

MEETING OF THE

PRESIDENT'S COMMISSION ON THE
ACCIDENT AT THREE MILE ISLAND

EPA DEPARTMENTAL AUDITORIUM
WASHINGTON, D.C.

THURSDAY, APRIL 16, 1979
9:40 A.M.

THIS DOCUMENT CONTAINS
POOR QUALITY PAGES

ATTENDEES

COMMISSIONERS

STAFF

John Kemeny, Chairman
Burr Habbitt
Patrick Haggerty
Paul Marks
Cora Marrett
Harry McPherson
Russell Peterson
Thomas Pigford
Theodore Taylor
Anne Trunk

Michael Hollis
Barbara Jorgenson
Bruce Lundin
Ronald Natalie
Karen Randall

APPEARANCES BEFORE THE COMMISSION

William Wilcox, HUD Federal Disaster Assistance Program
Robert Pollard, Union of Concerned Scientists
Douglas Costle, EPA
Joseph Hendrie, Chairman of NRC
Hale Champion, HEW
Rick Cotton, HEW
Jay Waldman, Executive Assistant to Governor Thronburgh
Robert Wilbrun, Secretary of Budget and Administration State
of Pennsylvania

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I ask if the representatives of Governor Thornburgh are here?

MS. JORGENSEN: Yes, they are.

CHAIRMAN KEMENY: They are? Yes, thank you, yes. May I invite them to join us please? And we apologize for running somewhat late. Let's see, perhaps while you're getting ready I might be able to make a brief remark just to bring you up to date on where the Commission is. The Commission had its organization meeting yesterday morning, and we are using the remainder of our first meeting to get as much informal input as possible. In particular, we're very much interested in suggestions as to what various groups and we certainly are most interested in Governor Thornburgh's feelings of what issues we should look at, what questions we should probe, and any suggestions you have on how we should go at it.

May I ask you to start out, simply so we have it on tape, that you introduce yourself, name and title, please?

MR. WALDMAN: Mr. Chairman, members of the Commission, my name is Jay C. Waldman, I'm Governor Thornburgh's executive assistant.

MR. WILBURN: I'm Robert C. Wilburn, and I'm Secretary of Budget Administration.

CHAIRMAN KEMENY: Would you care to make a

statement? You're most welcome, in any format you wish to proceed.

MR. WALDMAN: Thank you, Mr. Chairman, I will read into the record some very brief opening remarks and be available for any answers that I may be able to supply that might be of benefit to the members.

"Mr. Chairman and members of the Commission:

"I am Jay C. Waldman, Governor Dick Thornburgh's Executive Assistant. I have been privileged to serve with him in similar capacities over the past eight years. Pursuant to the Chairman's invitation, the Governor has asked me to represent him at today's meeting. I was advised by the Chairman that this would be an organizational meeting rather than a formal testimonial hearing. He indicated that the primary purpose of the meeting was to solicit suggestions on the best course to pursue and what things the Commission might focus on in undertaking the vital task assigned to it by the President.

"I have endeavored to structure my remarks accordingly. I do think, however, that a limited review of the crisis from the vantage point of the Governor's office may provide a useful framework within which to address this question.

"Dr. Wilburn and I were among the half-dozen people who virtually lived in the Governor's office during the crisis.

1 period, assisting in efforts to gather and evaluate infor-
2 mation needed to make some of the most difficult decisions
3 any Governor has ever had to confront. One of the
4 toughest problems we faced, especially in the initial stage of
5 the crisis, was obtaining adequate, timely, consistent
6 information. This was compounded at times, by alarming spec-
7 ulation from sources without knowledge of the situation at
8 the site.

9 "Generally, the sources who were closest to the
10 site provided far more reliable information than those at
11 a distance. This was particularly true of Mr. Harold Denton,
12 who was dispatched by the President to oversee all of the
13 technical aspects at the site. His presence provided a
14 regular and reliable source of information and technical
15 advice.

16 "The Governor at all times saw his paramount obliga-
17 tion as doing everything possible to secure the health and saf-
18 ety of the people in the affected area. He continuously sought
19 the best technical advice available. He ordered an
20 accelerated review, under Dr. Wilburn, of emergency pre-
21 paredness plans. Civil defense plans were activated and
22 National Guard units placed on an alert status to maintain
23 a ready posture for any eventuality. We continually monitored
24 readings from the site, and sought the best available advice
25 on potential health effects and precautions.

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"The Governor advised pregnant women and pre-school age children to leave the five mile area around the plant on March 30. (This advisory was vacated on April 9.) He ordered a closing of the schools within that area, as well, to facilitate preparedness for a general evacuation if necessary, and in recognition of the desire of parents to keep all of their children together.

"We were continuously pushing the experts to establish lead times for each possible contingency and insuring that they could be reconciled with the time required to execute an evacuation. The Governor constantly weighed the potential risks from Three Mile Island against the hazards of an evacuation of an unprecedented nature.

"At the same time, the Governor sought to prevent the dangerous risk of panic, and to provide the most accurate available information to a distraught public. To this end, the Governor and Mr. Denton held regular press briefings to apprise the public. A telephone rumor control center was established. It averaged several hundred calls an hour at its peak.

"Our experience underscores the need to insure an adequate flow of accurate information to the decisionmakers and public in this kind of an emergency. In our view, this requires cool, capable, credible management of a crisis at the site, and not from a distance. I suggest that this is an

7-11-68 1 appropriate area for study by the Commission.

2 "A greater understanding of nuclear power and
3 radioactivity may have reduced the potential for panic.
4 The Commission may want to consider appropriate means of
5 educating the public in that regard.

6 "Of course, efforts to prevent such accidents in
7 the future must include an evaluation of the causes in this
8 case. Any failure on the part of the utility should also be
9 evaluated in terms of what it may reveal about the licensing
10 and review process.

11 "The Governor has proposed licensing of utility
12 company executives, and development of independent inspec-
13 tion teams, directed by the States, to serve as a backup
14 to the federal system. The Commission may want to look at
15 these and other ways to assure the presence of round-the-
16 clock expertise at nuclear power plants.

17 "Another priority for attention by the Commission
18 would be development of standard emergency preparedness plans,
19 with input from the best experts available, to insure
20 maximum preparation to meet any nuclear contingency.

21 "While the work of this Commission is focused on one
22 incident at one facility, its findings and recommendations
23 will clearly have a profound effect on the future of nuclear
24 power in our country. With a commitment of federal support,
25 we have begun the task of assessing and addressing any

1 long-term environmental, health and economic consequences
2 of the Three Mile Island incident. The Commission may want
3 to look at the results of this, as well.

4 "As you undertake the important public responsibil-
5 ity entrusted to you, please be assured of the Governor's
6 support and cooperation.

7 "Thank you, very much, Mr. Chairman."

8 CHAIRMAN KEMENY: Thank you for your extremely
9 brief and very full statement. You touched on a large number
10 of issues that we have been probing all day, and I know
11 a number of us would wish to pursue them. Without prejudging
12 your own investigation, did you feel that there was suffic-
13 ient and timely technical expertise present to keep the
14 Governor thoroughly briefed?

15 MR. WALDMAN: I think Mr. Chairman, that varied
16 from period to period. In the early period, we were largely
17 dependent upon technical advice and reports from the utility,
18 and later that day, from regional NRC people from King of
19 Prussia, Pennsylvania. Neither the Governor, nor any of the
20 key administration officials involved are nuclear scientists,
21 so obviously we had to rely to a great deal for facts and
22 factual evaluations from people who were.

23 And I must say that the feeling developed, after
24 the first day or so, that we were not only getting the best
25 or the fullest or the most complete or the most accurate

1 information from the utility, and on at least one occasion
2 from the NRC people, there was a public statement made by the
3 NRC on Thursday the 29th of March, as I recall, public
4 statement, not by -- the Commission, but by one of its
5 regional people, that the danger was over, the crisis had
6 passed. Fortunately, we did not rely 100 percent on that state-
7 ment, but this is the kind of conflicting information that
8 was developed. I think starting Friday, March 30th, Mr.
9 Chairman, as I recall, it was about 2:30 p.m., that Mr.
10 Denton arrived. The Governor and the President spoke about
11 11:15 a.m. The Governor asked that the President please send
12 someone to the site who was capable of taking over the tech-
13 nical monitoring and information evaluation functions from
14 the various collectors, utility and other people at the site.
15 With respect to Mr. Denton, and I would say from that period
16 forth, we felt quite comfortable and confident, with the
17 extent and quality of technical advice. That was primarily,
18 Mr. Chairman, the area of radioactive readings, what events
19 and what possible contingencies at the site were, what the
20 various lead times might be in an event when one of these
21 contingencies developed. In the area of emergency
22 preparedness, I must say that at the end it was seven days
23 or more before we felt comfortable that we were getting
24 adequate and accurate information. At various times there
25 was loose talk of mass evacuations by people who never set

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1 foot at the site or in the state, for that matter, were talk-
2 ing about 30 mile evacuations, 20 mile evacuations. And
3 indeed, Mr. Wilcox' statement before the Commission talks
4 about evacuations being contemplated in an area broader than
5 that for which plans had been developed. The fact is, that
6 the NRC requires a five mile plan. The state had a five mile
7 plan and Doctor Wilburn had quickly tightened it up.
8 The state developed a ten mile plan as well, when it
9 learned that the NRC had developed a new proposed regulation
10 that plans be extended to 10 miles, although that proposal
11 has yet to be adopted officially.

12 I think the confusion is apparently -- may even
13 affect Mr. Wilcox, comments to the fact that there was, for
14 a period of about 72 hours, a lot of people -- some, some of
15 them self-appointed experts who had never been near the site,
16 throwing around figures very loosely, like 15, 20, 30 miles.
17 When the best advice that we were getting from private
18 experts and Federal and State Government people at the site,
19 was that the appropriate area to plan for would be five or 10
20 miles, depending on which number of contingencies might develop.

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21 CHAIRMAN KEMENY: May I ask, in that connection,
22 as we are probing branches of the Executive Branch of the
23 Federal Government, we have requested several of them to do
24 their best to put together their timetable in that crucial
25 period, say Wednesday to Saturday, or Wednesday to Sunday.

1 because we kept hearing testimony of how late certain Federal
2 departments realized that this was a serious situation they
3 were dealing with. Would it be reasonable to request that the
4 Governor's office -- do a similar sort of thing, because it
5 would be fascinating, I believe, for the Commission to compare
6 the timetable from your perspective, who were right on the
7 site and in the middle of it, with how it looked in Washington.
8 Remember, we are probing as to where, for example, Federal
9 agencies may have fallen down or where the regulations
10 that exist may be weak. The discrepancies between those time-
11 tables would be extremely useful to us.

12 MR. WALDMAN: I think, Mr. Chairman, we will do so,
13 and I think probably the most graphic thing that it would
14 point up -- having tried to tackle this task already somewhat --
15 is the thing that you can never know is the thing that you
16 don't know.

17 CHAIRMAN KEMENY: Yes.

18 MR. WALDMAN: The thing you are not being told.
19 To this day, I am amazed to hear what some officials sitting
20 in Washington or Bethesda were saying to recommend and
21 whether they were justified or not justified, I can tell you
22 that many of these things were never communicated, in any way,
23 shape, or form, to the Governor's office. And I think that's
24 an area that the Commission might want to take a
25 look at it.

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1 CHAIRMAN KEMENY: Thank you, for that suggestion.
2 I just have a couple of things more. You mentioned the
3 question of licensing, which, of course, is part of our
4 mandate that we must look at, and is a, quite, key question
5 here. And you coupled it fairly closely, I noticed -- at
6 least, soon in your statement came a remark about around-the-
7 clock emergency assistance available, a subject we have been
8 probing earlier today.

9 Would you, for example, feel that it would be
10 important that licensing should be coupled, to the availability
11 of such round-the-clock emergency crews and, if so, is there
12 any feeling as to whether they should be supplied by the
13 utility, whether each State should be required to do that, or
14 whether the Federal Government should play a role in this?

15 MR. WALDMAN: Well, I know that the Governor,
16 Mr. Chairman, feels that something should be done to achieve
17 that kind of on-site readiness. I think that we would be
18 much less concerned with whether the utility or the State or
19 Federal Government have primary responsibility for it, than
20 simply that it be done, that good people be involved, and it
21 be properly monitored.

22 One thing I don't know is, how much are they a factor
23 in the Commission's licensing determination? They accord
24 to the technical skill to deal with emergencies. I have very
25 little doubt, from what I do know, that the Commission

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1 certainly focuses on the operators and determines that they
2 are competent to operate on-going nuclear reactors. But I
3 am not sure, and I think the Commission might want to focus
4 at some point on this, whether they pay sufficient attention
5 in their licensing process to whether the utility has a suf-
6 ficiently capable technical staff to deal immediately with
7 any conceivable emergency that might arise, when the reactor
8 is not operating normally.

9 CHAIRMAN KEMENY: That's a most important remark,
10 because we had at least two very clear statements on that
11 subject in testimony this morning, which diametrically con-
12 tradicted each other and therefore clearly we will have to
13 probe further. I think that's a fair statement that they --
14 as Commissioner McPherson pointed out in his cross examina-
15 tion -- that those two statements diametrically contradicted
16 each other.

17 The last area I wanted to probe, other than to ask
18 a courtesy question, was the public information one. And
19 you do know the President of the United States is very much
20 concerned about that whole issue, and charged us to look into
21 that.

22 I understand what the Governor did, and Mr. Denton
23 together, and I was delighted. This is the first time I heard
24 you had a rumor control center. Let me ask a very naive
25 question, because I have never been in this kind of situation

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myself. How effective it is -- I'm quite sure the Governor did what he could. How effective is it? How much can -- in an emergency situation like this -- the responsible authorities control the flow of rumors? I ask it from the background of a university president with a much smaller constituency, but I have never succeeded in stopping totally outrageous rumors.

MR. WALDMAN: Well, I think, Mr. Chairman, that your ability to control, although probably never totally eliminate, rumors in a panic-type situation, probably turns on at least two things. One, the credibility of the source, which is seeking to allay rumor, and for that reason we thought it was very important at the Governor's office who was best to maintain his credibility throughout this crisis.

And secondly, on the availability of accurate information with which to dispel the rumors. And I think that if both of those conditions are met, you can calm the situation considerably. Not totally, but considerably.

And I think the fact that the center we set up ended up logging thousands of calls, shows that there was need for this kind of thing and that people will seek out accurate information from what they believe is a credible source and will accept it once they get it. If not I doubt that there would have been so many thousands of phone calls.

So, I think it is possible to obviate that problem.

1 probably never eliminate it. Maybe another--I suppose prevention
2 is -- worth a pound of -- an ounce of prevention is worth a
3 pound of cure, and I think about things that we do educate
4 the public through the normal schooling process.

5 I can remember going to school, elementary school,
6 high school, and learning about how steel was made, learning
7 about the Bessemer process, and learning about dozens of
8 scientific kinds of processes. If there were a general public
9 awareness of just the most basic facts about radiation, I
10 think a lot of the panic could have been allayed.

11 There is no reason why even a school child, through
12 the most basic kind of science course, couldn't learn that
13 readings of 10 or 15 millirems do not constitute an immediate
14 and great big danger to life and health, whereas readings of up-
15 wards of 10,000 would. I think if the public merely understood
16 better the terminology and the forms of measurement that are
17 used, you might have less panic in the first place.

18 I think the thing that made this crisis so unique
19 and so difficult from our point of view, especially in the
20 area you raised, controlling panic and rumors, is that it
21 involves an invisible danger, and one that people really
22 don't understand and really have never been much educated
23 about. I think that caused a good bit of the tension that
24 did exist during that period.

25 CHAIRMAN KEMENY: That gives me an opportunity to

1 clear myself with my fellow Commissioners, if I may make the
2 following statement. I was quoted extensively in a certain
3 article by the education editor of a well-known newspaper,
4 where he, of course, refers to me as Chairman of this particu-
5 lar Commission. I wanted the Commissioners to know I gave
6 that interview before I had any idea I would become Chairman
7 of this particular Commission. But by the time the article
8 was printed, I was correctly so labelled, and I was correctly
9 quoted in it. The subject happens to be the one you referred
10 to, where I took a fairly strong stand on the necessity of a
11 higher level of science education for the population. He hap-
12 pened to ask me what sort of thing would you need in education
13 for Three Mile Island, and remember at that time, I was not
14 Chairman and didn't know I would be Chairman, and I took a
15 very strong stand on that particular issue. But I want the
16 Commissioners to know I gave that interview before I became
17 Chairman.

18 My last question is a courtesy one, and we will more
19 formally approach Governor Thornburgh, but the Commission
20 hopes to have one of its early meetings in the state of Penn-
21 sylvania to take formal testimony. May I assume that you
22 would welcome that if we came, and obviously we would provide
23 the Governor's office or anyone he wished to appear before the
24 Commission, and we will formally make this request to the
25 Governor?

1 MR. WALDMAN: Let me say, Mr. Chairman, that as I indi-
 2 cated in my statement, the Governor is very eager to support
 3 the work of this Commission and cooperate with it. Hopefully,
 4 it will produce the type of definitive findings and recom-
 5 mendations which can answer a lot of the questions that have
 6 plagued all of us. As you know, there are potentially scores
 7 of inquiries and committees and commissions that are preparing
 8 to investigate this, some in our own state, many in Washington.
 9 I would have every reason to believe the Governor would want
 10 to make himself available to this Commission, although it is
 11 possible he cannot make himself available to each and every
 12 hearing and committee that is being set up at this time. But
 13 we will welcome you when you do arrive. I'm sure that the
 14 Governor will be delighted to appear. As I said, Mr. Chairman,
 15 I would, I have made available for each member of this Com-
 16 mission a copy of the Governor's statement before the United
 17 States Senate Subcommittee on Nuclear Regulations, which was
 18 delivered last Monday.

19 CHAIRMAN KEMENY: Thank you. Other members of the
 20 Commission? Professor Taylor.

21 COMMISSIONER TAYLOR: I'd like to try to get a feel-
 22 ing for what was in the Governor's mind, and of people like
 23 yourself around him, during the period from about Friday after
 24 the accident through that weekend, in terms of what he was
 25 really the most worried about in considering whether or not to

1 get serious about evacuation. What I mean by that is, the
2 question is, whether he was focusing on the extent of radiati-
3 that had already been released, or that might be released more
4 or less on the scale that it had been occasionally beforehand.
5 Or whether he was worried about the condition of the radio-
6 active material inside the containment, or inside the core it-
7 self, and whether that might be in some sense catastrophically
8 released, and have a much bigger effect on the radiation level
9 in the surroundings. Which of these two was he most worried
10 about? That's the first question. The second is: do you feel
11 that he had as much knowledge as, from all you've been able
12 to determine since then, of what the situation really was
13 inside that pressure vessel and inside the containment struc-
14 ture at the time when these questions were being made; did
15 he have as much information, as far as you can tell, as any
16 of the experts looking at the situation did?

17 MR. WALDMAN: Well, let me try to briefly answer
18 the second part first. In retrospect, it appears that we had
19 available to us the best available information. I have yet,
20 from reading all the accounts and NRC transcripts and every-
21 thing else that accompanied -- after that, to see any-
22 thing which would have drastically changed the approach that
23 the Governor's office took. On the first question, to under-
24 stand the Governor's frame of mind, or what he was focusing on
25 at the time, I think you have to understand the Governor is a

1 very intelligent person, a very methodical person. He's
2 trained as an engineer, and as a lawyer. Those are both
3 professions which depend heavily on the integrity of facts,
4 and his approach from the beginning and throughout the period
5 was to, partly by asking probing, relevant questions, to flush
6 out the most accurate and factual picture of what was going
7 on that he could. But I do believe that in a very short per-
8 iod of time, all of us became "instant experts" on rems and
9 millirems and melt-downs and reactor cores and a lot of things
10 that we happily knew nothing about only a matter of days be-
11 fore. I think through this process we did manage to flush
12 out the best available information. I don't mean to suggest
13 by that a better system could not be developed, partly through
14 constant onsite expertise to more quickly provide more accur-
15 ate information. But I'm convinced the Governor managed to
16 obtain as accurate a picture as anybody had throughout the
17 period.

18 We were focusing, of course, on the escape of radia-
19 tion. This was the hazard to health and safety, and as I
20 understood it at the time, as I still understand it, there
21 were at least three ways in which this could occur. One,
22 through a so-called melt-down of the core. Two, through a
23 hydrogen explosion because of the -- and I'm sure that you have
24 much more expertise on it than I do, but it's my understanding,
25 and was at the time, a hydrogen bubble developed in the reactor

1 because of certain steps that had been taken, we ran a possible
2 risk of explosion, because of the possibility of combining with
3 oxygen-- That would be another possible way. Thirdly, simply
4 leaking out through normal kinds of pipes or vents or cracks,
5 or what have you. So we were constantly, the Governor was
6 constantly, looking at what in fact are the readings. I mean
7 hourly, sometimes two-three times an hour, you know, what are
8 the readings? What in fact is the amount of radiation present
9 in the atmosphere, and that means the air, the water, the
10 soil, milk, and that meant at the site, and at a mile from
11 the site, and at five miles from the site, and so forth.
12 Secondly, and simultaneously, he and all of us were obviously
13 also preoccupied with what are the other contingencies that
14 could develop that might cause more and dangerous doses of
15 radiation to escape the containment into the environment?
16 What is the probability for each and every one, and most im-
17 portantly, what are the lead times, and again, can preventive
18 and precautionary and evacuatory actions be executed in time
19 if necessary? These questions were asked endlessly, hourly,
20 continuously, from Wednesday morning until we were past it.

21 CHAIRMAN KEMENY: May I ask what kind of answers you
22 got on lead time, because we have not heard anything about
23 that yet? I mean, were they like hours or like days?

24 MR. WALDMAN: It varied, depending on the period.
25 Mr. Chairman. I think at one point we were told that we could

1 get a serious incident with a lead time as short as six or
2 seven hours. By the time that developed, we had an emergency
3 plan which had been reviewed by state and federal officials,
4 by the Governor's office, which indicated the relevant area
5 that could be involved, could be evacuated, in the time of
6 panic.

7 COMMISSIONER TAYLOR: Where did that number, six or
8 seven hours, come from, as the lead time for a -- I gather
9 that was given as a number for a lead time for a much larger
10 release of material than had been released before? Where did
11 that number come from?

12 MR. WALDMAN: This developed, as did other numbers,
13 from constant questioning of Mr. Denton and his team of ex-
14 perts, who would brief us once, up to twice, a day, and then
15 in between by telephone from the site. And he would give us
16 continuing progress reports. And I might say, incidentally,
17 thinking back to the first part of your first question, it is
18 the Governor, ironically, someone who is not a nuclear scien-
19 tist, who was the first person to raise the question of fuel
20 damage.

21 CHAIRMAN KEMENY: Of what?

22 MR. WALDMAN: Of fuel damage. Of possible damage
23 to the core with a possibility of a melt-down. And this was
24 before Mr. Denton arrived, but it was after an NRC inspector
25 and other NRC officials had been to the plant and met with us

1 at least twice. The Governor was the first person to say wait
2 a minute, there's something here that bothers me. I haven't
3 heard a word about possible fuel damage.

4 COMMISSIONER TAYLOR: Did someone explain to you why
5 the time was six to eight hours, and not half an hour, or 20
6 minutes, or a much shorter time?

7 MR. WALDMAN: Not in any kind of scientific detail,
8 but they could probably do so, you know, to a scientist. But
9 we were asking for what could happen, what could cause it to
10 happen, and how much time would we have to respond to it if
11 it did happen.

12 COMMISSIONER TAYLOR: And this was the worst possible
13 period?

14 MR. WALDMAN: Yes, yes. And incidentally, again,
15 let me say we were always asking for the worst possible cases.
16 In other words, if actually we were told it was less than a
17 one percent chance of a melt-down by the time the lead-time was
18 six or seven hours. So --

19 COMMISSIONER TAYLOR: And that was from NRC people,
20 or --

21 MR. WALDMAN: Yes. At one point, and I think it would
22 have been -- It might have been Friday night. I might be
23 wrong, though, it might have been over the weekend. I'd have
24 to check our notes, but it was an NRC man.

25 COMMISSIONER FIGFORD: Do you happen to have in hand

1 now a documented description of what did happen?

2 MR. WALDMAN: A documented description?

3 COMMISSIONER PIGFORD: Yes. Some word description
4 in writing of what did happen. Do you happen to have that?

5 MR. WALDMAN: No. We have endless notes.

6 COMMISSIONER PIGFORD: Do you feel that there is
7 adequate understanding now in the state office of what did
8 happen?

9 MR. WALDMAN: In scientific terms?

10 COMMISSIONER PIGFORD: Whatever your frame of
11 reference is. You tell me. I'm not sure scientific is so
12 important.

13 MR. WALDMAN: I'd have to say yes and no. When
14 there's a current dispute within the NRC about whether the
15 type of plant in operation there can be safely operated or
16 not, I can't sit here and say that yes, we're confident we
17 really understand what happened.

18 COMMISSIONER PIGFORD: Yes, I now understand. But
19 you have been mentioning some things that happened along the
20 way that caused you concern, like the hydrogen bubble and so
21 forth. Do you now know, adequately feel that you know, what
22 happened in that regard? The possibility of a hydrogen
23 explosion.

24 MR. WALDMAN: I think we understand what that means.
25 so that we would require a lot less education and briefing

1 were it to happen again, but I certainly don't think we under-
2 stand the process in the sense that I would want any of us to
3 be in charge -- of the operation of the site.

4 COMMISSIONER PIGFORD: Do you feel that you under-
5 stand what, say, the probability was, in hindsight, now, of
6 that explosion occurring?

7 MR. WALDMAN: I can only go by the estimates we were
8 given by the NRC experts. I would have no independent way to
9 assess that.

10 COMMISSIONER PIGFORD: Do you happen to know what
11 those are? Could you tell us? Could you provide them to us?

12 MR. WALDMAN: Yes. I could only go by the best of
13 my recollection. NRC, I'm sure, could give you more accurate
14 data. My recollection is that that, too, was put at a rela-
15 tively low percent in terms of reaction. But I can't remember
16 the exact percentage.

17 CHAIRMAN KEMENY: Yes. We would be very grateful
18 if you would sometimes put those records together. You recall
19 why we are probing this: because part of our charge is that
20 in a case like this, the Governor of the state should certain-
21 ly have the best possible information available. If it's not
22 happening, we have to come up with a recommendation to make
23 sure that's the case. Therefore, comparing what you were told
24 at that time with the best determination this Commission can
25 make as to what really the situation was, is terribly relevant.

1 to our task.

2 COMMISSIONER FIGFORD: May I ask one more brief
3 question?

4 CHAIRMAN KEMENY: Oh, please do.

5 COMMISSIONER FIGFORD: Is the -- We understand that
6 there are some whole body counters in operation in the area.
7 Are these in any way connected with some state operation?
8 the state health department?

9 MR. WALDMAN: Are you talking about subsequent to
10 the accident?

11 COMMISSIONER FIGFORD: Yes.

12 MR. WALDMAN: We have continued, up to the current
13 time, cooperated with -- between state health department and
14 other relevant state agencies, in our state meaning the De-
15 partment of Environmental Resources, for one, and the various
16 federal agencies and teams that were deployed there during the
17 crisis; so that these readings, as I understand it, are being
18 done federally, under the aegis of EPA, by designation of the
19 White House, but coordinated closely with at least two of our
20 departments, the Department of Health and the Department of
21 Environmental Resources.

22 COMMISSIONER FIGFORD: You're speaking of the cur-
23 rent cooperations with those. What I'm interested in is what
24 were you getting out of these measurements? What -- and this
25 perhaps will require a technical answer, so maybe you'll want

1 to supply it later. What do you get out of these measurements
2 and what do they tell you? What's understood? Is it intended
3 that these tell you something about the doses that people re-
4 ceived as a result of the accident?

5 MR. WALDMAN: In part, but I think probably, well,
6 let me say this. I've been advised by health experts, and
7 I'm not one, that it could be years of analyzing one current
8 data such as you're referring to against genetic developments
9 and other developments in the area before they can --

10 COMMISSIONER PIGFORD: Yes. I understand the problem,
11 but that's not what I'm getting at. You're saying that to
12 translate the reading to some probability of some somatic effect
13 is a problem. I'm getting at a more immediate -- What do the
14 readings themselves mean? That's what I'm asking.

15 MR. WALDMAN: Well, again --

16 COMMISSIONER PIGFORD: Are they relevant to the
17 doses that people received, and to what extent are they
18 relevant?

19 MR. WALDMAN: Well, I'm not sure I understand the
20 question. Let me say-- About the best answer I can give you may
21 not be technically applicable to this. But from our vantage
22 point, all we could do, and I think all we can continue to do,
23 is to rely on health experts, such as Secretary Califano, who
24 testified what the maximum potential radiation exposure of any
25 individual was, and then to rely on other experts who can

1 interpret that for us, and tell us what that means, in terms
2 of health consequences, in terms of environmental consequences
3 and then take appropriate action. But I don't think any of
4 us have the capacity to independently determine that. When
5 this crisis started, I don't believe that any of us even knew
6 what a millirem was.

7 COMMISSIONER PIGFORD: I understand. I'm not asking
8 you to cover all different instruments, but this particular one
9 which is now an ongoing thing since the accident, I suppose
10 your health department has some attitude as to what the infor-
11 mation is that they're getting from that. I'm interested in
12 their interpretation of it.

13 MR. WALDMAN: I have yet to see any written report
14 from them, except that they're working with the federal govern-
15 ment in taking readings, and they're working on a long-range
16 plan which I understand will cover a period of 20 years.
17 That's what I'm told.

18 CHAIRMAN KEMENY: Other questions? Dr. Marks.

19 COMMISSIONER MARKS: Just to pursue this a little
20 further. Could you identify the experts who were providing
21 you with advice on the health risks?

22 MR. WALDMAN: Yes. At different times, they in-
23 cluded, of course, our own Secretary of Health, Dr. McLeod;
24 Dr. Neal Wald, University of Pittsburgh Medical School, who's
25 a radiation health expert, currently a consultant for the NRC.

1 although we approached him on our own, not through the NRC;
2 the NRC itself, which has developed, obviously some working
3 knowledge of health hazards. We talked with Dr. Denton
4 about an ongoing basis. We requested and received a -- I can-
5 not remember his name, but he's a doctor -- I can get this
6 from my notes -- a doctor from the Department of Health, Edu-
7 cation and Welfare. He was present for several of the discus-
8 sions. It is my understanding that Dr. Wald consulted, al-
9 though he could not personally be there, consulted by tele-
10 phone, Dr. Sanger, who is the person who wrote, I'm told,
11 many of the original studies on radiation effects on which
12 the NRC relied in adopting its regulations as to what dose is
13 required to take affirmative action. I may be forgetting some,
14 but --

15 COMMISSIONER MARKS: I'm not -- Was there someone
16 there as part of the decision-making apparatus, right on the
17 site? You know, you say that you are probing hour to hour,
18 and Denton was there. Who was your onsite, if any, expert,
19 so to speak, on the health risks? Who were you turning to to
20 sort of interpret the physical measurements in terms of health
21 risks?

22 MR. WALDMAN: To the extent one person coordinated,
23 I would say it was our health secretary, but the Governor --

24 COMMISSIONER MARKA: Dr. McLeod?

25 MR. WALDMAN: Yes. But the Governor and others of

1 us were directly questioning and probing the other health
2 experts as well. This is a situation in which, I think, it's
3 wise to get a second and third and fourth opinion.

4 COMMISSIONER MARKS: But they were not onsite?
5 I'm not getting a clear picture of --

6 MR. WALDMAN: My understanding is Dr. Wald did go outside

7 COMMISSIONER MARKS: Dr. Wald went onsite.

8 MR. WALDMAN: And then was, I am advised, present
9 when the situation -- in Colorado. But I cannot say for
10 sure which of them went actually into the plant.

11 COMMISSIONER MARKS: If it's possible, I think we'd
12 appreciate that information.

13 MR. WALDMAN: To a large extent, what would happen
14 was Mr. Denton would report with the scientific and technical
15 information, and then health people would be asked to evaluate
16 the health consequences and precautions that that kind of
17 information might facilitate either for or against. And that's
18 largely what happened. There would not -- We were not
19 looking to send a lot of people into the plant at the time,
20 although some of us ended up going in on Sunday afternoon.

21 COMMISSIONER MARKS: Could I ask one -- At the
22 present time, and the problems are continuing, could you give
23 us some idea of what strategy you have for dealing with
24 continuing concerns about health risks?

25 MR. WALDMAN: The information that I have,

1 the most current information is, that we would have considera-
2 bly over a day of notice now for any untoward thing that could
3 happen. In fact, I'm advised that this plant now is in sub-
4 stantially safer condition, in terms of risk to health and
5 safety, than any other operating plant in the country, where,
6 in theory, anything could happen on a moment's notice. This
7 plant is close to total shut-down. And so I don't think, from
8 the reports I'm getting, that it poses any kind of direct or
9 immediate danger.

10 COMMISSIONER MARKS: Of continuing emissions?

11 MR. WALDMAN: It is my understanding that the read-
12 ings were either at or very close to so-called background for
13 the days, with one exception, one day, at one location, as to
14 one thing, which was radioactive.

15 COMMISSIONER MARKS: Well, what about the concerns
16 of those pregnant women or parents of small children, who may
17 have felt they might have been in proximity to the site at a
18 time when there was a question raised with regard to levels
19 of exposure above so-called safe levels.

20 MR. WALDMAN: Well, at our request, we met with the
21 White House not quite a week ago, as I recall, and we
22 requested some assistance from them in this area. Our re-
23 sources are somewhat limited. We asked them to work with us,
24 either supplying manpower and resources or funding, and we
25 will get the medical experts, to conduct ongoing studies on

1 this and provide consultation and advice to people who may
2 be concerned about the physical effects that you allude to
3 and also the psychological effects, which in a disaster like
4 this, a factor which must be --

5 COMMISSIONER MARKS: Does the state have a posi-
6 tion with regard to advice to physicians and their patients
7 with respect to abortion of women who were in the first tri-
8 mester?

9 MR. WALDMAN: No.

10 COMMISSIONER MARKS: You don't have any position?

11 MR. WALDMAN: I think it's highly unlikely that the
12 Governor would consider that an area that was appropriate for
13 the state to comment upon. I think he would support the
14 integrity of the patient-doctor relationship.

15 COMMISSIONER MARKS: What about the doctor, the
16 question of the level of information that the doctors might
17 have? Is there a state position that information should be
18 provided to the doctors, that --

19 MR. WALDMAN: Oh, certainly. I mean, yes. The
20 health department is continuing the policy that we embarked
21 on earlier of trying to make available to the public, not
22 just an individual physician or patient, all of the relevant
23 information that we might have. I think they could get
24 that. I think, frankly, federal people there now, working
25 with our state health people, would also provide that.

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COMMISSIONER MARKS: You're providing the information and interpreting it, in terms of risk?

MR. WALDMAN: Yes, I think they have been doing that. But again, I think that it is their advice evaluation.

They are taking some care not to interfere with the patient-doctor relationship.

COMMISSIONER MARKS: Well, if anything is available, you know, sort of in written advice or statements, I think we'd appreciate seeing it, just to get some idea of the quality of this advice. Because you may have seen that there was an article in today's New York Times, for example, suggesting that there's a good deal of apprehension and even some confusion on the part of pregnant women exposed in this area, with regard to these issues.

COMMISSIONER PIGFORD: Is there someone in the state we might contact to ask about these whole body counters and the data they're getting and their interpretation of the data?

MR. WALDMAN: Yes. I would assume Secretary Jones.

COMMISSIONER PIGFORD: Jones?

MR. WALDMAN: Clifford Jones.

CHAIRMAN KEMENY: Governor Babbitt?

COMMISSIONER BABBITT: Mr. Waldman, why did the Governor choose not to ask the President for Federal disaster declaration?

1 MR. WALDMAN: He made that decision largely at the
2 request of the White House. We had a hotline, so-called hot
3 line, installed early in the crisis to provide ready communica-
4 tion between the White House and our office, and also Mr.
5 Denton's group at the site. On Friday that became a very real
6 concern. The White House indicated that its preference was we
7 not make a formal request for aid. We did not do so partly on
8 assurance from them that we were at that time, and that we
9 would continue to, receive the same type and level assistance
10 as if a formal declaration were made. Their concern, and I
11 think the Governor agreed, was that in this kind of situation,
12 that kind of declaration could generate a substantial panic
13 that could be very counter-productive, and that also --

14 CHAIRMAN KEMENY: A substantial what? A panic?

15 MR. WALDMAN: Panic. That could be counter-productive.
16 And that also might convey a false notion that the
17 emergency had escalated considerably, and that considerably
18 more radiation levels were present than in fact were. Since
19 the NRC regulations on evacuation recommendations, as I under-
20 stand it, talk in terms, I think, of at least 10,000
21 millirems. Obviously at no time during this period were
22 we even approaching that standard.

23 COMMISSIONER TRUNK: I'm curious. When the advisory
24 for pre-school children was given, why did you stop at pre-
25 school? Why not at six-year-old or seven-year-old?

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CHAIRMAN KEMENY: So, we're all set? Commissioner Trunk, the tape is all yours.

COMMISSIONER TRUNK: I have a daughter who's six years old, she just turned six. She's been in kindergarten five months, six months. Why isn't she considered pre-school age? I mean, she's just a little over school. Started school.

MR. WALDMAN: I don't know, Mrs. Trunk. Except to say that if the advisory had been children 1 through 6, somebody would now be asking me about their 7 year old daughter, or if it was 1 through 7, they'd be asking about their eight year old. We were advised that this is the first five years of life in which the child would be particularly susceptible. And that's what the decision was based on.

COMMISSIONER PIGFORD: Did anyone in the state make its own evaluation of that advice?

MR. WALDMAN: Well certainly by checking and cross checking with every health, nuclear science expert we can get. Including Dr. Wald, including Dr. Sangiman, everybody we can get our hands on, on very short notice.

COMMISSIONER PIGFORD: So there would be some one then who would say here is why that age is the cutoff, and some medical reasons, for example?

MR. WALDMAN: I believe that Dr. McCleod or Dr. Wald, or possibly many other doctors -- I mean, we

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1 were led to believe that this is standard and found in
2 medical tests. It has to do with the size of the thyroid
3 and other kinds of considerations.

4 COMMISSIONER MARKS: The size of what?

5 MR. WALDMAN: The thyroid, I believe. Again, I'm
6 not a doctor, I'm just going by my recollection of the kinds
7 of things that were discussed at the time. But my under-
8 standing of the medical situation was that it is fetuses
9 -- in particular, and small and young children have a some-
10 what greater sensitivity.

11 CHAIRMAN KEMENY: Of course, the fascination of
12 your whole testimony is that we, for the first time, get
13 the feeling of the extremely short time scale in which the
14 Governor and his associates have to make life and death
15 decisions.

16 MR. WALDMAN: It was a very pressurized situation,
17 Mr. Chairman.

18 CHAIRMAN KEMENY: I have great sympathy for the
19 Governor, if I may say that for the record.

20 MR. WALDMAN: Let me say this, too, Mrs. Trunk.
21 The advisory on pregnant women and young children was made
22 out of an extreme excess of caution --

23 COMMISSIONER TRUNK: Oh, I realize that.

24 MR. WALDMAN: -- which the Governor felt was the
25 prudent course. At no time did radiation levels even approach

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1 levels which, under existing health and NRC regulations,
 2 would have indicated that people should have been evacuated.
 3 In fact, I don't believe that to this day anybody who
 4 had documented it, that remained, would have necessarily
 5 been imposed to danger.

6 COMMISSIONER TRUNK: They brought that body
 7 scanner in, and nine people were told that they had large
 8 doses of radiation. How did they get the high dosage?

9 MR. WALDMAN: As opposed to the hundreds who didn't?
 10 I don't know. On the other hand, I've read accounts that
 11 people who lived in areas with -- rich phosphates in the
 12 soil, could register even higher readings without any nuclear
 13 occurrence. I just don't have the expertise to answer that
 14 question.

15 COMMISSIONER PIGFORD: Was the State considering
 16 distributing potassium iodide?

17 MR. WALDMAN: Yes.

18 COMMISSIONER PIGFORD: How close did you come?
 19 Were you prepared and did you have it ready to go?

20 MR. WALDMAN: Yes.

21 COMMISSIONER PIGFORD: Why did you decide not to
 22 distribute it?

23 MR. WALDMAN: Because the -- we felt, based on
 24 the medical, scientific advice we were getting, that it was
 25 not the prudent thing to do at that time.

1 COMMISSIONER PIGFORD: Was that from your State
2 people, or from the federal --

3 MR. WALDMAN: It was a combination of people,
4 including Dr. Wald, and also a feeling that it could
5 possibly contribute to a panic atmosphere and again,
6 counter-productive. But the basic decision was a scientific
7 health one; we did obtain -- and I personally read the study
8 submission when the FDA first approved the use of the drug, and
9 under what situations and conditions it was recommended, and
10 we were not even approaching them. I believe basically the
11 drug, as I understand it, was designed for use in -- blocking
12 possible exposure of thyroids to radio-iodine, in cases
13 where it was either a likelihood or almost a certainty of
14 exposure to at least 10,000 millirems. And we were not
15 getting readings even close to that.

16 CHAIRMAN KEMENY: Commissioner Taylor.

17 COMMISSIONER TAYLOR: I'd like to get back for a
18 ment to this question about what was known in the Governor's
19 office about the possibilities of a much bigger release
20 than actually took place. You mentioned two roots to that,
21 one was a core melt and the other was a hydrogen explosion.

22 CHAIRMAN KEMENY: You also mentioned leakage --

23 COMMISSIONER TAYLOR: And leakage of other types.
24 At what time do you recall, was the Governor's office inform-
25 ed that there had in fact been a hydrogen explosion in

1 containment?

2 MR. WALDMAN: No, I don't know, I'd have --

3 COMMISSIONER TAYLOR: If you don't know offhand,
4 I think we would like to know as accurately as possible,
5 when that piece of information came to the Governor's
6 office and where it came from. The second question, and I
7 think they're probably in the same category -- not asking
8 you for the timing on this right now, but at what time --
9 when, was the Governor informed about some picture of the
10 extent and nature of the core damage, how much of it had
11 been damaged, what the damage mechanism had been, where the
12 damaged fuel was, what problems that might lead to in terms
13 of them cooling, to what extent were people concerned about
14 any of the damaged fuel blocking the flow of water to make
15 it more difficult to cool, and so on? We're trying to get
16 established, not -- there are two things: one is, what
17 were people's perceptions of the answers to questions like
18 that, that relate to, is it eight hours warning, is it half
19 an hour, is it ten minutes, is it three weeks? And is the
20 probability one percent or ten percent or ninety percent?
21 We're trying to establish what people's perceptions of this
22 were, and I think for that, it's important we get as close as
23 we can to a chronology of the Governor's perceptions of what
24 was going on and who they came from. Whether or not, they
25 turned out now to have been wrong, because that's part of our

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1 job?

2 MR. WALDMAN: I think most of that can be put
3 together from voluminous notes already in existence. My
4 recollection is that it was at least sometime Friday before
5 we learned of the likelihood of significant damage to the
6 core. On Thursday night we received the information.

7 CHAIRMAN KEMENY: May I re-ask the question that
8 was asked earlier, because I've been sitting here thinking
9 about what I understood your answer was? Did you say that
10 to the best of your recollection, the person who first
11 raised the question of the possibility of core damage was
12 the Governor?

13 MR. WALDMAN: That's correct. I believe that was
14 Thursday morning, to the best of my recollection.

15 CHAIRMAN KEMENY: I find that astounding. That's --

16 MR. WALDMAN: In retrospect, so do we.

17 COMMISSIONER PIGFORD: Sir, when the question of
18 the hydrogen came up, then was it indicated that the danger
19 would then result if the hydrogen were to explode? Is that
20 the consequence, the -- of that?

21 MR. WALDMAN: Well we were led to believe that
22 that could indeed intensify the danger, yes sir.

23 COMMISSIONER PIGFORD: Okay. Was it more specific?
24 Was it stated it would rupture the pressure vessel?

25 MR. WALDMAN: I believe that Dr. Denton described

3-7 sec 1 it in some technical detail, and as we piece our notes back
2 together, I think it will reflect more the degree to which
3 we comprehend it. That level of technical details; than
4 the level we attempted to address the problem with.

5 COMMISSIONER PIGFORD: I'm sorry, I don't understand
6 that answer. Could you say it in somewhat different words,
7 or try it again, I'll listen again.

8 MR. WALDMAN: Well I'm suggesting that if we piece
9 together our notes on this --

10 COMMISSIONER PIGFORD: Oh, that you will, in the
11 future?

12 MR. WALDMAN: --that what you will find is not so
13 much the level of technical expertise that Dr. Denton brought
14 to bear on explaining the problem to us, as how much we could
15 comprehend. So what I'm suggesting is that you will end up
16 finding out what we thought might happen. That does not neces-
17 sarily mean that we -- let me say, we're not the people to ask
18 as to the best technical explanation of what happened --

19 COMMISSIONER PIGFORD: I understand that --

20 MR. WALDMAN: -- we're the worst people to ask --
21 are experts --

22 COMMISSIONER PIGFORD: I'm not trying to --

23 MR. WALDMAN: -- primarily in one thing, and what it
24 looked like to us. Now our notes will tell you, based on
25 Harold Denton's continuous briefings, what we thought the

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1 hydrogen bubble meant, what we thought could happen, and
2 what we thought the options were if it did happen.

3 COMMISSIONER PIGFORD: Yes. Excuse me, that's
4 really what I do want to get at; what you thought. And I'm
5 asking you this, did you think then that the problem would
6 be that the hydrogen bubble would explode and then rupture
7 the vessel and rupture the containment, is that the --

8 MR. WALDMAN: I was led to believe that that would
9 be a possibility.

10 COMMISSIONER PIGFORD: Yes. And is that then, the
11 thought that then led to the idea we must evacuate, is that the
12 next step?

13 MR. WALDMAN: No, not necessarily.

14 COMMISSIONER PIGFORD: What was the thing, then,
15 that led to that?

16 MR. WALDMAN: The Governor ultimately, as you know,
17 decided not to order evacuation.

18 COMMISSIONER PIGFORD: Yes, excuse me. That was
19 the wrong word to use. Whatever he called it when he sug-
20 gested these people leave?

21 MR. WALDMAN: Oh, that? That was based strictly out
22 of an excess of caution when he determined that there were
23 radioactive readings above background that-- within a five
24 mile radius.

25 COMMISSIONER PIGFORD: I see. That was not connected

with his perception of the hydrogen bubble?

MR. WALDMAN: That's correct.

COMMISSIONER FIGFORD: Thank you.

CHAIRMAN KEMENY: I don't see any other Commission-
ers asking for the floor. May I thank you very much for
your testimony, which we found fascinating. May I remind
the Commissioners that we will conclude our first series
of meetings tomorrow morning. We'll meet here at 10:00 to
hear from a representative of the Department of Energy
who could not come today. And we will then continue asking
the question where do we go from here in setting our next
few meetings? May I ask staff to stand by to meet and I
declare this session adjourned.

(Whereupon at 5:10 P.M. the hearing was adjourned as described
above.)