really surprised to find out about it.

6 DR. LAWROSKI: Well, the coal powered plants --

7 MR. COLLINS: Yes, but that really doesn't buy you
8 too much. These people just don't want any more radiation
9 released from the plant. And you try and explain to them
10 that's not possible. There is no such thing as a zero
11 release plant. I think that the releases that have occurred
12 at the plant since the accident have been very, very low,
13 well below what we would allow all the other nuclear power
14 plants to release. We're releasing in the order of about
15 60 to 70 curies a months, and most pressurized water reactors
16 average about 1000 curies a month, and that's still well
17 below our regulatory requirements.

18 And then you have the other group who view the
19 cleanup process as a step to putting the plant back in
20 operation, and they have not dissociated those two operations.
21 We try to make it very clear that no matter what is done
22 with the plant, whether you decommission it or entomb it,
23 mothball it, or restart it, you're going to have to clean it
24 up and get the fuel out of there. And it's essential -- the
25 issue on the restart is something that's going to be settled

1 five, six years from now on a different time and a different
2 place. But they don't view it that way. And then you have
3 the people -- many people up there have gone through a very
4 traumatic experience, and it's real. And they have a dreaded
5 fear of anything being released from the plant. And these
6 people, you know -- you can tell by talking to them that
7 they're very sincere. It's not something that they make up.
8 I mean, there are people, there are anti groups --

9 DR. KERR: I can see that they're having fear if
10 they didn't believe what you're telling them; namely, that
11 to release would be less than one day's background. If they
12 believe that, and they know that they're being subjected
13 to background radiation all the time -- I don't mean it's
14 impossible for them to show the attitude --

15 MR. COLLINS: It's correct.

16 DR. KERR: I would guess that they probably don't
17 believe you.

18 MR. COLLINS: They're willing to accept the risk
19 of the natural background because there isn't anything they
20 can do about it. And they feel that this is something they
21 can do about. Now, --

22 DR. KERR: On the contrary, there is something they
23 can do about it. They could move to central Florida, for
24 example, and the national background would be significantly
25 decreased. You know.

MR. COLLINS: But you know, we have tried to

1 discuss and put in perspective those very things, and by
2 flying back and forth from here to the West Coast you receive
3 more than you're going to receive there. Or moving to
4 Denter you're going to receive more. And it has not -- that
5 has not worked. Now, certainly there is the credibility
6 question. I certainly won't pass that off lightly. METED
7 has a credibility problem and the NRC has a credibility
8 problem. I think that we have been working very hard in the
9 last several months to turn that around, and I see a turnaround
10 and I see more people having restored confidence in the NRC.

11 I think the other thing that has helped is that the
12 Environmental Protection Agency has, in the last month,
13 taken a very active role in dissemination of all of the
14 environmental monitoring data that is accumulated from
15 their 18 monitoring stations. They make news release
16 every Monday, Wednesday, and Friday, and this is picked up
17 by the local TV stations and by the newspapers. And I
18 think that has helped restore some confidence in the
19 federal agencies.

20 The other program that just went into effect this
21 week is a community monitoring program. DOE, together with
22 the Pennsylvania DER, put together a community monitoring
23 program, trained people in the community to handle and
24 read the radiation monitoring equipment that is in the field.
25 They will have 12 stations manned by citizens. So I think

1 that also has helped a little bit. But it is a long road,
2 and the recovery program, or cleanup program, is going to
3 take a long time. My best estimate, we're talking five
4 years at the rate we're moving.

5 MR. EBERSOLE: In the meantime, when is unit 1 going
6 to start up?

7 MR. COLLINS: Well, the hearing, of course, is
8 underway, and I guess for that I would refer to Dick
9 Vollmer who really has headed up that -- the restart -- up
10 until he received his new assignment. Dick, do you want to --

11 MR. EBERSOLE: But anyway, it is going to start
12 up soon. That's the idea.

13 MR. COLLINS: Well, you don't want to start up.

14 CHAIRMAN PLESSET: Let Dr. Lawroski ask his question
15 first.

16 DR. LAWROSKI: Your answer to Dr. Marks' question
17 about the variations in the oxygen analyses left me wondering
18 whether or not you were confident in the competence of
19 METED to make adequate analysis. Am I wrong? Are you
20 satisfied with their competence?

21 MR. COLLINS: On the --

22 DR. LAWROSKI: On sampling the --

23 MR. COLLINS: On these last measurements, yes. Yes.

24 DR. LAWROSKI: And other work that they are doing,
25

1 do you want to comment also?

2 MR. COLLINS: Oh, I think that Metropolitan Edison
3 has a number of well-qualified people.

4 DR. LAWROSKI: You're satisfied.

5 MR. COLLINS: And I'm satisfied with these
6 measurements, yes.

7 DR. MARK: You're speaking of some which were
8 taken within the last four months.

9 MR. COLLINS: That's correct.

10 DR. MARK: Because the one I referred to was on
11 January 3.

12 MR. COLLINS: Oh, no. Most of these samples I'm
13 referring to were taken within the last -- in February,
14 March.

15 CHAIRMAN PLESSET: Okay, Dick.

16 DR. LAWROSKI: The reason I'm wondering, you
17 said, those are METED analyses, and I wanted to make sure --

18 MR. COLLINS: No, I meant it from the standpoint
19 of reporting the figure itself. I think you're aware,
20 you know, even in effluent releases it's always bothered me
21 that these licensees can report 8 significant figures when,
22 you know, they really don't mean anything.

23 VOICE: Could I ask what the answer was to
24 Mr. Etherington's question about the oxygen consumption?

25 MR. COLLINS: I said that I had not viewed it in
the way that he was looking at it. Now, we would go back and

1 take a look at it.

2 MR. ETHERINGTON: It just seems -- to get 9.6
3 percent.

4 MR. COLLINS: 9.6?

5 MR. ETHERINGTON: Would give you that, based on
6 2 million cubic feet originally. I don't know whether
7 that's right.

8 MR. COLLINS: Well, the free volume of the
9 containment is 2 million cubic feet.

10 MR. ETHERINGTON : What? How much?

11 MR. COLLINS: Two million cubit feet, yes.

12 MR. ETHERINGTON: Okay. Well, that's 9.6 percent
13 with the amount of hydrogen I would get would give you
14 12.8.

15 CHAIRMAN PLESSET: Okay, Dick.

16 DR. OKRENT: Could I ask one question? Somewhere I
17 have seen mention of some paper by some Japanese scientist
18 or engineer -- I'm not sure -- who questioned the previous
19 estimates of the total release of iodine at the site. Have
20 you gotten that paper, and have you found out what the basis
21 for the questions are, and so forth?

22 MR. VOLLMER: Yeah, we have -- radiological
23 assessment branch has looked at that. I am not sure that
24 they have written anything about it. But at least they
25 looked at the data. Apparently he used the same data that
they used, and applied a different interpretation to the

1 readings, and came out in some cases, -- he called it
2 significantly different numbers. And I think his maximum
3 estimate is something like -- instead of 3500 men, something
4 like 10,000 or something like that, which may not change
5 the basic conclusions. When we get through with the report
6 on that, I think we can make sure you get a copy of it.

7 While I have the mike; on the TMI restart effort,
8 a safety evaluation report on that staff evaluation is due
9 on the next few weeks or a month. The schedule for the
10 hearing would not probably be started before July. And it's
11 scheduled for a possible restart in the facility, would not
12 be probably before next January or February of next year.

13 CHAIRMAN PLESSET: Any other point or any other
14 questions?

15 MR. COLLINS: The only thing I could say is that the
16 next evolution that probably would occur after the man
17 entry would be to begin installation of the submerged
18 demineralizer system in to the b-spent fuel pool, in anticipa-
19 tion for operation of that unit in the latter part of this
20 year.

21 DR. LAWROSKI: Where would this go?

22 MR. COLLINS: Into the b-spent fuel pool in unit
23 2.

24 DR. LAWROSKI: You do that before venting.

25 MR. COLLINS: Oh, sure.

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DR. LAWROSKI: Or whatever.

MR. COLLINS: Yes. Unless you have any questions,
that's all I have.

MR. ETHERINGTON: I'd like to correct my figures.
That was oxygen deficiency, the hydrogen is double at 19.2,
but my number is --

DR. LAWROSKI: That's assuming that no two million
of air was originally too. Nothing in or out --

MR. ETHERINGTON: Nothing in or out.

DR. MARK: The fraction at age 2 that goes with
O-2 is twice the oxygen.

MR. ETHERINGTON: Right, I doubled the 9.6.

CHAIRMAN PLESSET: Well, let me declare a
short recess at this point,

(Whereupon a brief recess was taken at 2:22 p.m.)

TAPE 7
MLB

1 CHAIRMAN PLESSET: Let's reconvene. And we're
2 now scheduled to have our meeting with the Commissioners
3 and Joe Henry will be down shortly, but he suggested we
4 go ahead without his being on time, and precious procedure.

5 So, John, I would like to turn the meeting over
6 to you.

7 NRC CHAIRMAN AHEARN: Well, with this tremendous
8 list of topics that Ray Fraley sent me, I -- what was going
9 to happen is that you were going to inundate the coordination.
10 I got this list from Ray. I didn't know how you were --

11 CHAIRMAN PLESSET: Well, I can give you a lot
12 of maybe's and some yes's and some no's.

13 Now, on this report on the Action Plan, it seems
14 to be that we need to get these things by successive approxi-
15 mation. Right?

16 The note I have -- maybe you'll get a letter
17 this time, maybe not.

18 NRC CHAIRMAN AHEARN: Well, that seems to cover
19 the spectrum.

20 CHAIRMAN PLESSET: Now, the one regarding the
21 bulletins and orders, I think I told you that you would
22 not --

23 NRC CHAIRMAN AHEARN: Right. Right.

24 CHAIRMAN PLESSET: -- get it this time.

25 Now, we have -- I can get to some more positive

7/2

1 things. This letter regarding the pause in licensing --
2 that you will get. I definitely can say yes on that.

3 On the --

4 NRC CHAIRMAN AHEARN: I would -- I'd have to comment that
5 we really don't have a system which will enable us to give
6 you -- 1980 letters.

7 CHAIRMAN PLESSET: Nobody can do that. It says,
8 Ray, that this letter was dated December 11, 1980. Can
9 we make it '79?

10 MR. FRALEY: We'll change that --

11 CHAIRMAN PLESSET: We could just change the title
12 and use it in December '80. There'll be another one.

13 NRC CHAIRMAN AHEARN: I see.

14 CHAIRMAN PLESSET: Now, on this containment question,
15 I think that we will have a letter needed on that.

16 NRC CHAIRMAN AHEARN: And, Ray, I imagine has
17 filled an interview who might be interested in what Al
18 Ladder had to tell us.

19 CHAIRMAN PLESSET: Oh, yes. We've got --

20 Now, I think that that's -- because this Item
21 9 is --

22 MR. KERR: I must say Mr. Ladder's letter reminded
23 me of that of one of Will Rogers' columns in which he wrote
24 about menace in World War I. He said that he
25 had learned that submarines could not operate in boiling

7/3

1 water. Therefore the solution to the problem was to boil
2 the ocean. That he recognized that there were some details
3 to be decided upon. But that after all, was an engineering
4 problem and he was sure it could be solved.

5 NRC CHAIRMAN AHEARN: There's another solution
6 to locating submarines in the ocean, and that's to make
7 a transformation that turns the bottle inside out. I forget
8 the mathematical name for that.

9 CHAIRMAN PLESSET: The mathematicians can solve.

10 NRC CHAIRMAN AHEARN: That's a mathematicians
11 solution. Anyway --

12 MR. KERR: Always welcome for advice.

13 CHAIRMAN PLESSET: Now, on this coolant pump
14 trip, we will take care of that at the same time as we
15 take care of the bulletins and orders items.

16 NRC CHAIRMAN AHEARN: Fine. Fine.

17 CHAIRMAN PLESSET: And we're going to be doing
18 that as soon as we can.

19 Maybe we should have a little discussion of this
20 item regarding the Salem II, North Anna II and Farley II.
21 I think --

22 NRC CHAIRMAN AHEARN: What did you have in mind?

23 CHAIRMAN PLESSET: Well, I thought that perhaps,
24 I would let some of our more -- better informed members
25 talk to you on it.

7/4

1 I don't think we -- we had some discussion this
2 morning and I think that we most likely need -- actually
3 we could use some guidance.

4 Dave, you were the one that thought that there
5 should be some policy statement? No?

6 Oh, Mike did? I'm sorry. They all look alike
7 to me after a while.

8 AUDIENCE: I thought we had beaten the system,
9 but Mike was --

10 MR. BENDER: Let me not concern you about the
11 encouragement of specific policy decisions in the sense
12 of writing a policy. But we've -- the question has come
13 up as to what to do about a number of plants that have
14 operating license. That have not been completely reviewed
15 in terms of the bulletins and orders business.

16 And the question is should the Committee take
17 on the job of trying to re-review these things? Being
18 not too excited about adding to the Committee's work right
19 now, the argument I made is there is no more reason to
20 review these than there is to review the operating plants.
21 And as a matter of fact, if I were going to take a choice
22 between looking at something, I would look at the ongoing
23 operating plants, because they, in fact, are -- represent
24 a larger number of installations and ones that I -- I think
25 might have more difficulty in meeting the requirements.

7/5

1 However, there is a view that says, well, but
2 this thing is still in the licensing stage and just as
3 a matter of form you ought to do it.

4 Now, it would be interesting to know what the
5 Commission's view is, concerning those plants that are --
6 have operating license, but have not operated yet.

7 Then I think you ought to deal with in the context
8 of how does it compare with letting the rest of them run.
9 That's my view. And if the Committee has something different,
10 well, that's my view.

11 DR. OKRENT: Can I just ask one question? Do
12 these plants have operating licenses?

13 MR. BENDER: The Committee has reviewed them.
14 Let me put it that way.

15 DR. OKRENT: The staff has not completed its
16 report.

17 MR. BENDER: I appologize for that point.

18 NRC CHAIRMAN AHEARN: In two of the cases, Farley
19 and Salem, they do have low power operating license. In
20 North Anna, they have a low power operating license.

21 DR. OKRENT: But I meant in terms of the full
22 power.

23 CHAIRMAN PLESSET: Thank you, Dave. That's perhaps
24 an important correction, although it's more of a legality
25 than anything else.

7/6
1 NRC CHAIRMAN AHEARN: Right. Right. But I understand
2 the point.

3 What are some of the views of the others?

4 CHAIRMAN PLESSET: Well, really the question
5 boils down -- I don't think we decided that at yesterday's
6 meeting, whether we should have another review of these
7 plants. And I don't think we arrived at a conclusion,
8 did we? In our discussions that we had?

9 DR. LAWROSKI: But I would agree with Mike, particu-
10 larly bearing in mind that the load we see ahead of us.

11 MR. KERR: I don't think we'd write a formal
12 solution. I would detect a consensus that would not review
13 them. That would be my view.

14 CHAIRMAN PLESSET: What? I'm sorry.

15 MR. KERR: That we not review it.

16 CHAIRMAN PLESSET: Not make another review?

17 MR. KERR: Yes.

18 CHAIRMAN PLESSET: Is that the consensus?

19 DR. SIESS: They were all two unit -- they were
20 all second units of two unit plants.

21 MR. EBERSOLE: Oh, they were all second units?

22 CHAIRMAN PLESSET: Yes.

23 DR. SIESS: And if there were anything to review
24 it would be to do the sort of thing that we did when we --
25 we did review Salem II separate from Salem I, as I recall.

7/7

1 And we spent a fair amount of time determining to what
2 extent that the improvements that had been made in Salem
3 II since Salem I was licensed, had been made in Salem I.

4 And the only thing I could see any real interest
5 is to see how they compared. More changes were being made
6 in the second unit than in the first which is sort of line
7 with Mike's.

8 But I don't see anything that puts those other
9 plants in the same category as Sequoia for several reasons.

10 CHAIRMAN PLESSET: Sequoia, we're keeping separate,
11 yes.

12 DR. SIESS: Sequoia is a unique plant. It is
13 one was have not signed off on.

14 CHAIRMAN PLESSET: We're keeping it separate,
15 right. Dade, did you want to make a comment?

16 DR. MOELLER: Yes, I wanted to make a comment.
17 I'm trying to think exactly what it would be. But I'm
18 just not sure of the wisdom of just saying flatly that
19 we won't take a second look at these plants.

20 Now, we might not do it exhaustively one at a
21 time, but we might look at the group to -- or at least
22 have the staff come in and tell us to what extent have
23 they, you know, looked at these in terms of any changes
24 that would necessary in light of the action plan and the
25 other items.

7/8

1 CHAIRMAN PLESSET: Dade, did you want to connect
2 this with what they learned in the low power tests or not?

3 DR. MOELLER: Yes, I think that would be connected.

4 CHAIRMAN PLESSET: That's what I thought.

5 DR. MOELLER: Yes.

6 CHAIRMAN PLESSET: Okay.

7 NRC CHAIRMAN AHEARN: Well, the Commission hasn't
8 addressed explicitly whether or not we should ask you to
9 do that. I guess some of my comments would be, I'll be
10 glad to ask my colleagues whether they feel they should
11 ask you that.

12 I think in general, if you feel that you should
13 look at it, obviously you should.

14 But in general, what we are trying to do -- what
15 we have asked the staff, to help them to try to put down
16 what are the requirements that he believes should be necessary
17 for a plant to receive a full power operating license,
18 as well as what are the requirements he believes a plant
19 should meet to receive a construction permit. Two things
20 that we have, potential Boards and such that have to address,
and that the Commission has to address.

21 And when he -- and he should shortly have that.
22 I would think it would be quite important for the Commission
23 to have the ACRS, if you ask one who knows, just as you
24 address the MTOL. I think that would be a -- something
25

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1 that really would deserve careful scrutiny, because that's
2 the -- those will then end up being what the Commission
3 will address in trying to establish policy statements that
4 we would, in turn, give to the Boards to use, as well as
5 to the NRR staff to use in going to the Board.

6 DR. SIESS: But that is the NTOL.

7 NRC CHAIRMAN AHEARN: Well, Harold is trying
8 to think through that carefully. As you know, we have
9 only issued low power license. We have not issued any
10 full power license.

11 The Commission hasn't said that these are definitely
12 the requirements that will be met. Now, it --

13 DR. SIESS: But the NTOL requirements were for
14 license. They weren't qualified as to low power.

15 NRC CHAIRMAN AHEARN: Well, but the licenses
16 we have issued have only been for low power.

17 DR. SIESS: Yes.

18 NRC CHAIRMAN AHEARN: And so we have not yet
19 passed the threshold of what it is that is required for
20 the full power operating license. And consequently any
21 Board that has a contested operating license in front of
22 it, is still in a merky area.

23 DR. SIESS: Well, what I think the ACRS was deciding --
24 I thought what the ACRS was deciding, not to reopen a formal
25 review and write another letter on these plants.

7/10

1 I see nothing wrong with being kept informed
2 by the staff as to what they're doing. At least three
3 of them are identical, or near identical plants, and they
4 could handle it without taking an awful lot of time. There
5 are three Westinghouse plants, or are there four? I'm
6 not sure.

7 But -- and now what they're doing to Unit I,
8 to Unit II which is the one is question, and how it relates
9 to Unit I, which would give us some insight then of what
10 Bender's talking about is the operating plant.

11 And keeping informed is one thing, and maybe
12 having some dialog or input to the staff -- that's not
13 the same as making a full case review for each one of the
14 plants.

15 NRC CHAIRMAN AHEARN: I can only speak for myself,
16 and I would share Mike's view and your view of it on what
17 you ought to do.

18 But my colleagues may differ.

19 CHAIRMAN PLESSET: I think Dade wanted to make
20 a comment and then Mike wanted to make --

21 MR. BENDER: No, I don't any more. I think Chet
22 made the point quite well.

23 CHAIRMAN PLESSET: I was a little bit indefinite
24 when I said -- because it seems to me -- and Moeller expressed
25 the thought that I had. Well, we want to look at these
things after the low power license tests have been performed,

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1 we might want to make without a formal progress review
2 another look at Farley, since this is not a duplicate in
3 the same sense that North Anna II and Salem II are, if
4 I understand it correctly.

5 VOICE: It's Farley II.

6 CHAIRMAN PLESSET: Is it the same as Farley I?

7 VOICE: It is Farley II. I just am not familiar --

8 CHAIRMAN PLESSET: Is it a copy?

9 VOICE: Well, it's not a copy --

10 CHAIRMAN PLESSET: I'm not sure.

11 DR. SIESS: I think we wrote a single --

12 CHAIRMAN PLESSET: Chet said that it is. So
13 I'll withdraw that.

14 DR. SIESS: I think we wrote a single operating
15 license on Farley I and --

16 CHAIRMAN PLESSET: But they don't have a low
17 power test --

18 NRC CHAIRMAN AHEARN: No.

19 It didn't come to us.

20 CHAIRMAN PLESSET: I see, and you have no idea
21 whether they will, I presume.

22 NRC CHAIRMAN AHEARN: No, not off-hand.

23 CHAIRMAN PLESSET: Dave, would you make your
24 comment?
25

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1 DR. OKRENT: Well, earlier when we were talking
2 about this, I said I thought that there were questions
3 of more important probably that the Committee might better
4 spend its time on than trying to see whether each of those
5 plants met the NTOL and so forth.

6 I still think that's true. In connection with
7 those plants, it seems to me if the Committee were to review
8 one or each of them and write a letter, it might have to
9 go back and look at what it recommended in connection with
10 the actual plan and the NTOLs.

11 For example, the Committee has recommended that
12 each plant do a study on the possibility of modifying its
13 containment to handle accidents beyond the design basis,
14 to look at the pros and cons of possible designs.

15 The Committee made that recommendation in general
16 forum. We haven't any inkling yet what the Commission
17 plans to do with that recommendation.

18 It's -- but if we were going to review a plant,
19 I assume we would repeat this on the individual plant,
20 not as the condition to start up, because we made it clear
21 we didn't think it was a condition to start.

22 And there are a couple of others like that. We've
23 indicated that we think each plant should do a probablistic
24 analysis of systems to see whether there're places where
25 you -- augmentation and liability and so forth.

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1 So I'll take this occasion to point out, we don't
2 know what the Commission is going to do with these recommenda-
3 tions we've made, and to note that this might be a logical
4 result if we were to review plants individually, but stated
5 then be case letters.

6 The other point I wanted to make, in connection
7 with the kinds of general questions we earlier in this
8 discussion mentioned that, for example, we should get a
9 letter in response to your request about the potential.
10 The technical and practical feasibility of containing a
11 molten core.

12 Well, you're going to get some answers, and you're
13 going to get some questions in that letter. And the questions
14 are what are the NRC policies? Or what will it be, and
15 so forth.

16 Well, if we're supposed to be trying to assist
17 the Commissioners in that area, I would, myself, expect
18 that might take a higher priority than looking at the applica-
19 tion of NTOL items, or these sequences.

20 To me, those three -- these three plants are
21 not special. I don't see something unique about them,
22 either in the containment design or as far as we know,
23 it's a site.

24 There may be something about the hydrolysis of
25 the site. That I don't know.

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1 And simply, we just today were talking with Mr.
2 Denton and so forth about near term construction permits,
3 where again, they're going to be -- there's going to be
4 a need for some policy guidance, and in the end, I think,
5 the Commission is going to have to -- say. So in this
6 context, it seems to me that it would be better for us
7 to provide you with what advice you wanted or needed. These
8 are sometimes are not quite the same.

9 I mean you may need it for formal reasons. I
10 have seen such a case, even though you already knew the
11 answer to it.

12 But beyond that, I haven't heard around the table
13 somebody identify technical reason why it was important
14 that we reviewed it.

15 CHAIRMAN PLESSET: Any other comments? Mike
16 did you want to make a comment?

17 MR. BENDER: No, I think it's been adequate.

18 CHAIRMAN PLESSET: Okay. It's all yours now.

19 NRC CHAIRMAN AHEARN: Well, you had another item
20 listed here, desirability of the review of TMI II decontamina-
21 tion recovery operations.

22 CHAIRMAN PLESSET: Yes. Let me say I more or
23 less deliberately left that out. Because we just finished
24 a discussion that went four times as long as scheduled
25 on the question of what's going on there. And the

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1 decontamination.

2 And this is after this morning the Committee
3 said they didn't want the -- they're kind of aware of the
4 decontamination and recovery operations.

5 So, I don't know if they've changed their minds
6 since --

7 DR. SIESS: We didn't say we didn't want to be
8 informed.

9 CHAIRMAN PLESSET: No. I said it wrong. I said
10 it wrong. They said they didn't want to be involved. I
11 guess they want to be informed, but they don't want to
12 be involved.

13 Would that be correct?

14 MR. BENDER: I wanted to add something to the
15 point you made about that thing. I think being informed
16 is about all we can be for the kinds of operations that
17 are going on.

18 There's no reason to believe that the Committee
19 could deal with the thing in the kind of detail that's
20 being reviewed at -- by the people at the site.

21 There may be some principles involved in what
22 they're doing. That might have been appropriately reviewed
23 by the Committee.

24 I'm not sure that at this stage of the game it
25 would be very effective to make such a review now.

1
2 NRC CHAIRMAN AHEARN: Mike, what for example,
3 would you have in mind?

4 MR. BENDER: Well, the whole scheme of going
5 into the containment and what they were going to look at
6 and how they were going to make a decision, might well
7 have benefited from some of review.

8 I'm not really sure how it was done, as a matter
9 of fact.

10 CHAIRMAN PLESSET: Well, they haven't gone into
11 containment yet, Mike.

12 MR. BENDER: Well, but there's a plan.

13 CHAIRMAN PLESSET: There's a plan, right.

14 MR. BENDER: And I think that there is some reason
15 to believe that reviewing that plan might have some merit
16 to it.

17 But since it's been developed, I don't know that
18 I would want to go through and disturb the logic of it
19 at this stage of the game. That's all.

20 CHAIRMAN PLESSET: Steve, do you want to --

21 DR. LAWROSKI: Well, there may be later on down,
22 for example, when you will have removed the contents of
23 the containment and getting ready to deal with the primary
24 system. And there we may want to be informed of the plan,
25 because that can be potentially the next biggest place

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1 where -- the best place where you might encounter some
2 problems.

3 DR. SIESS: You mean the research plan?

4 DR. LAWROSKI: The research plan. Yes. And
5 the restoration of -- well, recovery first, and then --
6 restoration.

7 DR. SIESS: Because there's been -- there's a
8 whole group of panels proposing research plans.

9 DR. LAWROSKI: Yes.

10 DR. SIESS: And from what I read there are quite
11 a few conflicts. Some of them want to do this and some
12 of them don't want to do that. Want to do something else.

13 And I assume that the staff or somebody is reviewing
14 that now. This is something I'm sure the --

15 Now, the ACRS can be helpful to the Commission
16 in just about any area the the Commission asks us to be.
17 Whether we do better in some areas than others, I have
18 my opinions, which disagree with the opinions of some other
19 people around here.

20 And the Commission, I guess, has its opinions
21 as to whether they get better help from us, or quicker
22 help from us on some areas than others.

23 But I think the TMI II decontamination process
24 at this stage doesn't really require our attention. But
25 we might want to look at the research plans as part of

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1 our research obligations. Some of that's under research.
2 Some of it's DOE, industry.

3 I mean, it's not just NRC, but NRS's putting
4 a fair amount of -- I think some support into it at some
5 stage.

6 NRC CHAIRMAN AHEARN: Putting some support and
7 certainly has a lot of say about what can and cannot be
8 done in that.

9 DR. LAWROSKI: I would have included research
10 plus the implimentation of what I consider the major portion
11 or the major job that's going to have to be faced in the
12 recovery and restoration of this plant, if it can be --

13 Well, I with regard to containment -- it was
14 my -- always has been my impression that so little was
15 going to be done by way of respect to entry until the crypton
16 has been dealt with.

17 VOICE: I think that's correct.

18 DR. LAWROSKI: -- that it didn't --

19 NRC CHAIRMAN AHEARN: Let me get back --

20 DR. SIESS: Let me add one thing to that. I
21 think we should be concerned chiefly in those areas that
22 have approximate affect on the public health and safety
23 and a longer term effect in terms of what we can learn
24 when you get into there.

25 And the things that just affect the economics,

1
2 I don't really think we should be concerned with.

3 NRC CHAIRMAN AHEARN: The plan that you're talking
4 about is the plan of once the entry is made, what goes
5 on, what --

6 MR. BENDER: What goes --

7 I think we probably need to start with something
8 that says what's the philosophy of recovery? What is
9 it that you're really going to accomplish when you say
10 you're recovering.

11 You're going to get -- the first thing you're
12 going to try to do is get the thing in shape to get inside.
13 And that's about all you've done up until now.

14 But somewhere along the way, we have to -- somebody
15 has to say we're going to get the fuel out in some form
16 and put it somewhere. We're going to try to protect the
17 primary system, perhaps if you're going to reuse it, and
18 I don't think anybody knows whether we will or not. We're
19 going to have to consider things like where are the radio-
20 neuclides in this thing, and to get them out, what things
21 are going to be affected by it?

22 And to me -- I don't have much of a feeling for
23 what's going on. I do believe you ought to have a task
24 force of some sort that's doing this. Whether this Committee
25 should do it or not, I don't know. Certainly not the full

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2 Committee, it would take a long time.

3 But in order to be sure you understand the recovery
4 process, I think there should be something considerable
5 review of it by people that are not so close to the grindstone.

6 That's the whole point of what I'm saying.

7 NRC CHAIRMAN AHEARN: I'll have to talk to our
8 clean up people and think about that. That's a good point.

9 MR. EBERSOLE: Has there been any point in time
10 where these people say, now I'm going to take the reactor
11 literally?

12 NRC CHAIRMAN AHEARN: People have talked about
13 that, but that's -- given the process of getting the crypton
14 gas handle has taken as long as it has, and its resolution
15 is still far from clear. It's very difficult for those
16 people to be talking about anything about a specific dates
17 about when they might be taking the reactor lid off.

18 MR. EBERSOLE: But one thing you can do is identify
19 target in the distance and see how hard it is to get there.
20 And that must be a target.

21 NRC CHAIRMAN AHEARN: Yes, in fact, because in
22 the problematic environmental impact statement, that is
23 one of the steps.

24 And on the early drafts of that, was a much more
25 optimistic schedule than it will now look like, because

1 in the early drafts of it, the early actions were going
2 to have taken much faster.

3 But yes, that's at least in the draft process.

4 DR. SIESS: I don't see why it's much of concern
5 to us when they take the head off. I'm much more concerned
6 with what they do when they take the head off.

7 And what can be learned in the process.

8 NRC CHAIRMAN AHEARN: The concern, I think --

9 DR. SIESS: And what are their safety implications.

10 NRC CHAIRMAN AHEARN: The concern in the Commission's
11 view at the moment, has been the steps that provided the
12 clean up, trying to get rid of all the contaminated water.
13 I'll have to think about that one.

14 Dave, how are you coming on that quantitative
15 safety --

16 DR. OKRENT: Well, we had a subcommittee meeting
17 on Wednesday, part of which was devoted to, I guess what
18 you could say are in-house progress. Because the others
19 are format of states.

20 So there wasn't any outside group, at least that
21 we knew of that was ready to propose their specific approach.

22 I think the NRC staff group is certainly moving
23 ahead in the thinking. That's clear. Their ideas are
24 advanced from where they were several months ago.

25 I had originally been shooting for having a proposal

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1 to the Committee by next August, since we said we'd try
2 to do it in a year.

3 And if we were forced to -- that is the subcommittee,
4 we could, I think, have a proposal into the full Committee
5 because the one that we talked about at this meeting seemed
6 to have at least reasonable agreement from the members
7 there in the consultants -- in the general approach as
8 a possibility, although one would have to look a bit at
9 the parameters. The actual values of the parameters.

10 However, my understanding is that both the NRC
11 staff in their efforts, and the industry group or groups
12 and their efforts, are likely to have their own proposals,
13 oh, sometime in the fall.

14 And so I guess my thinking was that it was probably
15 going to make sense from the full Committee point of view
16 to wait and see what the others working in this area, had
17 in mind and they might feel it ill advised --

18 END OF TAPE

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DR. OKRENT: But that's a short summary.

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NRC CHAIRMAN AHEARNE: Speaking of -- myself, I would be interested in your pressing on. Both the other -- but I think we got into the --

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DR. OKRENT: Well, we will and we're -- will have another subcommittee meeting about two months from now at which time we expect to have done some sample testing of the different parameters and so forth that appear -- and so forth.

Just one other thing we want to explore. For example, it's very hard to put in what I would call a risk aversion factor. In other words, you say a big accident times its -- itsn't equal to the same number of accidents -- If it's not equal then what do you do about it.

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Well, I can't -- it's easy for me to do calculations which show what doesn't make sense because society isn't following -- and it's a little harder to come up with some kind of proposal that we -- be plausible for nuclear reactors in the light of everything else. -- have tried it -- sort of thing out for example.

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NRC CHAIRMAN AHEARNE: Dade, I should mention I did follow up on the crypton 85 -- and my understanding is that Eisenbud has got a revision -- or about to --

DR. MOELLER: Mr. Collins mentioned that to us in his presentation too, thank you.

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CHAIRMAN PLESSET: Okay.

All right.

I don't -- unless there's something else --

DR. SEISS: Could I ask --

CHAIRMAN PLESSET: Go ahead, Chet, and then --

DR. SEISS: We are assuming that the Commission would like a report from us in July on the proposed budget like last year.

NRC CHAIRMAN AHEARNE: Absolutely. Yes, that was very --

DR. SEISS: Would you like something shorter -- would you like something shorter than last year?

NRC CHAIRMAN AHEARNE: No, at least speaking for myself I find that --

DR. SEISS: About right?

NRC CHAIRMAN AHEARNE: Yes, and the research budget is -- I found the hardest part of our budget --

DR. SEISS: Well, our plans are to make about the same schedule. We'll try to meet about the same schedule as last year. We'll try to complete it at the July meeting.

CHAIRMAN PLESSET: You've got to watch these -- I got to do most of this by -- don't go.

DR. MARK: I think Carson and Max are on that.

On the point before this, the qualitative safety

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goals which is was mentioned they were going to be --

VOICE: Qualitative?

DR. MARK: Quantitative.

VOICE: Quantitative.

DR. MARK: Are going to be difficult to pin down and very hard to know what should be done with what you've written by the time you've even decided what to say.

Then holding that with the notion that nothing would come out of either this committee or probably the Commission would be the large chance of the intermediate public --

It mentions here and I'm sure it made this -- what one really needs ultimately is to have Congress give some kind of stamp of approval to some approach to the problems of that kind. You see or hear any --

NRC CHAIRMAN AHEARNE: Well, the discussions at least that I've had on that always end up with Congress saying well, NRC it is up to you to propose such things.

DR. MARK: But you think they would perhaps be willing to consider --

NRC CHAIRMAN AHEARNE: Well, there are certainly some who are willing to consider it. Members of our oversight committees are willing to consider it believing though that it is our responsibility to try to -- and that's why I think that and in my own personal view I think that the

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best source of that kind of advice really does come from --

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MR. BENDER: I just wanted to get -- refer to Carson Point for a minute. Have you done any talking to them along the lines of saying if the NRC puts something together, do you have any objection to it being in the context of other risks or have you -- have you tried to broach that point.

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NRC CHAIRMAN AHEARNE: I haven't explored it from that point of view because I've received the request from people and saying -- stating it both ways.

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MR. BENDER: Yes.

NRC CHAIRMAN AHEARNE: Clearly there are some of the answer -- forming the answer to be yes and there are some the answer would be no. But in all cases the answer would be well let's see what you.

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MR. BENDER: Okay.

NRC CHAIRMAN AHEARNE: What you --

MR. BENDER: Well, never mind I --

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NRC CHAIRMAN AHEARNE: Everybody fences around until they see something specific.

CHAIRMAN PLESSET: That's right.

DR. MARK: We're all waiting with bated breath to see the headlines on the anniversary of the DC 10 crash. I -- dread the TMI anniversary.

DR. CARBON: I'd like to go back to Chet's question.

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Can you do any guessing on what may come out for the advanced reactor safety resources budget?

NRC CHAIRMAN AHEARNE: I can make lots of guesses and I don't think any of it will be any better than the guesses some of you might have. It is -- it it obviously not really an issue of the advanced reactor safety research project.

The issue is as has been over the last three years in Congress, the argument between -- majority -- Congress of the Administration as to what paths would be taken on a very broadly described subject and which somebody described non-corporation and another described as an advanced reactors, another area was described as -- I -- I'm just out of touch with all those -- on both sides that have been making those arguments and my view would be just -- we are a very small part of it on a long chain and we'll be carried along with it in which ever direction it goes.

I would note that once again -- provided by the House -- which has sort of been -- it would be necessary but not sufficient.

CHAIRMAN PLESSET: Any other comments? Your remark about not going, I now understand why they're so enthusiastic. And I said I'd stay home and they said go.

NRC CHARIMAN AHEARNE: I'll take that advice.

CHAIRMAN PLESSET: Okay.

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VOICE: Are we going to have a break?

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CHAIRMAN PLESSET: Do you really want a break?

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VOICE: Sure we do.

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CHAIRMAN PLESSET: Okay.

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A very short one.

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(RECESS FROM 3:07 to 3:20)

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CHAIRMAN PLESSET: Gentlemen. Let's recess -- I mean reconvene.

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Let me read a note from Commissioner Gilinsky's office. He apologized for not being at our meeting today.

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DR. OKRENT: And instead he's sending us --

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VOICE: Sending us what, Dave?

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DR. OKRENT: The letters with questions.

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CHAIRMAN PLESSET: His daughter became ill and he had to go home and was unable to -- so I wanted you to know -- he planned to be here --

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VOICE: What's Joe's excuse?

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CHAIRMAN PLESSET: I haven't heard it. He was supposed to be here --

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VOICE: He's been here before.

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CHAIRMAN PLESSET: Yeah, he knows that we -- run a day late. He may show up tomorrow.

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Well, I want to call on Mr. Zech to give us our preview of what's coming up.

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MR. ZECH: Yes, sir, thank you.

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3 With regard to what we preceive the future schedule
4 from the Staff viewpoint, we had originally planned -- with
5 full Committee in June with regard to the TMI One restart
6 and I think what Dick Lomar mentioned earlier this afternoon
7 it appears that it will be a little later before we have
8 the supplement to the SER available.

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10 Actually, I understand it's going to be a new
11 issue of the SER and not a supplement. We hope to have that
12 available to the Committee at the end of this month. In
13 which case we're looking more toward July time frame to
14 discuss that subject.

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16 CHAIRMAN PLESSET: So that would be July.

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18 MR. ZECH: Yes, sir.

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20 The other thing that we have scheduled for June
21 and we discussed this last month, Denny Ross did in
22 particular with you, was to look at the Sequogah items that
23 are remaining outstanding from a full power license
24 standpoint and then to come back in July to talk about the
25 low power ... sts with the hope that we would finish up with
Sequogah discussions in July and I'm anticipating a letter
from the Committee sometime after that meeting.

CHAIRMAN PLESSET: A letter to what effect?

MR. ZECH: For the full power license.

CHAIRMAN PLESSET: For a full power -- okay.

MR. ZECH: Now, that was last month we discussed

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that. I think -- our hope was that we could go to the Commissioners the latter part of July and I think that still is our hope depending, of course, how things go.

Now, at Ray Fraley's request we've looked at an alternative as to whether or not we could handle the Sequogah questions that are outstanding in a single session. I've talked to the Staff and we feel that if we had a subcommittee meeting -- we haven't talked to Dr. Carbon about this yet, but if we had a subcommittee meeting to handle the outstanding issues from the full power license standpoint sometime in June and maybe we'd want to consider another subcommittee meeting for the low power tests that we than could in a one full session with the full committee in July -- accident of Sequogah Plant.

CHAIRMAN PLESSET: Does the Staff have anything else that they want or planning to bring in in June?

MR. ZECH: The only other item was the TM! One restart which I mentioned earlier.

CHAIRMAN PLESSET: That's already been put off.

MR. ZECH: Yes, sir.

CHAIRMAN PLESSET: If we went to this procedure with Sequogah, there would be -- there would not necessarily be anything coming in.

MR. ZECH: At this point, that's correct.

CHAIRMAN PLESSET: I think that what we had in

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mind tentatively was that there might not be a full committee meeting in June. Some us will have been barely back from Europe but I think you were rather negative about --

DR. SIESS: If there's not a full committee meeting in June, I would suggest strongly that you reserve all three days in July --

CHAIRMAN PLESSET: Well, that -- that -- I don't think that's possible. So you don't --

DR. SIESS: I don't think it's possible either but if you will recall last year, we had had enough sub-committee meetings by June that the issues on the research program could be raised and discussed by the full committee so that the individual -- in an office could go in the next month to prepare some drafts. And that in July then we finished that up. Some of them had had meetings during the period between June and July -- and we needed a fair amount of time to put it all together, to hear the Staff and --

I asked for I believe about eight hours at the June meeting for the research, review and about twelve hours at the July meeting

CHAIRMAN PLESSET: I think that we kind of disposed of the thought, Chet --

DR. SIESS: I made the suggestion yesterday on the

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condition that we didn't need the research report. That's all.

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CHAIRMAN PLESSET: Now, I don't know whether we'll be able to have a subcommittee meeting on the Sequogah with the outstanding items before the June meeting. Is that possible, Max, I don't think so? It's not possible to have it just before the full --

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DR. CARBON: There's so many meetings scheduled for the -- that's before --

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CHAIRMAN PLESSET: Oh, there is?

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MR. MATHIS: Yes, right here, the 2nd of June.

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DR. CARBON: The 2nd of June is a meeting of Sequogah.

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CHAIRMAN PLESSET: Whose the subcommittee chairman now? Oh, you are. Well, that involves the low power tests, I'm sorry.

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So you're planning a subcommittee --

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DR. MARK: I was planning on the 12th but it got scheduled yesterday for the 2nd and Bill has kindly offered to handle the meeting.

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CHAIRMAN PLESSET: Oh, okay.

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So there will be a --

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VOICE: You won't be here either?

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DR. MARK: No.

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HCIARMAN PLESSET: So there will be a subcommittee

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meeting and Sequogah could come in on that part.

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All right.

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I think we should leave it that way.

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MR. ZECH: Well, I think it would be better if -- particularly if we try to put on to July.

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CHAIRMAN PLESSET: Yes.

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MR. ZECH: I don't think it would work out too well because we'll -- we would need a full day I'm sure.

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CHAIRMAN PLESSET: Because July will also be involved with its report -- report -- not when I have too many other things --

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All right.

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So that's the way it will be. Anything else?

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MR. ZECH: At this point, no, sir.

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CHAIRMAN PLESSET: Okay.

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VOICE: Well, I only asked for 12 hours in July out of 36.

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CHAIRMAN PLESSET: Well, you might use more.

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DR. MARK: Well, how come you didn't say 72.

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CHAIRMAN PLESSET: Yes.

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Okay.

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Did any --

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VOICE: -- realistic, best estimate.

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VOICE: TMI One, does that come in July?

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CHAIRMAN PLESSET: July.

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CHAIRMAN PLESSET: Dave.

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DR. OKRENT: Depending on how we decide to approach the near term construction -- try to do something and do it on the schedule suggested by the representative of the applicant, the committee would be hearing something on that in July.

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So I would -- that's a possible topic for July. I don't know --

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VOICE: Can you give it to me again, Dave?

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DR. OKRENT: Sometime earlier this week we were talking about near term construction. The representative of the facility said that they were trying to work on proposed positions for the areas that need policy positions one way or another, whether legal or technical.

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He was suggesting that by the middle of June they might be ready to talk with the Staff, the ACRS and maybe by July the full committee could hear them.

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I'm going to recommend that when the committee writes a letter, presumably -- that we try to follow this approach rather than for example, recommending something without -- Now, I don't know whether there would be something ready for the committee in July. I think -- that's agreeing with them.

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But you're talking about June and July and I wanted to mention that rebuttal. The second thing is, since

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Chairman Ahearne has in effect asked us to try to push ahead in the area of quantitative risk criteria and not to wait until there are other proposals, it might be worthwhile for the full committee to schedule some time on this subject in June or July if you have time on one or the other of these agendas so that you -- you -- there's a chance for interaction.

CHAIRMAN PLESSET: Okay.

That's --

MR. BENDER: You mean other than a subcommittee report, Dave, or --

DR. OKRENT: Yes, I mean some serious discussion -- a block of prime time.

VOICE: Yesh, I think that's a good --

MR. ZECH: Excuse me, Mr. Chairman.

Dr. Okrent, would you want a Staff input in that regard also.

DR. OKRENT: We would welcome a Staff input if -- if they were ready to give us, you know, something other than --

MR. ZECH: On both items. The near term CP's and the quantitative risk?

DR. OKRENT: Well, on near term CP's again, if the committee decides tomorrow to do something -- to recommend something like was recommended by the applicant's

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2 representative, in other words, try to work with them and
3 the Staff for two or three months and see if one can develop
4 something more well formulated and well structured for the
5 Commission to look at.

6 Then obviously when -- when it came back to the
7 full committee there would have to be participation by the
8 staff and by the applicant. It couldn't proceed in any
9 other way.

10 CHAIRMAN PLESSET: It looks to me as though we'll
11 have a three day meeting in June.

12 DR. OKRENT: Yes, if I could offer one other
13 comment.

14 CHAIRMAN PLESSET: Yes.

15 DR. OKRENT: I think that the safety research
16 thing this time may not be as straight forward as you might
17 have guessed because it -- it's -- after all it's a year
18 later, what's new. In fact there are a range of new programs
19 in the -- and so forth that do not -- unrelated to some of
20 the topics on the agenda of this meeting.

21 DR. SIESS: It will not be routine. It will be
22 interesting and confusing which is they won't know what the
23 FY '81 budget is. They might not know what the FY '80
24 supplment is and they're going to have one heck of a time
25 telling us what '82 is.

DR. OKRENT: Well, in fact, I'll go one step

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further and I see Mr. Rowsome is sitting here and I'm glad.

VOICE: Don't like to talk behind his back.

DR. OKRENT: That's right.

The ACRS in fact in one of its last public reports on safety research recommended that the Safety Research Office apply its wisdom and -- analysis, risk analysis to it's own program to see which program should receive priority.

They may have been doing this but I have not yet seen the output if they have. If they aren't using their skills on the task action plan, if they're doing with near term construction permits, probably they're certainly doing it on the B&W thing, I don't know.

Since they're able to find time to help NRR, I suggest they find time to help themselves and that we ought to have the benefit of this by the June meeting.

DR. KERR: I would also call your attention in the material provided to us by Tom McCreless in a page entitled assumptions in fabrics and reduction exercise the following statement. A significant item assumed to be exempt from reduction is \$3 million for nuclear data link.

CHAIRMAN PLESSET: Yes, that reminds me that that's a subject dear to your heart I know.

VOICE: They're our scared cows, Bill, you know.

DR. SIESS: Asked for by the President and that's

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why it's getting such top priority.

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CHAIRMAN PLESSET: Well, I think we're ready for the staff to -- transient response. Bob?

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MR. TEDESCO: Yes, sir.

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Yes, Mr. Chairman, we're here again to talk with the full committee about the results of our task force effort which Mr. Denton had established -- operating instruments being -- with regard to their sensitivity for the various operating transients.

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Since our last meeting with the full -- with the ACRS which was last April 11th, we met with the Commissioner on April 21 and again with an older group on April 23rd and then most recently we met with the subcommittee this past week on the 29th, all of which to brief and to provide further information on the status of our task force evaluations.

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And given the Nureg 0667. We have completed Section 7 that we indicated last month. This section deals with an approach toward estimating a risk reduction potential for each of the 22 recommendations that are given in the report.

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I realize that it's -- the report that you have now before you has Section 7 in it and a particular Table, 7.3 that has some results that we'll be talking about more -- full committee.

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The report is now in its final form and copies have been provided to the committee. There have been no substantial or major changes in the report that we have now compared to the one you had before. There have been a lot of clarifications and some editorializing but it touches the recommendations we made pretty much the same.

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We have added another Section 8 to the report that deal with recommendations that the task force made with regard to some guidelines that Mr. Denton might use for implementation of these particular recommendations. Once he decides what are you going to do with our report.

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The recommendation that we have identified can in -- in some instances find counterparts in the task action plan at least to the level of -- of a particular title. But some of them go further than that. But in general they're not all in the task action plan per se.

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But if one were going to say where would I put a particular reference to our recommendation. We did identify a section that would be appropriate for that.

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Mr. Denton is awaiting the comments of the committee on our report so that he would then be in a position to make a decision on the action that he would take toward implementing these recommendations.

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So that we would encourage the committee to complete their deliberations and -- in a position to have all

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the input information that we need.

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Now, that's a very brief summary of where we are now -- primarily is based upon Dr. Rowsome talking to the committee about Section 7, exactly what the work that has been done in the past --

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CHAIRMAN PLESSET: Any questions for Bob Tedesco?

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MR. SIESS: Yeah.

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CHAIRMAN PLESSET: Okay, Chet.

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MR. SIESS: Bob, you said there were no changes, does that --

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MR. TEDESCO: No, major changes --

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MR. SIESS: But nothing in Chapter 7 changed anything you had earlier?

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MR. TEDESCO: No, not directly. What we've done in Section 7 was kind of use it as guideline in our establishing --

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MR. SIESS: But some of your comments in Chapter 7 said at least in part that this not only will not help much, it may harm.

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Now, did you look at that and decide that, no, it wouldn't have any ill effects and therefore, it still should be done although maybe at a lower priority?

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MR. TEDESCO: Our priorities balance pretty well with theirs. I don't think we're going to take it point by

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point because the indications that remain in Section 7 are somewhat objective and I guess if you're thinking of the approach that they indicate, that would -- agree with them.

But I think from another viewpoint you may take a different approach for it.

MR. SIESS: But you felt that even where they raised questions as to whether something might have adverse effects that unbalance that were still desirable?

MR. TEDESCO: Yes, there are things --

MR. SIESS: Or necessary I guess is the word, not desirable.

MR. TEDESCO: Yes, I think that's true, Chet.

You have things that -- the overflow protection as an example where we thought that based on the Part 21 in this notification by B&W that you wouldn't want to prevent overflow.

Well, the provision for an overflow protection may also lead to a negative effect that would terminate your -- feedwater system.

That's always true, whenever you put something on, there are going to be favorable effects --

9/1 1 DR. SIESS: I was thinking about one where they
2 said that having an instrument technician on duty 24 hours
3 a day just gave them three times as many chances to make
4 mistakes. And the mistakes would come during the off-
5 shifts where there might not be as many people to help
6 them get out of it.

7 MR. TEDESCO: Well, we would go to -- have to have
8 a knowledgeable technician on the shift.

9 DR. SIESS: Well, that's a different criterion;
10 isn't it?

11 MR. TEDESCO: Well --

12 DR. SIESS: Was knowledgeable in there to begin with?

13 MR. TEDESCO: Well, to me an instrumentation and
14 technician has to be knowledgeable about his plant.

15 DR. KERR: Is your point, Chet, that he should
16 be there but you shouldn't permit him to do anything?

17 DR. SIESS: Well, it's not my point. This was in
18 Chapter 7. The risk assessment said that a number of these
19 problems have been caused by maintenance -- errors by
20 maintenance personnel. And that if those are only made on
21 the dayshift, maybe that's better than having a made at any-
22 time during the day.

23 I don't think there was any suggestion that the off-
24 shift people might not be as knowledgeable as the dayshift
25 people. Although, I would suspect that there are a limited

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T 9/2 1 number of instrument technicians available.

2 DR. KERR: It seems to me it's okay to have a man
3 there as long as you don't permit him to do anything.

4 DR. SIESS: Yeah. Well, that's one solution.

5 DR. KERR: Then he can't cause any trouble.

6 MR. TEDESCO: No. I -- I don't understand. This
7 is a qualified man who really knows his plant and he's doing
8 routine calibrations and servicing. And we would -- you know,
9 if you had to use that by your Crystal River where you have
10 a failure by one of the circuit currents --

11 DR. KERR: Now, Bob, you -- you're requiring that
12 he there 24 hours a day in order to get the maintenance done
13 because he can get the maintenance done on one shift pre-
14 sumably. The reason you want him there is if something goes
15 wrong, you'd like for him to be available; isn't that the
16 idea?

17 MR. TEDESCO: That's his main objection. I don't
18 want him to go to sleep if there's nothing to do.

19 DR. KERR: Yeah, but you --

20 MR. TEDESCO: And if --

21 DR. KERR: -- if you had a choice between having him
22 do nothing and having him do the wrong thing, you might --

23 MR. TEDESCO: Well --

24 DR. KERR: -- think twice. And I think that --

25 MR. TEDESCO: Yes.

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CHAIRMAN PLESSET: Any other questions for Bob?

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I think we are going to have a presentation by

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Frank at this time; is that correct, Frank?

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MR. ROWSOME: I'm prepared to, yes.

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CHAIRMAN PLESSET: And you have a handout from --

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from him.

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MR. ROWSOME: My name is Frank Rowsome of the

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probabilistic analysis staff.

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When the task force was originally formed PAS was

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asked to provide a member for the task force, and we did that.

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Mark Cunningham participated in the original task force.

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About three weeks ago in the preliminary results,

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the 22 recommendations were presented to Harold Denton. He

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asked that PAS take another look at these recommendations.

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That he wanted a measure of the risk reduction effectiveness

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of the recommendations. He made it clear that he would

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prefer a quantitative measure. We made it clear that that

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was beyond the reach of what we could in the amount of time

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available. But that we would try to be as constructive as

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we could and bring in the prospective that we could provide

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based on our experience as risk assessment engineers, but that

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we would not have time to do a research project. And that

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we did not have the quantitative foundation and knowledge

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of the accident sequences and their probabilities in B&W

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plants with which we could do a quantitative evaluation of

1 the effect of these recommendations.

2 In essence, what was done -- well, myself,
3 Matt Taylor, and Mark Cunningham participated in this
4 evaluation. It was done electing to fill in three tables
5 using engineering judgment by consensus in the course of
6 hammering out a consensus we discussed the assumptions that
7 we were making and the judgments that we were making. And
8 these discussions became the material for the text and for
9 the footnotes to the -- to the tables.

10 We've prepared a background on the risk picture at
11 B&W plants, which I'll discuss in some length. And the
12 three tables dealt with the influence of B&W plants'
13 characteristics on the likelihood of severe accidents,
14 accidents and incidents.

15 The effect of each of the 22 recommendations on the
16 frequency of the number of incidents catalogued by the
17 initiating event, and the effect of the recommendations in
18 our judgment on the likelihood of incidents catalogued by
19 the severity of the outcome.

20 The risk picture, I think, is a useful contribution
21 to thinking about safety and light water reactors, particularly
22 PWR's and dry containments.

23 We have noticed in the risk assessment at Surry
24 in WASH-1400 and in the several other applications of
25 accident consequence analysis applied to dry containment

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1 PWR's that release category one, two, and three in the
2 reactor safety study notation are the only accident
3 scenarios which produce lethal doses of radiation to the
4 public outside defense.

5 Lesser core melts and accidents that do not go to
6 core melt do not produce lethal doses in the analyses using
7 the analytic tools prepared for the reactor safety study
8 and such attempts at realistic severe accident consequence
9 analysis.

10 Also, the break over point between release category
11 three and four also marks the point where you cease to get
12 severe land contamination by the atmospheric pathway. You
13 do not contaminate large amounts of land in accidents that
14 do not reach release category three severity.

15 Therefore, in -- as measured by the severity of
16 the outcome of an accident, PWR release category one, two,
17 and three is qualitatively in a different class than the other
18 core damage or release accidents which in turn are qualita-
19 tively in a different class than the accidents that do no
20 entail core damage or any abnormal containment leakage.

21 These same bins for incidents -- severe accident,
22 accidents and incidents, correspond with a natural distinction
23 in terms of the processes that go on in the plant itself.
24 So, that it is a natural classification to make the distinction
25 between severe accidents, accidents and incidents in terms of

1 the phenomena in the reactor as well as in consequences.

2 The release category one, two, and three, the
3 severe accidents, the ones that with -- with potentially
4 lethal doses are characterized by severe releases from the
5 fuel, that is severe core damage or melt, and the early
6 gross containment failure. You do not get to those release
7 categories if either of those two facets are missing.

8 The accidents are characterized by core damage
9 without early containment failure or incidents like design
10 basis LOCA with gross containment leakage.

11 And the -- and include incidents like the accident
12 at Three Mile Island, and the incidents do not entail severe
13 core damage.

14 Now --

15 DR. MOELLER: Excuse me. Under the first Item
16 Number 1 on severe accidents, what does the last bullet mean
17 once again? You had potentially lethal doses, potentially
18 severe land contamination. What is it that dominates the
19 health and safety measures?

20 MR. ROWSOME: In WASH-1400 and in the sensitivity
21 studies we've done and in the several other applications of
22 these tools for things like alternate sequences for TMI
23 and in the methodology application studies, which are not
24 yet published, we have found that even if the probability of
25 core damage accidents, or core melt accidents, in the higher --

1 numerically higher release categories are substantially
2 greater, nonetheless, the -- the expectation value of
3 casualties or cancers, or land contamination caused property
4 damage is nonetheless dominated by -- and this first order
5 given by the pro -- or proportional to the probability of
6 the events in release categories one through three.

7 Although accidents that come out in release categories
8 four, five, and six, and seven, and eight and nine can
9 produce some land contamination and can produce ground
10 water contamination, and can produce cancers the -- the
11 expected number is so much lower with those scenarios that
12 you are -- the public health consequence measures are
13 insensitive to that probability unless it turns out to be
14 very much higher than the probability of the release
15 category one, two, and three events.

16 DR. MOELLER: Thank you.

17 MR. ROWSOME: Now, it's worth taking a closer look
18 at what kinds of scenarios give rise to these severe acci-
19 dents. They are functionally defined in terms of what
20 happens in the plant by core melt and early gross containment
21 failure. You can get that through missiles that breach the
22 containment, breach the reactor coolant system, and fail
23 the emergency core cooling function.

24 For example, external missiles like a heavy aircraft
25 or internal missiles like a reactor vessel lid that blows off.

1 You can get it through a structural collapse of
2 the containment building leading to failure of the reactor
3 coolant system.

4 You could get it through a loss of coolant accident
5 which by-passes the containment and blows down outside and
6 which cannot be isolated. In other words, event V from the
7 reactor safety study.

8 One can get it through a simultaneous failure of
9 core cooling systems containment sprays and fan coolers,
10 in which case the containment will burst on over pressure
11 or through hydrogen burning or one of those other mechanisms
12 that will give rise to fairly early containment rupture.

13 And a borderline case is the failure of core
14 cooling systems with open containment atmospheric vents
15 with operable sprays and fan coolers. And in some variance
16 you get enough dose reduction factor from the sprays and
17 fan coolers so these don't really consistently emerge in
18 release categories one through three, although, they may
19 sometimes do so.

20 As an initial hypothesis you will notice that all
21 of these, with the possible exception of four and five, deal
22 with balance of plant features. They deal with the design
23 of -- of the containment, external hazards, the reactor
24 vessel, of course, the susceptibility to these interfacing
25 systems LOCA's depends upon the design and surveillance of

1 the pressure boundry valves on the larger lines which
2 connect the reactor coolant systems, low pressure systems
3 outside of containment.

4 So, they are not dependent really upon the char-
5 aacteristics -- the distinguishing characteristics of the
6 nuclear steam supply system per se.

7 So, one would tend to suspect the susceptability of
8 a plant would not be influenced particularly by whether you
9 had once-through steam generators or recirculating steam
10 generators, or a bigger -- small pressurizer or features
11 of that kind.

12 We looked more closely at the common mode failure
13 of core cooling and the containment systems. There you are
14 dealing with a rather large number of front-line systems.
15 Front line in the sense of the systems which cool the core
16 or transmit heat from the core or from the containment to the
17 outside world. To -- to have one of these Type 4 events, you
18 will have to fail in a typical plant, say, two trains of
19 containment sprays, two trains of fan coolers, two or three
20 trains of safety injection systems, and have a LOCA or a
21 fail of all the feedwater trains.

22 Depending on how you count these you find something
23 of the order of 8 to 12 different trains of systems are
24 failing in that kind of accident.

25 Now, it's fairly obvious that the purely coincidental

1 failure of all of these systems is going to be of absurdly
2 low probability and is not going to be a dominant influence
3 on the risk. So, that what governs the likelihood of this
4 kind of accident are the common cause failure mechanisms such
5 as fires, or floods, or earthquakes, or the failure of the
6 common support systems that underlie the many active
7 engineered safety features that participate -- whose failure
8 is postulated in this kind of accident scenario. For example,
9 loss of all AC power or DC power, or auxiliary cooling water
10 systems, or something of that kind could on the basis of
11 one, or two, or three root cause fault events produce the
12 functional failure in the dozen or so front-line trains whose
13 failure is necessary to give you an accident of this kind.

14 Those two are features of the balance of plant
15 and are not -- do not corrolate very well with the peculiarities
16 of the B&W system that launched this task force.

17 To test the hypothesis that B&W plants were no more
18 nor susceptible to severe accidents than other light water
19 reactors, other PWR's with dry containments, we went through
20 a list of B&W plant characteristics or concerns that had
21 arisen in the context of the sensitivity issue or the systems
22 interaction issue surrounding the integrated control system
23 and the non-nuclear instrument buses and fought our way
24 through each of these characteristics to see whether we really
25 could really believe that the severe accidents were not --

9/11 1 the susceptibility to the severe accidents were not affected
2 by the plant characteristic.

3 Here the baseline in this table is the risk
4 picture in the reactor safety study for the PWR for Surry.
5 If we -- if we had found B&W plants to be indistinguishable
6 from Surry in all respects you would expect to find
7 negligibles in all of these columns. To the extent that they
8 read something higher than negligible it means a higher
9 susceptibility that appears to be intrinsic to the B&W
10 design.

11 All of these concerns or characteristics have a
12 large influence on incidents. In fact, it is because of
13 their influence on incidents that they arose as concerns
14 in the first place. So, it is true almost by definition
15 that they should get largest in the right-hand column.

16 We fought our way through and came up with the
17 following rationale, which I will summarize for you, and
18 which is summarized in the footnotes in the handout.

19 We believe the influence of the prompt steam
20 generator dryout to be small on core damage incidents and
21 small on severe accidents. The one exception is that we
22 believe the availability of steam for the restart of turbine-
23 driven main feedwater pumps, or turbine-driven auxiliary feed-
24 water pumps may be somewhat less reliable in plants with the
25 once-through steam generator than they would be in plants with

9/12 1 recirculating steam generators, which is responsible for
2 the small enhancement we accorded them in the first line.

3 The frequent undercooling transients we believe
4 are unlikely to participate in or corrolate with the common
5 cause failure mechanisms that lead to the very severe
6 accidents. But they do corrolate well with the core damage
7 incidents.

8 And undercooling transient will in a B&W plant
9 challenge the pressurizer valve, either the safety valves
10 or the pressurizer relief valve. And the susceptibility of
11 the plant to these incidents will increase the frequency
12 with which transient induced LOCA's take place in the plant.
13 And so, the initiating event for core damage is somewhat
14 more probable, and so we give it a large in the accident
15 column. But since it doesn't corrolate with the common mode
16 failure of containment systems, we believe it's small in
17 the severe accident category.

18 CHAIRMAN PLESSET: Did you consider cumulative
19 effects of these characteristics?

20 MR. ROWSOME: I'm not sure I know what you mean by
21 cumulative.

22 CHAIRMAN PLESSET: Well, frequent challanges of
23 the PORV might mean that this thing would tend to leak and
24 malfunction and lead to other problems. That in itself
25 could mean if you --

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DR. KERR: Why does one refer to the operation of a valve as a challenge? I thought that's what the thing was designed to do.

CHAIRMAN PLESSET: Not a challenge. Frequent use -- let me just say frequent use.

MR. ROWSOME: I really doubt that the numbers of challenges approach the point where you have wear-out problems. If anything the experience gives you more opportunity to debug the system. In the long run you may have more confidence in --

CHAIRMAN PLESSET: That's really interesting. At TMI-2 they had this leaking PORV which was their excuse for not paying any attention to that higher temperature --

MR. ROWSOME: Yeah.

CHAIRMAN PLESSET -- in the pipe.

MR. ROWSOME: Yeah.

CHAIRMAN PLESSET: That's the kind of thing I was thinking of and --

DR. KERR: That brings to mind Winston Churchill's "This is the kind of nonsense up with which I shall not put."

CHAIRMAN PLESSET: Well, you -- which nonsense now?

DR. KERR: Using that excuse.

CHAIRMAN PLESSET: Oh.

So, you didn't think that there were any cumulative effects of -- of any of these things? Frequent undercooling

1 or --

2 MR. ROWSOME: Well, frequent undercooling produces --
3 as the text develops several angles relating to the under-
4 cooling incident. The undercooling incident will produce
5 a swell -- since you lose the heat sink in the steam generator
6 for awhile you get a swell in the primary coolant system.
7 The level goes up in the pressurizer you can go water solid
8 in the pressurizer and in severe cases you will lift valves.

9 We believe that this will increase the frequency
10 with which you start down the path to potential core damage.

11 There is a possible, positive correlation with the
12 delay in the auxiliary feedwater system that gets you in the
13 situation in the first place and the possible failure of the
14 high pressure safety injection system.

15 I mean you've already postulated that one -- one
16 safety system, quote, unquote, it's not always safety grade,
17 but one backup system has not started promptly. So, you
18 would expect a positive association with another system not
19 starting very reliably, in this case the high pressure
20 safety injection.

21 You will start down a potential path to core damage,
22 and the vast majority of these, I think, you will head it
23 off before you get to core damage. Nevertheless -- what
24 does that mean now?

25 CHAIRMAN PLESSET: Does that mean you're about out

1 of time?

2 MR. ROWSOME: No, it isn't my beeper. I thought it
3 might be.

4 We do find in our studies of accident sequences,
5 and the ones that are in draft, and the ones that we have --
6 we have completed, the transient induced LOCA is a signifi-
7 cant -- statistically significant contributor, one of the
8 more prominent routes to core damage. And you start down
9 that path more often in this kind of plant.

10 CHAIRMAN PLESSET: Yes, Dave?

11 DR. OKRENT: One thing that makes me just a little
12 bit sceptical about the conclusion in the upper left-hand
13 corner, small for short-term -- short time to steam generator
14 dry out, is the following. In LMFBR's I think the designers
15 of the pool system in which there is a large inventory in
16 the primary system which gives you considerable heat sink; I
17 find that, certainly comforting, I think they find that it
18 does give them advantages in a range of transients. I think
19 the situation has to be similar in the PWR if you have the
20 additional water in the steam generator.

21 And I'm just a bit nervous that the conclusion you're
22 drawing is from a broad perspective, and yet too limited a
23 perspective. If you see what I mean.

24 MR. ROWSOME: Um-hum.

25 DR. OKRENT: That there are other aspects that have

1 not been factored in.

2 In the same way the -- the loss of pressurizer
3 level is shown to be negligible. But there are other things
4 that may go along with that same event. I don't know.
5 Maybe you more frequently uncover the heaters and so forth
6 and get yourself into another situation where you wish to
7 have those heaters and so forth. And so -- well, I think
8 this has been really a very interesting study. I can
9 think of questions of this sort that I must say leave me
10 a little bit --

11 MR. ROWSOME: I'm sure you can, and I'm sure we
12 could too. What we did -- what you are seeing here is the
13 product of three people sitting down over the course of
14 two weeks and putting their thoughts on paper with the
15 knowledge that we had a limited perspective, a limited
16 background. We couldn't follow up all the leads. But that
17 we did think that we could contribute another perspective that
18 might be a valuable contribution to this effort. I would
19 not entertain for a moment the claim that this is complete
20 or necessarily accurate in all its details. It's just an
21 impression that we bring to bear on these recommendations.
22 I want to make that very clear that there may very well be
23 serious lacunae in what we are -- in the evaluation we are
24 making here. That's certainly true.

25 The rationale behind that first finding was that the

17 1 time to dry steam generator is -- while it is a -- an
2 interruption in normal core heat dissipation is not a point
3 of no return for core cooling. And we make the point in
4 the text that the provision of high head safety injection
5 pumps in all of the B&W plants except Davis-Besse provide
6 greater confidence than you have with some other PRW designs
7 that there is no artificial point of no return from recover-
8 ing from an interval in which there was no primary or
9 secondary makeup.

10 That all the way up to the onset of core damage you
11 can turn it around if you can turn on HPI in these plants.
12 And that the window in time up to a point of no return for
13 core damage or core melt, may be as long -- or perhaps
14 longer in these plants than it is in some other PWR designs.
15 That was the -- the basis for that first finding.

16 And to take it any further than just that observa-
17 tion clearly reads more into it than it's worth.

18 The heightened trip frequency, we looked at two leads
19 where we thought the heightened trip frequency might in fact
20 lead to higher risks. One is station blackout. We examined
21 the data base in the reactor safety study and concluded that
22 the record seems -- seems to show that most interruptions in
23 offsite power originate not from -- they're not just
24 precipitated by turbine trip, but cause turbine trip. They
25 originate outside the plant, or in the switchyard, or somewhere

2 0
18 1 else.

2 And so that a -- so that in a statistical sense
3 you are insulated from the turbine trip as an initiator
4 because it is down in the background in the noise. And that a
5 slight increase in the frequency of turbine generator trips
6 will have a somewhat damped effect on the overall frequency
7 of loss of offsite power.

8 We also followed up one other lead, and that was
9 that the -- Mark, can you remind what the other one was
10 that we --

11 VICE CHAIRMAN MARK: Atlas.

12 MR. ROWSOME: Atlas. All right.
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1 MR. ROWSOME: --association between ATWAS, the
2 kinds of faults in a plant that would give rise to an
3 ATWAS event, and the kinds of failures in the contain-
4 ment systems, which would lead to a severe release, in
5 release category 1, 2, or 3.

6 So, we attributed that to a small increment in
7 the frequency of core damage incidents, but to a negli-
8 gible increase in the frequency of severe accidents.

9 We looked at the nonnuclear instrument faults
10 and the faults originating in the integrated control sys-
11 tem that have been cropping up at the rate of, altogether
12 about .8 per year, all of them summed together in B&W
13 plants and concluded that these were certainly a signi-
14 ficant contributor to incidents in B&W plants that --
15 particularly in association with loss of all feed water,
16 they were a problem from the point of view of core damage,
17 as I pointed out in the memorandum I wrote on the Rancho
18 Seco light bulb incident.

19 But again, those nonnuclear instruments do not
20 seem to couple directly with the failure of containment
21 systems, except through the blinding of the operators.

22 And, we entertain the hypothesis that the
23 massive failure of the nonnuclear instruments that we
24 saw in Rancho Seco and in the Crystal River incident would
25 make it more likely that operators would make the kind
of mistakes that could get you into a release category

1 1, 2, or 3 event, concluded that it was quite unlikely
2 that it would do so.

3 To get such a result, the operators would
4 have to remain confused and misguided, not only through
5 core damage and through core melt, but through contain-
6 ment failure, as well, that they would have to not
7 only turn off containment sprays, which we think is quite
8 probable, if they misunderstand the incident with which
9 they're dealing, but would also have to turn off contain-
10 ment coolers, which we thought highly unlikely.

11 DR. OKRENT: Are you saying that the contain-
12 ment is invulnerable to hydrogen in going from a medium
13 to a negligible?

14 MR. ROWSOME: We think it pretty unlikely
15 that hydrogen burning is going to burst the containmen-
16 with sprays and fan coolers running. That was the re-
17 sult of WASH 1400 and has been the result of the other
18 surveys we've made of large volume dry containments,
19 PWR systems.

20 We certainly cannot exclude on bounding calcu-
21 lation grounds that it might not be failed, but we think
22 it unlikely.

23 Another reason to think this correlation would
24 be weak is that the historical incidents of NNI faults
25 have been fixed before a point of no return and for

1 containment failure, if not for core damage or core
2 melt, in each of the historical incidents.

3 In the post TMI environment with which we are
4 dealing and which was a base line for this evaluation,
5 we think it extremely unlikely that operators will go
6 around turning off engineered safety features and twittling
7 their thumbs for over an hour or two hours or three hours
8 that it would take to get one of these -- while their
9 instruments are patently screwed-up. I think they would
10 recognize such bus faults, and although they might not
11 be able to repair them promptly, I think it quite unlikely
12 in the post TMI environment that they would stumble into
13 a release category 1, 2, or 3 event because they were
14 blinded by NNI faults and the corresponding instrument
15 faults.

16 DR. OKRENT: Let's see -- Is it a factor of
17 10 from negligible to small and 10 from small to large
18 or is it a factor of 2? -- small to medium and medium
19 to large, and roughly, just --

20 MR. ROWSOME: Well, it doesn't really relate
21 to consequences directly at all, it relates to the likeli-
22 hood that the effect would have urged --

23 DR. OKRENT: But you're talking of frequency?

24 MR. ROWSOME: Yeah.

25 DR. OKRENT: In other words, if I see negligi-
ble, small, medium, and large, are these a factor of

1 10 in part of frequency? Roughly, I mean?

2 MR. ROWSOME: Really the way I think about it
3 is not -- Well, okay. Yes, okay, I see what you're
4 saying. Something in that area, yeah, roughly in that.

5 But the way I read it is something different,
6 because we are as ignorant of the background of compet-
7 ing risks as we are of the independent variable we're
8 trying to assess in each of these cases and so those
9 high, medium, and lows really reflect our estimate of
10 the likelihood that in effect emerges from the background,
11 from the noise as it were and not to measure by how
12 much it does so.

13 Since these risks exist over several decades
14 on logrhythmic paper, if you deposit background risk
15 from all accident scenarios or all effects except one,
16 and you let that one be the independent variable, there
17 is a large regime in which it's magnitude is essentially
18 irrelevant to the risk because it's so far below the
19 background.

20 And there's a small regime in which it's a
21 competitor with the other prominent contributors to
22 the risk. And there's a regime in which it is the domi-
23 nant contributor to the risk.

24 And, really, what we're doing here is assess-
25 ing the likelihood, in our judgment, that the effective
interest would emerge as a dominant contributor and it

1 really effects the comment on the state of our understand-
2 ing, rather than on the magnitude of the risk.

3 DR. KERR: You're assessing the likelihood
4 that it's likely to be a problem?

5 MR. ROWSOME: That it's likely to rival the
6 dominant contributors.

7 If we hypothesize that all the scenarios but
8 the one we happen to be looking at say, NNI, ICS buses,
9 producing severe accidents, produce severe accidents.
10 at 10 to the minus 5 per year and the NNI, ICS faults
11 produce 10 to the minus 6 or less per year, it doesn't
12 really effect the overall risk.

13 If it's 10 to the minus 5 by itself, it's
14 50 percent of the risk. If it's 10 to the minus 4,
15 it is the risk. So, it's a kind of all or nothing switch
16 that you go past on a logrhythmic scale when it emerges
17 from the background.

18 It's either down in the noise and really doesn't
19 effect suicidal risk at all, or it's up in prominent and
20 is governing the suicidal risk. There is a narrow
21 transition zone in between.

22 And what we're doing here is assessing -- con-
23 sidering the uncertainties, not only in the effect we're
24 looking at, but in our knowledge of the background and
25 competing risks, our judgment of the likelihood that this
effect might emerge from the nose.

1 DR. OKRENT: Did you want to tell the committee
2 what your background estimate was that you used in
3 comparison?

4 MR. ROWSOME: We didn't discuss it. I couldn't
5 give you a consensus number or a PAS number or a RES
6 number.

7 Let's procede. Overcooling incidents -- The
8 one area where we think the overcooling incidents are
9 troublesome are with respect to their effect on operator
10 behavior.

11 An overcooling incident, of course, looks to
12 the reactor coolant system parameters, like a small LOCA
13 produces a fall in the pressure in the fallen pressurizer
14 level and then it's more severe variance will cause ESSC
15 actuation.

16 If these occur frequently, there will be a strong
17 temptation to the operators to try to delay the start
18 the delay the start of the auxilliary feed water system,
19 or to promptly shut off ESSC to avoid lifting a pressurizer
20 valve in these scenarios.

21 They will learn to assume that the systems --
22 will be conditioned that the systems of a small LOCA
23 are just one of these nuisance of a cooling incident.

24 CHAIRMAN PLESSET: You said it would look to
25 an amateur like a small LOCA --

1 CHAIRMAN PLESSET: Oh, operator. Oh, I'm
2 sorry. I was going to ask what it would look like to
3 a professional. I'm sorry.

4 MR. ROWSOME: And to the extent that they
5 make it more likely that an operator will leave the
6 auxilliary feed water system block valves closed to
7 avoid this situation or to cavalierly turn off high
8 pressure safety injection, it can contribute to the
9 risk.

10 This is very much less probable today than
11 it would have been before the consciousness raising
12 experience of the accident of Three Mile Island.

13 And, nevertheless -- And, it can be tackled
14 by other approaches and changing the frequency of over-
15 cooling transients, one can deal with it through opera-
16 tor training and in fact we are dealing with it through
17 operator training.

18 So, we assess it only to have a medium likeli-
19 hood of being an important effect.

20 That kind of route to core damage through small
21 LOCA's is one of the two most probable avenues we think,
22 that and loss of all feed water.

23 So, that it is influential in one of the more
24 important classes of accident scenario.

25 It's been discussed here in the ACRS and elsewhere

1 that one might observe a fault in a B&W plant in which
2 the main feed water system failed to trip, when the
3 reactors tripped and that it would run the steam genera-
4 tor water solid, very promptly, pump water into the
5 main feed water line, and that might cause a main steam-
6 line break, and that that itself might be a dangerous
7 scenario.

8 We thought about that for a while and concluded
9 that if it breaks in the containment, we do not believe
10 that poses much of a hazard to continued core cooling.

11 If it breaks in the auxilliary building, it
12 probably wouldn't either, unless it floods out a large
13 set of engineered safety features and defeats both feed
14 water and high safety pressure injection options for
15 cooling the core. That's described a little further in
the text.

16 We don't think it's a problem, but we put a
17 question mark on it because it is not clear that the
18 deterministic phenomenology has been explored very well
19 yet, and when that's done, we could try to assess the
20 likelihood of it, but we don't know the course of such
21 accidents well enough to talk probabilities about it
22 and to talk likelihood, to talk risk.

23 Finally, we think the provision of high
24 pressure injection pumps can be a significant improve-
25 ment in the risk picture, both in terms of the frequency

1 with which one would expect core damage incidents and
2 the frequency with which one would expect severe acci-
3 dent, because we think it gives you as big or bigger
4 window for recovery of core cooling after an interrup-
5 tion than one might have with designs that have lower
6 head, HBI pumps.

7 We think that's quite a significant improve-
8 ment over having low head pumps.

9 DR. OKRENT: Before you take that one off --

10 In a talk at the Oakridge -- I'm sorry, the
11 Knoxville meeting on water reactor safety, Professor
12 Schmidt from the German ACRS gave some specific comments
13 on things that he thought would have avoided TMI and I
14 think they are also things that are in the German PWR's.
15 One of them was automatic initiation of the auxilliary
16 feed water system.

17 I think, if I remember, one was automatic closure
18 of the block valve. One was HPI systems at less than sys-
19 tem design pressure.

20 Now, I'd like to elaborate on this point now.
21 If I understand correctly, what they try to do is accom-
22 plish a very reliable auxilliary feed water system which
23 is also automatic, and may in fact also be bunkered, for
24 all I know. And, in fact, it's programmed under certain
25 circumstances to start cooling down to the secondary
system and therefore to drop the pressure in the primary

1 system so that then the HPI which is set at somewhat
2 below system pressure can come on at the right time.

3 In any event, in what you've written, we see
4 here something endorsing feed and bleed, later on in
5 your written document -- you may not reach it today in
6 your talk -- you question the desirability of the auto-
7 matic block valve actuation.

8 So, we see your group arriving at one set of
9 conclusions, the German group using risk ideas, in fact,
10 though not necessarily exclusively, but this was in-
11 cluded in their thinking, seem to have arrived at an
12 approach which is 180 degrees out of phase.

13 But, this is not on a piecemill basis. They
14 have a combination of systems. And maybe if you took
15 just one of these at a time and left out the other, none
16 of their features would look desirable, but maybe as a
17 group they do.

18 Now, this creates a little bit of a -- an in-
19 teresting matter, interesting, I mean, from the safety
20 point of view. We should really understand, it seems
21 to me, why they think their system is the right one.

22 They continue to think that their system is
23 the right one and somehow it seems to me we ought to
24 develop a rather deep understanding of alternate approaches
25 in this area. It does, I think, -- relate to what you're
saying.

1 You're making comments in terms of an existing
2 design. You're saying, with the current feed water
3 system, feed and bleed capability is an improvement,
4 this way. But, I think that there is a rather important
5 question that warrants attention.

6 MR. ROWSOME: Well, the only competing risk
7 we identified and we did think about it a little bit,
8 associated with having a high head safety injection
9 pump, which is capable of lifting the code safeties,
10 is that in fact you can lift them when you might not
11 otherwise do so and they might stick open as they would
12 not otherwise do.

13 On the other hand, under such circumstances,
14 the reliability of the high head pumps, you'd want to
15 mitigate such a LOCA, is greater than average because
16 they have just passed an availability test. They open
17 the valve in the first place.

18 So, the likelihood of getting such a stuck open
19 valve and the failure of ECCS is a good deal less than
20 there would be with a small LOCA of random origin not
21 associated with the ECCS actuation.

22 DR. OKRENT: I'm not arguing that either posi-
23 tion is right. I'm just saying there seems to be a
24 considerable difference in opinion. It'd be well, it
25 seems to me, for the NRC to try to explore in detail and
to get documented, you know, the studies that seems to

1 support one approach to the other, the pros and cons.
2 It's a real difference in philosophy and it's not based
3 just on judgment, apparently.

4 MR. ROWSOME: Now, to turn to the recommenda-
5 tions of the task force. We want to note that the recom-
6 mendations were mostly tailored to the concerns that
7 in turn were spunned by the frequent and embarrassing
8 incident which are, when removed, coupled to the vulner-
9 ability to core damage, which in turn had one remove,
10 correlate with the vulnerability of major releases,
11 so that the recommendations, while not wholly or
12 thaugonal to vulnerability to major release, do not
13 really focus in on that. That was not the principal
14 objective.

15 There are some, we found, however, that do
16 relate to the reduction and susceptibility of severe
17 accidents. I'll not show table 7-2 unless it comes up
18 in the course of questions, but will jump onto table
19 7-3 which you have before you that talks about the
20 specific recommendations.

21 I doubt if it will be legible on the board,
22 but you have it before you.

23 Of the many aspects of qualifying the emergency
24 or auxilliary feed water systems as engineered safety
25 features, the ones we thought most productive of reduced
risk, that is, reduction in the likelihood of severe

1 accidents, is the diversity of power supplies and some
2 other suggestions we made, such as the provision of
3 a dedicated safe shutdown system of the kind proposed
4 in the Ebersole-Okrent paper of the extension of the
5 single failure criterion to address single manual
6 isolation valves and to errors made in the course of
7 surveillance testing that could leave one train, or
8 more than one train, out of service, faults of that
9 kind.

10 DR. MOELLER: Where is the key to your table?

11 MR. ROWSOME: Again, it's high, medium, and
12 low, as the prior tables were.

13 DR. MOELLER: All right, and what is the --

14 MR. ROWSOME: An epsilon or --

15 DR. MOELLER: Epsilon?

16 MR. ROWSOME: -- is negligible.

17 DR. MOELLER: Okay, thank you.

18 MR. ROWSOME: And the columns at the top are
19 severe accidents, accidents and incidents and --

20 DR. MOELLER: And, like you said, the diversity
21 of power supplied was an important item and yet the
22 one just below it, other, has high, high, and low,
23 which is higher or stronger than G.

24 Am I reading it correctly?

25 MR. ROWSOME: That's right. Well, we recommended
extending diversity, not only as it's now defined in the

1 branch technical position, 10-2, I believe it is, which
2 requires diversity of the balk power supplied for the
3 auxilliary feed water pump, but also the diversity in
4 the valving and support systems like the lube oil cool-
5 ing system, and power supplies for valves which must be
6 operable to start or to control the system and the like,
7 which are not now covered in the Regulations.

8 So, what we were suggesting in our list of
9 additional recommendations was that the diversity
10 requirement be strengthened.

11 DR. OKRENT: I might just note for the record, --
12 At least as of now, I'm not inclined to go along with
13 your 1-D.

14 MR. ROWSOME: No, I wouldn't have expected you.
15 We gave it a low even though those are common-cause
16 failure mechanisms that can give rise to the severe
17 accidents, mostly because we think most of these plants
18 can successfully cool the core in these circumstances,
19 not necessarily with proven systems.

20 They may go to feed and bleed or something of
21 that kind which -- for which the qualification or functional
22 adequacy is then summed out, but we think it would
23 probably work most of the time.

24 DR. SIESS: And this table applies to the B&W
25 reactors only?

MR. ROWSOME: This is the -- Yeah, this is

1 a measure of the efficacy of the recommendations that
2 have been proposed for B&W plants.

3 DR. SIESS: Well, the item you just mentioned,
4 is that anything unique about a B&W plant, as far as
5 the seismic and external events --

6 MR. ROWSOME: No.

7 DR. SIESS: -- of the auxilliary feed water
8 system?

9 MR. ROWSOME: No. The only thing that's unique
10 about it is we might have given a higher value than low
11 on a plant that did not have high head safety injec-
12 tion pumps.

13 DR. SIESS: And there would be some others
14 in there of that type and not unique to B&W?

15 MR. ROWSOME: Yeah. We didn't bother to flagg
16 out Davis-Besse because we understand they have plans
17 to add high head, ACCS.

18 Under the qualification of --

19 DR. OKRENT: Excuse me, -- Are you assuming
20 that the PORV would be working?

21 MR. ROWSOME: No. My understanding is Realistic
22 Analyses suggests that just lifting safety valves with
23 the high head pumps, while it might not meet appendix
24 K and keep the reactor coolant system water solid or
25 anything like that, would avoid severe core damage, even

1 with the PORV closed or blocked.

2 In some of the other PWOR designs with the
3 1600 PSI, high pressure safety injection pumps, they
4 can conceivably squeak by in the same manner if the
5 PORV is wide, full open, or so the realistic calculations
6 seem to suggest

7 DR. SIESS: If you lift a safety and it fails
8 to open, but you have prevented core damage, then
9 that would fall into the incident category?

10 MR. ROWSOME: Yes.

11 DR. SIESS: Just like Crystal River?

12 MR. ROWSOME: Yes.

13 DR. SIESS: Except it would be more than 40,000?

14 MR. ROWSOME: That's right.

15 DR. SIESS: -- columns?

16 MR. ROWSOME: That's right.

17 DR. SIESS: But you could continue to cool the
18 core with the safety stuck open?

19 MR. ROWSOME: I should think so.

20 DR. MOELLER: Excuse me. To follow up and be
21 sure I understand the table, -- I find I apparently
22 don't.

23 But, Dr. Okrent said that under item D that
24 he would not agree with the table, if I interpreted
25 what he said.

1 Now, the table tells me that your assessment
2 has shown that the task force recommendations will have
3 no benefit in terms of counteracting seismic events.

4 Now, David, are you telling me that you are
5 satis -- or, that you believe the task force recommenda-
6 tions are going to have more benefit than shown?

7 See, -- Because, I read the table, under
8 potential benefit --

9 DR. OKRENT: Well, there's low, negligible,
10 and negligible.

11 DR. MOELLER: Well, that tells me for a severe
12 accident it might potentially in a very small way, re-
13 duce the effects, but for the other two it won't do --
14 won't have any benefit at all.

15 DR. OKRENT: Well, we should have a definition,
16 I guess, and make sure we're all talking about the same
17 thing.

18 It says, auxilliary feed water systems up-
19 grade to an engineering safety feature system. And
20 then it says, seismic and external events qualifications,
21 which I take to mean should you upgrade this system to
22 be qualified for seismic events.

23 If you do, is there a potential benefit to
24 a serious accident, accidents, and -- Was my reading
25 what you meant?

1 MR. ROWSOME: Close, but not quite. What we're
2 saying here is that we think it improbable, but not of
3 negligible probability that the risk is, the likelihood
4 of severe accidents, will be reduced significantly by
5 this this provision.

6 DR. OKRENT: Yeah. All right. I think he and
7 I are talking about the same thing. Now, --

8 DR. MOELLER: Well, say it to me the way you
9 interpret it to be sure I'm --

10 DR. OKRENT: What I'm saying is that I think
11 it unlikely that this will make much of a difference, --
12 And, Dave was thinking that --

13 I can tell you why, I think you lose your main
14 feed water system and you lose offsite power and your
15 scrammed and you're in a shutdown, heat removal situation,
16 and I don't really have all that confidence in any single
17 system in a major earthquake for a range of reasons.

18 I'd like to have two systems, in fact, and I'd
19 be happy if we had both the feed water system and the
20 feed and bleed, either of which would work, not to depend
21 on a single one.

22 The way the plants are designed, there's lots
23 of things that have to work to get one of these systems
24 going. There's alot of instrumentation --

25 DR. SIESS: Did you say you're off, Frank,

1 more than an order of magnitude?

2 DR. OKRENT: Yeah -- Oh, yeah, he's on low.

3 DR. SIESS: You'd be on high?

4 DR. OKRENT: Jesse -- Is that the point Jesse
5 was raising in a related way.

6 MR. EBERSOLE: A certain amount of this, I
7 guess Frank, has to do with your judgment of what con-
8 stitutes upgrading and how much the system would be
9 improved thereby.

10 MR. ROWSOME: Yes. One of the reasons, Dave,
11 and I disagree on this -- I suspect -- I agree with
12 what Dave just said, incidentally, and if I had thought
13 a seismic qualification made a step change probability
14 1 to probability 0 difference in the likelihood the
15 system would fail in an earthquake, I might agree with
16 you.

17 But there's also the very real possibility
18 that nonseismic equipment will survive, and that seismic
19 qualified equipment will fail. So, there is not a
20 sudden set change in the probability of failure of the
21 system, given an earthquake, merely because you've gone
22 through the exercise of --
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1 MR. ROWSOME: -- of the systems is not so large
2 that it would -- as a statically significant.

3 MR. BENDER: Well, given the premise, and I think
4 I'm inclined to go along with your viewpoint on it. We
5 don't really know what the seismic qualification would
6 consist of. If your definition were wrong, if there were
7 something meaningful that really should be done, what would
8 that do to your chart?

9 MR. ROWSOME: Well, if we could wave a magic wand
10 and make these things absolutely immune seismically induced
11 failure, then I would give it an N maybe. Possibly even an
12 H but I think an N.

13 MR. BENDER: Thank you. I -- it just helps to
14 understand what you're doing.

15 MR. ROWSOME: To proceed to the qualification and
16 provision of safety grade -- and control system. We clearly
17 think it's important to -- of the emergency feed water
18 system that does not share a common cause failure with the
19 failure of the main feed water system.

20 We really want to get rid of the design that now
21 prevails in a couple of these plants in which the intergrated
22 control system and trip off main feed water and also disable
23 the auto-start of the feed water systems.

24 That is important for core damage and therefore
25 important for accidents hence the high rating there. That
kind of an initiating event is not correlated with the kinds
of massive common cause failures that afflict the containment

1 systems as well. So, it's less directly coupled with the
2 severe accidents hence the end.

3 The specific provision of a design in the auto
4 start system to avoid steam generators, the amber reflects
5 our feeling that it is useful to avoid the under tooling
6 incidents and to put in some diverse or redundant actuation
7 project to assure that we do get a reliable auto start and a
8 loss of feed water, loss of the main feed water. But that
9 dry steam generators per se is not a point of no return for
10 power cooling and that that criterion is not essential to
11 the value of this idea.

12 We think though that a diverse auto start will
13 have a fairly significant affect on the likelihood of core
14 damage. A negligible affect on the likelihood of severe
15 accidents.

16 There're competing risk associated as we've
17 already mentioned with throttling the auxiliary feed water
18 system to avoid over cooling or over filling the steam
19 generators.

20 What we're suggesting here is not so much that this
21 ought not to be done but that in the course of conducting
22 the design and the evaluation of such systems that care
23 should be taken to evaluate the competing risks and the
24 failure modes you're introducing into the system when you
25 do put in certain provisions in the design.

We like the idea of a diversily powered auxiliary
feed water pump for --. The modifications to the main steam

1 and feed water line break and -- and mitigation systems to
2 avoid or very much reduce the likelihood that this system
3 will put off all feed water, main and auxiliary feed water,
4 we think is quite important.

5 We've had a couple of instances -- historically
6 instances already in which these systems have shut off all
7 feed water and we regarded as a very undesirable idea to
8 have a protective action that isolates you from your heat
sink which in effect these do.

9 If you have to do it at all, do it -- do it only
10 when you absolutely have to and do it with great care. Careful
11 analysis of the --. We think on balance, the idea of tripping
12 off auxiliary feed water as well as main feed water to the
13 steam generator is unwise. You are throwing away your heat
sink.

14 Improvements to the integrated control systems in
15 the non-nuclear instruments. The low ratings we gave most
16 of these are not a reflection of the desire -- reflection of
17 our judgement of the desirability to improve the reliability
18 or to alter the failure mode to the integrated control system
19 in the non-nuclear instrument process. But rather an
20 expression of pessimism that there is much room for improvement
in the system as it is now designed.

21 The recommendations do not say scrape the integrated
22 control system and start from scratch. It said take this
23 design and tweak it a little bit. Alter it a little bit here,
24 alter it a little there. See if you can channelize it
25

11/4

1 See if you can alter the failure modes of the instruments
2 on -- and the like. And we're pessimistic about how much
3 can be done to the system as it's currently designed to
4 address these points.

5 We like in particular the recommendations -- some
6 the recommendations in the IEEE Bullentin 79-27 which in
7 affect ask the owners to identify the symptoms and the
8 affects of power interruptions on all their instrument
9 buses both safety grade and non-safety grade. There to
10 understand the signature of losing one and what it means to
11 the systems. Learn how to fix it. The affect on operator
12 training of knowing this information and training operators
13 on this -- in this information. I think would have benefits
14 extending beyond mere bus failures.

15 It will teach them about the systems interaction
16 potential, how things are integrated among one another. And
17 I think that will be a very valuable contribution.

18 Installing a safety grade panel of vital instruments.
19 Clearly a motherhood recommendation which we endorse. It
20 may very well have a significant affect on the frequency of
21 core damage accidents.

22 It's hard for us to see the presence of such a
23 panel of instruments making the difference between a severe
24 release accident and no severe release accidents. So we
25 only give it a -- there.

Let me see if I can find some other high ones.
Operating training on the Crystal River incident and the

1 development of the plants specific procedures through the loss
2 of the buses. We don't see a bases for now on that operator
3 training to the Crystal River incident. I think I prefer the
4 broader suggestion of the IEEE Bulletin when I look at the
5 whole class of such bus.

6 The others are given fairly small ratings. I'll
7 not discuss them unless you want the --.

8 And the recommendations we come up with are not
9 in the report. They extend somewhat beyond the scope of
10 our charter in preparing Chapter 7.

11 We draw an inference from that over view of the
12 risk picture that we think it would be preferable to focus
13 more attention in the agency on the kind of common cause
14 failure mechanisms that affect the susceptibility of a plant
15 to severe accidents even though we come out with a fairly
16 clean bill of health for B&W in the sense that we find it
17 no more -- perhaps less susceptible to severe accidents than
18 other PWR design.

19 Nevertheless we think that this perportion of the
20 tension is being paid to rather minor incidents and we would
21 be well advised to focus in on the severe accidents.

22 The way we are doing this are of course through
23 the integrated or the interim reliability evaluation program.
24 And we are suggesting as a focus for the priority in
25 implementing the recommendations and I'm pleased to see
a correlates pretty well with the task forces recommendations
on their priority of their own recommendation.

11/6

1 I would recommend that NRR and I&E provide a -- a
2 little more attention to the severe accidents in their other
3 activities than reflected by -- the present priority.

4 We think in the recommendation to set performance
5 criteria for transients and the like, it would be very
6 desirable in systems like auxiliary feed water, instrument
7 power supplies, and the like to set reliability criteria as
8 well as performance criteria in the sense of pressures and
temperatures and -- and the like.

9 These criteria need not be probabilistic, they
10 could deal with diversity redundancy and susceptibility to
11 common cause failure. We think that would be a very valuable
improvement.

12 Many of the recommendations have the character of
13 suggestions of where to look for improvements rather than
14 prescriptions that say do this and all will be well. I
15 think in many cases it is unclear now, how much room for
16 improvement there is. Whether it's feasible or not in fact
17 to do many of the changes that have been suggested for the
non-nuclear instruments and the integrated control system.

18 So, we suggest that the implementation be developed
19 in close coordination with the owners and Babcock and
20 Wilcox to explore the feasibility and probably efficacy of
21 these recommendations. And to consider the possibility that
22 we may want to alter -- in light of what proves to be
practical and feasible.

23 And finally we think that a real improvement in
24
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1 likelihood that these plants would sacome to either core
2 damage accidents or to severe release accidents could be
3 achieved by adding on a dedicated independent train of
4 emergency feed water and high pressure safety injection.
5 Which is free of dependencies of the support systems upon
6 which most of the engineered safety features depend. AC
7 DC power which is in the cooling water systems and the
8 like. Along the lines of the Ebersole - Okrent proposal.

8 Mr. BENDER: In looking at your lists up there,
9 A through D. I sort of ask myself if I were to take D
10 seriously, would it influence what I would do with your list.
11 Should I reassess everything else in the Y if I decide to
12 consider the add on dedicated safe shut on system?

12 MR. ROWSOME: Well, 2 or 3 policy decisions have to
13 be made before you come to that. The addition of such a
14 system would not affect the frequency of the nuisance
15 events.

15 What they would do is affect the frequency with
16 which these events would go on to something serious. If
17 that is perceived to be important to this agency, I perceive
18 that it is important that improvements be made at the severe
19 end of the consequent specter.

20 I think this is the way -- one of the ways to do
21 it with the most confidence that there are not subtle common
22 cause failures lying in wait that will obviate the benefits
23 of the alteration.

23 That would take the pressure off of alot of
24
25

1 concerns we have. Concerns with things like station black
2 outs and earthquakes and a large number of generic safety
3 could be addressed --

4 MR. BENDER: Alot depends on the properties you
5 give to the same systems but --

6 MR. ROWSOME: Yeah. But as you'll note, I pointed
7 out that this need , if the need is in fact real, is not
8 in any sense unique to B&W plant and really in a sense
9 orthogonal to the subject of this NUREG and this task force.

10 MR. BENDER: Well, if the policy permitted it, and
11 I don't know -- I'm sure right now the policy does not permit
12 it. But if the policy permitted it, would you people be
13 inclined to something that said well, let's make it an
14 either or proposition. You can do everything that's proposed
15 in this short term list or maybe it's the long term list
16 depending upon your definition or you can find a way to have
17 a safe shut down system and get rid of alot of these things
18 that we don't -- aren't bene -- only beneficial because you
19 don't have one. Would you be inclined to want to offer that
20 option?

21 MR. ROWSOME: I would probably want to add to the
22 enticement of this option above and beyond the enticements
23 you've already suggested.

24 MR. BENDER: You mean you think there's more to
25 be gained than just that?

MR. ROWSOME: Yeah. Many of these recommendations
not all, but many of them are addressed at the frequency of

11/9

1 incident. So that's really a whole different concern.

2 I would suggest offering a trade off of some of
3 the -- maybe some of the other TMI lessons learned that are
4 proving to be particularly costly as an alternative. This
5 is an alternative to some --.

6 MR. BENDER: And how would you go about defining the
7 adequacy of the reliability of the safe shut down? Dedicated
8 one.

9 MR. ROWSOME: Well, there's the regulatory issue
10 of how do you prescribe exceptability and then there's the
11 reliability issue and that's where our reliability, at least
12 in the probabilistic sense, and regulatory exceptability have
13 largely been in the orthogonal concepts.

14 MR. BENDER: They shouldn't be orthogonal, but
15 they may be.

16 MR. ROWSOME: My feeling is that it would be fairly
17 easy to get a decade. It would be fairly hard to get 2
18 decades of reduction frequency of core damage or high
19 consequence accidents with such a system.

20 I suspect you would be suffering diminishing returns
21 if you tried to strive for more than 2 decades. And that a
22 simple 1 train system that was safety grey but not necessarily
23 redundant, of emergency feed water high pressure injection
24 in support control regulations systems. There probably be
25 what you would want to look for.

MR. BENDER: Well, let me try one more just to see
if I can't at least put a -- provide a benchmark. If I

1 were looking -- were to look at the kind of dedicated systems
2 that exist in several European installations, could I make
3 a judgement from that as to whether that would influence this
4 list? Would it have to be better than those installations to
5 be usable or would that type of thing met your standard?

6 MR. ROWSOME: I'm not aware of a European one that
7 mets the diversity criterion I'd like to bring about. There
8 maybe some but the concept of the 4 50 per cent capacity
9 train systems that I show is common in Germany that have an
10 N-2 criterion. One out for service in a single failure
11 that have alot of redundancy without diversity is not what
12 I'm looking for. I want diversity here. I would like to see
13 an independent water source. Independent motive power supply
14 here that is not similiar in kind and equipment and has not
15 common dependencies on the support systems we have in the rest
16 of the plant.

17 But given that diversity I don't think I need
18 extra redundancy. I think I'd be running into diminishing
19 returns if I asked for it.

20 MR. BENDER: Thank you. That's very enlightening.

21 CHAIRMAN PLESSET: Any other question for Frank?
22 Thank you very much, Frank.

23 MR. CAPRA: My name is Bob Capra, I'm also a member
24 of the task force. I want to clear up a couple of things.
25 We thought this was the Cameratti version that we sent down
to you but there are a couple of minor typographical errors
here in the implementation -- recommended implementation table.

1 On Table 8-1 which is page 8.1-2. Recommendation
2 number 4 should actually be action group B vice A.

3 UNKNOWN VOICE: What table?

4 MR. CAPRA: It's Table 8.1.

5 UNKNOWN VOICE: Okay. Give us the line number
6 again.

7 MR. CAPRA: In recommendation number 4, it should
8 be action group B vice A. And recommendation 15 on that
9 same page, it doesn't have an action group. It should be
B.

10 UNKNOWN VOICE: Boy or dog?

11 MR. CAPRA: Boy.

12 UNKNOWN VOICE: There's a blank down there, put
and X in the B's.

13 CHAIRMAN PLESSET: Anything else on that Bob?
14 Yes, Harold.

15 HAROLD: Well, I think the staff wrote me a letter
16 on this. So we have drafted a letter but it's not on the
17 agenda for discussion. Does the Committee wish to review
a letter tomorrow or today, whatever?

18 VOICE: Well, I like tomorrow better.

19 HAROLD: Well, I mean does it want to review a
20 letter? That's the question.

21 CHAIRMAN PLESSET: I don't see why not. I would
22 expect so. Tomorrow though.

23 VOICE: We've got a letter plus.

24 HAROLD: Yeah, the plus 2.
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VOICE: Yeah, I think we need to discuss it.

CHAIRMAN PLESSET: All right. So that will be tomorrow. Is there feelings we should have a break at this point?

VOICE: A short one.

(Whereupon, the meeting was adjourned at 5:30 p.m., May 2, 1980.)