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NUCLEAR REGULATORY COMMISSION

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IN THE MATTER OF:

PUBLIC MEETING

BRIEFING ON THREE-MILE ISLAND INCIDENT

Place - Washington, D. C.

Date - Thursday, 29 March 1979

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Telephone:  
(202) 347-2700

ACE - FEDERAL REPORTERS, INC.

Official Reporters

444 North Capitol Street  
Washington, D.C. 20001

NATIONWIDE COVERAGE - DAILY

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

PUBLIC MEETING

BRIEFING ON THREE-MILE ISLAND INCIDENT

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

Thursday, 29 March 1979

The commission met, pursuant to notice, at 9:55 a.m.

BEFORE:

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

PRESENT:

Messrs. Eisenhut, Gossick, Jordan, Kelley, Bickwit,  
Grimes and Davis.

P R O C E E D I N G S

#1

(9:55 a.m.)

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2  
3 CHAIRMAN HENDRIE: If the Commission could come to  
4 order, my understanding is that this morning's briefing on  
5 the events yesterday at Three Mile Island Station -- that the  
6 Commission yesterday afternoon in effect voted a short-notice  
7 meeting for this briefing, so that we do not need formally to  
8 take that matter up, counsel?

9 MR. BICKWIT: That's correct.

10 CHAIRMAN HENDRIE: You will notice that we have,  
11 I think perhaps for the first time, camera coverage in the  
12 room, which in the circumstances seem to Commissioner Gilinsky  
13 and I to not be unreasonable.

14 Now, Lee, why don't you go ahead and introduce  
15 people.

16 MR. GOSSICK: Thank you, Mr. Chairman.

17 Commissioners, we have an overall briefing on the  
18 events at Three Mile Island, its current status. Mr. Eisenhut  
19 and Mr. Jordan will provide this briefing.

20 Before they start, I would like to give you just  
21 some overall information on the status of the operation up  
22 there.

23 Region I has a team of 11 inspectors on the site.  
24 There are 7 health physicists -- health physics specialists;  
25 and 4 operations inspectors; and we have additional assistants

1 being dispatched from other regions.

2 EG&G, a contractor for NRC, has two specially  
3 equipped helicopters and a motorized van performing radiation  
4 surveys at the site, with liaison being furnished by DOE.  
5 They have a senior official on the site up there coordinating  
6 the activities of the equipment I just mentioned, the so-called  
7 "arms equipment" out of Andrews, and the two radiological  
8 assistance teams from Brookhaven National Laboratory that are  
9 performing surveys and obtaining and analyzing environmental  
10 samples in the site vicinity.

11 The Coast Guard provided air transport for one of  
12 these teams.

13 A team comprised of seven senior people from the  
14 Nuclear Reactor Regulation Staff will be traveling to the  
15 site for the purpose -- this morning -- of monitoring the  
16 activities of the licensee in recovery operations.

17 NRR will assume lead responsibility for the  
18 situation up there on the team's arrival at the site. Until  
19 then, I&E, Inspection and Enforcement, are in charge.

20 The Bureau of Radiological Health of HEW, EPA, and  
21 the State of Pennsylvania all are providing support in the  
22 form of collection and analysis of environmental samples in  
23 the environment locally.

24 A special investigating team is being assembled to  
25 examine in detail the causes, the sequence of events, and the

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1 adequacy of corrective measures. The investigation will  
2 commence within the next two or three days.

3 Throughout the incident, NRC has maintained and  
4 is still maintaining the Operations Center on a continuous  
5 basis, the headquarters, and has provided frequent status  
6 reports on the situation to other interested federal and  
7 state agencies. They have been updated as of this morning  
8 with the latest status.

9 NRC's Region I has also continued to keep in  
10 continuous operation its Operations Center since the initial  
11 notification about 7:45 yesterday morning.

12 The Public Affairs Office from NRC's Region I has  
13 been relocated to the vicinity of the site to respond to  
14 inquiries from members of the press covering the incident at  
15 the scene, and additional Public Affairs assistance for the  
16 Region I office was dispatched from Atlanta last night from  
17 our Region III office.

18 There have been three press announcements that  
19 have been released so far, the last one at just about midnight  
20 last night.

21 Unless there are any questions, I will ask  
22 Mr. Eisenhower and Mr. Jordan to go ahead with the briefing on  
23 the details.

24 Darrell?

25 MR. EISENHUT: Go ahead, Mr. Jordan.

1 MR. JORDAN: The Three Mile Island facility is one  
2 unit of a two-unit facility located 10 miles southeast of  
3 Harrisburg. The license power of the Unit 2 reactor is  
4 2772 megawatts thermal. The unit was constructed by UE&C.  
5 Babcock and Wilcox is the nuclear steam supply system designer.

6 The Unit 1's reactor is presently in a refueling  
7 status. Preceding this event yesterday, the Unit 2 reactor  
8 was operating at a power of 98 percent. We understand that  
9 the incident initiated at about 4:30 a.m. yesterday.

10 The Region I office --

11 COMMISSIONER GILINSKY: Excuse me. Would you get  
12 the microphone closer?

13 MR. JORDAN: Certainly. I'm sorry.

14 The Region I Office of Inspection and Enforcement  
15 was notified at 7:45 a.m. The Regional Office is near  
16 Philadelphia, Pennsylvania, in the King of Prussia area.

17 The response center in the region was activated a  
18 little after 8:00, and the headquarters -- the NRC Headquarters  
19 Office was notified at 8:35, and the center was activated in  
20 the Phillips building.

21 Shortly thereafter, at approximately 8:45, the  
22 Region I response team -- which initially consisted of some  
23 5 individuals -- was dispatched to the site, and then  
24 subsequent individuals were dispatched shortly thereafter.

25 The incident was initiated as a result of a feedwater

1 pump trip, and I think we'll need to start working on some  
2 slides.

3           Could we have slide number five, please.

4           (Slide.)

5           I think it would be appropriate for Darrell to  
6 give just a brief description, a general description of the  
7 reactor system at this point.

8           MR. EISENHUT: Thanks, Ed.

9           This is a hand-sketch we put together of a B&W 2  
10 applicance. You see on the right the reactor pressure vessel  
11 and the two steam generators which constitute the primary  
12 loop. The little reactor coolant pump is the RCP at the  
13 bottom. There are actually two of those for each of the loops.

14           The pressurizer is at the top with the pressurizer  
15 relief valve. The secondary system you see on the left coming  
16 out of the steam generator, the steam normally flows through  
17 various valves to the turbine where it turns the generator.

18           The steam is condensed back to cooling water in the  
19 condenser, flowing back through the various pumps and cleanup  
20 systems, back to the steam generator.

21           The sequence of events that occurred early yester-  
22 day morning is a little bit sketchy at this time, but as we  
23 understand them now there was apparently a problem with the  
24 cleanup system in the secondary loop.

25           The cleanup system in the secondary loop resulted



1 in the disabling of that loop and the pumps on the steam  
2 generator.

3 Since the water flow back to the steam generator  
4 was lost, the turbine valves closed, tripping off the  
5 turbine. So we had a situation of a loss of normal feedwater  
6 turbine trip. Upon turbine trip, you get a reactor trip.

7 Now the normal sequence of events would be that you  
8 would continue to cool the plant down on the auxiliary or  
9 emergency feedwater system. There was apparently a problem  
10 using the feedwater system and the plant was not normally  
11 being cooled down to the steam generator.

12 The main coolant loop therefore began to heat up  
13 and to pressurize.

14 COMMISSIONER BRADFORD: Jarrell, can you give us  
15 some idea of the time elapsing in the events you are  
16 describing?

17 MR. EISENHUT: I would like to. We really don't  
18 have them yet.

19 The sequence of events that we are just generally  
20 discussing occurred sometime early yesterday morning. The  
21 early event we believe began at 4:00 a.m. So this sequence  
22 of events occurred in the early hours of yesterday morning.

23 As Ed mentioned, we were notified about 8:45, and  
24 the NRR staff began following the development about 6:45  
25 yesterday morning.

1 COMMISSIONER BRADFORD: And Region I was notified  
2 earlier?

3 MR. EISENHUT: 7:45.

4 MR. JORDAN: 7:45.

5 MR. EISENHUT: It was just a simple matter of the  
6 Incident Center here was activated at 8:35. So it was just  
7 a matter of making the phone calls, getting the people  
8 together, and activating the center as fast as I&E could  
9 possibly do it.

10 COMMISSIONER BRADFORD: Do we know yet why it was  
11 3 and 3/4 hours before Region I was notified?

12 MR. EISENHUT: We do not know.

13 It is one piece of information we will be following  
14 up on of course. We just don't have it available at this  
15 time.

16 MR. EISENHUT: The system began heating up. The  
17 primary loop began -- from the pieces we're piecing together,  
18 anyway, it appears that the primary system heated up, and the  
19 pressurizer relief valve opened with high pressure.

20 CHAIRMAN HENDRIE: Darrell, what do you we know  
21 about how complete a loss of feedwater and emergency feedwater  
22 there was?

23 MR. EISENHUT: We know no details on the actual --  
24 the extent, the sequence, the timing, the degree to which we  
25 lost the main feedwater, auxiliary feedwater, and in fact the

1 sequence of events, as I am going through them, as I said,  
2 are really pieced together based on information that we had  
3 before us literally from yesterday morning until this morning.

4 COMMISSIONER AHEARNE: Darrell, I think it is  
5 preliminary; correct?

6 MR. EISENHUT: It is very preliminary.

7 COMMISSIONER AHEARNE: And at some later stage  
8 when the tapes, et cetera, have been analyzed, then you will  
9 have a firmer view?

10 MR. EISENHUT: Yes, sir.

11 And as Mr. Gossick mentioned, there is a team of  
12 people on the way to the site right now to try to start  
13 helping piece more of the pieces together, and to try to pin  
14 down these events.

15 Apparently we now believe the pressurizer relief  
16 system relieved -- it is supposed to relieve into a quench  
17 tank. It apparently continued to relieve and ruptured a  
18 rupture disk, which is designed to rupture in the quench  
19 tank.

20 This means the primary system coolant --

21 COMMISSIONER KENNEDY: That's when the tank is  
22 full, or nearly full?

23 MR. EISENHUT: Yes. The tank is a small tank --

24 COMMISSIONER KENNEDY: To allow continued  
25 evacuation.

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MR. EISENHUT: Yes. It blows into the quench tank through the rupture disk into the reactor containment floor.

CHAIRMAN HENDRIE: I take it we don't know whether the relief valve hung open, or whether there was simply continued blowdown in order to relieve the energy buildup in the primary system?

MR. EISENHUT: We don't know whether it hung open. We do have an indication that it hung open enough to blowdown the system; that you had a low pressurizer level indication, and you would of course also have had a steam indication in the containment, safety injection, and the ECCS system did turn on.

The -- we understand it automatically came on on low-pressurizer level.

The ECCS system did actuate as it was designed to, we believe. It injected water into the reactor vessel system.

We have -- some information we have also indicates that some moments later, the safety injection system of the ECCS system was manually secured.

COMMISSIONER GILINSKY: Turned off.

MR. EISENHUT: Turned off, yes, sir. I'm sorry.

This is basically our understanding of the sequence of events that happened. There now is a gap in the sequence of events that we have.

1 The next item that we do know is that high  
2 radioactivity was noted in the reactor coolant system sample  
3 lines. It was this activity, high radiation, that in fact  
4 led the site to be declared "emergency" yesterday morning.

5 COMMISSIONER AHEARNE: Did they subsequently turn  
6 the ECCS system back on?

7 MR. EISENHUT: Yes, sir. The ECCS system was  
8 operable for a considerable period of yesterday until later  
9 in yesterday a more normal mode of cooling was established.

10 COMMISSIONER AHEARNE: You haven't yet gotten an  
11 explanation from them as to why they manually turned it off?

12 MR. EISENHUT: We do not. That is certainly  
13 another area we will be looking into.

14 COMMISSIONER GILINSKY: Do you know how long it was  
15 off?

16 MR. EISENHUT: No, we do not.

17 MR. JORDAN: No, I do not.

18 COMMISSIONER KENNEDY: What time was this high  
19 level of radioactivity noticed first?

20 MR. EISENHUT: About 7:00 a.m. yesterday morning.

21 COMMISSIONER KENNEDY: That is when the ECCS system  
22 came on first?

23 MR. EISENHUT: No. The ECCS system apparently  
24 actuated sometime before that. The high radioactivity however  
25 was noted in the sample lines about 7:00 a.m. As I said, the

1 sequence of events was a little bit sketchy after that. The  
 2 plant was -- the plant crew had the plant in somewhat of an  
 3 emergency cooldown mode for a considerable period of yesterday.

4 There was another group of people who were of course  
 5 monitoring very closely the radiation levels in the contain-  
 6 ment, both on-site and off-site.

7 And, Ed, maybe you would like to summarize the  
 8 kinds of radiation levels we are seeing.

9 MR. JORDAN: Okay, the off-site measurements of  
 10 radioactivity have been monitored continuously by both federal,  
 11 NRC, and Department of Energy pertinent state personnel since  
 12 about 9:00 a.m. on Wednesday.

13 These measurements, which are both air, water, and  
 14 soil in a general sense, indicate that there is no immediate  
 15 threat to health and safety.

16 The off-site airborne radioactivity is almost  
 17 exclusively noble gases, primarily xenon 133. There have  
 18 been small amounts iodine detected in one of several milk  
 19 samples. This is a very slight increase above the threshold  
 20 of detectability at this point.

21 We believe that the off-site airborne radioactivity  
 22 has resulted in minimal exposures to the public in a northerly  
 23 direction from the plant -- and I wonder if I could have your  
 24 chart.

25 Let's have slide 3, please.

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1 (Slide.)

2 In the northerly quadrant, we had a plume, if you  
3 will, of noble gases that had drifted in a northerly direction  
4 and the dose rates resulting from the plume were of the  
5 order of 2 to 5 millirem per hour. Throughout this event,  
6 there has continued to be a low-level release of the noble  
7 gases.

8 COMMISSIONER GILINSKY: What sort of distance is  
9 that?

10 COMMISSIONER AHEARNE: You aren't implying that --  
11 you have a large rosette which is marked with the plant at  
12 the center. You're not implying that that whole shaded area  
13 was covered by --

14 MR. JORDAN: No, the distances we're talking about  
15 are out to 5 or 10 miles that we are monitoring.

16 COMMISSIONER AHEARNE: Those are the inner  
17 circles on this?

18 MR. JORDAN: That's correct.

19 Could we have slide 11, please? It's not as busy,  
20 and I think it will put us in better context.

21 (Slide.)

22 Okay, the Three Mile Island Station has a community  
23 directly across the river from it, 2-1/2 miles north -- I'm  
24 sorry -- 2-1/2 miles north of the site, Middletown. And the  
25 dose rates there have been of the order of 1-1/2 -- 1 to 1-1/2

1 milliroentgen. And these are primarily we believe due to  
2 the xenon 133. It's just about where the "3" is, I believe.

3 COMMISSIONER GILINSKY: Where is Gouldsboro?

4 MR. JORDAN: Gouldsboro is just about due west,  
5 across the river.

6 MR. GOSSICK: Just about a mile away.

7 MR. JORDAN: Harrisburg, which is 8 miles north,  
8 has been -- very early on, was at background. We have no  
9 measurable activities, and we have had fluctuations on the  
10 order of .8 milliroentgen due to xenon 133.

11 COMMISSIONER GILINSKY: What are those dotted  
12 lines there? Is that related to this incident? Or is that  
13 something else?

14 MR. JORDAN: Those were the sectors of wind shift  
15 that we have gone through. So that we have had a shifting  
16 generally from -- towards the northeast to the northwest.

17 COMMISSIONER KENNEDY: Which way is it blowing now?

18 MR. JORDAN: Okay, as of this morning, I believe  
19 the wind is blowing west, towards the west.

20 COMMISSIONER AHEARNE: It's also raining, isn't it?

21 MR. JORDAN: Yes, there was a light rain that  
22 occurred about 5:00 a.m.

23 COMMISSIONER GILINSKY: Where is the airport?  
24 There were readings taken there, weren't there (indicating),  
25 so it's pretty close to the station?



1 MR. JORDAN: Yes.

2 MR. EISENHUT: About 2, 2-1/2 miles.

3 COMMISSIONER GILINSKY: What was the reading there?

4 MR. EISENHUT: 1 of 12 millirem.

5 COMMISSIONER GILINSKY: What was it?

6 MR. JORDAN: 1 of 12.

7 COMMISSIONER KENNEDY: Was that sort of an  
8 episodic thing? Or was it --

9 MR. JORDAN: The readings are fluctuating somewhat  
10 as winddrift causes the plume to shift. And as far as an  
11 explanation of the continuing release, this water that was  
12 released from the reactor vessel into the quench tank which  
13 overflowed into the containment building sump, when --  
14 apparently when the safety injection was reset, the containment  
15 building isolation was also reset.

16 So that that water was pumped from the containment  
17 building sump into the auxiliary building. The auxiliary  
18 building is a closed ventilation area. It has the filters.  
19 It has the stall differential pressure, negative pressure, so  
20 that you have controlled paths of radioactivity.

21 The quantity of water that was pumped to the  
22 radiation waste holding area was greater than the capacity of  
23 the tanks. So that that water overflowed on the floor. It  
24 was at that point that the noble gases were evolved and then  
25 swept out of the building through the ventilation building

1 stack.

2 COMMISSIONER GILINSKY: How much water seems to have  
3 gotten pumped over there?

4 MR. JORDAN: We do not have a measure.

5 CHAIRMAN HENDRIE: Don, do you know what the tank  
6 capacity is, approximately?

7 MR. DAVIS: Yes. The tank capacity is about 450,000  
8 and about 300,000 gallons was pumped out of the tank.

9 CHAIRMAN HENDRIE: But that's condensate storage.

10 MR. JORDAN: That's condensate storage.

11 MR. DAVIS: That's storage and water.

12 CHAIRMAN HENDRIE: No, we're talking about waste  
13 storage tanks that the quench overflow went to.

14 MR. DAVIS: That was basically the boric acid from  
15 the pumpwater storage tank that was pumped by the high-  
16 pressure injection pump into the reactor, out through the  
17 relief valve into the sump containment for water, and that  
18 was pumped to the auxiliary building.

19 MR. JORDAN: We really don't know all of the  
20 quantity --

21 CHAIRMAN HENDRIE: Not all of it, I would think.

22 MR. DAVIS: No, not all of it.

23 CHAIRMAN HENDRIE: I am just trying to find a  
24 measure of how much is over there in the auxiliary building.

25 MR. EISENHUT: The figure that Don mentioned is the

1 storage tank is 450,000 gallons. Certainly --

2 CHAIRMAN HENDRIE: The tanks I'm interested in are  
3 the holding tanks --

4 MR. EISENHUT: Yes. There are a couple of thousand  
5 gallons.

6 CHAIRMAN HENDRIE: They're very small -- okay,  
7 a couple of thousand gallons.

8 MR. EISENHUT: Yes, they're small.

9 I was just going to say that the sequence is that  
10 a very small fraction of that would logically have gone over  
11 to the other building.

12 MR. DAVIS: It's still in the containment.

13 CHAIRMAN HENDRIE: How much iodine sensing have  
14 we had off-site?

15 MR. JORDAN: We've taken iodine samples, and we've  
16 had them counted, and we do not see iodine.

17 CHAIRMAN HENDRIE: Okay, so apparently the filters  
18 are in fact scrubbing the iodine release from this carryover  
19 water in the auxiliary building, and what we are seeing outside  
20 then are the noble gases which are not filterable.

21 MR. JORDAN: Yes.

22 MR. GRIMES: Other than that one milk --

23 MR. JORDAN: That's correct. The only iodine  
24 indication we have is the one milk sample, which is --

25 CHAIRMAN HENDRIE: Is that -- is it clear that that's

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1 a --

2 MR. JORDAN: It's not clear --

3 CHAIRMAN HENDRIE: -- validated sample?

4 MR. JORDAN: It's only slightly above the threshold  
5 of detection.

6 CHAIRMAN HENDRIE: Yes. That's what I understood.

7 MR. JORDAN: So that we're --

8 CHAIRMAN HENDRIE: Those measurements on the  
9 threshold of detection, you're never quite sure --

10 MR. GOSSICK: It was 1 out of 6, and the one they  
11 got this very low reading on was from a cow on stored feed in  
12 a barn.

13 (Laughter.)

14 CHAIRMAN HENDRIE: Yes, that sounds more like a  
15 measurement difficulty down at the threshold of detection.

16 Okay, so it's noble gas activity which is coming  
17 out of the excess water pumped over from the primary system,  
18 from the primary containment.

19 MR. GRIMES: I don't think we should leave the  
20 impression that it's only a minor amount of water, maybe a  
21 small fraction. There may be still tens of thousands of  
22 gallons in the auxiliary building which is continuing to emit  
23 the gases.

24 CHAIRMAN HENDRIE: What do -- Do we know what the  
25 plant configuration is in the auxiliary building? Is it in

1 some sort of sump? What's -- Do we have any sense on how  
2 physically that fluid lies there?

3 MR. EISENHUT: Yes. That's one of the things we're  
4 working with the licensee right now on. We're trying to find  
5 out where the sump lies and what equipment might be affected  
6 by it, how it would be shielded, and where it could get to.

7 We are also looking at possible ways -- or the  
8 licensee is looking at ways, and we're trying to work with  
9 them to give them whatever assistance we can, as to what they  
10 might be able to do about pumping it somewhere -- pumping it  
11 into another tank, pumping it back into containment, pumping  
12 it into a better shielded contained location.

13 COMMISSIONER AHEARNE: Have you been in contact  
14 with the A&E, also, on this?

15 MR. EISENHUT: Yes, we've been in contact with the  
16 A&E since yesterday morning, because of course they certainly  
17 are -- I'm sorry, they've corrected me. It's really the  
18 nuclear steam supplier. We haven't really been in contact  
19 that I'm personally aware of with the A&E. I assume we have  
20 been.

21 MR. GOSSICK: I was told last night we were.

22 MR. EISENHUT: I guess a couple of comments on the  
23 present plant configuration as it now stands.

24 Last night the operational mode of the plant was  
25 somewhat stabilized by starting up a reactor coolant pump. So

1 one of the main loops was started up. They were drawing a  
2 bubble in the pressurizer, and the cooling was being done  
3 through the steam generator.

4 They were getting some auxiliary flows, and  
5 they were in fact in a somewhat more normal cooldown mode.  
6 They have been in that mode essentially since late yesterday.

7 CHAIRMAN HENDRIE: What kind of temperatures are  
8 you seeing hot leg and cold leg?

9 MR. EISENHUT: That was my next sentence.

10 At the present time, the cold leg temperature at  
11 6:30 this morning was about 285 degrees F. It's essentially  
12 at equilibrium, cold and hot leg both. They're running at  
13 around 30 pounds on the steam generator.

14 And to give you an idea of how it's coming down,  
15 it dropped 1 degree from 6:30 to 6:45. We have essentially  
16 been monitoring this, both the temperatures in the hot and  
17 cold leg, pressures in the pressurizer, temperatures in the  
18 pressurizer, level in the pressurizer, on essentially about  
19 every-15-minute increments.

20 COMMISSIONER AHEARNE: Are they still aiming at  
21 trying to get the RHR?

22 MR. EISENHUT: Yes, the primary goal right now is  
23 to get the plant down to a temperature configuration where  
24 it can switch to the RHR mode.

25 COMMISSIONER BRADFORD: What would that be?

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1 MR. EISENHUT: The pressure must be below 400,  
2 below about 400 psi. The temperature limitation is also in  
3 that same range, but they are already down to 285, so they  
4 are almost there.

5 The temperature limit at one point was thought to  
6 be about 280, but I -- they can -- we believe that they can  
7 get to the RHR mode as far as temperature is concerned, at  
8 this point.

9 COMMISSIONER GILINSKY: They're only using one  
10 steam generator. Is that right?

11 MR. EISENHUT: Yes. One steam generator is being  
12 used at this time. A second steam generator apparently has  
13 a leak, primary to secondary.

14 We are not sure that that leak occurred during  
15 this transient accident situation, or whether in fact it  
16 occurred somewhat before that situation.

17 CHAIRMAN HENDRIE: We're seeing some activity in  
18 the secondary side, then.

19 MR. EISENHUT: Yes, we are.

20 MR. GRIMES: That's based on one sample early in  
21 the incident. They took a sample from each and could not find  
22 any activity in one loop, and found some activity in the other  
23 loop, and decided to just use the loop they knew was clean.

24 CHAIRMAN HENDRIE: Do they -- I don't remember.  
25 Do they have isolation capability where they can lock a loop

1 out?

2 MR. GRIMES: No, but they just don't --

3 CHAIRMAN HENDRIE: -- don't pump it from the --

4 MR. EISENHUT: No primary access.

5 MR. GRIMES: They isolate the secondary, but they  
6 just don't allow the steam to go out --

7 COMMISSIONER KENNEDY: So they can isolate the  
8 secondary.

9 MR. EISENHUT: Yes. They do have isolation  
10 capability in the secondary.

11 I think in --

12 CHAIRMAN HENDRIE: There were some -- as I would  
13 call in yesterday to get progress reports, there were some  
14 hot-leg/cold-leg temperature differences which seemed  
15 peculiar to me, and I would be interested in finding out what  
16 we understand about those.

17 MR. EISENHUT: Yes. We had some quite large hot-leg  
18 cold-leg temperature differentials yesterday of maybe 2- to  
19 300 degrees F.

20 Our only belief may be that it was associated with  
21 some steam binding, perhaps maybe not steam as much as a  
22 bubble somewhere in the system.

23 The system was not flowing by natural circulation.  
24 Because of that, the licensee elected to go on a path of  
25 bringing the system up solid, and heating it up and bringing



1 it back to pressure to try to either collapse or do away  
2 with any bubbles in the system.

3 He was on a very deliberate approach to do this,  
4 very methodical, and it took a long time. He brought the  
5 system back solid, and after he got the system solid there  
6 was a period of time where the pressurizer heaters were out.

7 The pressurizer heaters were restored, and they  
8 began to start drawing a bubble on the pressurizer. They  
9 drew a small bubble on the pressurizer, and then they tried  
10 to use the pressurizer sprays. But the bubble was too small,  
11 and using the pressurizer sprays just ramped the situation  
12 back up and they lost the bubble, or part of the bubble. It  
13 was going in the wrong direction.

14 And it's been oscillating in this situation. They  
15 have not yet, as of when we left, had a large enough bubble  
16 to be able to turn on the pressurizer sprays to be effective.

17 COMMISSIONER BRADFORD: It's the effort to get rid  
18 of the steam binding, is it, that prevents their being able  
19 to get the pressures down to a point that they can go on the  
20 PWR system?

21 MR. EISENHUT: No, the system is -- they've also --  
22 the sequence of events get even more complicated, because  
23 for awhile they lost letdown flow, so they really couldn't be  
24 lowering the pressure even after they thought that they may  
25 have eliminated the bubble.

1           The situation at this point is, they're letting  
2 the situation gradually slowly cool down to the point where  
3 they could turn on the pressurizer sprays, for example, and  
4 drop the pressure enough to get to the point where RHR could  
5 be turned on.

6           While this is being very slowly -- the temperature,  
7 as I indicated a minute ago, is cooling down very slowly. The  
8 licensee is checking to verify, of course, that all of his  
9 RHR system is in a good configuration and a good situation.

10          He's checked all his valve alignments to be sure  
11 that the valves are in fact aligned properly or could be  
12 aligned properly, and being sure the RHR system is in good  
13 shape.

14          We have every reason to believe at this point -- or  
15 we have no reason to believe it's not.

16          COMMISSIONER AHEARNE: What can you say about the  
17 core? Anything, yet?

18          MR. EISENHUT: We can't really say too much about  
19 the core, except we can make one inference from the activity.  
20 The activity levels that we have seen inside the containment  
21 would infer that we have had fuel failure. To the degree of  
22 fuel failure, it's just unclear.

23          COMMISSIONER AHEARNE: What are the readings that  
24 you're getting inside?

25          MR. EISENHUT: The last reading at the operating

20 178

1 deck was 10R per hour. We are still receiving --

2 COMMISSIONER KENNEDY: At the "operating deck," you  
3 say?

4 MR. EISENHUT: At the operating deck, yes.

5 We are still receiving information that states  
6 there is a very high level in the dome of the containment on  
7 one monitor on the order of thousands, many thousands of rad  
8 per hour, 20,000 rad per hour.

9 COMMISSIONER BRADFORD: Are there other monitors  
10 in the dome in the containment, as well, that are giving a  
11 different reading?

12 MR. EISENHUT: No, this is one monitor that is  
13 reading in the dome at this very high level. Other locations  
14 in the containment are not reading that high level. So it  
15 may well -- at this point, based on the information we see,  
16 that appears to be in all likelihood a misleading indication.

17 CHAIRMAN HENDRIE: It sounds like instrument --

18 MR. EISENHUT: It sounds like an instrument  
19 problem, yes.

20 COMMISSIONER BRADFORD: But it has in fact been  
21 going up since yesterday.

22 MR. EISENHUT: No, it went up yesterday, probably  
23 earlier in sort of the mid-day yesterday, to about 20,000,  
24 and it has pretty much stabilized and has been reading that.

25 Very early yesterday, it did go up. The first

1 indication we had was about 600R per hour, and then it was  
2 up to a few thousand, and up to 6000, and 10,000, and 20,000.

3 COMMISSIONER AHEARNE: But right outside the  
4 containment, it has been coming down, hasn't it?

5 MR. EISENHUT: Yes, that's right.

6 COMMISSIONER KENNEDY: Can you tell us something  
7 about what you are reading outside?

8 MR. JORDAN: I have that figure. At the site  
9 parimeter, the dose rates have ranged up to 20 milliroentgen  
10 throughout this event. At the north gate --

11 CHAIRMAN HENDRIE: Per what?

12 MR. JORDAN: Milliroentgen per hour, yes.

13 The west boundary has ranged up to 28 milliroentgen  
14 per hour. And this has varied depending on whether you are  
15 seeing shine from the actual containment -- the radiation  
16 that's contained within containment -- or whether you're  
17 seeing the drifting plume from the auxiliary building.

18 CHAIRMAN HENDRIE: What's the shine level, sort  
19 of at the site boundary?

20 MR. JORDAN: I don't believe we have separated yet  
21 the plume from the shine. So we have site boundary readings  
22 that are on the order of 25 milliroentgen, and in some cases  
23 they have been as low as 1 milliroentgen.

24 MR. GRIMES: I think we did make a differentiation  
25 of 1 point yesterday. We had some cross-wind doses of about

1 3 millirem on the edge of the island, which would be consis-  
 2 tent with some of the lower readings in the containment that  
 3 we read out.

4 We've also had measurements immediately outside  
 5 the equipment hatch which would corroborate the lower --

6 COMMISSIONER AHEARNE: Outside the equipment  
 7 hatch?

8 MR. GRIMES: Outside the equipment hatch they have  
 9 been falling.

10 COMMISSIONER GILINSKY: What can you say about the  
 11 status of the monitoring helicopters and so on? Are they  
 12 back up?

13 MR. GOSSICK: They were flying up until late last  
 14 night, until the weather turned bad, and I understand they  
 15 stayed on the ground until early this morning. But they're  
 16 back regularly flying surveys now.

17 COMMISSIONER GILINSKY: And do they report  
 18 periodically to us?

19 MR. GOSSICK: They report after each flight to our  
 20 people on the site up there, and that will be fed back to us.

21 COMMISSIONER AHEARNE: What is the status of the  
 22 radiation water -- radioactive water, now? What plans do  
 23 they have?

24 MR. EISENHUT: The latest -- when we were -- just  
 25 left the incident center an hour or so ago, the licensee had

1 yet to decide on the course of action. He's considering a  
 2 number of options, and he is right now looking at all the  
 3 system accommodations that he has to see what options he  
 4 really has before him that are really feasible options.

5 COMMISSIONER AHEARNE: And you're keeping track of  
 6 these options?

7 MR. EISENHUT: Yes. The incident center has been  
 8 manned essentially -- not "essentially," -- completely, 24  
 9 hours since the incident began by a large group of the staff,  
 10 both systems people, off-site consequences people, a variety  
 11 of disciplines, and we have essentially through I&E have a  
 12 link to the site that has been open for conversations back  
 13 and forth literally since the incident began.

14 COMMISSIONER AHEARNE: Will the licensee, once  
 15 they make a decision as to how they propose to go, will you  
 16 have a chance to comment on what decision they're taking?

17 MR. JORDAN: Yes. We are interacting with their  
 18 plans now, with the I&E personnel at the site, and to take  
 19 Darrell's side, NRR has also transmitted or sent people to  
 20 the site who will look at that recovery operation.

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1                   COMMISSIONER AHEARNE: Do you have one individual  
2 who is up there, sort of nominal in charge?

3                   MR. GOSSICK: Mr. Keimig is the I&E representative  
4 there. He is the on-site team leader, reporting back to  
5 us and will remain in charge until we can get the NRR team  
6 there under Mr. Vollmer.

7                   MR. EISENHUT: I think that team should be getting  
8 there, actually about now.

9                   COMMISSIONER AHEARNE: As far as you know, was  
10 there any dumping of water into the river?

11                  MR. JORDAN: No.

12                  Water samples have been taken of the circulating  
13 water discharge, and there has been no indication of  
14 releases of liquid from the plant.

15                  MR. GOSSICK: We got a report last night from some  
16 press announcement that there had been and we checked it  
17 thoroughly and couldn't find any support of that at all.

18                  COMMISSIONER AHEARNE: Are they still pumping into  
19 the auxiliary building, or has that stopped?

20                  MR. JORDAN: No, that apparently ceased sometime  
21 before 7; between 4 and 7 we understand is when that  
22 water was moved into the auxiliary building upon reset of  
23 the isolation.

24                  COMMISSIONER BRADFORD: Why was that done?

25                  MR. JORDAN: We believe it was inadvertent

1 associated with-- and this is conjecture -- associated with  
2 resetting of the safety ejection so that they no longer had.  
3 the containment isolated.

4 Then the natural pathway would be pumping from that  
5 sump to the auxiliary building.

6 COMMISSIONER GILINSKY: How high are the levels  
7 in there?

8 Can the Licensee get people in to work?

9 MR. JORDAN: The auxiliary building, I think was  
10 10 rem was the maximum.

11 COMMISSIONER KENNEDY: 10 rem?

12 MR. JORDAN: Yes.

13 COMMISSIONER GILINSKY: Per hour?

14 MR. JORDAN: Yes.

15 COMMISSIONER GILINSKY: And did they have anybody  
16 working there in the vicinity that they have to go in?

17 MR. JORDAN: Certainly their goal right now is  
18 to collect that water and put it into a tank where they  
19 can control the off-gassing of it through an off-gas scrubbing  
20 system.

21 And as Darrell said, they are progressing in that  
22 direction, but we have no definite knowledge of their plans  
23 right now.

24 COMMISSIONER AHEARNE: The two teams that you will  
25 have up there, what basically, functions, will they begin to

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perform?

MR. GOSSICK: The team up there at present, of course, are the I&E people that I described that are assisting on site right now following the events and communicating back with us.

Mr. Vollmer's group, when they will arrive, will literally assume the responsibility for seeing that the state of the plant is kept in a safe condition; any changes to tech specs and all the things that have to be done to assure the continued safety of everything.

MR. EISENHUT: By that we don't mean taking the primary lead away from the Licensee.

Another way may be to say that when the incident center closes down at the point the event is in a stable mode, Dick Vollmer's team takes over as sort of incident center on the site.

COMMISSIONER AHEARNE: Have you thought through when you are going to go about examining what happened, recommendations and review?

MR. GOSSICK: The investigation team is being formed up now and will start its operation of making the usual complete investigation of everything that happened.

That will probably take, you know, the better part of a month or so, at least, to completely carry that out.

Under our manual chapter on incident response, we

1 have something called incident investigating review  
2 committee, which in the case of the Browns Ferry event was  
3 headed by Dr. Hanzuer.

4 And I am proposing to establish such a review  
5 committee on this one to review the results of the investiga-  
6 tion, the interaction of the various players in this whole  
7 event, and to glean from that lessons learned, any changes  
8 in our requirements and so forth that are necessary.

9 And I will be talking to the Commission about who  
10 I propose to put in charge of that.

11 CHAIRMAN HENDRIE: Other questions?

12 COMMISSIONER AHEARNE: Could you say anything about  
13 the interrelationship as far as you can see it so far, with  
14 the state and the other federal agencies that you had to  
15 coordinate?

16 MR. GOSSICK: My impression is that it has gone  
17 quite well.

18 I think early on there may have been some misunder-  
19 standing as to what was actually going on. But certainly,  
20 with all of the other federal agencies here it went very  
21 smoothly.

22 The DOE emergency operation center was activated  
23 yesterday. We kept the White House situation room informed.  
24 All of the other agencies --

25 COMMISSIONER AHEARNE: How about the state?

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mm5 1 MR. GOSSICK: On the state level, I think  
2 Commissioner Gilinsky spoke to the Governor this morning.

3 COMMISSIONER GILINSKY: Yes, I spoke to the  
4 Governor this morning.

5 MR. GOSSICK: Apparently he seemed to be quite  
6 satisfied.

7 COMMISSIONER GILINSKY: Yes, he was, with the level  
8 of cooperation.

9 MR. GOSSICK: And certainly we got excellent  
10 support --

11 COMMISSIONER AHEARNE: In this kind of situation  
12 it is the state that is responsible in the local area for  
13 the emergency operation, is that correct?

14 MR. GOSSICK: In the event of any decision to  
15 order an evacuation or something like that, yes, that would  
16 be their responsibility working with the Licensee.

17 COMMISSIONER AHEARNE: And as far as the control --  
18 in the control room of the plant, the Licensee?

19 MR. GOSSICK: Yes, the Licensee is fully responsible.

20 COMMISSIONER KENNEDY: Speaking of the control  
21 room, a couple of times we were informed that there was some  
22 low level of activity in the control room.

23 MR. GOSSICK: 'Es.

24 COMMISSIONER KENNEDY: Is that still the case?

25 And, to what level did it actually rise?

1 MR. JORDAN: They have had airborne activity in  
2 the control room at relatively low levels.

3 They took precautionary measures of wearing  
4 face masks with filter charcoal, and eliminating any extraneous  
5 personnel from the control room.

6 So that the levels did not cause the control room  
7 to be uninhabitable. The levels did require or did suggest  
8 some precautions be taken.

9 COMMISSIONER KENNEDY: Is that still the case?

10 MR. JORDAN: It was not this morning.

11 MR. EISENHUT: It has decreased.

12 MR. GRIMES: It was an intermittent wearing of  
13 masks.

14 I think typical reads were .1 to .4 millirem  
15 exposures in the control room. Some airborne activity  
16 indicated.

17 And at one point last night during one period where  
18 fans were turned off, I think it got up to a maximum of 5  
19 millirem. Very, very low levels.

20 CHAIRMAN HENDRIE: What are current site boundary  
21 levels?

22 Do we know?

23 You reflected a range at various points and various  
24 times they had been up to 20 or so millirem per hour. Do  
25 we know what the current situation is? Is it about the same,

7  
1 or what?

2 MR. JORDAN: The current is about the same.

3 They are in the mid-20's now at this point.

4 COMMISSIONER GILINSKY: Does that indicate that  
5 we basically have a continuous source of constant strength?

6 MR. JORDAN: Yes.

7 CHAIRMAN HENDRIE: Very nearly, you are getting a  
8 degassing of that water which is open in the auxiliary building.-

9 COMMISSIONER KENNEDY: You indicated some of that to  
10 an undefined level is shine.

11 MR. JORDAN: Yes.

12 And Brian characterized it as being --

13 MR. GRIMES: Probably only a few millirem if that.  
14 By this morning I would expect that is down to less than a  
15 millirem.

16 COMMISSIONER KENNEDY: So the rest of it then, in  
17 the range of 20, is plume.

18 MR. JORDAN: Yes.

19 CHAIRMAN HENDRIE: And what is controlling this  
20 source then is just a rate of diffusion of the dissolved  
21 gases up to the surface and evaporation --

22 COMMISSIONER GILINSKY: Coming out of solution.

23 CHAIRMAN HENDRIE: -- coming out of solution?

24 COMMISSIONER AHEARNE: A half-life dose of what,  
25 several days?

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MR. JORDAN: Five days.

The xenon 133 being the predominant one.

CHAIRMAN HENDRIE: What is it?

MR. JORDAN: Five days.

COMMISSIONER AHEARNE: So you wouldn't really see much of a change at the moment.

CHAIRMAN HENDRIE: It would be highly desirable to find a way to remove the bulk of that water to a closed storage tank.

MR. JORDAN: That's correct.

CHAIRMAN HENDRIE: However, that operation in itself will probably cause a spike in the release rate, as you stir it up and move it around, you will get a higher out-gassing rate while you are doing it, I suspect.

MR. JORDAN: Yes.

COMMISSIONER GILINSKY: Let's see. Does this suggest that so far only a small fraction of the dissolved gases have been released?

MR. EISENHUT: I wouldn't say a small fraction, Brian, would you?

MR. GRIMES: I don't think we know.

I certainly expect it to continue during today, at some point it should start to decrease.

MR. EISENHUT: We did some rough calculations last night that we might estimate that it might continue for a

1 couple of days. It is not like --

2 COMMISSIONER GILINSKY: Roughly at this rate?

3 MR. EISENHUT: We think it would be dying.

4 COMMISSIONER GILINSKY: I see.

5 So dying off over a period of a couple of days.

6 MR. EISENHUT: Yes.

7 MR. GOSSICK: Isn't the relation of temperature --  
8 initially when the water was very hot, wasn't there very  
9 likely more increased off-gas release than it is now when  
10 it is cooled down?

11 MR. GRIMES: Yes, there should be slow decrease.

12 I think it will be more a function of the inventory  
13 in the water, noble gases dissolved in water would start  
14 depleting that inventory.

15 COMMISSIONER AHEARNE: Licensee was also working  
16 with the reactor manufacturer?

17 MR. EISENHUT: Yes, the Licensee is working with  
18 B&W. B&W established a communication link with the site  
19 sometime yesterday afternoon and has essentially been working  
20 with them through the night also.

21 COMMISSIONER BRADFORD: Is B&W or someone keeping  
22 other similarly designed B&W plants appraised of what  
23 happened here?

24 MR. EISENHUT: Rest assured, that they are  
25 probably keeping themselves appraised of what is going on here

mun10  
1 due to their similarity since most of the B&W plants are  
2 quite similar.

3 COMMISSIONER BRADFORD: How many are there?

4 MR. EISENHUT: Seven in operation, I believe --  
5 six others besides --

6 COMMISSIONER AHEARNE: Of course at the moment  
7 they are still not really sure what happened, so that other  
8 than alert --

9 MR. GOSSICK: There have been calls from various  
10 utilities into the center. We referred them to the regional  
11 offices whom we have kept completely informed on what is  
12 going on, too. And they are aware of it.

13 COMMISSIONER BRADFORD: Our regional offices that  
14 have these plants?

15 MR. GOSSICK: Right.

16 COMMISSIONER BRADFORD: Am I right in understanding  
17 in summary then that there is no further release of radioactivity  
18 from the containment to the auxiliary building or anywhere  
19 else, other than the direct radiation, so-called shine?

20 MR. GRIMES: I think that is our belief at this  
21 time, there is no driving pressure in the containment right  
22 now. It is essentially atmospheric pressure.

23 COMMISSIONER BRADFORD: To the best of your  
24 knowledge.

25 MR. GRIMES: Yes.



mm11 1 COMMISSIONER AHEARNE: Well, there would be no  
2 pressure in the containment now.

3 MR. EISENHUT: Yes, and I think the pressure is  
4 actually negative, which would infer they are pumping it  
5 down so that they would have in-leakage rather than out-  
6 leakage if there were any leakage present.

7 MR. GOSSICK: You might indicate the highest  
8 containment pressure we had yesterday.

9 What was it?

10 MR. EISENHUT: Yes.

11 The highest containment pressure was, I think,  
12 about four pounds. It was that only for a short period of time,  
13 couple hours, then it was falling back to one to two psi.

14 MR. GOSSICK: The limit being 50, in the neighborhood?

15 MR. EISENHUT: Yes, certainly in that neighborhood.

16 COMMISSIONER BRADFORD: So that if nothing else  
17 goes wrong, then the remaining problems are the water in the  
18 auxiliary building and the radioactivity in the containment?

19 MR. EISENHUT: Yes.

20 But in all fairness, in front of that, I would put  
21 "getting the plant over on RHR."

22 COMMISSIONER BRADFORD: Well, I was about to ask  
23 you -- I should have said the remaining problems were  
24 with radiological problems.

25 Now as far as getting the plant on to RHR, what

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1 are the pitfalls there?

2 MR. EISENHUT: We are not really sure.

3 There are a number of system problems that seem  
4 to have arisen as time goes on.

5 If they bring the pressure down to the 400, we see  
6 no reason that the plant cannot be put on RHR. From that  
7 point forth --

8 COMMISSIONER AHEARNE: Until it really goes on,  
9 it is running.

10 MR. EISENHUT: That's right.

11 There has been enough anomalous behavior, that  
12 we don't want to speculate too much.

13 COMMISSIONER AHEARNE: We are not making any  
14 optimistic forecasts until --

15 COMMISSIONER BRADFORD: The significance of not going  
16 to residual heat removal system is because it takes longer  
17 to cool down?.

18 MR. EISENHUT: It is much longer and the RHR is  
19 sort of the stable base way of cooling the plant down to  
20 essentially cold position.

21 It is more effective because it involves water-to-  
22 water transfer as opposed to water-to-steam transfer in a  
23 steam generator. So it is therefore a more efficient mode  
24 for getting there for long-term cooling, to keep the plant  
25 cool.

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1 CHAIRMAN HENDRIE: Other questions?

2 (No response.)

3 COMMISSIONER AHEARNE: I would just like to comment,  
4 I think they did a very fine job.

5 COMMISSIONER BRADFORD: This is the incidence  
6 response group?

7 COMMISSIONER AHEARNE: Yes.

8 CHAIRMAN HENDRIE: Thank you very much.

9 (Whereupon, at 10:50 a.m., the hearing in  
10 the above-entitled matter was adjourned.)

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