

eb

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

NRC/Response Center Discussion
Related to
Metropolitan Edison Company,
Three Mile Island Nuclear Station

Saturday, March 31, 1979.

THIS TRANSCRIPT WAS PREPARED FROM A TAPE RECORDING

(Note: This is a transcript of Commission meetings for March 31, 1979. The meeting commenced in the Chairman's Office at 10:27 a.m. on this date. Commissioners present: Chairman Hendrie, Commissioner Gilinsky, Commissioner Kennedy, Commissioner Bradford, Commissioner Ahearne. Also present: Mr. Dorie, Mr. Mazuzan. The transcript begins with a phone conversation between the Chairman and Mr. Gossick and staff. Please note the times and data as reflected in the left-hand margin of other Commission meetings as contained herein.)

eb

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

NRC/Response Center Discussion

Related to

Metropolitan Edison Company,
Three Mile Island Nuclear Station

Saturday, March 31, 1979.

THIS TRANSCRIPT WAS PREPARED FROM A TAPE RECORDING

(Note: This is a transcript of Commission meetings for March 31, 1979. The meeting commenced in the Chairman's Office at 10:27 a.m. on this date. Commissioners present: Chairman Hendrie, Commissioner Gilinsky, Commissioner Kennedy, Commissioner Bradford, Commissioner Ahearne. Also present: Mr. Dorie, Mr. Mazuzan. The transcript begins with a phone conversation between the Chairman and Mr. Gossick and staff. Please note the times and data as reflected in the lefthand margin of other Commission meetings as contained herein.)

BACKGROUND INFORMATION

As the Three Mile Island situation developed beginning on Wednesday, March 28, the Commissioners met to discuss the nature of the event and scheduled a staff briefing held on March 29 at 9:50 a.m. The emergency nature of this situation at Three Mile Island led the Commission to go into "continuous" session for the duration of the event beginning on the morning of March 30. This meant that whenever a quorum was present, it was part of the continuous session. Because of the nature of these sessions, particularly on Friday, March 30, Saturday, March 31, and Sunday, April 1, most of the Commission meetings were held outside the Chairman's Conference Room which is equipped with magnetic tape recorders. Part of Saturday's and Sunday's meetings, for example, were at the Incident Response Center at Bethesda.

The nature of these meetings was informal and often interrupted. Commissioners and staff members came and went as conditions arose. During many of the sessions, multiple conference telephone calls and twoway telephone calls were made and received that were difficult to record and to transcribe.

These continuous meetings were for the most part recorded by several portable tape recorders using mini cassettes and regular cassettes. Nonetheless, in the fast moving events connected with this incident, there may have been times when Commissioners discussed matters which were not recorded.

The transcripts of the tapes of these continuous sessions, particularly where the meetings were held outside the regular meeting room, are a composite of several tapes. For all of the reasons above, these transcripts do not represent formal or official Commission statements on the matters discussed therein, nor have they been reviewed or edited by the Commission.

P R O C E E D I N G S

10:27 a.m. 1

CHAIRMAN HENDRIE: I was looking at the thing
Harold sent down.

2

3

The Bettis calculation, when they go over -- when
they calculate the inventory in the coolant of the isotopes
they sampled for, what are they doing? Multiplying by the
total volume of water in the containment as best it's known,
is your guess, or do you have any feeling at all for it?

4

5

6

7

8

VOICE: Okay.

9

10

COMMISSIONER AHEARNE: Is this calculation --
why is it so (inaudible) What is the reg number?

11

(simultaneous discussion)

12

13

14

15

16

CHAIRMAN HENDRIE: The Bettis sample data, the
handwritten stuff that came down. I'm just curious. The
coolant inventory in curies, are they multiplying the
concentrations by what's thought to be the total water in
the containment?

17

18

19

20

COMMISSIONER AHEARNE: There isn't any -- you
don't have any indications of any exposure to burning inside
the containment? Of course, the pressure is not exactly
constant.

21

22

CHAIRMAN HENDRIE: Just a primary inventory. Does
the sample line come from the primary?

23

Okay, so this is...

24

(simultaneous discussion)

25

CHAIRMAN HENDRIE: Okay.

1 Okay. What that means is that the coolant
2 inventory column in the final fraction, which I assume is
3 fraction of full core initial inventory, it may be low so
4 that it means that we focus interest on the
5 ratio between these numbers rather than on the absolute
6 numbers.

7 (simultaneous discussion)

8 CHAIRMAN HENDRIE: That's the first good news I've
9 had in a long time.

10 MR. AUSTIN: I hope it's not against policy to open
11 it up.

12 CHAIRMAN HENDRIE: Okay.

13 COMMISSIONER KENNEDY: Just so you don't say what
14 it is,

15 CHAIRMAN HENDRIE: Let me go back and harass you
16 or Roger, somebody, about my favorite subject, hydrogen,
17 oxygen, and all those great things.

18 You've been designated a hydrogen-oxygen chemist
19 by Brian who chortled as he turned over the telephone.

20 Rog, what we've, I had an earlier report when I called
21 Darryl earlier this morning in fact when B&W had done a
22 cut at the peak pressure on what as I understood it was,
23 a stoichiometric thousand pound gauge of thousand or so,
24 cubic foot gas volume, and I got a splendid 14,000 psi
25 pressure peak.

1 Westinghouse was working -- was to be working
2 both an independent evolution calculation on radiolytic
3 oxygen, and I wonder if there's any, enough stuff coming in so
4 you can begin to pull together any sort of a picture?

5 Okay. Good. Because, you know, some of the
6 evolution rates from Tedesco's first cuts at it, at least,
7 sounded like it would come up flammable pretty rapidly.

8 And I think, you know, that we want to, A, check
9 that; is this stuff indeed stripping pretty completely
10 into the dome as the decomposition occurs, the radiation,
11 or is a good part of it staying dissolved and circulating
12 around? Unfortunately there isn't much else in the way of
13 a place for it to strip except the damn dome, but...

14 And what does it mean as we go toward the flammable
15 limit? Do I remember correctly that the flammable limit
16 doesn't change usefully as you go up in pressure? Or --
17 anyway, somebody -- okay?

18 Well, let's -- yeah, that's right. You know,
19 I'll bet a cookie that in the containment pressure range,
20 why, never mind the pressure. Never mind whether there's
21 steam present either. The three go on a diagram --

22 Yeah. Does it change, and what does it all mean?
23 I think --

24 Okay. We're all kind of anxious here because of the
25 feeling of -- that if the flammability limit is a point of
major concern, then we may be getting there faster than we

1 like.

2 Yeah. Okay. Thank you.

3 Yeah. Okay. Thank you, Ray.

4 No, it hasn't -- it's not integrated.

5 COMMISSIONER AHEARNE: On this chart they sent out,
6 they plot the inside of the containment at 16.5 percent oxygen
7 and 82 percent nitrogen. It just seems an odd mixture.

Commissioner
Bradford
arrives at
10:35 a.m.

8 COMMISSIONER BRADFORD: [Expletive] I just
9 had to turn that meeting down.

10 I expect I'd get a medal.

11 CHAIRMAN HENDRIE: I think one of us has the
12 responsibility to go on television and go deeply into that
13 1000 manrem situation, you know, just make that all crystal
14 clear.

15 COMMISSIONER BRADFORD. And you think I'm the one to
16 do it.

17 COMMISSIONER AHEARNE: Yes.

18 CHAIRMAN HENDRIE: You have that talent for neat
19 expression that you need.

20 COMMISSIONER BRADFORD: I have the advantage of
21 knowing little enough about it that I probably can say
22 what I do know in a relatively short time. Harold could
23 difficulty was that he took more time than he needed.

24 CHAIRMAN HENDIRE: I got into that situation with
25 Mr. Weaver the other day at that hearing. He said "is

1 there anything you know that you haven't told me", and I
2 was able to say that since I was away yesterday "I told
3 you more than I know".

4 (Laughter)

5 COMMISSIONER AHEARNE: Does that indicate that
6 there was an explosion?

7 CHAIRMAN HENDRIE: Well, the oxygen -- several
8 percent, two or three percent oxygen went someplace. Now
9 in order, you know -- that wouldn't be otherwise with the
10 hydrogen burning. And there is that 28-30 pound pressure
11 spike.

12 COMMISSIONER BRADFORD: How would the oxygen have
13 gotten in the --

14 CHAIRMAN HENDRIE: Well, because of the containment
15 this is the containment building now, which is just a normal
16 atmosphere, a normal 20 percent oxygen and 80 percent nitrogen
17 And there was that pressure spike and the oxygen is a little
18 depleted.

19 I think it's real forethought of Ed to have
20 conducted a detonation test of the containment. Expect to
21 do that again -- went so well the tested procedure --

22 COMMISSIONER AHEARNE: As Ralph Lapp said last night

23 COMMISSIONER KENNEDY: Was he on?

24 COMMISSIONER AHEARNE: Yes, yes. He knew this was
25 going to be really -- really wonderful. The word he used

1 which might not have been the most felicitous, the "autopsy"
2 of the event.

3 (Laughter)

4 COMMISSIONER BRADFORD: It was not one of Ralph's
5 finer moments. Except that the circumstances favor following
6 normal procedure. There have been other occasions --

7 CHAIRMAN HENDRIE: After a (gopher's) prognostication
8 on Wall Street Week we'll probably enter -- what is it? --
9 probably four or five months of over-regulation of the
10 nuclear industry.

11 COMMISSIONER KENNEDY: As contrasted with what

12 CHAIRMAN HENDRIE: I feel an inadequacy in almost
13 any statement I make.

14 (simultaneous discussion)

15 The hydrogen problem is still working, and I want
16 them to get around it. He has reported in and he is talking
17 to his troops now and will as arranged [get] back to us range
18 sometime after 11:00. He'll call us. We'll try to patch
19 him simultaneously on the response center so they can
20 listen and tape him out there. I don't know how that will
21 work - probably boost the signals. Then he's going to
22 talk to the President.

23 COMMISSIONER BRADFORD: Is that going to be the
24 same sort of thing he did last night, where he could take
25 questions?

1 CHAIRMAN HENDRIE: I don't know, but at least
2 they've said "we'll try to keep you up to date", and this
3 one is in Middletown, you know, right up there at the site.

4 There is a Congressman flapping up and down.
5 They're anxious to have it in Middletown. It's inevitable.

6 The Governor of New Jersey wants into this
7 afternoon. [Expletivw]

8 COMMISSIONER BRADFORD: Is our situation in
9 relation to the press such that basically we've decided
10 that the statement should come from Harold Monday or --

11 CHAIRMAN HENDRIE: At the moment, unless we want
12 to change things, we haven't stopped (recording interference)-
13 cutting off the press release or the ACRS.

14 They have got a rapid-fax hookup now down at the
15 site so that PNs and such things can, texts can go back and
16 forth for confirmation of the details.

17 There's a steady -- what the response center is
18 doing is producing, you know, a sort of - here we are or
19 so while you get a PN presumably -- I want to make sure--

20 Bill, would you make sure that Congressional is
21 getting these waves of PN in the hands of, you know,
22 everybody.

23 MR. DORIE: I'm sure they are, but I'll doublecheck
24 it.

25 Frank Ingram called me this morning. He's very

1 anxious to get you out there if you want to go about 12:30
2 to talk to the press people, whether or not you really have
3 anything additional to say. But he was thinking for the
4 weekend, you know, papers and so forth.

5 If you're amenable, I'm sure it could be arranged
6 down here, if you wish.

7 (Inaudible.)
8 They say that just your appearing would have a
9 calming effect. It might be better --

10 (simultaneous discussion)

11 (Laughter)

12 If you just show up so they know who you are.

13 CHAIRMAN HENDRIE: It generally leads to dismay.
14 I don't know why that group would find it different.

15 (simultaneous discussion)

16 COMMISSIONER KENNEDY: It wouldn't be a bad idea
17 and if you're going to do it, it would be better to do it
18 here.

19 (Inaudible.)

20 COMMISSIONER BRADFORD: I think certainly at some
21 point you're going to have to do it. It's just a matter of
22 picking the time.

23 The situation looks like a relatively stable one.

24 I guess from your point of view, it would be
25 better to do it at a time when you knew what you thought
26 you could say about to be (inaudible - recording interference)
27 How much time do you have before you can do anything again.
28 And you do not want to get into the box Harold got into last
29 night. On one end you would like to be able to say weeks

1 and on the other hand say you know the answer to that. In
2 the process you really don't know what sells.

~~CHAIRMAN HENDRIE~~: I don't know whether we're going to know the
4 answer to that, alright. I think that has to be how long
5 before we have to do something. That has to be regarded
6 as one of the questions which is pensive to be studied,
7 along with some others.

8 COMMISSIONER BRADFORD: Well, if the answer to
9 that question isn't likely to change soon, then I think
10 probably this morning is as good a time as any to address
11 it, if you expect by mid afternoon to have a better handle
12 on it.

13 COMMISSIONER AHEARNE: Nick said that he mentioned
14 something about a Brookhaven calculation of 200 minutes or
15 between when things start going bad.

16 COMMISSIONER KENNEDY: 200 minutes, three hours
17 and --

18 CHAIRMAN HENDRIE: It sounds like WASH-1400 --
19 WASH-0740.

20 COMMISSIONER AHEARNE: Just a minute.

21 CHAIRMAN HENDRIE: The correct calculation or...

22 COMMISSIONER AHEARNE: He just whispered that one
23 on his way up.

24 CHAIRMAN HENDRIE: Who's that?

25 COMMISSIONER AHEARNE: Vic.

1 CHAIRMAN HENDRIE: Oh.

2 COMMISSIONER AHEARNE: He had been out to Bethesda
3 and he said that the guys out there gave him heck.

4 COMMISSIONER AHEARNE: It's probably best to wait
5 until Vic gets here to straighten this out.

6 CHAIRMAN HENDRIE: If it dates back to WASH-0740 (recording
7 interference). It's not necessarily a very useful number
8 because of their -- you know, when they were making estimates
9 it was on the basis of suppose all this stuff gets out in the
10 atmosphere then what happens. They weren't dealing with the
11 probabilities or with the details of a release in any
12 attempt to calculate what it would be.

13 It would be just simply put everything up there
14 and then what they stripped out was the stuff that just
15 immediately falls down. Their aim would have been to get
16 things out in an early time. They would then have the
17 choice of either starting with the core at equilibrium, the
18 fission product burden at full power, or deciding there
19 ain't no way you're going to avoid having maybe two hours
20 or three or ten or whatever delay and then select some
21 number, and they would tend to select on the shorter side
22 so as not to be prejudicing their estimate.

23 (recording interference)

24 CHAIRMAN HENDRIE: There may have also been some
25 further calculation but there's been some contractors--

1 this containment group up there, the technical support group
2 by the containment branch.

3 On the other thing, I don't know. I think there's
4 some advantage of urging the press people to keep working
5 with Bethesda press men. So maybe I'd better try to go
6 out there. It may run a little later than 12:30, depending
7 on Harold's call in -- its a half-hour ride, or a little
8 longer, probably.

9 COMMISSIONER BRADFORD: What is the status of the
10 Kennedy hearing?

11 CHAIRMAN HENDRIE: I talked to -- well, as I told
12 you, I talked to Cubie last night. They told him that it
13 really bothers him. He said he was going to recommend to
14 the Senator that they postpone. He said the Senator might
15 want to call back. I haven't heard anything.

16 I'm going on the assumption that I'm not going
17 (inaudible). And if I don't hear anything else about it
18 I won't go (inaudible). There's been a terrible misunder-
19 standing and I will write letters of apology. My heart
20 is --

21 COMMISSIONER KENNEDY: It's pure, there's no
22 question.

23 VOICE: We'll each write a letter in your --

24 COMMISSIONER AHEARNE: That's why you give a
25 calming influence.

1 COMMISSIONER KENNEDY: We'll each write a letter
2 on your behalf.

3 CHAIRMAN HENDRIE: It's stupid.

4 COMMISSIONER KENNEDY: Dear Senator Kennedy.

5 CHAIRMAN HENDRIE: With regard to the exercise at
6 Bethesda, do you think we should all go out?

7 COMMISSIONER AHEARNE: Well, if you're going to
8 transfer all the information for them, probably yes. As far
9 as meeting the press, then I think --

10 CHAIRMAN HENDRIE: No, no; it was for the press
11 meeting. The information flow -- we'll get Harold's report
12 here and discuss it.

13 But then I'm wondering whether --

14 COMMISSIONER KENNEDY: I don't think so.

15 CHAIRMAN HENDRIE: Do you want to come out?
16 You're more than welcome to come.

17 COMMISSIONER AHEARNE: I think in this situation
18 getting a clear message is much more important than the
19 number of persons.

20 COMMISSIONER KENNEDY: Also, maybe in a subverse
21 way it would have the opposite effect you're trying to
22 seek, which is to keep them there.

23 If they see the whole crew of Commissioners there,
24 they will look the next time for where are they going to
25 find the whole crew of Commissioners and they are going to
find that that is on H Street.

1 CHAIRMAN HENDRIE: A pride of Commissioners?

2 COMMISSIONER KENNEDY: A pride. I do recall
3 believe --

4 (Laughter)

5 (Simultaneous discussion)

6 CHAIRMAN HENDRIE: A gaggle is good. A gaggle
7 of Commissioners met this morning.

8 MS. SHUTTLEWORTH: Dr. Hendrie, Frank Ingram on 59.

9 CHAIRMAN HENDRIE: All right.

10 10:50 a.m. Hey there.

11 COMMISSIONER AHEARNE: (inaudible) -- he was getting
12 briefed by his troops. Ed Case.

13 CHAIRMAN HENDRIE: Yeah. I'll try to come out.

14 You were talking about 12:30?

15 Oh, that would be handier, because I was going

16 to say it didn't look like the time would make -- I'll

17 come out there and we'll get the report from Harold.

18 All right. Yeah, sure. And -- Frank? Yeah, yeah. I guess

19 so. Yeah, okay. Okay. The time is a little bit flexible

20 because -- I will want to hear back from Harold, okay? And

21 you'll arrange -- get through to Sharon and arrange for

22 Harold to try and call me as soon as he gets off the floor.

23 Okay. Okay. Are we keeping the White House information

24 people informed about these progressions of events?

25 By the way, is Lee at hand there?

(recording interference)

1 COMMISSIONER KENNEDY: Why don't we leave that
2 open and get some recirculation of air?

3 CHAIRMAN HENDRIE: Yes, I think so. And it's
4 open at the other end, good.

5 Why don't we circulate it amongst the -- so that
6 everybody knows? I don't know.

10:54 a.m.

7 Hi, Lee.

8 We're keeping the situation room at the White House
9 updated on the status.

10 Yeah, Okay. One thing I would like to -- that's
11 okay. All right.

12 For what.

13 Somebody threw away a piece of paper out of one of
14 those files. Gone through it and said "what's this doing
15 in here" and threw it away.

10:56 a.m. 16
Bickwit arrives
with McDonald's
bag.

16 Okay, thanks.

17 You come prepared to share Egg McMuffin, I trust.

18 MR. DORIE: It's too late for Egg McMuffin.

19 COMMISSIONER AHEARNE: That's all right, we'll
20 share whatever you have.

21 COMMISSIONER AHEARNE: A Big Mac?

22 CHAIRMAN HENDRIE: He's got a thick chocolate malt
23 and 12 straws.

24 (Laughter)

25 CHAIRMAN HENDRIE: In one enormous schlurp the
whole thing disappears.

1 COMMISSIONER AHEARNE: Joe, what about the
2 possibility of asking, oh, I don't know who would be there --
3 it may take a minute - Ed - to jot down a couple of points
4 to advise other B&W operators of caution on such things as
5 perhaps avoiding tinkering with the caution adjustments
6 to the chief pump and rechecking operator procedures.

7 CHAIRMAN HENDRIE: And if they get a high pressure
8 relief after a feedwater transient --

9 COMMISSIONER AHEARNE: Well --

10 CHAIRMAN HENDRIE: Don't turn off the main pumps
11 yet.

12 COMMISSIONER AHEARNE: You know, just a couple of
13 advisories. They don't really know yet what the problems
14 were, but it might be useful to try to share with the
15 other operators some initial precautions.

16 CHAIRMAN HENDRIE: Yeah.

17 Let's see, I guess the response center, would be
18 the best place to --

19 Peggy, you want to see if you can get out to -
20 I guess Roger would be the best person.

21 MS. SHUTTLEWORTH: Will do.

22 CHAIRMAN HENDRIE: I think he's ranking on the
23 NRR side now.

24 COMMISSIONER KENNEDY: Where's Case?

25 CHAIRMAN HENDRIE: Oh that's right, Case is
probably ranking (inaudible)

1 Peg, Case would do fine, Maybe better.

2 MS. SHUTTLEWORTH: Okay.

3 (Simultaneous group discussion)

4 MS. SHUTTLEWORTH: Mr. Case is on 59.

5 CHAIRMAN HENDRIE: Edson. In the midst of all of
6 the flurry and hoo-rah, is there any staff resource between
7 I&E and NRR left that might contemplate a sort of interim
8 advisory to the other B&W plant operators about watch out
9 for this or that?

10 Yeah. I think, you know, you don't want to pull
11 people off the sort of primary tasks, but I think it would
12 be useful and John thought it would be a good idea, I
13 agree, so why don't you see what you can do about that.

14 And I think the I&E side can contribute.

15 I think whatever --

16 Yeah, and I think, you know, there are -- we have
17 got some residents out at other B&W plants, and it might
18 be useful for I&E to sample there and see what suggestions
19 come through.

20 The one from Davis-Besse. Okay, I had that in
21 mind specifically.

22 Good-0. Thank you.

23 He has the -- that paper.

24 Let's see, why don't you tell Vic about that
25 open thing. Okay. Good.

(Recording difficulties)

10:59 a.m.

11:03 a.m.

1 CHAIRMAN HENDRIE: I'm glad to see we have the
2 sunshine officer here.

3 MR. BICKWIT: It does present an issue.

4 CHAIRMAN HENDRIE: Does it?

5 MR. BICKWIT: Yes. I think you should vote to --

6 CHAIRMAN HENDRIE: Why?

7 MR. BICKWIT: close this continuing series of
8 meetings.

9 COMMISSIONER BRADFORD: What basis?

10 MR. BICKWIT: On the basis of 9b of the Sunshine
11 Act, frustration of purpose. We discussed this last night.

12 COMMISSIONER KENNEDY: I know when we discussed
13 that. --

14 MR. BICKWIT: The issue is if you were to have this
15 meeting open, would you be frustrating some of your purposes,
16 those being to advise the state, advise the public on questions
17 which require your deliberation prior to that advice.

18 As I read the Act, you're entitled to close the
19 meeting under 9b of the Act because it deals with that kind
20 of situation.

21 COMMISSIONER BRADFORD: I'll buy it under these
22 circumstances, I'm not sure that I would if the weight on the
23 other side --

24 COMMISSIONER AHEARNE: Under these circumstances,
25 to be frustrated in what we're trying to do because of the
constraints of --

1 COMMISSIONER BRANDFORD: Mere requirements of law?

2 COMMISSIONER AHEARNE: Well it's not mere
3 requirements of law.

4 MR. BICKWIT: I think it is -- I really believe
5 it is consistent with the requirements.

6 COMMISSIONER AHEARNE: I am sure that Senator
7 Chiles did not intend, in writing the bill, to frustrate --

8 COMMISSIONER BRADFORD: I'm sure Senator Chiles
9 never thought of it, you know, we could do our legislative
10 in ten exercises --

11 MR. BICKWIT: The General Counsel's office would
12 have no problem arguing this in litigation.

13 COMMISSIONER BRADFORD: I don't even think you'll
14 ever have to.

15 MR. BICKWIT: I don't expect to.

16 CHAIRMAN HENDRIE: Okay, well let me just call
17 for a vote to close, then.

18 Chorus of Ayes (Commissioner Gilinsky not present)

19 CHAIRMAN HENDRIE: So ordered.

20 (Simultaneous group discussion)

21 CHAIRMAN HENDRIE: This is a continuing series of
22 meetings.

23 COMMISSIONER KENNEDY: That's interesting because
24 I think one of very first ones we voted as an open short
25 notice meeting, I think the record will show.

1 MR. BICKWIT: That's true.

2 COMMISSIONER BRADFORD: But having closed it,
3 Steve, we are now obligated to keep the -- I mean, Len --

4 MR. BICKWIT: Steve's away.

5 MR. BRADFORD: -- we are now obligated to keep the
6 transcripts.

7 MR. BICKWIT: You are keeping one.

8 SOMEONE FROM SECY: We're recording (inaudible) --

9 COMMISSIONER BRADFORD: Yeah, but I mean some of
10 these sort of wandering discussions that have been going around
11 the building, I --

12 MR. BICKWIT: We've been trying to tape everything,
13 everything, even the wandering --

14 COMMISSIONER BRADFORD: Yeah, but I'll be amazed
15 if you succeed in getting all --

16 MR. BICKWIT: We haven't succeeded in following.
17 We've done our best.

18 COMMISSIONER AHEARNE: We may not have, but I
19 think you do your best, the primary thing is to make sure
20 that a crisis is handled here --

21 CHAIRMAN HENDRIE: Come on over here and I'll --
22 I'll withdraw to the desk, it's a more comfortable
23 chair.

24 (Simultaneous group discussion - Commissioner
25 Gilinsky arrives)

1 COMMISSIONER AHEARNE: Vic, can you tell us, what
2 does this 200 mean in the calculation you're talking about?

3 COMMISSIONER GILINSKY: Well this is some numbers
4 I had run up at Brookhaven.

5 CHAIRMAN HENDRIE: It's current, it isn't just out
6 of the WASH 740?

7 COMMISSIONER GILINSKY: No, this is something
8 that Brookhaven calculated I guess yesterday, today.

9 COMMISSIONER KENNEDY: But what assumptions, what
10 scenario?

11 COMMISSIONER GILINSKY: That from the time you
12 lose coolant, how long would it take for the water to go
13 into steam, for the stuff to slump down and --

14 COMMISSIONER AHEARNE: Lose the coolant pump?

15 COMMISSIONER GILINSKY: That was my impression, yes.

16 CHAIRMAN HENDRIE: Well to go into a --

17 COMMISSIONER GILINSKY: From the time you lose
18 circulation.

19 CHAIRMAN HENDRIE: To go into a --

20 Well, and then what, on through to what?

21 COMMISSIONER GILINSKY: I think on through the
22 vessel.

23 And it was 230, 250, something like that, 211 --
24 I can't remember the numbers.

25 COMMISSIONER AHEARNE: For whom was it meant?

1 COMMISSIONER GILINSKY: I think Roger was the
2 one that was quoting that or Steve.

3 COMMISSIONER AHEARNE: Yeah.

4 CHAIRMAN HENDRIE: My guess is that it would have
5 been requested out of the containment systems group who have
6 that technical assistance group at Brookhaven in particular.

7 COMMISSIONER KENNEDY: I'm not yet clear on what
8 the scenario is that takes 200-plus whatever it is.

9 COMMISSIONER GILINSKY: Well, the best thing to do,
10 of course, is to call them up. But as I understand it,
11 from the time you lose cooling -- sense of circulation --
12 because they were allowing something like 50 minutes for
13 boiling off the water, another 100 minutes for fuel
14 collapsing, I guess the rest of the time is going to the
15 vessel. So that would bring it up to, times to be consistent
16 with other things I've heard earlier, I've read in the past
17 or something.

18 COMMISSIONER BRADFORD: That assumes you starting
19 with fuel that suffered no damage.

20 COMMISSIONER GILINSKY: Well, since these
21 calculations were just done, I presume that it's the
22 best estimate, I don't know whether it is with no damage or --

23 CHAIRMAN HENDRIE: I don't think it makes -- in
24 the kind of calculation they would do that is available on
25 short notice, you simply assume an adiabatic -- once you

1 go through the, getting the water out and getting the heat
2 transfer dropped, why you just go through adiabatic heatup
3 to get to --

4 COMMISSIONER GILINSKY: I think I remember them
5 using the word, "realistic" in connection with that.

6 But, again, I mean, I didn't come here to, sort
7 of, conveying these views and it ought really to come from
8 them.

9 COMMISSIONER BRADFORD: Did the measurements come
10 back from the Bettis analysis on the --

11 CHAIRMAN HENDRIE: Sample?

12 COMMISSIONER BRADFORD: Sample? What did it say
13 about melting?

14 (Simultaneous group discussion)

15 COMMISSIONER BRADFORD: It probably told you something
16 that it didn't clearly tell me. That's okay, if its in
17 the guess.

18 CHAIRMAN HENDRIE: Yeah, I've talked to Brian Grimes
19 about it. It's a sample -- they took a sample from the
20 letdown line so that its out of the primary system.

21 They analyzed for the contents of certain isotopes --
22 fission product isotopes of interest to get the concentration.
23 Then they multiplied by the nominal primary system volume and
24 get an inventory, then, in the primary system water, compare
25 that to the core inventory calculated for the appropriate

1 running time of the machine, 1200 hours up to 330, and then
2 calculate then the fraction of these fission product isotopes
3 apparently in the primary system water compared to the
4 original -- to the total core inventory.

5 Now there are bound to be a lot of fission products
6 that are out in the containment. What that means is that
7 these fractions of the total core inventory of these isotopes
8 are not, in themselves, very significant. We know that the
9 release is larger than that and may be a factor of two or
10 three or who knows.

11 What is of interest, then, is not the absolute
12 number which we recognize as having that kind of uncertainty
13 but, rather, the ratio between the isotopes and what this
14 means with regard to fuel condition.

15 And if the sample is -- you know, if the concentra-
16 tion analysis is correct, the strontium is the interesting one
17 compared to the volatile elements. And the strontium to
18 iodine ratio would be consistent with high fuel temperatures,
19 oxide temperatures, but not with a melting situation. That is
20 if there had been extensive melting --

21 COMMISSIONER GILINSKY: It would be nice to know --
22 I wonder, did you discuss those things with them, because
23 they said one of those lines was wrong on that. I don't
24 know if you got a corrected one or not.

25 CHAIRMAN HENDRIE: Yeah. Yeah, I know which one --

1 There's one that's quite apparently wrong. They quote three
2 cesium isotopes. One of them ending up at 0.24 percent and
3 the other two at 2 percent and 1.7 percent. Now, there's
4 no --

5 COMMISSIONER GILINSKY: It said something about a
6 factor of 10 on one of those.

7 CHAIRMAN HENDRIE: Yeah. There's no way that
8 cesium-134 can come out at a rate 10 times less than the
9 other cesium isotopes, so that's clearly in error.

10 But the interesting -- but cesium is fairly
11 volatile. That is, it moves as the temperature goes up.
12 And what's interesting, then, is that the strontium ratio
13 to the iodines would be consistent with the amount of
14 strontium you would see in the gap of the fuel rods, rather
15 than with a melting situation.

16 So it's -- I regard it as a preliminary set of
17 numbers that suggests that -- you know, certainly fuel
18 temperatures have been high, we know that, but there ought
19 to be more strontium in that water if there has been any
20 substantial amount of pellet melting.

21 COMMISSIONER BRADFORD: Would you also expect
22 to see uranium in itself in water?

23 CHAIRMAN HENDRIE: They didn't analyze for it.
24 They were looking for things which, in particular --

25 (End of tape) (Tape 1-A)

11:14 a.m.

(Continuing discussion) (Beginning Tape 1-B)

CHAIRMAN HENDRIE: Indeed, you have to sort out the log there are more important things that can -- but they have got, sorted out some of these things. I haven't read down it to see what they all mean. I think maybe it's too sketchy as yet to make that a very useful exercise. That's a post-mortem proposition.

They also said they had that gas header hookup back to the --

COMMISSIONER GILINSKY: -- to the containment?

CHAIRMAN HENDRIE: -- to the containment place. They haven't tested it. They propose not to exercise it until they think they're going to have to do --

COMMISSIONER AHEARNE: Another release?

(Recording difficulties)

COMMISSIONER AHEARNE: How are they coming with the lead bricks?

CHAIRMAN HENDRIE: Haven't asked since about 8:30.

I asked them last night if they could check out -- there is a hydrogen recombiner on the containment hooked up, probably one of the flame type.

I'd asked them to -- you know, was it operable, could they please look at that, what was the situation and, if it could be gotten into operation-- at that time they didn't have a containment atmosphere sample, they were

1 going to try to get one -- I suggested if they could get the
2 recombiner in operation to get some gas to flow out of the
3 containment to the recombiner and back, you could tell from
4 the recombiner temperatures whether you were burning any
5 perceptible amount of hydrogen.

6 Since then they have a sample -- they've gotten a
7 sample which shows gas numbers that we have slightly reduced
8 oxygen and about 1.7 percent hydrogen.

9 COMMISSIONER AHEARNE: Is it right that there
10 probably was an explosion or some burning.

11 CHAIRMAN HENDRIE: I think --

12 COMMISSIONER AHEARNE: -- at least consistent.

13 CHAIRMAN HENDRIE: It's -- that is consistent with
14 the pressure spike with the oxygen level and with that kind
15 of residual hydrogen level.

16 MR. AUSTIN: Yesterday it was asked of Roger, if
17 that recombiner was working, how is it that we could have
18 had a hydrogen explosion earlier?

19 CHAIRMAN HENDRIE: Well, because it wasn't working.

20 MR. AUSTIN: It was just not on?

21 CHAIRMAN HENDRIE: You don't run the recombiner, it's valved
22 off. It hasn't been opened up.

23 Furthermore, in a situation in which you have a
24 release to the containment associated with a substantial
25 amount of metal-water reaction, enough to give you

1 appreciable hydrogen fractions in the containment, that
2 evolution occurs fairly briskly and the recombiner flow
3 is small, so that's a slow, slower control situation.

4 You get a batch of hydrogen in the containment and
5 if it takes you up over the flammable limit in the initial
6 evolutionary stage, an hour or two or whatever, you can't
7 catch that with a recombiner, because you don't have a
8 sufficient flow rate to it to hold that down.

9 The estimates of metal-water reaction here are
10 way up, so even if it had been running, why I expect it
11 probably wouldn't have stopped the burst.

12 COMMISSIONER GILINSKY: There was apparently a
13 report that got over across the street that the NRC had
14 recommended evacuation within a 20 mile circle, which I
15 told them didn't sound like anything I'd heard --

16 COMMISSIONER BRADFORD: Well, Joe had said to the
17 Governor --

18 COMMISSIONER AHEARNE: You talked to the
19 Governor --

20 COMMISSIONER BRADFORD: Yeah, Joe had said to the Governor that if
21 you had to evacuate, in order to play with the bubble, you
22 might have to evacuate out to 20 miles. That's the only
23 time I've heard 20 miles mentioned.

24 COMMISSIONER GILINSKY: I see.

25 CHAIRMAN HENDRIE: And over in the situation room

1 report -- you know, the emergency plan people were interested
2 in, you know, notice time, how far out --

3 COMMISSIONER GILINSKY: That's right.

4 CHAIRMAN HENDRIE: -- and details like that.

5 And for want of any sort of better calculation at
6 hand, why my estimate was 20 miles which is not inconsistent
7 with some kind of an average over the, you know, the
8 isopleths

9 COMMISSIONER GILINSKY: What you'd have to do if
10 things went bad.

11 CHAIRMAN HENDRIE: Yeah.

12 That you might want to go out with now --

13 COMMISSIONER KENNEDY: The question was in the
14 worst case?

15 COMMISSIONER GILINSKY: Yeah.

16 Okay. What about --

17 CHAIRMAN HENDRIE: In the worst case, who knows, if
18 you were in inversion conditions and that plume were moving,
19 why you might want to ask people down the track of the damn
20 thing, considerably further out to at least stay indoors
21 and --

22 COMMISSIONER GILINSKY: Yeah.

23 COMMISSIONER KENNEDY: -- and nobody else?

24 COMMISSIONER GILINSKY: Well, it's some kind of
25 average over bad cases --

1 CHAIRMAN HENDRIE: Yeah, I think so.

2 Because, you know, the more favorable the diffusion
3 conditions indicate tht you --

4 COMMISSIONER GILINSKY: Maximum probable or
5 something.

6 CHAIRMAN HENDRIE: Or the probable maximum.

7 COMMISSIONER GILINSKY: Look what about --
8 where do we stand on this question of whether people ought
9 to be advised to move out or not?

10 I guess even though the situation looks better
11 to me today than it did yesterday, I wonder if -- well,
12 oughtn't we think about at least urging people who are
13 real close in, they don't have to be around here now to, if
14 they've got relatives 20 miles away, to go visit them.

15 COMMISSIONER KENNEDY: Given what we know today
16 as contrasted with what we knew yesterday, let's say, in
17 comparison of law, what would be the rationale for it?

18 COMMISSIONER GILINSKY: Well, you see, the way
19 it looks to me is that, in a number of ways the situation
20 looks better. I mean, the temperatures in the reactor in
21 these hot spots seem to be going down and that's better and
22 they seem to be developing all sorts of backups to pumps
23 in other parts of the system and that's better and we've
24 got a lot of talent on the spot that can think things through
25 and they're organized and that's much better.

1 COMMISSIONER KENNEDY: And they're making --
2 taking steps to minimize the effect of any subsequent
3 release which might have to be evacuated.

4 COMMISSIONER GILINSKY: Yeah. Right. So that's
5 another --

6 COMMISSIONER KENNEDY: Is that better?

7 COMMISSIONER GILINSKY: -- that's another point
8 on the plus side.

9 On the minus side is, they still don't have a way
10 of dealing with this major hydrogen problem in the pressure
11 vessel and, even though things are better, you know, there's
12 still a possibility of the system degrading and if it does
13 the time scales over which things might happen seem rather
14 shorter to me than -- if I understand them correctly, than
15 I understood them to be yesterday.

16 COMMISSIONER KENNEDY: That's something we
17 need to --

18 COMMISSIONER GILINSKY: Check, sure.

19 COMMISSIONER KENNEDY: -- we need to check out.

20 COMMISSIONER GILINSKY: Absolutely.

21 CHAIRMAN HENDRIE: Yeah.

22 COMMISSIONER GILINSKY: So I guess in my mind, I gue
23 I view it as whether it's worth buying a certain amount of
24 portection for limited dislocations, limited economic costs
25 and terms and costs of other kinds involved when you start
moving people.

1 And I -- you know, I'm sort of thinking, if I had
2 a friend in Harrisburg, I guess I'd -- I don't think I'd tell
3 him to move, I'd tell him to keep close to his radio,
4 something, if you had somebody really close in, you might
5 tell him, if he didn't have to stick around, why maybe he
6 oughtn't to be there.

7 And there's a factor of 10 in the number of people
8 that would be involved, say, as between five miles and 10
9 miles, I think, roughly speaking.

10 COMMISSIONER KENNEDY: And you're speaking about
11 people where?

12 COMMISSIONER GILINSKY: Well, say, you know, in
13 the first few miles.

14 COMMISSIONER KENNEDY: Which is which, five or 10?

15 COMMISSIONER GILINSKY: Say five.

16 COMMISSIONER KENNEDY: Five

17 COMMISSIONER GILINSKY: Five

18 Yeah.

19 VOICE: So I would say then count what, Middletown?

20 COMMISSIONER GILINSKY: I guess so.

21 MR. KENNEKE: There's a substantial jump in
22 population between five and 10.

23 COMMISSIONER GILINSKY: You go out -- how far is
24 Middleton?

25 MR. KENNEKE: Five miles, it's within five miles.

1 COMMISSIONER KENNEDY: Three miles.

2 (simultaneous discussion)

3 COMMISSIONER GILINSKY: Okay. I haven't thought
4 it through in terms of sitting down and looking at the map.

5 (simultaneous discussion)

6 COMMISSIONER GILINSKY: These are the people who
7 would have the least time -- You know, if you really got
8 into a situation that was bad, people further out would have
9 more time, you also would have a more specific evacuation, in
10 other words, you wouldn't be doing it in a circle. And
11 I guess I just don't think the situation calls for going
12 beyond that.

13 On the other hand, it seems to me, it might be
14 prudent to move them. And, I don't know, I'm also thinking
15 in my mind, if the guy's got cows he's got to feed, I guess
16 I'd probably tell him to stay there and feed his cows.
17 But I think I'd go beyond women and -- pregnant women
18 and children.

19 MR. KENNEKE: The farmer doesn't need to think
20 about where he's going to get the feed to give the cows.

21 COMMISSIONER GILINSKY: Yeah. So it's not a
22 simple answer to this and I'm raising it for your
23 consideration, you know.

24 COMMISSIONER AHEARNE: I guess I'd like to hear
25 what they've found out and what leads them to numbers.

1 COMMISSIONER GILINSKY: True.

2 Yeah.

3 COMMISSIONER AHEARNE: And if they've got any
4 new calculations on how much oxygen they think might be
5 generated --

6 The negative that you talked about -- all the
7 positives, all the positives are unrelated in the hydrogen
8 bubble content, the negatives relate to the
9 hydrogen bubble content.

10 COMMISSIONER GILINSKY: Right. Yeah.

11 COMMISSIONER AHEARNE: So that's what you have to focus on - find
12 out what those negatives are.

13 COMMISSIONER GILINSKY: Now one of the problems
14 here is you don't know how long this is for. I mean, you
15 just have to say that, maybe you have to leave it to
16 people's judgement.

17 COMMISSIONER KENNEDY: Yeah, but don't you -- if
18 you're going to take that kind of a step, don't have have to be
19 more direct about it? I mean, you can't sort of -- the
20 agency to whom they would look for for advice, you can't
21 sort of toss it out and say well, you know, golly, maybe --

22 COMMISSIONER GILINSKY: Well, I --

23 COMMISSIONER KENNEDY: You gotta say - say some-
24 thing fairly clear, a fairly clear indication of what you're
25 saying to them. You can't leave it ambiguous.

1 COMMISSIONER GILINSKY: Right. And you would have
2 to say that, on the whole, you think the situation has
3 improved, but if you were going to take this step that it's
4 a matter of prudence and a reasonable step to take, you may
5 even, if things get better, draw back; if they get worse,
6 you'd be in a better position to deal with the rest of
7 the situation.

8 And --

9 CHAIRMAN HENDRIE: Yeah.

10 COMMISSIONER GILINSKY: You'd have to look at
11 the numbers, but --

12 CHAIRMAN HENDRIE: I'm not sure, in terms of dealing
13 with a population like this, how well you can -- how well you
14 can do this sort of an intermediate stage.

15 I think later on, after we get the update and so
16 on, and we've had a chance to talk to Harold --

17 COMMISSIONER GILINSKY: Let me say, by the way,
18 I have sympathy for the guys in Bethesda (inaudible) --

19 CHAIRMAN HENDRIE: -- one would want to talk to --

20 COMMISSIONER GILINSKY: who, yesterday, seemed to be more inclined
21 toward movement of people, today less inclined and seemed
22 not to be thinking about that at all so this doesn't --
23 their views seem to have turned around.

24 CHAIRMAN HENDRIE: Yeah.

25 COMMISSIONER GILINSKY: But somehow in spite of

1 that -- well, it would seem to be a useful precept -- to
2 check on that number about just what sort of times are
3 involved and various kinds of contingencies.

4 CHAIRMAN HENDRIE: Okay. Let's exercise --

5 COMMISSIONER GILINSKY: You know, I might have
6 gotten that one wrong and it would change the picture somewhat

7 CHAIRMAN HENDRIE: Well I don't, it's not -- let
8 me talk first about the time, that's the technical problem --
9 that's not inconsistent with the kinds of times that I have
10 in mind when I say 6 to 12 hours once things begin to go and
11 you figure it's going to go, you know, that there's nothing
12 else you can press or pull in the way of switches and you're
13 going to have to let it run its course and the best thing
14 to do is to just get away, this could take several hours
15 which is consistent with this, four hours, three-four hours,
16 at least, to work its way through the vessel.

17 The vents there, after you --

18 COMMISSIONER KENNEDY: That's after the event is --
19 that's from the beginning of the event.

20 CHAIRMAN HENDRIE: Well that's from the point
21 where you say where Oh Boy, you know, it's gone, we've
22 lost it.

23 COMMISSIONER KENNEDY: Haven't you reached --
24 Aren't you likely to reach that conclusion before the
25 event itself actually begins, after that course of events
that the scenario --

1 COMMISSIONER GILINSKY: Not necessarily.

2 CHAIRMAN HENDRIE:-- the valve --

3 COMMISSIONER KENNEDY: -- the point that your
4 scenario begins --

5 CHAIRMAN HENDRIE: You probably hang in there
6 trying to drive injection water and crank pumps and so on
7 for a while down the line.

8 But let me just sketch loosely down the line:
9 three to four hours for it to work its way -- for a melt,
10 which would be assumed to be a core volume melt on the bottom
11 head of the vessel to -- to work its way out of the vessel.

12 Now the vessel is in a substantial amount of water --
13 That is, the water level is well up in there, so the bottom
14 of the vessel is in contact with the water and this melt,
15 then, has got to go down into that water get on the bottom of
16 the containment.

17 You can't absolutely rule out a steam explosion
18 situation, but a much more likely course is that it settles
19 down on the containment bottom and it's going to take a
20 while to work back.

21 It doesn't necessarily have to spall its way all
22 the way down to that white, thick concrete mat. What
23 happens with a hot melt on concrete is that you get spalling
24 and the concrete elements break up, some of them liquefy,
25 float up as a slag, and you start getting substantial
volumes of CO₂ out of it.

1 And what happens then is you've now got a non-
2 condensable gas evolution at substantial rate into the
3 containment; the containment pressure goes up, you're going
4 to come to a point eventually where you either vent the
5 containment -- you've got your choice, then, you can either
6 vent the containment or you can let it go on up past the
7 design pressure and probably somewhere on beyond a factor of
8 two above design, why you'll blow something out.

9 But that again is at least like a several hour --

10 COMMISSIONER GILINSKY: So you're adding that
11 on to this sequence --

12 CHAIRMAN HENDRIE: Yeah, an with -- obviously with
13 caveat that once the melt is through the bottom of the
14 vessel and beginning to work down, why you know, there's
15 no way you can absolutely eliminate a steam explosion which
16 would be -- which in itself would be enough to give you a
17 containment leak someplace.

18 COMMISSIONER GILINSKY: Suppose we look at the
19 beginning of that sequence, though. Suppose you lose the
20 pumps on your cooling and you're not going to, at that
21 point, call an evacuation. It seems to me you'd be
22 rushing people in to try and fix those pumps and then it
23 would be a certain amount of time before you press
24 the button, and you may lose some time at the front end.

25 CHAIRMAN HENDRIE: Well, I think probably not all
that long because --

1 COMMISSIONER KENNEDY: My question goes to
2 precisely that.

3 If you begin well -- First of all, if your
4 sequence runs to the point where you start, as Joe says,
5 start rushing around trying to turn on other pumps and shift
6 one line to another, at that point, you know you're in a
7 kind of Let's go all out here to see if we can save the
8 ballgame.

9 It seems to me at that point you've reached a
10 point where prudence says you've reached the end game as
11 far as population is concerned. You really ought to get them
12 out because you have a reasonable probability -- not a high
13 probability, at least, but a reasonable probability of
14 failure.

15 COMMISSIONER GILINSKY: Yeah, but --

16 COMMISSIONER KENNEDY: And so you add that to the
17 front end. I wouldn't have thought you'd get as far as the
18 actual total failure of the pumps. I would have added
19 something on the front end.

20 COMMISSIONER GILINSKY: Well, that would be the --
21 Well, I'm not sure.

22 COMMISSIONER AHEARNE: In a nutshell --

23 COMMISSIONER KENNEDY: Two different groups --
24 Well -- two different groups of people.

25 You're right about, you know, you'd be rushing

1 people in to work in the pumps. So if you're talking
2 about, if you're talking about the people in the plant,
3 right, I think that's one set of conditions. I think
4 population evacuation, that is, outside the boundary,
5 is another issue.

6 COMMISSIONER GILINSKY: In a way, you raise an
7 interesting point, is that, you know, does Harold or
8 whoever down there have a set of events which, if they
9 occur, call for evacuation -- in other words, even though
10 you're rushing guys in and trying to restore, you know, the
11 flow or whatever, is that the point at which you go.

12 COMMISSIONER KENNEDY: Yeah, even at evacuation
13 point you're still trying to save the plant, to stop it.

14 COMMISSIONER GILINSKY: And you've decided that
15 beforehand or, at that point, is somebody going to be
16 trying to reach Harold and, you know, people are going
17 to be deciding and they're even calling back here trying
18 to decide what to do.

19 Also what concerns me is then you really are
20 talking about an emergency evacuation, which has all kinds
21 of overtones to it and problems --

22 COMMISSIONER KENNEDY: Yeah, Vic, I don't --
23 I think yesterday's events suggest that there's far less
24 difference in the popular mind between what we would take to
25 be an emergency evacuation and something lesser. The act

1 of suggesting that people ought to go away is seen by most
2 people -- the effect on people hasn't lessened.

3 COMMISSIONER GILINSKY: Yeah.

4 MR. KENNEKE: Do we have any idea how many people
5 actually left the five mile --

6 COMMISSIONER GILINSKY: I saw a number like 25
7 percent of the people in Goldsboro left for somewhere.

8 COMMISSIONER AHEARNE: That's a town of 600.

9 COMMISSIONER KENNEDY: Yeah, but they kept --
10 who knows.

11 -- they kept saying but nobody knows because they
12 were all going off to visit friends or someplace.

13 COMMISSIONER AHEARNE: You've got 29,000 people,
14 roughly, 20,000 within a five mile zone.

15 I heard another report that there were a couple of
16 hundred people in Hershey at the reception center.

17 COMMISSIONER KENNEDY: I got the impression the
18 bulk of those came from Middletown.

19 COMMISSIONER AHEARNE: In this -- in WASH-1400,
20 when they have these accident sequences, there -- one of
21 them for PWRs which is the core meltdown steam explosion
22 occurring. And there they have a one hour warning time
23 for evacuation.

24 How similar to that is what we have here?

25 COMMISSIONER GILINSKY: Why are you looking at me?

1 MR. KENNEKE: Because of the core melt sequence.

2 CHAIRMAN HENDRIE: Say it again.

3 COMMISSIONER AHEARNE: WASH-1400 has -- one of
4 its PWR accident sequences, there's a core meltdown and
5 steam explosion. And there they have a one hour warning
6 time for evacuation, 2.5 hours for the time of release.

7 COMMISSIONER KENNEDY: So that's 3.5 --

8 COMMISSIONER AHEARNE: How soon is --

9 COMMISSIONER KENNEDY: Is that cumulative?

10 COMMISSIONER AHEARNE: I don't know. I haven't
11 got that figure yet.

12 How similar to what we have here is what 1400 has
13 done?

14 COMMISSIONER KENNEDY: If it's cumulative, even at
15 2.5 hours, that's similar to the numbers you were quoting.
16 210 minutes.

17 CHAIRMAN HENDRIE: Yeah, several hours.

18 (Simultaneous discussion)

19 COMMISSIONER KENNEDY: If those are cumulative
20 numbers, they come out to be the same as your numbers then,
21 210 minutes.

22 COMMISSIONER BRADFORD: Is that the one that's they
23 talked about a big pipe break?

24 COMMISSIONER GILINSKY: I hope they didn't just
25 look at it.

1 COMMISSIONER KENNEDY: It's interesting that it
2 comes out this way.

3 They may have had some old computer tapes.

4 CHAIRMAN HENDRIE: The PWR -- we're not in the
5 PWR -- one category is a, would have to be a large break LOCA
6 with injection failure, so that in a relatively short time
7 from full power you've gone over to a dry core. This thing
8 then takes that core adiabatic heat up and puts that melt
9 down into the water in the bottom head and gets you a steam
10 explosion that reaches the vessel and the containment --

11 (Simultaneous discussion)

12 CHAIRMAN HENDRIE: -- were well down so the, you know, the
13 adiabatic heat rates are lower and we're not starting from
14 that situation where full power, void the core region,
15 let it come molten, go as a blob, you know, down into the
16 vessel.

17 The situation here would be a much more fragmented
18 and sort of, you know, sequenced sort of -- this chunk goes
19 and that chunk goes and then another one goes.

20 COMMISSIONER GILINSKY: But you're also starting
21 off with a cooler, a cooler --

22 CHAIRMAN HENDRIE: Yeah, yeah, the after heat
23 raises, it's way down from the full power thing. So -- yeah.

24 COMMISSIONER BRADFORD: Can you say with confidence
25 at this point that you haven't got an explosive oxygen-
hydrogen mixture in the reactor and --

1 CHAIRMAN HENDRIE: In the bubble?

2 COMMISSIONER BRADFORD: Yeah. If the answer to
3 that is no, then can you be sure that if you did have a
4 whump in there, you wouldn't have something close to the
5 situation that I am talking about.

6 CHAIRMAN HENDRIE: This situation.

7 COMMISSIONER BRADFORD: Yeah.

8 MR. KENNEKE: It might lead to the same situation,
9 but you would get presumably a smaller but more immediate
10 release, in which case you're boiling time is much less --
11 about seven seconds -- so that would contribute also --

12 CHAIRMAN HENDRIE: Why do you say a smaller release?

13 MR. KENNEKE: Assuming that the initial burst that
14 came out of it were the accumulated gases -- somehow found
15 their way out of that initial thing.

16 It's a sudden thing, and if there were a release
17 that might also occur suddenly.

18 (Simultaneous discussion)

19 CHAIRMAN HENDRIE: This one's pretty sudden, too.

20 MR. KENNEKE: Well, in terms of warning times to
21 nearby folks -- you tend to minimize that --

22 CHAIRMAN HENDRIE: At this point, we haven't got
23 our hands around the hydrogen -- around the bubble problem
24 from the standpoint of flammability. The results aren't in
25 out there, I called, I don't know, a little while ago and
they were still trying to gather it together.

1 CHAIRMAN HENDRIE: Yeah.

2 COMMISSIONER GILINSKY: And what, tearing the
3 head off and --

4 CHAIRMAN HENDRIE: Breach. Breach.

5 COMMISSIONER GILINSKY: -- breaching the
6 containment somehow?

7 CHAIRMAN HENDRIE: Breach of the vessel.

8 COMMISSIONER KENNEDY: Breach of the vessel and
9 containment.

10 CHAIRMAN HENDRIE: Well --

11 COMMISSIONER GILINSKY: What would that do to the
12 containment if that went flying around?

13 CHAIRMAN HENDRIE: There's a fair amount of
14 shielding on top and you're not going to -- the chances
15 that you make a rocket out of a head is probably not,
16 but --

17 (Simultaneous discussion)

18 CHAIRMAN HENDRIE: Probably not, but you know --

19 COMMISSIONER KENNEDY: Is it more likely to
20 rupture or blow?

21 CHAIRMAN HENDRIE: Rupture.

22 COMMISSIONER KENNEDY: Yeah.

23 CHAIRMAN HENDRIE: Yeah.

24 COMMISSIONER KENNEDY: So that you're not going
25 to have large missiles.

agb29

1
2 CHAIRMAN HENDRIE: Well, that's where I would judge the center
3 of the probability distribution is, but it's clear that,
4 you know, you can't rule out a containment failure.

5 COMMISSIONER GILINSKY: How would -- I mean, suppose it ruptured,
6 suppose you don't worry about the head flying around or
7 whatever and all those -- well, then what then, what are we
8 worried about at that point?

9 CHAIRMAN HENDRIE: What you've got then is, there'll be a
10 substantial shaking up and the bang. This core isn't in any
11 great shape to be rattled at the moment, so the brittle
12 parts of the core, you'll have a lot of debris there. The thing
13 will be water flooded and -- you know, as I was speculating
14 yesterday with regard to debris beds in water, why there's a
15 pretty fair chance you'll stay cooled, but again that's not
16 an absolute by any manner of means.

17 If you don't produce some sort of projectile that
18 would put a hole or cause a penetration failure in the
19 containment, then the concern with regard to the containment
20 comes from two sources: one, whether the debris bed which is
21 the core will equilibrate short of consolidating into a molten
22 mass and, secondly, whether you've still got enough hydrogen
23 left -- which is now loose in the containment which has 16
24 percent oxygen in it, so that you could have a secondary
25 hydrogen explosion and would that be enough to breach the

agb30

1 containment or blow out a penetration or something.

2 Now my understanding is that the amount of hydrogen
3 in the bubble, 1000 to 1500 cubic feet, probably most of it
4 hydrogen, 1000 pounds gauge, there is enough hydrogen mass
5 there so that it will take the -- if that were released into
6 the containment, it would take it well up into the flammable
7 region.

8 If you get a bang, you will probably burn a good
9 chunk of that hydrogen, but not all of it. So there's that,
10 that's the second part of the containment failure possibility.

11 COMMISSIONER BRADFORD: What would initiate the first bump in the
12 reactor, would it take a spark of some sort or just the heat
13 from the --

14 CHAIRMAN HENDRIE: That's one of the things I want an opinion
15 from from the hydrogen flammability crowd. And that's one of
16 the reasons I've got it out working at, in the vendor shops
17 and elsewhere, Bettis and so on.

18 It may be that -- you know, the fact that you've
19 got a flammable mixture doesn't necessarily mean that it's
20 going to go. It's a nice, damp contained volume. And the
21 judgement may be that while you're not happy with having that
22 thing over the flammable limit that it's not that --

23 COMMISSIONER BRADFORD: There's no way to set it off.

24 CHAIRMAN HENDRIE: -- not that much of concern.

25 But that's one of the things I'd like to know before

1 we --

2 COMMISSIONER BRADFORD: But we are in a situation
3 now that -- there is a sequence of events that we can't rule
4 out that would give you well under six hours.

5 CHAIRMAN HENDRIE: Six to 12 hours.

6 COMMISSIONER BRADFORD: Yeah.

7 CHAIRMAN HENDRIE: Yeah, I think that's a fair
8 statement.

9 COMMISSIONER BRADFORD: I think that that really
10 ought to be told to the Governor in clear terms tht it has
11 been -- I mean, he knows about the concern --

12 CHAIRMAN HENDRIE: Yeah.

13 COMMISSIONER BRADFORD: But I don't think he knows
14 that there's some low percentage possibility that we could
15 run out in that shape.

16 CHAIRMAN HENDRIE: Well I think I ought to talk
17 to the Governor to get some of this report. Harold's
18 overdue in to us, I presume he's finishing up his
19 discussions with his own staff.

20 Why don't I call now and see what's going on.

21 (Simultaneous discussion)

22 CHAIRMAN HENDRIE: Hi there. This is Chairman
23 Hendrie of the NRC, can you connect me down to the Three
24 Mile Island communications center, please?

11:52 a.m.

25 Okay.

1 CHAIRMAN HENDRIE: Harold? Chairman.

2 We're waiting for you to check in and report.

3 How are you doing?

4 Well hang on because I want to put you on the
5 squawk box. Are you ready to go ahead or are you still in
6 talking to the troops?

7 COMMISSIONER BRADFORD: You'll have to have him
8 call on the phone.

9 COMMISSIONER KENNEDY: You'll have to call him
10 on the other green phone.

11 CHAIRMAN HENDRIE: Okay now what I would like to
12 do is to try to get -- do you want to go ahead now or do you
13 want to take a few more minutes for the -- Okay.

14 What I want to try to do is to a) get you on the
15 squawk box here and b) -- Yeah, it may require some repatching
16 here -- the other thing we were hoping to do is to get a
17 patch out to the response center so that you were to them at
18 the same time.

19 Just hang with me a second, can you?

20 Who understands the electronics?

21 COMMISSIONER KENNEDY: They told us yesterday
22 it is not hooked up to the squawk box.

23 COMMISSIONER BRADFORD: It is now hooked up?

24 MR. DORIE: No, it is not.

25 No, you can't get him through the speaker

1 phone here. You can have a conference call with the response
2 center and him at the same time, but that has to be done
3 on the black phone so best he call back on the other number
4 or else we'll call him.

5 COMMISSIONER BRADFORD: If we just call him on the
6 other number --

7 MR. DORIE: Yeah, there's no way he can brief them
8 at the same time --

9 CHAIRMAN HENDRIE: Harold, is there any way to get --

10 COMMISSIONER KENNEDY: There's another way to do it.

11 CHAIRMAN HENDRIE: -- Is there any way to get to you

12 COMMISSIONER KENNEDY: Just dial -- what is it?

13 395-4000?

14 COMMISSIONER BRADFORD: Yeah.

15 COMMISSIONER KENNEDY: What's the number?

16 CHAIRMAN HENDRIE: Just don't match the colors
17 on my desk, Harold, I don't know how we're in touch.

18 MR. DORIE: It's 395-2000.

19 COMMISSIONER KENNEDY: That's right.

20 If you just call -- Joe, if you just call 395-2000.

21 CHAIRMAN HENDRIE: Hang on a second. Dick under-
22 stands this stuff better than I.

23 COMMISSIONER KENNEDY: If you just use the other
24 phone, call the White House on the other phone, 395-2000,
25 ask them to do the same thing using the other phone and

1 it'll come in on that phone you won't use the black phone
2 number.

3 That's all you have to do.

4 And then you'll be on this thing.

5 CHAIRMAN HENDRIE: Okay.

6 MR. DORIE: Let me try on this phone.

7 CHAIRMAN HENDRIE: Do you understand that sequence?

8 MR. DORIE: I understand what the procedures are --

9 CHAIRMAN HENDRIE: See if they can -- see if the
10 White House can patch the response center and this telephone.

11 It's going to take a minute or two to try to crank
12 this thing around --

13 (End of tape) (Tape 1-B)

11:55 a.m.

14

15

16

17

18

19

20

21

22

23

24

25

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

NRC/Response Center Discussion
Related to
Metropolitan Edison Company,
Three Mile Island Nuclear Station

Saturday, March 31, 1979.

THIS TRANSCRIPT WAS PREPARED FROM A TAPE RECORDING.

(Note: Continuation of Commission Meetings for
this date, Chairman's Office at 12:00 noon.)

eb

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

Tape No. 2-A

12:00 noon 1

MR. DORIE: Get Mr. Gossick on please
MR. DORIE: Thank you (confused - noises)

MR. DORIE: Are there, Harold?

MR. DENTON: Yes, I'm here.

MR. DORIE: Okay. Fine. Thank you.

Please just stand by.

Lee, the Chairman is out of the office at the moment
but the other Commissioners are here and we got you patched through
with Harold on the other end and all the Commissioners here.
So I trust Hal can brief everybody all at once.

Someone may have a question or so. The Chairman
will be back in in just a minute.

MR. DENTON: Alright.

MR. DORIE: Hang on, please.

COMMISSIONER GILINSKY: Harold.

MR. DENTON: Yes?

Talk to us. I can hardly hear you. Am I coming
through?

COMMISSIONER GILINSKY: Yes, you are. You're coming
through very well. Joe isn't here yet but you might tell us
how things look to you.

MR. DENTON: I'll give you a general rundown. It's
awfully noisy and hard to hear the other way, coming back.
It's kind of a one-way conversation because you're barely
perceptible.

If we could get the switchboard to try another
reconnect?

1 COMMISSIONER GILINSKY: Let's take a look at that.
2 Apparently he can't hear us very well.

3 COMMISSIONER BRADFORD: Can you hear us if we speak
4 closer to the box, Harold?

5 MR. DENTON: That's much better.

6 VOICE: Okay.

7 MR. DENTON: We have a noisy environment here anyway.
8 Do you want to try to plug in again?

9 COMMISSIONER GILINSKY: Go ahead, Harold. Joe just
10 walked in.

11 MR. DENTON: Let me just give you a general state of
12 summary. You may have heard that already, and then maybe get
13 into some of the details.

14 But I guess I think we're making some progress. The
15 big picture is the heat from the reactor is still being re-
16 moved by the circulating pumps and the heat exchangers. The
17 pressure is up to 1,000 pounds.

18 The letdown flow of primary coolant has been re-
19 duced to a few GPM. The release of gases from that source
20 is down somewhat. No liquid waste is being discharged
21 from the primary system and no reactor building waste is
22 being pumped out.

23 They are bringing in a lot of tankage -- capacity
24 in the way of trucks, bringing them onsite.

25 They've got this line or this juryrig hooked up

1 to permit cutback of the waste gas storage tanks and the let-
2 down system into the containment. We're holding on that until
3 we have a better handle on the hydrogen situation within the
4 containment.

5 The first sample that was taken shows 1.7 percent
6 hydrogen. The hydrogen recombiner, and there are redundant
7 hydrogen recombiners at this plant, one of them is operational
8 now. The other one is not yet operational. The Licensee
9 doesn't want to begin operation until both are running.

10 I have asked someone to calculate how effective
11 they'll be in bringing the concentration down. I think one of
12 our first decisions we'll have to make today if they both
13 appear to be working and functioning, and after we take another
14 grab sample of the containment to be sure it's really going
15 down, is to permit pumping back these waste gas storage
16 tanks and the letdown gas into the containment.

17 It's a continuing problem because this waste gas
18 storage tank is sitting there at about 80 psi and even right
19 now it's occasionally burping occasional releases out. It's
20 intermittent -- Excuse me, Dick was shaking his head. I have
21 new information.

22 (Pause.)

23 Well, there is another, apparently, a source of
24 activity going out of the plant in addition to that from
25 degasification or letdown flow that bears --

eb4 1 VOICE: (Inaudible) -- contradiction.

2 VOICE: Well, the dose rates are going up a bit in the
3 plume at this time, Frank. Does that make sense?

4 Hang on while I clarify what is happening. Just a
5 second.

6 (Pause.)

7 Well, mainly there isn't any release from that tank.
8 What we have are four measurements in a straight line that
9 start at 10:30 and the last one, say, 11:45. They show at
10 the closest location like 12 millirem an hour and they drop
11 down to .067 and .75 at various locations? But maybe that was--
12 maybe not entirely accurate.

13 If the hydrogen-- If the recombiners are working,
14 if we can verify the hydrogen concentrations are dropping, and
15 if we can get a sample of this offgas tank which holds the
16 80,000 standard feet, or so I understand, and be sure it's not all
17 hydrogen and can start venting the hydrogen -- that system back
18 in there and the letdown system, I think we'll go a long way
19 toward controlling the continuing release that's occurring.

20 What's occurring right at this moment appears to be
21 a little murky and I'll have to retract that the valve
22 released slightly.

23 Going to the status of the core, there's been little
24 change in the bubble. I think it's going in the positive
25 direction. The idea of using the one-inch line on the

1 pressurizer to blow down a little bit and sort of degasify the
2 coolant appears to be a feasible but very slow process. And
3 once again, from what I understand, the containment atmosphere
4 before going very far in that --

5 The loose parts monitor that's in operation says
6 the core is not very noisy apparently by comparison to other
7 cores so we're not-- much out of it except the
8 noise that's being generated doesn't alarm the specialists in
9 that area.

10 Core temperatures look slightly better than yesterday
11 The flow patterns are still holding up and of course (recording
12 difficulties) -- cool.

13 pump vibration is going up a bit. It's
14 up to about 20 mills now and it's supposed to be (inaudible) --
15 at about 60 mills. That's something we're following.

16 COMMISSIONER GILINSKY: Repeat that

17 VOICE: If it happened what --

18 Mr. DENTON: Let me go through my notes here and see
19 if there are any other highlights I want to hit.

20 The control room dose levels are now down enough so
21 respiratory equipment is not required. This makes things a
22 lot better.

23 I guess I've developed a management concern about
24 the capability of the utility here to cope with new problems
25 that come up. They're stretched very thin in some areas. I've
discussed it with the local management and with the management

eb6

of GPU I think they need stem to stern reinforcements
down here in many areas.

Everyone here is putting out 150 percent but
basically it's modifying operations work here.

For example, the health physics teams on both Units
1 and 2 are contaminated. We can't use them. (Inaudible) --
in the first place, health physics technicians -- go in and
(inaudible) -- taking samples. No effort was being made
toward restoring the plant.

Bill Creegar tells me if he were running it he'd
need 50 more technicians to get the thing back in shape.

Defining the same absence of formal -- planning
applied to core recovery, B&W is -- operating mainly
in a monitoring -- situation, they're not being asked yet to
look into what is the thermocouple mean what are all the
(inaudible) -- fuel failures.

What I'd really like to do is to get them turned
on in terms of analyses that we require for an FSAR and do
them for the core in its present situation. And I did talk
to the company president this morning. He said-- I tried
to heighten his sensitivity. That is, if I were he, that if
forward looking, planning, developing procedures to cope
with eventualities rather than waiting for something to fail
and then trying to work your way out of it.

I would sure like to see them muster their resources
against (inaudible) -- and tackle these problems clearly.

eb7

1 That's kind of where I am today.

2 COMMISSIONER BRADFORD: Harold, does it require their invitation to
3 muster the resources of the industry, or is that something we
4 can do?

5 MR. DENTON: You'll have to get a little closer.

6 COMMISSIONER BRADFORD: I'm sorry.

7 Does it require the company's invitation to muster
8 the resources of the industry, or is that something we can do?

9 MR. DENTON: I can move to a quieter environment I'm
10 told on this phone. If you'll let me come out here a moment
11 and move to the other area?

12 COMMISSIONER AHEARNE: Joe, how serious -- (mumble)

13 MR. DENTON: Well, I think it really would take their initiative.
14 I think we could always muster it ourselves. But, for example,
15 I know from some of the discussions with B&W that they sure
16 have the capability to do exactly what we want here and down
17 there, and they just have not been turned on full bore
18 to do what we're trying to do.

19 I think each one of these technical areas ought to
20 be explored now because the basis for not ordering the evacuatio
21 in the interim is that we can cope with whatever eventualities w
22 come up, and the plant operators have ideas in their heads
23 which might be very good and might be exactly the thing to do,
24 but still these considerations need to be thought out and
25 evaluated in advance so that if there are events that happen,

1 in the future, they've got the best procedures that they can
2 develop in the time.

3 I'm kind of waiting for them to respond. The area,
4 the forward-looking area is half the problem.

5 The other half is just this problem of -- that
6 they've run out of HP technicians and other technicians
7 maintaining things. And I think they have just underestimate
8 the size of the problem they're trying to cope with.

9 CHAIRMAN HENDRIE: Hal, I'll try to get through to
10 the company officers soon after this conversation.

11 MR. DENTON: I think a call from you would probably
12 be in order.

13 CHAIRMAN HENDRIE: Yeah. I think we ought to boost
14 that effort up considerably. I thought I'd made the point with
15 Creitz yesterday but it can stand reinforcing, clearly.

16 MR. DENTON: (Inaudible). If you ask them what
17 happens if, you know, the attitude is well, maybe that won't
18 happen and if it does, we'll cope with it then.

19 CHAIRMAN HENDRIE: Yeah.

20 MR. DENTON: It's just too low a level of attention.

21 CHAIRMAN HENDRIE: Yeah.

22 Harold, have you got any sort of an idea at this
23 point what sort of a trigger situation might be where you
24 would want to see evacuation started?

25 MR. DENTON: I guess the only one that -- There are

eb9 1 perhaps two that you can visualize. One is if they do lose the
2 method of cooling they've got and if for some reason were not
3 able to stay on the steam generator and if for some reason
4 if they didn't actuate (inaudible) -- pumps immediately
5 effective and they had to go down to the low pressure injection
6 system, maybe by the time you degrade that far, you might want
7 to reconsider evacuation, even though you're safely injecting
8 and so forth.

9 If you go to the recirc mode you might have a poten-
10 tial for leakage out. I guess that's one eventuality that
11 if we end up losing this present system and there's a signi-
12 ficant degradation of the systems that should be functioning
13 we might want to reconsider.

14 The other one is once we figure out a plan to try
15 to make the switch over to RHR in an orderly fashion, depending
16 on the circumstances of the bubble at that time, it might be
17 well to plan it at 10:00 a.m. with the Governor put on standby
18 and everybody all alerted so that if anything happened during
19 that time, everybody would be coordinated and know what to do.

20 I guess in either of them would I consider it
21 necessary to evacuate just in anticipation of a problem.

22 CHAIRMAN HENDRIE: I had the impression in talking to Vic last
23 night that in your discussions with the Governor there was a
24 pretty fair discussion of the various scenarios and so on, and
25 that he's aware that the situation could change here and give

eb10

1 rise to a need for evacuation.

2 It seemed to me that at least in some of his com-
3 ments last night about reassessing that situation, you know,
4 on a daily basis and so on that he was reflecting that.

5 Is that your impression?

6 MR. DENTON: We walked him through the scenarios all the
7 way from a complete failure of all the core cooling systems
8 and what kind of time swings might be available, up to the
9 likelihood of the systems working.

10 I think the one he's reconsidering is if we get
11 control of these routine emissions that are occurring now, he
12 would want to cancel his recommendation for pregnant women and
13 small children to stay out of the area. That one was more
14 connected with this continual offgassing.

15 COMMISSIONER GILINSKY: What sort of times did you lay out?

16 MR. DENTON: Excuse me?

17 COMMISSIONER GILINSKY: What sort of times did you associate with
18 systems degrading?

19 MR. DENTON: Not very specific. This was something we
20 asked Matt Taylor to get on and told him we'd get back to him.

21 With the core being somewhat cooler and decay heat
22 being where it is, it's not as critical a case as for an
23 instantaneous pipe break. And we tried to tell him the time
24 series as short as 30 minutes (inaudible) -- out to several
25 hours.

1 Our own speculation was if everything failed here
2 it was likely we'd have several hours before the thing would
3 fail, but we promised to confirm that with better calculations
4 And I understand Research is doing that for us.

5 COMMISSIONER AHEARNE: Dick, ask him about the hydro
6 explosion.

7 CHAIRMAN HENDRIE: Harold, --

8 MR. DENTON: Yes, sir?

9 CHAIRMAN HENDRIE: -- I talked to Matt last night and
10 also a limited amount to Vic about a concern that I've had that
11 we're evolving oxygen from radiolytic decomposition up into the
12 bubble, and that at some of the rates that have been quoted,
13 why we're either at or getting close to flammability, or at
14 least if I remember the 4 percent number correctly, and it's
15 also true up at 1,000 pounds.

16 It's another possible scenario --

17 MR. DENTON: That right.

18 CHAIRMAN HENDRIE: -- that could lead -- not necessa
19 ily lead but could lead to, you know, short times to a breach
20 the containment and significant release.

21 We're trying to have Bethesda pull the problem toget

22 MR. DENTON: They've given me a calcualtion estimate

23 CHAIRMAN HENDRIE: It's not in hand at the moment.

24 MR. DENTON: It is still being worked, on the order
25 of 15,000 psi. Does that sound in the ballpark?

1 CHAIRMAN HENDRIE: That sounded like -- yeah -- the
2 number I got back from a B&W calculation overnight of peak
3 pressure.

4 COMMISSIONER GILINSKY: If it all went.

5 CHAIRMAN HENDRIE: If it all went, yeah. Sort of a

6 COMMISSIONER AHEARNE: (Inaudible.)

7 CHAIRMAN HENDRIE: Sort of a -- Well, a stochi -- I
8 think that was it, a stochiometric mix.

9 But it is a considerable concern and I wonder -- Your
10 capabilities for looking at it are limited but I think it's --

11 MR. DENTON: That's clearly one that this extra
12 industry effort could really do some good in.

13 CHAIRMAN HENDRIE: Yeah, and they're working it.
14 We've got people at Westinghouse and at Bettis and so on
15 working on it.

16 In the near term it enters the consideration in the
17 sense how -- what sort of a risk does it present and what does
18 that mean about our judgment on advising the Governor either
19 for some further evacuation, limited evacuation measures or a
20 general recommendation.

21 MR. DENTON: Right.

22 COMMISSIONER GILINSKY: Have you heard of this one?

23 MR. DENTON: Vic and I discussed the need to generate
24 some hard numbers on it and see if it went back but I've gotter
25 really no feedback since that time.

1 CHAIRMAN HENDRIE: Yeah. I take it that this was not
2 one of the scenarios that was discussed with the Governor last
3 night.

4 MR. DENTON: No, it wasn't. We described more the
5 WASH-1400 spectrum --

6 COMMISSIONER AHEARNE: (Inaudible.) You -- We really
7 should.

8 MR. DENTON: -- but we didn't cover this one at all.

9 CHAIRMAN HENDRIE: Yeah. I think at some point here
10 either you or I should call him and make him aware of this one

11 MR. DENTON: At this time we've got very good commun-
12 cations and I call him about every two hours. Why don't
13 I just follow up with it the next time I call him?

14 CHAIRMAN HENDRIE: Alright.

15 MR. DENTON: Let me say I think Lt. Governor Scranton is
16 very interested and we've got very good communications. They
17 have a person aiding us all the time, and we call them
18 periodically and update them.

19 CHAIRMAN HENDRIE: When will you probably be back in
20 touch with that office?

21 MR. DENTON: I think I can do it as soon as the pres-
22 briefing that's been laid on for 12:30 or so is over.

23 CHAIRMAN HENDRIE: Okay.

24 MR. DENTON: What's the Headquarter's view of the
25 potential?

1 CHAIRMAN HENDRIE: Well, we're still working it and
2 urging them to get their integrated intellects pulled together
3 and, you know, see what the judgment is. We don't have one yet

4 MR. DENTON: I guess my comments on it which prompted
5 it are about the lack of an ignition mechanism.

6 CHAIRMAN HENDRIE: Yeah. Well, that's certainly one
7 of the elements that goes into the judgment.

8 MR. DENTON: If the recombiners really perform well
9 and we can demonstrate the containment levels are dropping,
10 get a sample in the gas storage tank and so forth, maybe
11 we'd want to move faster toward trying to degas the primary
12 coolant through this one-inch relief valve.

13 CHAIRMAN HENDRIE: Well, yeah. My concerns in this
14 area actually run two ways. One of them has to do with whether
15 we may be already close enough to a situation where one ought
16 to consider some further evacuation measures.

17 And the other one is in moving the gas bubble around
18 if we get it out into the containment I believe we're going to
19 be flammable.

20 MR. DENTON: Yes.

21 CHAIRMAN HENDRIE: That is, if it doesn't go in the
22 vessel and you do discharge it into the containment, why I
23 think that takes you well up into the flammable region.

24 And I guess there's a third one and that is we may
25 be thrust forward toward trying to get that bubble out of the

1 vessel a little sooner than we would otherwise like to have
2 to do it on this account.

3 MR. DENTON: Well, and we could face that if there
4 are malfunctions in the present cooling system.

5 CHAIRMAN HENDRIE: Well, that's true, yeah. That is
6 certainly true.

7 Alright, Well, I think --

8 MR. DENTON: Well, I guess I had not put that one high
9 on my scale of concerns. You have heightened my worry about it
10 I guess I need -- Really, it is going to take a lot of assistance
11 from back there, people looking at this I guess to get me and
12 us up here up to speed on it.

13 CHAIRMAN HENDRIE: Yeah. I think it would be useful

14 MR. DENTON: Is there any way to get a sample even out of
15 that upper head?

16 CHAIRMAN HENDRIE: I don't know.

17 What you might do is just take a minute before your
18 press conference and go through to the folks in Bethesda and
19 see what they've got on it. Presumably they're on a parallel
20 patch-in and are also listening to this discussion so they can
21 be alerted for a call to give you a rapid brief on what they
22 think they know at this time.

23 MR. DENTON: I think about all the other issues you
24 probably have heard from other channels. Congressman Walter
25 spent some time here with us this morning and I had breakfast

1 with Congressman Eiler. I assume you're aware of these con-
2 tinuing Congressional interests, and they all are as helpful
3 as they can be.

4 CHAIRMAN HENDRIE: Yeah.

5 MR. DENTON: I will get back with the center after
6 this briefing.

7 CHAIRMAN HENDRIE: Okay. Let me see what other
8 questions people have.

9 COMMISSIONER BRADFORD: Harold, did I understand you
10 earlier to say that you had indicated to the Governor--

11 VOICE: Excuse me, sir. This is the White House
12 operator.

13 Mr. Denton?

14 MR. DENTON: Yes, sir?

15 VOICE: The President has requested you on a call
16 sir. Can you (inaudible) -- call, sir

17 VOICE: Yes, sir.

18 (Laughter.)

19 (Pause - There is inaudible conversation)

20 CHAIRMAN HENDRIE: Gee, I guess I ought to turn this
21 off. Okay.

22 COMMISSIONER GILINSKY: Unless you want to listen to
23 the President.

24 CHAIRMAN HENDRIE: No.

25 CHAIRMAN HENDRIE: All we were doing was listening
to the Response Center's recorder go beep.

12:42 noon

1 (Laughter)

2 Yeah. I think it's useful that they did, and that was
3 my impression last night from the conversation with Vic, that
4 they had talked about a range of errors, not about the hydroge
5 in the vessel burning, but had talked about, you know, short
6 noticing.

7 COMMISSIONER BRADFORD: I thought that they had, too
8 I wasn't sure they'd associated any time with it, --

9 COMMISSIONER AHEARNE: Right.

10 COMMISSIONER BRADFORD: -- but that -- I thought that
11 they'd (inaudible).

12 CHAIRMAN HENDRIE: As you say, I think it's helpful
13 that the Governor has got in mind that there may be some short
14 some --

15 COMMISSIONER BRADFORD: Yeah.

16 CHAIRMAN HENDRIE: -- pretty short --

17 COMMISSIONER BRADFORD: He's less interested in the
18 exact sequence than in knowing the time, but I wanted Harold
19 to focus on that for a minute and tell us exactly what he has
20 told the Governor about it.

21 CHAIRMAN HENDRIE: Oh.

22 VOICE: The utility in all events (inaudible).

23 CHAIRMAN HENDRIE: He's talking about seeing the
24 explosion; he's talking about a breach of the containment.

25 COMMISSIONER BRADFORD: But not all the core (inaudible)

1 CHAIRMAN HENDRIE: Well, when you breach your con-
2 tainment, Christ, we've got -- I don't know, we've probably
3 got 15, 20 percent of the core iodine out there which is --
4 You know, that will do for starters.

5 (Laughter)

6 CHAIRMAN HENDRIE: That's -- Huh?

7 VOICE: (Inaudible.)

8 (Inaudible discussion.)

9 CHAIRMAN HENDRIE: Moderate. An item to watch.
10 They tell me that something like a 7 mill ampli-
11 tude is the normal experience on that pump.

12 COMMISSIONER AHEARNE: This is up three times.

13 CHAIRMAN HENDRIE: This is up three times normal.
14 I don't have a continuous report so I don't know
15 whether that's growing gradually or whether it's coming, you
16 know, like this.

17 COMMISSIONER KENNEDY: The limits are about 30.

18 VOICE: (Inaudible.) said 60

19 CHAIRMAN HENDRIE: Yeah. I've also heard-- But I
20 believe the plant previously, Del, earlier in the morning, Del
21 it said that the plant had been using 30 mills as a point wher
22 they would normally contemplate getting to it at the next
23 convenient down time.

24 They have got, I understand, got the lube oil
25 systems running on --

1 COMMISSIONER AHEARNE: The other pump in that circuit

2 CHAIRMAN HENDRIE: Well, it turns out the pumps
3 running is over here. The second pump that looked like it
4 would be available is over there on the loop with the damaged
5 steam generator.

6 VOICE: (Inaudible.)

7 CHAIRMAN HENDRIE: Then the two that we had heard
8 were the ones that were out are like that.

9 (Pause.) Can't feed back?

10 COMMISSIONER AHEARNE: It was backwards, wasn't it?
11 If you ran that pump, wasn't it backwards?

12 CHAIRMAN HENDRIE: No, because it comes out of the
13 core and goes to the same side of the exchanger.

14 See all of these--

15 COMMISSIONER AHEARNE: Aren't they on opposite sides

16 CHAIRMAN HENDRIE: All of these-- Well, let's see.
17 There's a loop configuration there in one of your drawings, but
18 these pumps take suction from the exchanger right into the
19 vessel. It goes up through the vessel and comes out in two
20 large pipes. Each pipe then goes to an exchanger -- a
21 steam generator.

22 Out of the steam generator it splits and you've got two
23 pumps in parallel on the back end.

24 Now one of the useful attributes of the system at
25 present is that there is a nice forced circulation to the
core. It is pulling the temperatures down. One of those

1 off-- You remember yesterday there were three thermocouples;
2 there were two offscale and one okay. The one that was above
3 saturation has come below saturation. One of the offscales
4 has come down. I believe the last one has come falling 20
5 degrees an hour or something like that. It is still above
6 saturation, I would guess, now but coming down. I haven't
7 heard about the remaining one.

8 So clearly that's having a beneficial effect.

9 Now you'd continue to have that forced flow on the
10 other loop, but you wouldn't be driving through the operable
11 steam generator, other than in a -- oh, a sort of a natural
12 circulation plus just a sort of an over -- of, a little tail
13 of the driving force to go that way because the main push
14 would be over here on the other one.

15 We don't know the extent of the two failures
16 and I don't know that they've been in a position to make any
17 sort of measurements. I don't think they've attempted any
18 sort of measurements on that side.

19 Because running the damaged side means that you--
20 What you do on the secondary side is take the steam evolved
21 from the heat transfer from the primary. That steam then
22 goes over and is condensed in the hot well. It's the same
23 hot well that's the operable one (inaudible).

24 That secondary side isn't-- You know, that's
25 out in the turbine building and it isn't all that well
sealed so if you've got an appreciable leak rate you're

eb21

1 going to be putting fission products over into that secondary
2 loop and there's going to be an assortment of these low-
3 grade leakages which are then just going to come out, so
4 the local area dose rate is going to go up.

5 I don't think one wants to open the isolation
6 valves on that secondary -- the damaged steam generator
7 secondary loop short of pretty extreme circumstances.

8 On the other hand you can run a mode in which
9 you're circulating through the core with the pump on the
10 damaged side so you keep the forced circulation going and what
11 will happen is that the primary system-- may not be
12 able to get enough energy out on the good side; the flow
13 just won't be there. You will then have temperature rise,
14 just bulk expansion, and periodically you'll toot at the
15 pressurizer release.

16 And then what you'd do would be to let it toot
17 for a while, let the pressure come back down, the level
18 drop in the pressurizer, cut it off and then let it build
19 again. And so you'd do a burp and slurp energy release.
20 You know, you're dumping the energy by that method into the
21 containment.

22 So it's a feasible mode and is one that is
23 contemplated in some of the loss-of-coolant sequences, some
24 of the degraded small break cases.

25 COMMISSIONER AHEARNE: His concern about having--

1 CHAIRMAN HENDRIE: It would be nice if the other
2 pump in the good loop could be rolled.

3 COMMISSIONER AHEARNE: He said it was operable.

4 CHAIRMAN HENDRIE: He didn't say it was operable. He
5 said they got the lube oil system working again, they say.

6 COMMISSIONER AHEARNE: Joe --

7 COMMISSIONER AHEARNE: Were there more problems in that?

8 COMMISSIONER KENNEDY: They were operable but they
9 were not tested.

10 CHAIRMAN HENDRIE: These are big pumps

11 VOICE: (Inaudible)

12 CHAIRMAN HENDRIE: Until you bump it and pick up
13 load, why you don't know. And they are reluctant to make a
14 test of that kind at the moment; they'd just as soon not.
15 Because then what you do is go through a regime in which you're
16 you know, coming up toward double the present core flow.
17 They're not all that anxious to rattle things around that much

18 COMMISSIONER AHEARNE: Is Harold's concern about more
19 industry cooperation? Is it possible to get the company or
20 someone to request some of the other --

21 CHAIRMAN HENDRIE: I'm going to call Creitz and
22 DeCamp at GPU as soon as we get off here and --

23 COMMISSIONER GILINSKY: (Inaudible)

24 COMMISSIONER BRADFORD: (Inaudible) I'm flabbergast
25 both that B&W needs an invitation and that the invitation hasn't

1 been issued.

2 COMMISSIONER GILINSKY: Yeah.

3 COMMISSIONER KENNEDY: Well, of course I'm flabber-
4 gasted, too, but on the other hand, they have a fire and they'
5 standing there with a fire hose trying to put it out, and
6 they're not thinking about -- like what color the roof should
7 be when they rebuild the building.

8 COMMISSIONER BRADFORD: No, these are more basic questions

9 COMMISSIONER AHEARNE: (Inaudible) -- ended up really
10 talking about they need more help to think about emergencies -- procedure

11 COMMISSIONER KENNEDY: They need more help to do what
12 they're doing.

13 COMMISSIONER AHEARNE: That's right.

14 COMMISSIONER KENNEDY: To think ahead.

15 COMMISSIONER GILINSKY: Aren't we doing that kind of
16 thing?

17 VOICE: (Inaudible)

18 VOICE: Yes.

19 COMMISSIONER AHEARNE: One of the things that Joe sa
20 to Stello last night is if people during the night were workin
21 out what kinds of accidents might happen here (inaudible).

22 COMMISSIONER KENNEDY: I think we ought to talk to
23 B&W and we ought to talk to Creitz (inaudible).

24 COMMISSIONER KENNEDY: We will.

25 VOICE: (Inaudible)

1 COMMISSIONER AHEARNE: (Inaudible.) And there are a
2 number of other plants, people who have the same kind of plant
3 (inaudible). I can jot down.

4 (Inaudible discussion.)

5 CHAIRMAN HENDRIE: We may get a patch back from Harold
6 after his talk with the President and I'll sent it up.

7 COMMISSIONER AHEARNE: He said he has a press confer
8 ence at 12:30.

9 VOICE: (Inaudible) -- press conferences?

10 CHAIRMAN HENDRIE: Lovely.

11 Well this is as of today, up to --

12 (Inaudible discussion between Bradford and Ahearne)

13 CHAIRMAN HENDRIE: You think maybe I ought not to
14 talk to him?

15 Well, let me talk to Harold later on and see if it
16 would be useful.

17 COMMISSIONER GILINSKY: (Inaudible) -- it's got to
18 be with Harold.

19 COMMISSIONER BRADFORD: Yes.

20 CHAIRMAN HENDRIE: It certainly would.

21 COMMISSIONER GILINSKY: And maybe he didn't want to get on the
22 phone with Harold on his own.

23 (Inaudible discussion.)

24 COMMISSIONER GILINSKY: I think the range of un-
25 certainty here is --

1 (Inaudible discussion.)

2 (Interruption in recording.)

3 CHAIRMAN HENDRIE: We ought to get an update on that
4 licensing situation there with some encouraging news there
5 right after the press conference and ask him to-- You know,
6 it's still in a preliminary stage but we've got lots of
7 people working on it.

8 And then I think we should think about next steps.

9 Did I tell you, by the way, that we did get
10 through to Herman DeCamp, the general public utility engineer-
11 ing vice president whom I've known for some time, and I
12 couldn't get to him-- I had to wait a little bit. The reason
13 I was waiting a little bit was so that Jack Watson could read
14 him the riot act, to get people down there.

15 (Recording difficulties.)

16 Get people down there.

17 He said, "Listen, I've kind of heard that before."
18 Denton had talked to him, and so he understood,
19 and told me some of what they're doing. They're pulling in
20 people from all over.

21 COMMISSIONER GILINSKY: What about B&W (inaudible)?

22 CHAIRMAN HENDRIE: Yeah. But he's got people from the
23 rest of the industry. DeCamp has got Miles and that crowd at
24 Naval Reactors coming down, and Joe West and John Detrick are
25 on their way down with a team from Combustion and (inaudible).

1 Laney is sending in experts from Argonne as well.

2 I told him to-- Let's see. And he's getting health
3 physics people from someplace or other but I don't remember
4 where at the moment.

5 I told him that I thought he ought to supplement his
6 operator and auxiliary operator crews with some additional
7 experienced and knowledgeable reactor plant people, and that I
8 recommended he call Duke Power and Arkansas 1 place, you know,
9 where they have B&W plants of the same general vintage.

10 Told him if he needs any encouragement from the
11 government to help with these people, why--

12 COMMISSIONER GILINSKY: Wasn't Harold, (inaudible) --
13 complaining about B&W. I don't understand.

14 CHAIRMAN HENDRIE: He wasn't complaining about B&W.
15 What he was saying was it was his impression that B&W was sort
16 of off, you know, monitoring and providing calculations and
17 setting aside and more monitoring respectively,

18 COMMISSIONER KENNEDY: he said his impression was
19 they were fully prepared to be more active if the utility asked
20 them to do so.

21 CHAIRMAN HENDRIE: Yes.

22 COMMISSIONER KENNEDY: They haven't asked them.

23 CHAIRMAN HENDRIE: Yes. Apparently, you see, we've
24 been using B&W perhaps more vigorously than the utility.

25 COMMISSIONER GILINSKY: (Inaudible) -- working them

1 up in the middle of the night?

2 CHAIRMAN HENDRIE: Yes.

3 Yeah, and what we have to do, and now on the hydrogen
4 problem in particular, why, we have got most of the ranking
5 world experts, you know, working in several parallel groups so
6 there will be a cross-check of independently done calculations
7 by different people in a helpful way to avoid getting caught
8 in errors in assumptions or arithmetic.

9 Now I-- Go ahead. Go ahead.

10 VOICE: Go ahead and fill up some of the cameras
11 so (inaudible).

12 CHAIRMAN HENDRIE: What have they got, Jim?

13 VOICE: (Inaudible)

14 CHAIRMAN HENDRIE: Tell us about hydrogen.

15 MR. MATTSON: We're learning about hydrogen at 1,000 psi.
16 We're going to be concerned about (inaudible).

17 CHAIRMAN HENDRIE: Well, if pressure helps, I guess
18 we can run it up another thousand pounds.

19 MR. MATTSON: Yes, pressure does help, and somebody
20 has suggested that in the last half hour. I'll get a hold
21 of one of the chemists at SAI made suggestions

22 Let's see. I can better trace the results that I
23 was giving you before you went up there.

24 The name of the man that's performing the calculations
25 is Bob Ritzman. He was with Battelle Columbus for a number

3:27 p.m.

All 5 Commissioners
and various
assistants at
Bethesda
Response Center
Also, J. Austin
L. Bickwit,
G. Mazozan

1 of years. He was the Reactor Safety Study expert on hydrogen.
2 Saul says he's the best man in the country on--

3 VOICE: (Inaudible.)

4 MR. MATTSON: He's at SAI He's working in California
5 right now, today making these calculations.

6 It's his number says 2 percent. It could be as high
7 as 3 percent oxygen in the bubble.

8 COMMISSIONER GILINSKY: What determines that? In oth
9 words, what--

10 MR. MATTSON: He says radiolysis. He assumed that the
11 oxygen was all scrubbed by the zirconium and the zirconium
12 (inaudible). Ignition, 8 to 9 percent, detonational factor,
13 2 or 3 higher.

14 When I made that number off the top of my head it
15 said you say 3 percent in 3 days, then you've got 5 days to
16 reach 8 percent, probably a little longer because the rate of
17 production is going to go down. It goes down about --

18 VOICE: (Inaudible.)

19 MR. MATTSON: -- 30 percent per day.

20 (Pause)

21 It goes down as the power decays, and today in a
22 12-hour period, it's going down three parts out of 20 --
23 it's going down 15 percent a day.

24 MR. MATTSON: There are control rod drives, and we've
25 got people looking at the way to fail a control rod drive on

1 purpose and provide a crack. Unfortunately the only way you
2 can do that that we know is to heat it; in other words, you
3 want to start a fire.

4 We think we've got a way we can break the control
5 rod--

6 CHAIRMAN HENDRIE: Let's see. That-- You know, it
7 condenses to slightly over flammable conditions and if you
8 wanted to burn it rather than let it continue to rise--

9 MR. MATTSON: You could convince yourself--

10 VOICE: (Inaudible.)

11 MR. MATTSON: You could convince yourself you were well
12 under. If you knew it and were certain of it, there's
13 probably a way to break it, which they're going to attempt
14 at Ohio right now (inaudible).

15 CHAIRMAN HENDRIE: Okay.

16 VOICE: (Inaudible)

17 MR. MATTSON: I guess the latest we have is that three
18 pumps are now operable. Last night it was felt that they
19 only had one of the pumps that they thought they could go
20 to start. At least Hal said this morning that they had three
21 ready to start.

22 MR. MATTSON: They're running the noise monitor on the
23 plant now. We got a call from the man who invented it at
24 Oak Ridge. He said if they'd run it there were things he
25 could learn about it. And they now think they can see the

1 bubble move with the noise monitor and do a noise analysis
2 at Oak Ridge now to get up for that.

3 They've confirmed that the noise from the pump
4 is not bad. The pump's in good shape even though it seems
5 to be showing some motion. They've learned one of the things
6 from the noise monitor must not have been that important
7 it slipped my mind. Well, the performance and equipment, real

8 The fuel is continuing to improve, the temperatures.

9 CHAIRMAN HENDRIE: Yes. I was delighted to learn--

10 MR. MATTSON: One of our errant thermocouples returned--

11 CHAIRMAN HENDRIE: Well, the last of your-- They told
12 me the last of your errant thermocouples had returned.

13 (Simultaneous discussion.)

14 CHAIRMAN HENDRIE: I was so proud of it I stole the
15 drawing off the table.

16 MR. MATTSON: That's not it. It's this one here that's
17 still out. Yes, there's still one. This one returned last
18 night.

19 What's the time on that one?

20 CHAIRMAN HENDRIE: 231, 12:50.

21 VOICE: I thought they--

22 VOICE: There's still one out.

23 VOICE: -- told me that every one--

24 VOICE: That one wasn't (inaudible) -- on the
25 table. The one across the table (inaudible).

1 MR. MATTSON: That one was not on the table.

2 When I generated that table I decided I'd
3 (inaudible) -- leave out the few that were known but they've
4 been adding them as they go along.

5 CHAIRMAN HENDRIE: They do have one (inaudible).

6 MR. MATTSON: Well, of course the question is how long
7 do you stay here, and why do you stay here? I guess the
8 bottom-line answer to that is because you know you're okay
9 where you're at and things don't look like they're changing
10 rapidly. The only things that are changing are getting
11 better.

12 And until you know for certain that there's been
13 close coordination between CPU and the plant staff and B&W
14 on the procedure, the checkout procedure for bringing it
15 down,--

16 CHAIRMAN HENDRIE: We all agree.

17 MR. MATTSON: -- and we've seen it, and you know I've
18 got lists of things that ought to be thought about when
19 we finally see a procedure,-- I can't sit here and develop
20 a procedure for bringing it down. I'm not qualified to do
21 that, but I can sure comment on one. And I've got lots of
22 things I want to ask them when I see that procedure. But
23 they're being very careful, studied four or five ways to
24 bring it down, slowly, rapidly.

25 VOICE: What do they do--

1 MR. MATTSON: On any of those they could exercise a
2 judgment at any given point in time and go. But they all
3 need to be thought through.

4 COMMISSIONER GILINSKY: Right. (Inaudible)

5 MR. MATTSON: B&W is organizing teams that are looking
6 at various ways to come down. The Westinghouse and Combustion
7 Engineering people who are at (inaudible), New Jersey some-
8 place now, they're at some kind of center where they're
9 helping double-check these kinds of things with GPU management
10 as the third party, on considering the various ways to vent
11 in the process of bringing the pressure down to keep the bubble
12 out of the core.

13 COMMISSIONER GILINSKY: What's the role of our guys
14 down there in this process?

15 MR. MATTSON: Well, I'm not certain what the involve-
16 ment has been for our people at the site with GPU management
17 developing the procedures. We've got four people a shift
18 in the control room, answering hands-on kinds of questions,
19 dealing with hands-on kinds of problems; when you're in that
20 environment and occasionally wearing a radiation mask, you're
21 not really thinking much about protocol and procedures
22 (inaudible).

23 CHAIRMAN HENDRIE: I don't think the on-site team
24 has all that much -- worked all that much on those -- getting
25 the bubble out as yet.

1 Stello, you know, after the press conference last
2 night, I got him when he got back to the Visitor's Center
3 and was back there, having the press out from under foot
4 and getting down to work, --

5 VOICE: (Inaudible.)

6 VOICE: I'm sure he said so.

7 CHAIRMAN HENDRIE: -- was shaking down his night
8 team to get started on a set of what-if's, which are not quite
9 the same as these sequences but, rather, what will we do if the
10 pump quits, what will we do if the core looks like it's
11 beginning to move around, what will we do if the temperatures
12 start to go, which obviously affects, you know, in a few
13 hours, where you don't get very far.

14 Anything you put down in those lines is going to
15 be a help if one of those things happens. You aren't going
16 to have much time to think when they go.

17 MR. MATSON: He's doing some of that work there and he
18 calls in questions here and we put teams of people in this
19 building and in the Phillips Building on the line.

20 He called up three or four things today and we
21 found out the blocked valve leading to the vent pressurizer
22 is not on an emergency bus.

23 We're calling the Navy. They've got portable
24 power supplies, as I understand There aren't any portable
25 power supplies of the size you need for a reactor coolant

1 pump. Reactor coolant pumps are not on emergency buses
2 so if we find a portable power supply we'll get it to the
3 site.

4 The big one at the moment is Levine and I, I
5 guess, are adamant about this we ought to be flying in addi-
6 tional RHR capacity for that plant. We ought
7 to get it up there now, and we ought to get it installed
8 now. We know we've got debris. We know we've got plugged
9 lines in the primary system, and we can bet that will happen
10 in the RHR heat exchangers when we finally get
11 down to it.

12 Now's the time to be adding those three or four
13 chains in parallel, to put additional line exchangers in
14 the auxiliary building now rather than after you've got the
15 hot RHR going. There are things you can accomplish while
16 you're figuring out how to go the next step.

17 The (inaudible) -- It seems to be stable where it's
18 at now.

19 VOICE: (Inaudible.)

20 MR. MATTSON: Well, so far we just suggested it to the
21 people at the site to see what the reaction is there. They
22 may have started something. If they have not, then I think
23 we ought to pump up something pretty fast.

24 This is something that Westinghouse and Combustion
25 and others could help (inaudible).

1 COMMISSIONER BRADFORD: We'll be glad to help you.

2 CHAIRMAN HENDRIE: Yes.

3 We're still going to be vulnerable to a jump in
4 the containment sump.

5 VOICE: Yes.

6 CHAIRMAN HENDRIE: What do the sump experts -- Have
7 they got anything to offer?

8 MR. MATTSON: Got a screen. I don't believe one of
9 the tests itself.

10 CHAIRMAN HENDRIE: Is it one of those--

11 VOICE: It's one of our mid-class sumps.

12 MR. MATTSON: It's mid-class sumps. They're not as bad
13 as some of the old ones and as good as some of the new ones.

14 There was some talk about some strainers that
15 may have confused people. They gave them a year to install
16 strainers between the low head system and the high head
17 system. You can pass particulate matter through the low
18 head pumps that might cause the high head pumps difficulty.
19 And there's a mode of operation on a B&W machines where you
20 piggyback, where you can use the high head pumps on the
21 sump water in case you run out of water.

22 That was a concern early in the transient when
23 they were using the safety injection system and not using
24 the reactor coolant pump, but since the water has been re-
25 plenished, there should be no need for that mode of operation

1 at this juncture.

2 COMMISSIONER GILINSKY: Let me ask you--

3 MR. MATTSON: There is always the unknown in the RHR
4 pumps and the sumps.

5 Yes?

6 COMMISSIONER GILINSKY: To return to this hydrogen
7 problem, have we put that to bed?

8 CHAIRMAN HENDRIE: No, but I think at the moment we
9 have a reasonable basis for believing it is not a problem for
10 Saturday night. Okay? It is several days out into the next
11 week before -- the best judgment is, before we hit the
12 probability limit and the detonation limit is more than a
13 week beyond that.

14 So at least it seems to me that to the extent
15 there was concern, and there was concern, and we intended to
16 sit here -- In fact, the reason we're all here is so we
17 didn't have to waste time -- I didn't have to waste time
18 driving back down if-- you know, if the word on hydrogen
19 was that the best guess is that it's 3-1/4 and it's going
20 flammable tonight and the limit's 4, and the spontaneous
21 flammability point is 1,000 pounds at 200 degrees F.,
22 why you'd say we would call the Governor at the meeting and
23 say we think you ought to get people out of here.

24 MR. MATTSON: Yes, we will be getting more --

25 CHAIRMAN HENDRIE: I think that situation is not

1 now before us.

2 COMMISSIONER BRADFORD: Joe, just one other thing.
3 What are the uncertainties in the various numbers
4 like the 3 percent --

5 CHAIRMAN HENDRIE: I think there's a fair amount of
6 slop. I think you have to regard it as being a fair amount
7 of slop.

8 MR. MATTSON: I suspect we'll see some differences in
9 the numbers before the day's over.

10 COMMISSIONER AHEARNE: (Inaudible.)

11 MR. MATTSON: Yes, yes.

12 VOICE: (Inaudible.)

13 MR. MATTSON Same problem, different people.

14 COMMISSIONER BRADFORD: You assume the worst case
15 in each of the uncertainties.

16 VOICE: (Inaudible.)

17 COMMISSIONER KENNEDY: In other words, how much
18 closer in does all this get?

19 MR. MATTSON: I can't answer the question.

20 COMMISSIONER AHEARNE: These other people that are
21 giving us (inaudible).

22 MR. MATTSON: Well, that isn't-- I can give you better
23 than that.

24 (Pause.)

25 Most of the uncertainty is in what's inside the

1 water. There's probably causing radiolysis -- at various
2 points in time (inaudible). It's possible to bound that.
3 I'm fairly certain at this point they are making attempts to
4 bound that.

5 We've given everyone the measurements that were
6 taken from the water so they can see the dispersal (inaudible)
7 The calculations that were performed early were being performed
8 on the TID release, and I think the measurements tell
9 us now we do not have a TID release.

10 VOICE: (Inaudible.)

11 MR. MATTSON: And so we will be able to bound it.

12 COMMISSIONER KENNEDY: How much (inaudible)?
13 About 60 percent iodine (inaudible)?

14 MR. MATTSON: The uncertainty shouldn't be sufficient
15 to (inaudible). There's just not that much uncertainty
16 on the other side (inaudible).

17 COMMISSIONER KENNEDY: That was the nature of the
18 question.

19 MR. MATTSON: But we're not grossly underestimating
20 this thing.

21 COMMISSIONER AHEARNE: Well, but now there are--
22 "Grossly," your term, does that mean that you're talking
23 that you're not overestimating by a couple of days or--

24 MR. MATTSON: Well, I'm confident that I'm not under-
25 estimating it at this junction, and I will be confident

1 before I turn it over to the next person who has got the
2 watch that he's not underestimating it either. And we just
3 have to follow it, day by day. We're doing better on every
4 calculation we do with each passing hour.

5 COMMISSIONER KENNEDY: It feels comfortable at least
6 until the watch change.

7 (Laughter.)

8 Mr. MATTSON: The first calculation you make you
9 make very roughly because you need an answer quickly, and then
10 you keep people making calculations. That's the best I can
11 give you.

12 COMMISSIONER AHEARNE: Well, I guess obviously
13 what I'm pushing for is your estimate as to how much certainty
14 in one of the earlier calculations would have led you to a
15 concern at tonight or tomorrow morning?

16 MR. MATTSON: No, the earlier calculations were
17 wrong. The measurements made today is going to make it go up.

18 The first number I have for the measurement made
19 today says I've got two to three days.

20 CHAIRMAN HENDRIE: Yes. Well, except that I had
21 an evolution number, number 30 to 40, cubic feet per day at
22 or about 1,000 pounds, and --

23 COMMISSIONER AHEARNE: That's going to go up to
24 4 percent, isn't it?

25 CHAIRMAN HENDRIE: And I was using 4 percent because

1 couldn't remember high pressure data and I was saying, well,
2 you know, in the containment pressure range it doesn't make
3 any difference so I was working 40 cubic feet/day -- available
4 at 4 percent flammability and--

5 MR. MATTSON: You said you're within?

6 COMMISSIONER AHEARNE: Well, fairly close.

7 CHAIRMAN HENDRIE: Then I couldn't remember whether
8 the 40 cubic feet was total gas evolution or the hydrated --
9 you know, so the oxygen part was a third of it, or whether--
10 I think it turned out it was total, so that helped some.

11 But you know, it looked like we might be there
12 and we've become very concerned, if it looked like that might
13 be the case, that then we'd have to think very seriously --

14 MR. MATTSON: But that's (inaudible).

15 CHAIRMAN HENDRIE: -- about getting people out of at
16 least the close-in region.

17 MR. MATTSON: (Inaudible) -- the source of the 40 cubic
18 foot per day.

19 CHAIRMAN HENDRIE: Yes.

20 MR. MATTSON: They're the ones that have to report in.
21 They're working with the Navy to make sure they've got the
22 right numbers. Most of where they got their information was
23 working with the Navy on the submarines and aircraft carriers.
24 Those are harder numbers than (inaudible).

25 COMMISSIONER AHEARNE: Do they expect to be down sometime soon

Approx 3:34 p.m. 14
E. Case and B. Grimes
join meeting. 15

Approx 3:52 p.m.
Hendrie leaves
to take call
from Mr. Denton.

1 MR. MATTSON: He told me about an hour ago --

2 VOICE: Denton's on the line.

3 MR. MATTSON: -- he had the calculations set up ready
4 to go.

5 COMMISSIONER AHEARNE: Do they have that-- What's the
6 status of getting that line -- that jury-rigged line --

7 VOICE: It's-- They've made the connection but
8 they haven't tested it and haven't used it.

9 COMMISSIONER AHEARNE: They're waiting to get
10 shielding around it?

11 MR. GRIMES: No, I don't think they need shielding
12 for that.

13 MR. MATTSON: It's a fairly simple thing they did. They
14 had a nipple coming out of the containment with a valve and an
15 instrument. They went outside the containment, shut the valve
16 removed the instrument.

17 They went to the makeup tank. They had the same
18 think on a line out of the makeup tank. They shut the valve
19 and removed the instrument.

20 They took a piece of tubing with tubing connections
21 at each end, screwed them into the places where the instrument
22 had been, opened the valves. They did it very quickly. I
23 assume it's a very hot area.

24 COMMISSIONER AHEARNE: They're not using it?

25 MR. MATTSON: They are not using it. It hasn't been
tested. I assume what they mean when they say it hasn't been

1 tested, they haven't pressure tested it, which means they
2 haven't opened up that line for the makeup tank yet. I don't
3 know--

4 Brian, maybe you know more than I do about why not.

5 MR. GRIMES: It should be a fairly easy, simple thing to do.

6 It's a hot area and they did it rapidly so they run the risk
7 that they didn't stay there long enough to pipe it down enough
8 with just a wrench.

9 COMMISSIONER KENNEDY: One of the latest numbers
10 we're hearing on the recent (inaudible)

11 MR. GRIMES: -- no substantial change in the offsite
12 numbers (inaudible) -- a couple of millirem per hour immediate
13 offsite dropping to a millirem within a mile and then dropping
14 out further to .1 millirem in three or four miles and that's
15 in the plume above ground so it's even less at ground level.

16 We have done some rough calculations to try to
17 figure out the worst individual dose, dose to an individual
18 on the ground offsite. We think it's probably less than 50
19 millirem. Although, we had 20 millirem clouds and individual
20 20 millirem readings (inaudible).

21 COMMISSIONER KENNEDY: This is cumulative dose?

22 MR. GRIMES: We've done another-- Yes, cumulative dose
23 to an individual.

24 We've done some man-rem calculations and came up
25 on the order of 1,000 man-rem.

1 MR. MATTSON: What fraction of that is total exposure
2 for the 30-year life of the plant, to give a scale for that?
3 Is that one year's worth or two year's--

4 MR. GRIMES: I think it's about a year's worth.

5 VOICE: Well, maybe two year's worth.

6 MR. GRIMES: Three years?

7 COMMISSIONER GILINSKY: (Inaudible.) I thought some-
8 body was saying that that was like--

9 MR. GRIMES: We're calling it Appendix A here.

10 MR. MATTSON: Yes.

11 MR. GRIMES: That's the basis they used in their --

12 COMMISSIONER GILINSKY: I thought it was like 50 man
13 year.

14 MR. GRIMES: Maybe on the new plants that's more typical.

15 I don't think there'd be any point--

16 COMMISSIONER GILINSKY: Harold said 2,000 over what time--

17 MR. GRIMES: I think you're right in that the 300
18 number was associated with the Indian Point type populations.

19 COMMISSIONER GILINSKY: Well, Harold said 2,000
20 was the--

21 MR. GRIMES: (Inaudible.)

22 MR. MATTSON: So it could be as high as 25 (inaudible).

23 COMMISSIONER GILINSKY: Suppose the system ticks
24 along nicely. What are we looking to? Something like a
25 couple of weeks of it sitting like this, it seems to me, for

1 people to think through a scheme, to write down procedures,
2 for those to be checked out, since we haven't really zeroed
3 in on anything at this point?

4 MR. CASE: I think --

5 MR. MATTSON: I don't think it will be that long.

6 MR. CASE: -- the human element enters in before that
7 time, the psychological element of the tick, tick, tick.

8 COMMISSIONER GILINSKY: What is your limiting--
9 If you say you've got to bring it down earlier, can you tell
10 me why?

11 MR. MATTSON: Because of the element that they're talking
12 about.

13 COMMISSIONER GILINSKY: Just things breaking down in
14 some way, --

15 MR. MATTSON: No, --

16 VOICE: (inaudible) operator?

17 COMMISSIONER KENNEDY: Because there's going to come
18 a point where --

19 VOICE: Human nature --

20 COMMISSIONER KENNEDY: -- an optimum is reached in
21 which (a), they've learned about all they think they can learn
22 and (b), they're just getting nervous with the situation and
23 they've got to do somewhat--

24 MR. MATTSON: Let me say, as frankly as I know how,
25 bringing this plant down is risky. There's a not negligible

1 risk in bringing this plant down. No plant has ever been in
2 this condition, no plant has ever been tested in this condi-
3 tion, no plant has ever been analyzed in this condition in
4 the history of this program, --

5 COMMISSIONER GILINSKY: Alright --

6 MR. MATTSON: -- and there's risk in doing that in short
7 order with a damaged core.

8 COMMISSIONER GILINSKY: Okay. Now that means --
9 That's the actual maneuver for bringing it down.

10 MR. CASE: Yes, anything to this system.

11 COMMISSIONER GILINSKY: What about getting to that
12 point from here on? I mean that sounds a lot less cheerful
13 than your description--

14 MR. CASE: Well, but you can make the same kind of
15 table (inaudible).

16 MR. MATTSON: You'd be then staying where you are.

17 MR. CASE: Right. This has never been done before,
18 and this has never been analyzed before, and we think we've
19 thought it through--

20 COMMISSIONER GILINSKY: But the thing that we were
21 talking about--

22 COMMISSIONER KENNEDY: It says here you ought to be
23 prepared to make a decision.

24 MR. MATTSON: That's right.

25 COMMISSIONER KENNEDY: Well, you don't want to rush
that but neither do you want to sit there, --

1 MR. MATTSON: That's right.

2 COMMISSIONER KENNEDY: -- I think is what you're say:

3 MR. MATTSON: And I don't think it's two weeks.

4 COMMISSIONER KENNEDY: I understand.

5 MR. CASE: No, I don't either.

6 MR. MATTSON: It could be as short as a couple days.

7 COMMISSIONER AHEARNE: A couple of days, because of
8 this pressure--

9 MR. MATTSON: No, there is just time to do it in a couple days.

10 COMMISSIONER GILINSKY: Well, do we know--

11 MR. MATTSON: Well, do we know--

12 No, you're generating more oxygen, you're
13 generating more hydrogen --

14 (Simultaneous discussion.)

15 MR. MATTSON:-- your pump is running in a condition it
16 doesn't like to run in. You've got three of them sitting ther
17 you hope four. You've got radiation in that containment with
18 equipment you're depending on now that's not radiation-qualifi

19 It's going to reach a time when it's time to do it.
20 The risk of staying there is going to continue to grow.

21 (Simultaneous discussion)

22 MR. MATTSON: It's going down; it's going to decrease some
23 And they're going to balance it.

24 COMMISSIONER GILINSKY: Alright. One of the things
25 we're going to discuss is should we be recommending anything
about moving

1 some people. And I guess I'm trying to relate what you're
2 saying to that sort of a decision. Can you help me relate it?
3 Because what you've been saying in the last few minutes seems
4 to point in a different direction than what I took to be a
5 rather more cheerful proposal --

6 COMMISSIONER AHEARNE: Optimistic is (inaudible).

7 VOICE: (Inaudible.)

8 COMMISSIONER GILINSKY: I mean a more favorable
9 appraisal of, you know, a few minutes ago. You know, whatever
10 is changing is changing for the better, and it's okay to keep
11 doing what we're doing.

12 MR. MATTSON: Number one, are you asking me for a
13 recommendation?

14 COMMISSIONER GILINSKY: No, no. I'm trying-- No, no,
15 I understand-- Well, if you have one I'll take it. But I
16 guess I'm trying to get a feeling for--

17 MR. MATTSON: Let me give you a feel for--

18 COMMISSIONER GILINSKY: No, no, I don't want to push
19 you on that one, Roger, but I guess I'm trying to understand
20 what are the things that you find troubling in this situation,
21 or what are the things that you feel contribute to, you know,
22 possible degradation of the system, and what sort of time
23 scales might they operate under.

24 MR. MATTSON: Well, the environment that the plant is
25 operating in contributes to its eventual degradation. They

1 make estimates of what margin is there in that degradation,
2 and we've got factors of safety. They're not large but there
3 are factors of safety.

4 And how long the pumps will stand up under the
5 environment, how long the valve operators will stay up on
6 this environment, how long the pressurizer heater will stay
7 good. --

8 COMMISSIONER KENNEDY: There are some available
9 redundancies that people weren't fully satisfied with, a
10 couple of them, that are beginning to look a little better now.

11 MR. MATTSON: We found ways to improve situations.

12 COMMISSIONER KENNEDY: Right.

13 MR. MATTSON: We found they worked good. That's
14 right. And there's also a reason to wait because there are
15 things that can be done now that can't be done once you go
16 down, the addition of the additional RHR capacity, for example,
17 the improvement of the procedures.

18 COMMISSIONER KENNEDY: Things that if you have a
19 chance to do you will do. Your -- RHR things, for example,
20 you mentioned was something which in your view --

21
22 (Simultaneous discussion.)

23 MR. MATTSON: I think, yes, my recommendation to
24 evacuate I'd change today. When I made that recommendation
25 two days ago, it was on the basis that you were releasing

1 large amounts of radioactivity unfiltered up the stack with
2 no apparent way to stop it and were allowing him to continue
3 to do it with no recourse.

4 And so I saw a precipitous move to a shutdown and
5 I wasn't convinced of control of the reactor, and I said
6 move them.

7 Within the hour they had an apparent fix. It's
8 gotten better as we've gone along, and there are additional
9 things that we can do that we've identified. We've improved
10 the procedure since then I think (inaudible).

11 COMMISSIONER GILINSKY: If that's kind of a--

12 MR. MATTSON: If the hydrogen explosion thing changes
13 I'll probably change my position here.

14 COMMISSIONER GILINSKY: But that, in a way, was a
15 problem. You had a release which it looked like you couldn't
16 control and--

17 MR. MATTSON: No, I saw--

18 MR. CASE: That related to the uncertainty in the
19 cooldown situation.

20 MR. MATTSON: I saw that release driving a quick
21 decision on going to RHR and the early indications were that
22 the procedure they had in hand would fail and that the core
23 would melt. I didn't have any choice but to make that
24 recommendation. Almost an hour away from starting a core
25 melt sequence, what else could I say?

1 COMMISSIONER AHEARNE: You have to look at even if
2 you don't start, you know,--

3 (Inaudible) -- would you have enough time.

4 MR. MATTSON: Yeah, but if you know you're going to
5 start in an hour, you need all the time you've got.

6 COMMISSIONER GILINSKY: Suppose we're in a much more
7 comfortable state right now, --

8 MR. MATTSON: We are.

9 COMMISSIONER GILINSKY: -- or at least we thought we
10 were. Okay?

11 MR. MATTSON: Yes, you are.

12 COMMISSIONER GILINSKY: Even so, you know, what are
13 the objectives and does it call for -- I guess I could say
14 taking out a certain amount of insurance?

15 MR. CASE. The best you can do is alert people.
16 You can't pull them out.

17 COMMISSIONER GILINSKY: In a way, --

18 MR. CASE: That's the worst case.

19 COMMISSIONER GILINSKY: In a way, Joe, --

20 COMMISSIONER AHEARNE: You know, they're certainly
21 alerted.

22 MR. MATTSON: Yes.

23 COMMISSIONER GILINSKY: The world is alerted.

24 COMMISSIONER GILINSKY: Joe, I didn't hear the press
25 conference but I gather in effect he said that one is taking

1 evacuation into consideration, --

2 MR. CASE: Yes, he did.

3 COMMISSIONER GILINSKY: -- and that's a certain kind
4 of alerting.

5 MR. MATTSON: At least it gives them a chance to make
6 a choice themselves, the individuals.

7 MR. GRIMES: Which isn't working (inaudible).

8 MR. MATTSON: Some of them are leaving.

9 MR. GRIMES: We've got some information on time scales for
10 evacuation and we think within an hour probably we could
11 evacuate five miles.

12 COMMISSIONER GILINSKY: I guess I'd find that hard to
13 believe. I guess I just don't think these sorts of things work
14 out.

15 COMMISSIONER BRADFORD: Especially if they are subjective.

16 MR. GRIMES: (Inaudible) -- local authorities go
17 around alerting and they're well planned and (inaudible) -- for
18 several days now. Even if that's off by a factor of two or
19 three, probably once the situation gets out of control you've
20 got three or four hours before you'd actually start having
21 releases from the facility.

22 Once you know you're in a--

23 COMMISSIONER GILINSKY: Okay. Let me ask you this
24 question: Suppose one of these pumps goes and you can't
25 replace it. Now at that point it seems to me that we want to

1 start working on trying to fix that.

2 And at what point do we-- We're getting into this
3 question of -- what we were talking about.

*Chairman
returns to
room

4 CHAIRMAN HENDRIE: Which one?

5 COMMISSIONER GILINSKY: Of evacuation..

6 CHAIRMAN HENDRIE: Oh, yeah.

7 COMMISSIONER GILINSKY: And Brian was talking about
8 the times that would be involved if something went bad, and
9 the number of hours, and the question is what could you do in
10 that time? Would you in fact have that time?

11 Because it would seem to me that you would -- the
12 first thing you'd do, you know, unless there is a specific
13 trigger that --

14 MR. GRIMES: Yes?

15 COMMISSIONER GILINSKY: -- everyone has decided on
16 beforehand, saying when that goes, that's it, even though
17 we're trying to fix it, we would order, you know, movement in
18 certain areas--

19 MR. MATTSON: I know what that trigger is in my mind.

20 CHAIRMAN HENDRIE: Sure.

21 MR. MATTSON: If they go to a shutdown without a
22 procedure known to us in here and been reviewed by us, I'd say
23 evacuate.

24 If they go to a shutdown with a procedure that's
25 thought out and shared and talked about a little bit, with

1 24 hours notice, that kind of thing, then we'd have a tough
2 question, but I'm not sure how it could come out. You might
3 still want to--

4 MR. GRIMES: Well, we talked about the thermocouples
5 starting all to go up. And then others --

6 MR. MATTSON: That's another trigger.

7 MR. GRIMES: -- where you've got the bubble laid out
8 and --

9 COMMISSIONER GILINSKY: It seems to me it's worth
10 writing these things down and I don't know whether anybody is
11 doing that.

12 MR. MATTSON: Well, they kind of change as the
13 situation changes, as you balance the changes.

14 COMMISSIONER AHEARNE: Brian, when you were giving
15 the estimates these are estimates made by the people in
16 Pennsylvania?

17 MR. GRIMES: Yes, --

18 VOICE: Those people--

19 MR. GRIMES: -- our state program.

20 COMMISSIONER AHEARNE: I gather from the -- Joe that you mentioned
21 the other day, the Federal Disaster Preparedness, or whatever
22 they are, also called?

23 CHAIRMAN HENDRIE: Yes, but they're standing by quiet
24 because if there are going to be things like a federal set of
25 planes flying in cots and camps and field toilets and who
knows what --

1 (Simultaneous discussion.)

2 COMMISSIONER KENNEDY: Yeah, they don't have anybody
3 who even fools with that sort of thing anymore.

4 COMMISSIONER AHEARNE: And your estimate time is one
5 hour out to the five miles?

6 MR. GRIMES: Well, I had some estimates on time
7 available if things started to go bad before you'd get a major
8 release.

9 COMMISSIONER BRADFORD: Do you know that estimate to
10 be 10 miles, 15, 20?

11 MR. GRIMES: No, but we can think about walking. The
12 brisk walking pace is three or four miles per hour. And
13 everybody is in cars and they're alerted and the roads have
14 plenty of capacity.

15 COMMISSIONER AHEARNE: In that part of Pennsylvania?

16 MR. GRIMES: It's a matter of notification.

17 COMMISSIONER KENNEDY: The Pennsylvania Turnpike, the
18 east-west Interstate, and two north-south Interstates pass
19 through Harrisburg.

20 MR. GRIMES: Which means all brings in the opposite
21 direction.

22 COMMISSIONER KENNEDY: That's right. All roads in
23 the area would immediately be blocked by the State Police
24 for one-way traffic.

25 VOICE: But that one hour time was for the sector,

1 not for-- Was that for--

2 VOICE: Well, you could--

3 VOICE: -- all sectors in one hour?

4 MR. MATTSON: Dr. Collins, I think gave a two-hour
5 estimate at 10 miles to Hart.

6 CHAIRMAN HENDRIE: I wish we had a map someplace.

7 (Laughter)

8 COMMISSIONER KENNEDY: We sent Fouchard -- away.

9 (Laughter)

10 CHAIRMAN HENDRIE: Well, let's see. On the next
11 question--

12 I guess we hadn't gotten around to covering all the
13 evacuation possibilities for consideration.

14 It seems to me with what we believe we now know about
15 the hydrogen-oxygen situation in the vessel, that that certainly
16 has relieved that, at least sort of you know in the next 24 hours
17 as sort of a proposition where you would want to make some
18 decision on that now.

19 It seems to me the situation is unchanged with regard
20 to the other two evacuation situations. The one of concern to
21 me is the change in the configuration of the plant that would
22 worry you. If that happens, why I think we want to see what
23 it's like and where it's headed and make a rapid decision on it.

24 That will have to be in large part Harold and his
25 team's decision. You know, we'll know about it in parallel

1 but from up here with any sort of a dynamic situation in the
2 plant it's just not wise to second-guess the people who are on
3 the ground. He is in close contact with the state people, the
4 county people, and so on, so all of that can trigger very
5 fast if it is (inaudible).

6 And it seems to me that we're--

7 MR. MATTSON: And so the situation is that you'd
8 expect Harold to advise the Governor --

9 CHAIRMAN HENDRIE: Yeah.

10 MR. MATTSON: -- as far as --

11 CHAIRMAN HENDRIE: Yeah, yeah.

12 MR. MATTSON: Fine.

13 CHAIRMAN HENDRIE: You know, somebody can be calling
14 us at the same time --

15 MR. MATTSON: Sure.

16 CHAIRMAN HENDRIE: -- so we're on board, but--

17 If the agency's senior officer at the site
18 says get them out, why we're not going to sit around up here
19 and debate whether that's a good idea or not.

20 MR. MATTSON: You know, it might be good if we would
21 make it a point once a day, with a little bit better perspecti
22 than Harold's probably got and his people have got there, to
23 check on things like what do you think the criteria are today,
24 Washington, on the system changes, or the (inaudible)
25 -- changes.

1 You can write him an approval if you've got time
2 for that kind of thing.

3 CHAIRMAN HENDRIE: Yes.

4 MR. MATTSON: Doesn't hurt, one conversation today and say what
5 do we think today?

6 CHAIRMAN HENDRIE: Yes, it's a useful thing to keep
7 working along. I wouldn't-- Don't pull anybody off the
8 hydrogen problem, --

9 (Laughter)

10 MR. CASE: No.

11 CHAIRMAN HENDRIE: -- but work along. And as they are trying
12 to develop these scenarios down there, Vic's effort to get in
13 place a minimum set of what do we do if emergency things,
14 that gives you some lead because you can see as you go down
15 those, as you develop them, why if you come rapidly to a place
16 where if that doesn't go on and work why it's time to
17 start (inaudible).

18 So that will develop out of that some discussion
19 up here with the people who will be helpful to them and help
20 judgments.

21 Now the other-- So it seems to me that that situation
22 does not change, you know. We had that situation-- We've had
23 that before us ever since we went on this 1,000 pound inter-
24 mediate cooling mode operation. In fact, you know, the situat:
25 is modestly better, but I don't think-- You're a shade cooler

1 now. We seem to have a better grip on the pump situation.
2 We're getting into shape to be able to bump and roll the other
3 pumps. We seem to know a little better that we have observed
4 vibration in the one that's running may not be a problem.

5 COMMISSIONER AHEARNE: (Inaudible)

6 CHAIRMAN HENDRIE: And at least they're keeping
7 track of it. So in a sense, the stability of this mode of
8 operation is better right now than it has been since we went
9 into it.

10 So I think the need for evacuation in this situation
11 is, you know, modestly lessened although it is of the same
12 order of magnitude.

13 The other situation of course is the one when we
14 know what the evolution is going to be to get down to RHR
15 cooling and low pressure and get the damned bubble out of
16 there and get onto a long-term cooling thing. And I think
17 the judgment as to whether a precautionary evacuation ought
18 to be carried out during that evolution --

19 VOICE: Volmer?

20 VOICE: How about (inaudible)?

21 VOICE: Who?

22 VOICE: (Inaudible)

23 CHAIRMAN HENDRIE: Whether precautionary evacuation
24 ought to be done at that time I think is a very alive question
25 but we, you know, need to see the sequence and have a sense

1 of the confidence in it, and so on. I'd leave that for the
2 future.

3 Let me go see what's up.

4 COMMISSIONER AHEARNE: Brian, you're, were talking
5 about the various hours that you thought you might have in
6 case that sequence (inaudible). You said three or four hours?

7 (Inaudible conversation.)

8 COMMISSIONER GILINSKY: Let me go back over this
9 point.

10 This is a situation we've been living with and
11 (inaudible).

12 (Simultaneous discussion.)

13 COMMISSIONER GILINSKY: On the other hand,
14 there's a feeling that this plant cannot hold out indefinitely
15 so if there is something else that works which is degrading
16 the situation, whether it's the people or concern about the
17 machinery or something else, or some combination --

18 (Simultaneous discussion.)

19 (Recording difficulties.)

20 COMMISSIONER GILINSKY: Plus factor and the minus factor,
21 And it's not clear.

22 It seems to me that when you project that into the
23 future, you're a pretty strong minus factor if you go out
24 several days, or certainly you'd feel that was past a week.

25 COMMISSIONER KENNEDY: That's what I think you could

1 say today. I don't know whether we'd say that Monday or
2 Tuesday.

3 My impression of what Roger is saying, obviously
4 the situation is maturing. Some things are getting better.
5 You have to assume that at some point you have a situation
6 system which is working in a mode for which it was never
7 designed and in a mode which nobody understands or knows
8 very much about.

9 So you have to assume that at some point it isn't
10 going to be stable any longer, it's going to do something.
11 Something's going to happen. You don't know whether that's
12 going--

13 MR. CASE: You have the unknown too. So you don't
14 know--

15 (Simultaneous discussion.)

16 COMMISSIONER KENNEDY: No, but I keep thinking, I
17 keep thinking you know we may not be as close to the edge of
18 that precipice as it seems all the time to us. Which, as a
19 matter of fact, time has shown to be (inaudible). It's that
20 step to the edge of the precipice. The closer you get to it
21 the more comfortable you are and yet you're quite a long
22 way from the edge of it.

23 CHAIRMAN HENDRIE: Oh, boy. No matter what you say
24 the press -- up.

25 VOICE: (Inaudible.)

VOICE: But if you have a long (inaudible).

1 (Simultaneous discussion)

2 CHAIRMAN HENDRIE: The Chairman said that when we
3 try to get rid of the bubble we're going to evacuate everybody
4 out to 10 or 20 miles. Oh, boy.

5 What I said was what we told the Governor the other
6 day and the whole shmear.

7 COMMISSIONER KENNEDY: Yeah.

8 CHAIRMAN HENDRIE: Oh, boy, (inaudible).

9 Listen, tell him that exceeds my normal standard of
10 living.

11 (Laughter)

12 I'll treat it with great respect.

13 MR. CASE: Well, as a matter of fact you're going to
14 ask two questions. One, you said you'd seriously consider
15 it, or words to that effect.

16 And then they said Well, if you did, how far might
17 you go? And you said --

18 COMMISSIONER GILINSKY: Implying the worst case.

19 COMMISSIONER KENNEDY: Yeah, you said 10 to 20
20 miles.

21
22 MR. CASE: Yes, he said that.

23 VOICE: He trimmed it.

24 VOICE: And we qualified it somewhat later.

25 CHAIRMAN HENDRIE: Well, that was a press dodge,

1 You know, the press people play this game. They now call up
2 the State Emergency Planning Office. They say, "The Chairman
3 of the NRC just said you've got to evacuate. What have you
4 got to say about that?"

5 CHAIRMAN HENDRIE: (Inaudible) -- when are you going
6 to do any. The Pennsylvania Emergency State people think
7 "Whish" when they think about that.

8 (Laughter.)

9 CHAIRMAN HENDRIE: I think they have a problem with
10 the press.

11 (Laughter)

12 MR. MATTSON: There was a time when I was sitting
13 in rooms the last few days that every time somebody came by
14 the door I felt that way.

15 (Laughter.)

16 CHAIRMAN HENDRIE: Which amendment guarantees
17 freedom of the press. I'm against it.

18 COMMISSIONER BRADFORD: (Inaudible) -- in the last
19 four or five hours, has someone in fact either reaffirmed or
20 made sure that the Governor's office is kept current on --

Approx 4:20pm 21 CHAIRMAN HENDRIE: I'm about to do it. I'm about
22 to do it. And the first call, which I didn't get a chance
23 to -- from Harold -- I've been on twice, but I didn't get a
24 chance to report to the agency important elements of that.

25 He was talking about the evacuation situation

1 (inaudible) -- has set up. The Governor has asked Harold
2 to please get back to him by 6:00 p.m. with our recommendation
3 on the pregnant women and pre-school children coming back in
4 or staying out.

5 Now, you know-- And it seems to me that we ought
6 to talk some about that and anything further we want to say
7 about more major evacuation matters, and then I think I ought
8 to go call the Governor.

9 Now that will provide me an opportunity to make
10 those recommendations clear to him. I think what I'll do
11 is call Harold before I call the Governor, but I think I
12 ought to call the Governor. You know, we ought to be coordina
13 and not say different things but I think I ought to call him
14 and give me a chance to make our recommendations and the
15 nuances in them clear about evacuation matters affecting
16 women and pre-school children.

17 And also I can probe a little bit and see if he
18 seems, you know, to understand the sort of thing we're
19 worried about with the hydrogen bubble, you know. At the
20 moment, you know, the data we have at hand suggests that it's
21 not the concern that we thought it might be last night and
22 this morning.

23 COMMISSIONER GILINSKY: (Inaudible)

24 (End of Tape 2-B)

25

eb

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

NRC/Response Center Discussion
Related to
Metropolitan Edison Company,
Three Mile Island Nuclear Station

Saturday, March 31, 1979.

THIS TRANSCRIPT WAS PREPARED FROM A TAPE RECORDING.

(Beginning of Tape 3-A) 4:25 p.m.

3A agbl 1

CHAIRMAN HENDRIE: Governor, how are you?

Starting at 2
.087

No, I was just getting ready to call you. The Commission has been meeting out here at the incident center where we've been shaking down the latest round of information and were just about to get back to you, so your call was particularly opportune.

7

Yes. Yes, of course.

8

Yes, are we on the speaker? You manage to accomplish that better than I do. Every time I try to make that transition, I drop the calling party.

11

Yes, we want to talk to you about evacuation matters and I'm sure some of your questions relate to that. Why don't you go ahead with your questions and then let me fill you in on what we see here about the situation.

15

CHAIRMAN HENDRIE: No, that's not correct. I'm afraid that's one of those cases where the press is trying to work you -- work us at cross purposes.

18

What I -- Right. What I said at the press conference in response to a question specifically about whether evacuation might be a consideration during the time that we would be carrying out that, you know, those steps to try to get rid of the hydrogen bubble in the vessel.

23

And my answer was clearly it is -- that we would be considering whether, in view of the nature of those steps and an overall evaluation, whether a precautionary evacuation in the

agb2

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

downwind quadrant would be a prudent step.

And I said that, you know, it would receive, obviously, very serious consideration and we would be discussing it with you and that it would certainly be considered and it could fairly be considered, you know, part of what we would be talking about when we get to that stage.

CHAIRMAN HENDRIE: Well, then there was a question, okay, if you were to think that kind of an evacuation were the right thing to do, what would the distance be?

And I told him as a rough number I would think between 10 and 20 miles. And then -- but in the downwind sector, and then we got into somebody wanted to know how about Washington at 100 miles and I said that was pretty unlikely, and then they got down to Baltimore at 55 and I tried to point out that at normal daytime diffusion conditions when we would be doing this sort of an operation that the dose rates if anything happened would not go above, you know, wouldn't trigger an evacuation need out much beyond a couple of miles so that when I said 10 to 20 I was trying to include a broad range of weather conditions, although not necessarily the very worst conditions obviously.

And I don't recall much discussion beyond it. But the --

CHAIRMAN HENDRIE: Well, yeah.

No, I don't regard what's going on at the site in any

1 sense, manipulation of the bubble, of concern, which is the one
2 in the reactor vessel.

3 CHAIRMAN HENDRIE: Yeah, I know.

4 Yeah, Harold was talking about the bubble
5 in the vessel and Met Ed was talking about the bubble in the
6 pressurizer and it came up at my press conference, and I
7 attempted to point out that I thought the difference arose
8 because people were talking about different bubbles and we had
9 some discussion about that.

10 Yeah, well, you know, it's -- in order to avoid
11 those kinds of things, why I'm afraid we all have to limit any
12 public statements at all more than is probably reasonable with
13 trying to keep people aware and reasonably up to date on things
14 but then, inevitably, as you try to -- as you get into a little
15 more detail, why they develop these differences and the press
16 is very quick to exercise them and try to make something out
17 of them.

18 CHAIRMAN HENDRIE: Okay -- think about it, yeah. Yeah.

19 First let me speak to the matter which, I believe,
20 you'd asked Harold to please get -- for us to please get back
21 to you pretty quick on the question of taking off the suggestion
22 that pregnant women and preschool children stay out of the
23 immediate plant area.

24 It's the judgment here that as long as we still have
25 these low-level noble gas releases from the auxiliary building,

agb4

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

that it's probably prudent to keep that recommendation in place,
I would think at least overnight and, you know, we're --

CHAIRMAN HENDRIE: Yeah, we're, you know, we'll continue to
evaluate it and we may have a better handle on those releases
tomorrow and, you know, we've talked frequently.

But I think it would be premature to just say,
you know, come back in, because that contains a suggestion that,
you know, everything's just hunky-dory and maybe that's a little
bit too cheerful for the situation.

CHAIRMAN HENDRIE: Now, with regard to other evacuation possi-
bilities, the assessment here is that the plant is stable,
that on balance we're in somewhat better condition than -- today
than we were, say, 24 hours ago.

We're not going to allow any sort of, you know,
radical plant evolutionary steps to take place. We'll all
know about them and discuss them in detail before they do.

We don't think that any precautionary evacuation
at the moment is called for and, as I say, the situation, the
plant situation is slightly better.

I think that prudence dictates that all the emergency
planning people continue to be on alert status. There is, I'm
sorry to say, always the possibility that we could get a change
in conditions at the plant which would, you know, make us think
it would be prudent to ask people to move out. But that's not
a decision that is before us at the moment, in my view.

agb5

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

CHAIRMAN HENDRIE: Right, so you improve that responsibility, yeah, I think that's a very wise thing to do.

CHAIRMAN HENDRIE: Right. Right.

CHAIRMAN HENDRIE: Right. Yes. Yes.

CHAIRMAN HENDRIE: Right.

Yeah, I think so. Let me, right after we finish this conversation, talk to Harold and he can plan when it would work best into his schedule and his team's schedule to get up there --

CHAIRMAN HENDRIE: Yeah. Yeah.

Okay, well I'll -- what I'll ask him to do is to plan to do that and to call you pretty quick, call your office to let you know what looks to him like the best time to come up and to bring you up to date on everything that's going on there and his views and things.

CHAIRMAN HENDRIE: Right.

.298

CHAIRMAN HENDRIE: Well, I'm not -- as time goes along a little bit and people work the possible ways to get that bubble out of the vessel, why it may -- we may find a procedure in which we have such high confidence in the way it is laid out and can go and have covered all the likelihoods that we're all agreed that it's just not a problem and at an appropriate time we'll go ahead and do it.

CHAIRMAN HENDRIE: It's, at this stage, I think, still in an outline form.

agb6

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

Now what I should note and what we should all understand is that before any such debubbling process starts, there would be a very carefully worked out and detailed procedure which will have been extensively reviewed, we'll want to go over it with your technical people, it will be critiqued extensively up here and it will occur at a time that we all agree we're ready to go and, you know, so there would be lots of notice.

CHAIRMAN HENDRIE: Yeah. Well that -- yeah, that's the kind of thing I'm talking about when I talk about --

CHAIRMAN HENDRIE: No, I -- these are the same things.

Yeah, these are the same things. This is a process in which you get rid of the bubble in the dome of the vessel and then the system can be depressurized down to the point where you can go on the regular shutdown cooling systems at lower pressure.

So this is the same thing I'm talking about. Now this is --

CHAIRMAN HENDRIE: Getting to a cold shutdown, the process of getting there.

Once we're there, why then we will then be in a very stable recirculating mode with the core being cooled -- a mode in which we can stay for extended periods of time with, you know essentially, what, very low risk levels.

CHAIRMAN HENDRIE: Yes, with the -- but let me put an asterisk

1 on that and say we have to do that step, that step is inevit-
2 able. Whether or not we'll decide on balance between us that
3 a precautionary evacuation should go with it remains to be seen
4 and I think that will depend, you know, on the details of the
5 procedure, as I say, and what we assess as the possibility of
6 anything going wrong at any step of it.

7 So I think we're by no means at this point saying
8 we've got to evacuate when we do this inevitable step. But
9 it surely is something that we ought to discuss and balance the
10 pros and cons and we ought to have ample time to do it.

11 Now just to finish the evacuation discussion there is,
12 indeed, a second circumstance in which you might face evacuation.
13 We don't think it will occur but it certainly is a possibility
14 and, you know, you need to keep it in mind.

15 And that is the one where we get, whether we like
16 it or not, changes in the plant condition which lead us to
17 think we've got to do something.

18 CHAIRMAN HENDRIE: Okay. By the way, did Harold -- Harold
19 mentioned to you some of the concerns we've had about hydrogen
20 flammability for that --

21 CHAIRMAN HENDRIE: Yeah. Yes, we've had some returns from
22 the technical groups around the country that are working the
23 problem, and it appears that it's at least not near term, not
24 something that we have to deal with here immediately.

25 CHAIRMAN HENDRIE: Just so, yeah, just so.

agb8

387

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

CHAIRMAN HENDRIE: Go ahead. (Now speaking to Governor Thornburgh's Ass't. Mr. Critchlow.)

CHAIRMAN HENDRIE: Yes, sir.

CHAIRMAN HENDRIE: It's possible. Our public information people here are looking at some sort of an explanatory press release which would explain about pressurizers and gas bubbles in pressurizers and the bubble we've got over here in the reactor dome and how Met Ed meant when they said the reactor system, they meant -- well, they were getting part of it out of the system, indeed, but it was over there in the pressurizer, where Harold Denton was, you know, his concern was more concentrated on the larger bubble in the vessel which is the one giving us the current problem.

I tell you what, why don't -- let me get a telephone number from you and your name, again, is Chris -- Okay.

CHAIRMAN HENDRIE: Well, what I was going to suggest was that I ask the public information officer here to give you a call and you professionals can talk about the best way to, you know, get it straightened out.

CHAIRMAN HENDRIE: Yeah. Yeah. I agree.

CHAIRMAN HENDRIE: Yeah. Okay.

Very good.

Listen, before I go away, why the Commissioners wanted me just to note -- not to be a Gloomy Gus, but we do have to keep in mind that we could need to move, with regard to protective actions for the public, in a hurry and the alert

agb9

1 status of all the emergency teams is a matter of considerable
2 importance, we think.

3 CHAIRMAN HENDRIE: Very good. I knew it would be.

4 Thank you very much, sir. Bye-bye now.

5 (Commissioners Gilinsky and Bradford leave for meeting with Califano and Cost

* * *

6 CHAIRMAN HENDRIE: Yeah, this is the -- his name is Critchlow
7 in the Governor's Office, and I think, you know, he's very
8 worried about all of these bubbles.

9 And I think that some sort of three-way discussion
10 between Frank and Joe Fouchard and Mr. Critchlow as to the best
11 way to deal with it and let them figure out where to go.

12 Let's see, I -- they had to go off to the Califano-
13 Costle party.

14 COMMISSIONER AHEARNE: What's the Califano-Costle party?

15 CHAIRMAN HENDRIE: Well, you know, they had to go to a meeting
16 with Joe Califano and Doug Costle yesterday at 5:00, do you
17 remember?

18 And now they've had to go again today, so I assume
19 that there is a daily 5:00 p.m. --

20 COMMISSIONER KENNEDY: Yeah, it's cocktails.

21 CHAIRMAN HENDRIE: -- cocktail

22 COMMISSIONER AHEARNE: -- and I don't know why we're not invited to that

23 COMMISSIONER KENNEDY: You're needed here.

24 CHAIRMAN HENDRIE: Okay, he -- the Governor's instincts on
25 that pregnant women thing was just, you know, that -- keep it

4:46 p.m.

425

agbl0

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

on for a bit longer and we'll keep reassessing sort of on a six hour basis, you know, twice a day and --

COMMISSIONER AHEARNE: Joe, once you recommend that there's no way

CHAIRMAN HENDRIE: Yeah, but he was saying that he didn't have a bit of problem with that.

COMMISSIONER KENNEDY: His problem would be off and on again.

CHAIRMAN HENDRIE: Yeah, absolutely.

CHAIRMAN HENDRIE: You see, though, it's (inaudible) -- when asked what the term meant, what's the term mean.

COMMISSIONER AHEARNE: Sure.

CHAIRMAN HENDRIE: And he was very, he is very concerned about the off again, on again because he wanted to be very clear about what was said at the press conference about the possible need for evacuation when we go through the debubbling process, the depressurization process, when we get around to that, and also to be very clear as to what I meant by that and whether that was the same as what we talked about before and whether the sense here was that it was an inevitable evacuation, that it was a step we would have to take some time and, you know, either we're dead sure now or very sure that we want everybody out. And I told him, you know, we'll have to wait and see.

I guess yesterday my guess, if you'd asked me, would have been that I'd be -- there was about an 80 percent chance that I'd be voting for evacuation in the downwind quadrant when

1 that took place. I think it's a little lower today but I suspect
2 it's probably still higher than 50 percent. We'll have to see
3 what the procedure looks like and what some of the developments are

4 (Simultaneous group discussion.)

5 CHAIRMAN HENDRIE: Yeah, that's right.

6 CHAIRMAN HENDRIE: I'd sure hate to sweat it over this thing for a week
7 and get down to the place where we have to take a final step
8 on the long term cooling and then blow the whole thing.

9 COMMISSIONER AHEARNE: What is the, this bit about these described
10 pressurizers, is there any kind of (inaudible) --

11 CHAIRMAN HENDRIE: I don't know, it depends on the solubility
12 of hydrogen in borax and some other things, they'll have to wait
13 and see. It goes like this --

14 COMMISSIONER AHEARNE: No, I understand about it, I'm just not
15 sure how (inaudible) --

16 CHAIRMAN HENDRIE: It depends on, you know, if the solution
17 rate is sensitive to pressure and (inaudible) --

18 COMMISSIONER AHEARNE: Yeah, I understand all those. It's just
19 what are the numbers?

20 CHAIRMAN HENDRIE: Oh, no, no, I don't know the numbers --
21 (inaudible).

22 COMMISSIONER KENNEDY: If the numbers are right, it's the theoretic-
23 ally reasonable thing to do.

24 COMMISSIONER AHEARNE Well I think it's reasonable to do, except
25 how?

1 COMMISSIONER KENNEDY: Well, if the numbers -- it isn't worth --
2 well, if they're not right, it's not a good thing to do, it'll
3 cause other problems, won't it?

4 CHAIRMAN HENDRIE: Well, if it turned out that the solubility,
5 say, of hydrogen were high and oxygen low, so that you would
6 preferentially deplete the hydrogen in that bubble, what do you
7 do if you if --

8 COMMISSIONER KENNEDY: -- increasing the potential (inaudible).

9 CHAIRMAN HENDRIE: -- increase the rate at which you approach
10 the flammability? And you might, you know, you might find that
11 point instead of the greatest thing (inaudible).

12 (Simultaneous group discussion.)

13 CHAIRMAN HENDRIE: My guess is that it's in Frank's view,
14 they're about equal the other way around, but that remains to
15 be seen.

16 And the base question just is whether those pollu-
17 tion rates, in fact, are anywhere near large enough to make
18 much of a damn bit of difference.

19 But what Harold -- I was talking to Dick Volmer on
20 one of those trips out there and he said if the plant people were
21 pretty sure that they -- in the course of that venting opera-
22 tion that pretty well vented the noncondensable component out
23 of the pressurizer bubble. And they're pretty proud of that.

24 (Inaudible.)

25 COMMISSIONER KENNEDY: And this was (inaudible) -- over in the

agbl3

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

pressurizer.

CHAIRMAN HENDRIE: And now, now if this process would give us a way of transferring from the vessel bubble into the pressurizer, why then there is a vent valve, a remote valve controlled vent on the top of the pressurizer which just toots to the containment, so boy that's just what we need.

COMMISSIONER KENNEDY: Which you could do at a controlled rate.

CHAIRMAN HENDRIE: Exactly. And it would be a nice slow evolution into the containment, you're on the -- you're on the recombiners and, you know. It probably won't work anyhow (inaudible) --

COMMISSIONER AHEARNE: Where does the recombiner -- (Recording difficulties.)

CHAIRMAN HENDRIE: The recombiner takes it in a pipe out of the containment into the auxiliary building. Here's this recombiner, plain recombiner, two of them in parallel, and then the line goes back into the containment. And there must be a fan in there.

COMMISSIONER AHEARNE: All right. So there's no access into the auxiliary building from -- that is --

CHAIRMAN HENDRIE: Well, not unless -- not unless valve bonnets leak or seals blow out or a pipe breaks or something like that. The pipe does come out of the containment and the equipment is in the auxiliary building.

COMMISSIONER AHEARNE: That's true, but there's no planned leak -- planned venting into the auxiliary building.

agbl4

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

CHAIRMAN HENDRIE: No. Furthermore, there will be containment isolation valves, double isolation valves on the line out and the line in. So you've got a way of clamping it off if something happens.

COMMISSIONER AHEARNE: As with the air, that's what they are (inaudible) -- There's a question, they didn't want to (inaudible) both recombiners?

CHAIRMAN HENDRIE: They wanted to get them both up and ready to run.

Well, I have a notion that they're probably located close together because you'll almost certainly have a single line out and a header to parallel lines. And once you've got one of them running hot as holy smokes you're going to be in rough shape to get in there and piddle around with the other one. Furthermore, in getting Number Two running, why you might want to look up and see how Number One is adjusting and so on.

So I've been encouraging Harold and Dick to, you know kind of keep the pressure up, to keep that effort up because I think it's very desirable to get those things running and that circulation established so we can start controlling the hydrogen levels in there.

Furthermore, we've got 80,000 cubic feet at 30 # gauge in a waste gas tank which is from the -- the gas evolved from that letdown process. It's highly desirable to pump that back into the containment.

.527

agbl5

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

On the other hand, if most of that is hydrogen. You want to stop and do a few calculations and just see if you're going to run flammable, you know.

So there again, is a nice reason to have a full going in and cleaning the hydrogen out.

COMMISSIONER KENNEDY: Is there anything that could be done about increasing the clotting capability of the filters, so -- a better filtering system --

CHAIRMAN HENDRIE: In the auxiliary building?

CHAIRMAN HENDRIE: -- so that we can vent some of this stuff from the auxiliary building without substantially increasing off-site releases?

CHAIRMAN HENDRIE: Now the filters they've got in there, in terms of their ability to remove material, are as good as you can do. The only thing that you could do, and it would be rather cumbersome because you're dealing with large cross-section ducts and they have to be dead tight and so on, would be to double the capacity.

See those filters at the present time are taking out all the iodine, as far as we can tell, and anything else that comes through it except the noble gases, which are just untouchable, except maybe by cryogenic trapping and that's, that's a little too far out.

COMMISSIONER AHEARNE: So that that essentially wouldn't help out any?

agbl6

1 COMMISSIONER KENNEDY: No.

2 CHAIRMAN HENDRIE: No, so the double filter wouldn't improve
3 the removal factor. All you could do is to say is increase
4 the capacity.

5 COMMISSIONER KENNEDY: There's nothing that will take the --

6 CHAIRMAN HENDRIE: And that's my way --

7 COMMISSIONER KENNEDY: Except cryogenic, nothing will touch the
8 noble gas.

9 CHAIRMAN HENDRIE: No.

10 In the cryogenic systems, (expletive) you've got to hav
11 hydrogen or helium refrigerators and all kinds of (inaudible)
12 which I just don't want to burden the (inaudible) operating
13 staff.

14 CHAIRMAN HENDRIE: And the business of trying to double up those
15 filters, I don't know, I think that would be a tough proposition
16 to get in there and try to -- well, it would be a long-term
17 job, you'd have to prebuild the set of ducts, the set of
18 filter banks that are all welded (inaudible) -- pressure test
19 and leak test the whole assembly and then have, plan the way
20 that you could slide it over.

21 But then you have to go through a stage where you're
22 opening a hole in the auxiliary building in order to make --
23 couple it on and there are ways to do that without having an
24 open hole, but it's a long-term proposition and, you know, that's
25 some weeks of work to get that done.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

COMMISSIONER KENNEDY: I must say, in listening to the posture as Roger sees it, it seems to me that from a general perspective, the best thing that we can do is to try to stay in this kind of mode for some days, if that's possible.

CHAIRMAN HENDRIE: Yeah.

COMMISSIONER KENNEDY: Simply because every hour that goes by there is a better handle being gotten on a) what the situation really is and b) therefore, what your options really are as contrasted with what you they are and more chance to run all the calculations against each of those options to find out where your optimums are.

CHAIRMAN HENDRIE: And sort of day by day we're getting more equipment operable, ready to go and, as Roger says, there is every reason to line up alternates in case these exchangers -- have it all in place before you go over to that mode.

And I think in the next couple of days, the efforts by GPU, gather in strong teams to supplement the operating group and the engineering support groups, will begin to bear some fruit and that will considerably increase the effectiveness of the whole operation.

COMMISSIONER AHEARNE: (Inaudible) I think some probably tomorrow, maybe, is the best time. But after you've got all these other calculations, the groups that are looking at what are the procedures (inaudible). The next stop is very important, because that's as I understand it we're looking at is what if

1 something goes wrong --

2 CHAIRMAN HENDRIE: That's exactly right. What do we do now?

3 He's worried that the operating staff has not had
4 a chance to think some of that stuff through and he feels
5 negative about it.

6 COMMISSIONER AHEARNE: That's absolutely true.

7 CHAIRMAN HENDRIE: Well the upcoming teams will add considerably
8 to that --

9 COMMISSIONER AHEARNE: The other sets of procedures are when you
10 are going to try to remove the bubble, how do you go about it?

11 CHAIRMAN HENDRIE: Yeah. Just so. In a sense, that's
12 a separate set of endeavors.

13 COMMISSIONER AHEARNE: But based upon, at least, an initial look
14 at that and probably some of the estimates, the revised estimate
15 of this hydrogen problem, sometime tomorrow we ought to try
16 and give the Governor a sense of --

17 CHAIRMAN HENDRIE: When.

18 COMMISSIONER AHEARNE: -- when --

19 CHAIRMAN HENDRIE: Yeah.

20 COMMISSIONER AHEARNE: -- because you've got three-quarters of a
21 million people now within a 20 mile region which are tense.

22 CHAIRMAN HENDRIE: Yeah.

23 COMMISSIONER AHEARNE: And as Roger and Ed were talking about the
24 human nature problem of events--predict what the people in the
25 plant are going to want to try to do, we also have the human

agbl9 1 nature problem of this, these people sitting there under this
2 increasing tension.

3 And so I think we owe it to the Governor and he
4 owes it to the people to try to give them some idea if it's
5 going to give them some idea

6 COMMISSIONER KENNEDY: You're right, you're right. I'm not sure
7 that tomorrow, I'm not sure we'll be there tomorrow, I mean,
8 I just don't have that (inaudible) --

9 CHAIRMAN HENDRIE: But as soon as we possibly can, Marty
10 (inaudible) --

11 COMMISSIONER KENNEDY: The principle is exactly right, it ought
12 to be done sooner rather than later, but I guess -- I'm not
13 sure that from what I can see thus far, I'm not sure that
14 we're that far along.

15 COMMISSIONER AHEARNE: For example, I think it would be very
16 useful to let the people know that if it is still solid, the
17 way we're thinking tomorrow, we don't see any real likelihood
18 of an emergency. There is a chance, like it's a 1 to 5 percent
19 chance that something significant is happening.

20 But other than that, the plan is to compare the
21 procedures carefully and then at the appropriate time decide.
22 And if a decision is made, as a precautionary thing.

23 COMMISSIONER KENNEDY: There will be plenty of time.

24 COMMISSIONER KENNEDY: It will not be an emergency matter. There
25 will be (inaudible) --

agb20

(Simultaneous group discussion.)

COMMISSIONER AHEARNE: And so a whole series of actions will take place some time in the next X. X may be in the next few days, X may be next week.

But that information -- we're relatively comfortable with it, we're (inaudible).

COMMISSIONER KENNEDY: Yeah, I think that -- and I think the way you put it is just about the way it ought to be put.

CHAIRMAN HENDRIE: All right. Let me go and call Harold, because I want to get him -- call the Governor back and make an arrangement.

COMMISSIONER KENNEDY: What are your plans now?

CHAIRMAN HENDRIE: I think I'll call Harold, then I probably want to talk to several of the Staff people here about the plant details and then I'm going to head back to the office for a little while.

It seems to me I don't, at the moment, see any need for a continued Commission collegial presence.

COMMISSIONER AHEARNE: Yeah, we had a reason

CHAIRMAN HENDRIE: Yeah.

(Recording difficulties.)

COMMISSIONER KENNEDY: What about tomorrow?

What time?

(End of tape)

5:03 p.m. Chairman Hendrie, Commissioners Kennedy and Ahearne go to another area of Response Center.

D-3A