

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

1 In the Matter of:

2 IE TMI INVESTIGATION INTERVIEW

3 of Karl E. Plumlee
4 Radiation Specialist

5 Ronald L. Nimitz
6 Radiation Specialist

7
8
9 Trailer #203
10 NRC Investigation Site
11 TMI Nuclear Power Plant
12 Middletown, Pennsylvania

13 May 30, 1979
14 (Date of Interview)

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17 271 and 272
18 (Tape Number(s))

19
20
21 NRC PERSONNEL:

22 Thomas H. Essig
23 Mark E. Resner

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1 RESNER: This is an interview of Mr. Karl E. Plumlee and Mr. Ronald L. Nimitz.
2 Mr. Plumlee is employed with the U.S. Nuclear Regulatory Commission, Region I
3 office, and he is a Radiation Specialist. Mr. Nimitz is also employed with
4 the U.S. Nuclear Regulatory Commission at the Region I office, and he is a
5 Radiation Specialist also. The present time is 11:37 a.m. EST; today's
6 date is May 30, 1979. This interview is being conducted in office 114B at
7 631 Park Avenue, King of Prussia, which is the NRC Region I office. Indivi-
8 duals conducting this interview are Mr. Thomas h. Essig. Mr. Essig is the
9 Chief, Environmental and Special Projects Section, assigned to Region III
10 of the U.S. Nuclear Regulatory Commission; and presently speaking and
11 moderating this interview is Mark E. Resner, Investigator, Office of Inspec-
12 tor and Auditor at the Headquarters of the U.S. Nuclear Regulatory Commis-
13 sion. Prior to taping this interview, both Mr. Plumlee and Mr. Nimitz were
14 given a two-page document which explained the purpose, the scope, and the
15 authority which the NRC has been given to conduct this investigation. In
16 addition, it apprised them of the fact that they are entitled to a represen-
17 tative of their choice to be present during the interview should they
18 desire one and, additionally, that in no way are they compelled to talk
19 with us should they not want to. On the second page of this document,
20 there are three questions which each individual has answered. I will state
21 these for the record. Question 1: "Do you understand the above?" Mr.
22 Nimitz has checked "yes." Is that correct, Mr. Nimitz?

23
24 NIMITZ: Yes, that's correct.

25
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1 RESNER: Question 2: "Do we have your permission to tape the interview?"
2 Mr. Nimitz has checked "yes." Is that correct, Mr. Nimitz?

3
4 NIMITZ: Yes, that is correct.

5
6 RESNER: Question 3: "Do you want a copy of the tape?" Mr. Nimitz has
7 checked "yes," indicating that he does, and he will be provided with a copy
8 of the tape. Is that correct, Mr. Nimitz?

9
10 NIMITZ: Yes.

11
12 RESNER: Thank you. Mr. Plumlee's document: "Do you understand the above?"
13 He has checked "yes." Is that correct, Mr. Plumlee?

14
15 PLUMLEE: Yes.

16
17 RESNER: Question 2: "Do we have your permission to tape this interview?"
18 Mr. Plumlee has checked "yes." Is that correct, Mr. Plumlee?

19
20 PLUMLEE: Yes.

21
22 RESNER: Question 3: "Do you want a copy of this tape?" Mr. Plumlee has
23 checked "yes." Is that correct, Mr. Plumlee?

1 PLUMLEE: Yes.

2
3 RESNER: O.K., thank you, we'll provide you with a copy of the tape. At
4 this point, I will ask first Mr. Plumlee, and then Mr. Nimitz, to give us a
5 brief synopsis of their educational and job experience as related to the
6 nuclear industry. Mr. Plumlee?

7
8 PLUMLEE: I am a graduate of Southern Illinois University. I have a bachelor's
9 degree in chemistry, and I also have a master's degree in physics from the
10 University of Illinois; in addition, I am a registered Professional Engineer
11 in Illinois. I have worked in the nuclear field since 1948, starting in
12 Hanford Works for 2 years and roughly 6 years following that in the Savannah
13 River plant and 2 years following that for Combustion Engineering and
14 13½ years at Argonne National Laboratory prior to taking a job with the AEC
15 Office of Inspection and Enforcement.

16
17 RESNER: Thank you, Mr. Plumlee. Mr. Nimitz, if you will please give us a
18 synopsis of your experience and education and job-related...

19
20 NIMITZ: I have a B.S. degree in nuclear mechanical engineering and graduate
21 level courses in radiation shielding and neutron transport. My experience
22 related to the nuclear industry--I spent several years at the Indian Point
23 Atomic Power Station as a Senior Health Physics technician and, while
24 working at the Pennsylvania State University spent approximately 3½ years
25 working with the research reactor, the accelerator, and working in conjunc-

1 tion with a certified Health Physicist at the facility. I've got approxi-
2 mately 3½-4 years of nuclear power experience, both at fuel fabrication
3 facilities. I spent time at the General Electric Nuclear Fuels Fabrication
4 facility in North Carolina, and on my summers between my courses at Penn
5 State I spent time at other facilities working as a Health Physicist.

6
7 RESNER: Thank you, Mr. Nimitz. At this time, Mr. Essig has some questions
8 he would like to pose to you both.

9
10 ESSIG: What we'd like to do in the interview this morning with both you
11 gentlemen is to reconstruct as best we can, given the fact that the event
12 of March 28 now is, has nearly been, well it's been over 2 months ago, we'd
13 like to reconstruct as best we can from either your memory or your notes,
14 or a combination of the two, starting with when you gentlemen were first
15 informed that there had been an incident at Three Mile Island and when you
16 were requested to report to the site. When you arrived at the site--we'd
17 like to know of any independent measurements that you conducted enroute,
18 and know of any independent measurements or other evaluatory type functions
19 that you were involved in once you arrived at the site. We're talking only
20 now of the first 3 days following the event; this would be March 28--
21 Wednesday--the 29th and the 30th. So I'd like to turn the microphone over
22 to whichever one of you would care to start, and just like to let you sort
23 of ramble on for a while and reconstruct the chronology of your involvement
24 in those first 3 days. Would you care to start, Karl?

1 PLUMLEE: The first inkling I had that there was an accident was at 8:00 on
2 the morning of the 28th when I came past the receptionist and she was
3 complaining that someone had been paged on the beeper and had failed to
4 call in--not me. About 15 minutes after 8, I was informed that there was a
5 briefing on the problem at Three Mile Island, and this briefing was, in
6 effect, a statement that there was a shutdown,... the cause of the shutdown.
7 And, in addition, the fact that highly radioactive water had been pumped
8 from the containment building over into the auxiliary building, the fact
9 that the containment building had the hydrogen present in the atmosphere in
10 a significant quantity. I don't know whether it was 2% or 3%, but it was
11 well above the detection limit--and, thirdly, that there had been some
12 release of airborne activity, primarily through the auxiliary building
13 ventilation system. At 8:30, as I recall, a number of us were told to be
14 ready to leave for the Three Mile Island facility and, as I recall, Ronald
15 Nimitz was one of these members. Gallina and--uh, gee, the name of this
16 other guy has slipped me here--uh, do you want to break the tape a minute
17 while I look up the name... it was Higgins from Operations, and Smith
18 from... an investigator, and Neely, who is another Radiation Specialist.
19 O.K., as I recall, about 8:45 we were actually on the,... in the emergency
20 vehicle ready to leave, and we arrived at the North Gate at Three Mile
21 Island about 10 minutes after 10 on the 28th. There was a delay of roughly
22 a half-hour at the North Gate, partly because some of the people did not
23 have badges that were outstanding and valid assigned to them, and they had
24 to obtain permission from the control room or the emergency coordinator, I
25 don't know which at this point, to enter the plant. The plant had been

1 evacuated except for essential personnel by that time. At roughly 10:40, I
2 was--because I had an assigned badge at the North Gate--was allowed to
3 escort the remaining people who did not have badges other than visitor's
4 badges, escort required into the Unit 1. We reached Unit 1 control room
5 where they had set up an emergency control center. At that point, as I
6 recall it, Jim Seelinger was in charge of the emergency control center and
7 my notes indicate that Hitz was a Unit 1 Shift Supervisor who was actually
8 in charge of the operation of Unit 1. Unit 1 was, I think, reaching hot
9 critical or hot standby condition. They were starting up following a
10 refueling outage.

11
12 ESSIG: O.K., you used the term "emergency control center," Karl, and I
13 just want to draw a distinction if... I want to make sure we're not confusing
14 two terms. The licensee, as I understand it, has two centers that are
15 established: one is called the emergency control center, the other is
16 called the emergency control station. The center, I believe, is in the
17 control room of the effected unit--that would be Unit 2--and I just want to
18 make sure... were you, in fact, talking about the emergency control center
19 or the emergency control station?

20
21 PLUMLEE: I stand corrected. The people in the Unit 1 were looking after
22 the offsite problem, and that I guess is the emergency control station. We
23 were briefed by the people onsite at that time, and, if you will stay with
24 me a moment, my notes indicated that they had identified the B steam generator
25 leak which they thought was a tube rupture; they were having problems with

1 the condensate polishers, and they had had a feed pump trip which I think
2 was part of the initial reason for the shutdown. They had a group of
3 people set up in Unit 1 control room with their isopleths, etc., to try to
4 show the wind direction and try to direct an offsite team. I don't know
5 anything about their offsite team activities at that point. They stated
6 that no exceptional releases had occurred, and that there were no high
7 radiation readings offsite. At that point, which was something like 10:45
8 or 11:00 a.m. on the 28th, Unit 1 and Unit 2 auxiliary building ventilation
9 systems were isolated, and they stated that they had 532°F in Unit 2 and
10 2155 psi pressure, and they had identified 2×10^{-7} microcuries per milli-
11 liter in the airborne levels in the auxiliary building, which I think was
12 Unit 2--I don't show which it was. They had B steam generator isolated,
13 and they had a 2.8 psi positive pressure in Unit 2 containment. There was
14 a report that there was 3 mR/hr at roughly that time at the north parking
15 lot, which is right outside the, uh, what is the right word for this building,
16 the process center. They said they had a helicopter assisting at that
17 point with their offsite monitoring, and that Gary Miller was in the Unit 2
18 control room at that time. They were roughly at 11:00 attempting to restart
19 the auxiliary building/ fuel handling building ventilation, and they had a
20 number of high radiation monitor trips in Unit 1, which they attributed to
21 ventilation problems drawing the airborne activity over into Unit 1. I
22 took some readings, which I think are the readings at 10:50 a.m. in the
23 Unit 1 instruments. They had a liquid monitor RML-6 radwaste discharge
24 which was tripped and indicating 4×10^4 cpm. RMA-9, which is the reactor
25 building stack particulate, also tripped showing 10^5 cpm. RMA-6 which is

1 the auxiliary building particulate ventilation monitor was indicating
2 10^6 cpm, and it was really offscale. That was as far as the scale went.
3 The fuel handling building ventilation monitor particulate RMA-4 was offscale.
4 They stated that Gary Reed and Cary Harner had taken some samples at 10:25
5 a.m. which indicated 130 microcuries/ml of activity in the primary water of
6 Unit 2. Roughly, this is the point that, as far as you're concerned about
7 offsite activity, etc., the point which I would have to stop and go on
8 another topic. During this period of time of 10:45 to 11:00, we were
9 informed that the people in Unit 2 control room were on masks and they did
10 not have enough respirators for more than two people to go over to Unit 2.
11 Don Neely and Higgins (Operations inspector) immediately went over to
12 Unit 2 and the remainder of us, because there were not enough respirators,
13 remained in the vicinity of Unit 1's control room. At about 11:30, I was
14 requested by George Smith by telephone to make a survey around the exterior
15 of the reactor facility, and I discussed this with Jim Seelinger. He did
16 not want me to go out alone; he asked to have one of his people accompany
17 me, and the individual who accompanied me was an auxiliary operator named
18 Joe Manoskey. We found about 5 mR/hr along the east fence surrounding the
19 reactor building and the auxiliary building, etc., and 20 mR/hr at the west
20 fence. The west fence was almost downwind; I did not intend to get into
21 the plume--I had walked up to the area near the plume and (when I say plume
22 I mean by visible steam vapor coming off the atmospheric dumps) and we were
23 at 10 mR/hr, which was as far as I intended to go. The wind shift put
24 this, as far as we know, right on us. As far as appearances, it raised our
25 radiation indication of 20 mR/hr on the E-120 detector. We were afraid we

1 were going to find ourselves royally contaminated with iodine, and we were
2 very happy when we got away from that to find that we had no activity on
3 us. We did have the presence of mind to stop inhaling while we were in
4 that plume. One of the things that I reported back to George Smith about
5 12 noon was that there was no indication of any activity on the ground, and
6 there was no indication that any of this plume activity adhered to us or to
7 our clothing. That was, I think, a significant difference from what I
8 would have anticipated beforehand. If I'd been asked what would happen if
9 you get caught in a plume reading 20 mR/hr--I would have said, "Well, you'd
10 come out of there with a lot of activity on you." That was not the case.
11 At about 12:45 or 12:50, I spoke with Jim Seelinger and I told him of the
12 radiation levels that we had found in the plume outside, and the reason
13 that I was specific in going to him was that I understood that he had told
14 people there was no release to the atmosphere from the facility. Specifi-
15 cally, Tom Gerusky of the Pennsylvania Bureau of Radiation Health was on
16 the line, an open line, complaining that he was being told that there was
17 no release taking place, and yet he was able to read radiation airborne in
18 Harrisburg, which is 15 miles away, roughly. I also told Seelinger that,
19 as far as I could determine, the wind was variable and that sooner or later
20 this airborne activity would get into the ventilation intakes, and he would
21 have a major problem, when that occurred, with airborne in the buildings.
22 This did occur later in the day. At about 1:00 in the afternoon...

23
24 ESSIG: Karl, do you recall what Jim Seelinger's reaction was when you gave
25 him the news that there was, in fact, measurable levels of radioactivity in

1 effluents outside the facility, and he had... you indicated he had maintained
2 up to that point that there were no offsite releases... do you recall what
3 his reaction was?

4
5 PLUMLEE: I didn't... let's say, bring up anything controversial. I merely
6 informed him that there was 20 mR/hr measurable at ground level outside the
7 facility, and it appeared to be due to the plume, specifically that the
8 wind change had doubled the reading from 10 mR/hr to 20 mR/hr, so I was
9 sure that it was an airborne problem and not a matter of radiation coming
10 out of the building. I did not burden him with anything of the nature,
11 "Well, I hear you're telling people that it's, that nothing is coming off."
12 I told him the facts as I could see them, and he played it poker face. He
13 was very busy, and I assumed that he would make good use of the information
14 I had given him. Roughly, at 1:00 p.m., I had telephone conversations
15 first with Tom Gerusky (I would have preferred to talk with George Smith,
16 who is my supervisor), but Tom Gerusky had an open line, and he was asking
17 for information. I informed him of the same information I had given Jim
18 Seelinger. I also told him that I had not yet gotten to my own supervisor
19 with this information, and that I had to get to him immediately with this
20 information. George Smith then, excuse me... at roughly 1:20 p.m., we were
21 told that the airborne activity was making it necessary to leave the building
22 or to go on a respirator. We had no respirators, so in our case--I've
23 forgotten whether it was one or two people remained behind; as I recall,
24 Nimitz and I were going to leave the facility. George Smith specifically
25 asked me to try to make some surveys offsite at this point. Joe Manoskey

1 was assigned to me as a driver, and the Met Ed vehicle at some point was
2 made available. I'm not sure whether I left the site with Manosky or if I
3 left the site I think with Nimitz. The next note that I have I think
4 indicates that at 1330 hours, we were leaving the north gate and a radiation
5 technician was there surveying the vehicles as they left and the people.
6 This person's name was Harry Furst; he told me that they had had no conta-
7 minated vehicles identified at that point, but that he had found a few
8 individuals who were contaminated. They were sent over to the Observation
9 Center or to the--I'm not sure whether they went to the Observation Center
10 or whether they went to the substation to be decontaminated--and even
11 though there had been higher levels at the north gate prior to that time, I
12 didn't really find any significant reading, maybe a tenth of an mR/hr or
13 so. That was about the same radiation level found over at the Observation
14 Center. Manoskey...

15
16 ESSIG: Two questions at this point, Karl. The radiation levels that you
17 talked about measuring. You indicated that these were measured with an E-
18 120. Did you make measurements in the open window mode or closed window,
19 or both--that's the first question. Secondly, you indicated that Harry
20 Furst had indicated that there were people... a few people had left the...
21 through the north gate that were detectable... personnel contamination had
22 been noted. Did Mr. Furst indicate to you how many people there were
23 having personal contamination, and did he go so far as to give you any
24 names, or did you inquire about that?

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1 PLUMLEE: First of all Harry indicated that there were no high contamination
2 levels. It was more on the order of detectable contamination but he did
3 not say how many and I don't think he had made or logged their names. I
4 think the intent was that they would go to a decon station that was set up,
5 and whether that was observation center or not, I can't tell you at this
6 point. But he was doing a screening of vehicles and people as they left.
7 And apparently the airborne had gotten around to areas and such there was
8 some chance of both vehicles and certainly personnel being contaminated. I
9 don't know how many there were. Now roughly two o'clock, Joe Manoskey and
10 I were in a Met Ed vehicle and as we left the observation center, one of
11 the camera crews followed us but as far as I know, they never ran that
12 film. They were taking pictures as we drove along down the highway.
13 Shortly after 2:00 in the afternoon we found there was one-half to one mR
14 per hour airborne generally in downtown Middletown and somewhere around
15 2:30 I was able to get on the pay phone and call this information into
16 George Simth but by 2:30 in the afternoon we were having trouble with phone
17 connections in the Middletown area. The phone system later was swamped and
18 was very difficult to make that sort of a call and up to about five o'clock
19 we were on the road. We drove north on route 83 and west across the river
20 and north and then back east to downtown Harrisburgh over throughout 283
21 back to the observation center. There was no activity indicated by an E-
22 120, anywhere along that area from the,... let's say from the edge of
23 Middletown until we returned back to that area. At something like 6:00
24 p.m., we noted that the Met Ed survey team had reported 100 mR per hour at
25 the north gate and I later found 70 mR per hour inside the outer fenced

1 area at that point. Now, at that point the Met Ed personnel had begun to
2 question their instruments and one of the survey teams was at hand. The
3 reason they questioned their instruments was that the airborne drifted so
4 fast that they were use to being able to say, well it's X mR per hour at
5 point A and then somebody else would come by and say, oh no there's nothing
6 there at all. So we got together with them and I had a Digi-master, an E-
7 120 and the Met Ed personnel read their own instrumentation and we compared
8 these instruments at a point where there was 50 to 60 mR per hour. At that
9 point we compared and we found no difference between the instruments
10 essentially with the windows closed. They were reading very close to the
11 same identical no matter whose instrument I think they were using 520s. I
12 had a Digi-master, and an E-120 and with the windows closed on these they
13 all read the same and this at something on the order of 50 or 60 mR per
14 hour. With the windows open you have variability and, I believe that the
15 reason for the variability is determined by your distance from source of
16 radiation. I think if your in the plume that you get a factor up to three
17 to one, window open gives you three times as high reading as when they are
18 closed. If your far enough away that you are not getting beta in the
19 window, it doesn't make any difference whether the window is opened or
20 closed. Getting back to this topic which you asked for and had a lot of
21 patience on. The window open and closed readings varied. The window open
22 was different on different instruments. It's only... they corresponded
23 very well only if the window was closed. Getting back to the readings
24 which I had made about 12:30 or 12:45 onsite, I didn't see any difference
25 in the readings that I took, window open or closed then which would indicate

1 that we weren't actually in the plume, but we thought we were in the plume
2 because the steam was coming down on us. The readings in Middletown typically
3 are a factor of two difference whether the window is open or closed. And
4 later that night I found an area near the airport, what is the right word,
5 the terminal, the airport terminal where it was three to one.

6
7 ESSIG: You indicated that this comparison was made with licensee instruments.
8 Was it around six o'clock? Was that correct?

9
10 PLUMLEE: I think so.

11
12 ESSIG: Ok. And the licensee at that time was using an E-520 or 530 but
13 was it just one instrument that you compared with the license? One of his
14 license?

15
16 PLUMLEE: As I recall, there were three or four of the licensee's people
17 present and these three instruments of theirs and they were all in excellent
18 agreement between the licensees instruments and also between my instruments
19 of which I had two, a Digimaster and and E-120 and with the licensees
20 instruments they all read the same window closed. At roughly 6:00 p.m. I
21 continued on into the process center and we had to wear respirators to
22 enter into the process center and at roughly 7:00 p.m. George Smith requested
23 me to make another offsite survey and specifically he wanted me to try to
24 define isopleth, I supposed to actually go out, and try to give him some
25 readings as to where say half mR per hour was detectable. At roughly 2100

1 I was out; this was two hours later. I was out in the vicinity of the
2 Harrisburgh International Airport terminal and between the Olmstead Plaza
3 and the Harrisburgh International Airport there was a plume that was about
4 200 feet wide and I could detect radiation over a distance, which I estimated
5 it to be 200 feet in width and it was 12 mR per hour at the peak on the E-
6 120 and the Digi-master. The E-120 reading was 12 mR per hour window open
7 and seven mR per on the Digi-master with the window closed. The window
8 opened they both agreed roughly 12 to 14 mR per hour. I made two loops in
9 the plume. It gave me a total of 4 passes through it and on three of them
10 it agreed identically with what I got at the peak. Before the fourth pass
11 through it, the radiation level was significantly reduced, it was only
12 three mR per hour at maximum. Do you want to interrupt?

13
14 RESNER: Mr. Essig is at a phone call at this time we will break. It is
15 now 12:15 p.m.

16
17 RESNER: The time is now 12:34 p.m. Mr. Essig has now rejoined us from his
18 phone call and we'll resume and I believe Mr. Plumlee is about to respond to
19 a question.

20
21 PLUMLEE: Continuing with the discussion of the measurements in the vicinity
22 of the Harrisburgh International Airport. I made a phone call back to the
23 Region I office to convey that information. It took something on the order
24 of half an hour to complete the call and by that time the phone system was
25 in real trouble due to the heavy load on the telephone system in the area.

1 At roughly 11:00 p.m. or midnight I was back at the observation center and
2 Mr. Stohr had taken me off the surveys offsite with intent that Jim Kotton
3 and Ron Nimitz would continue using the mobil lab. I returned to the
4 facility and took readings at Unit 1 and performed another survey, I believe
5 outside the Unit 1 and 2 close into the facility and at seven o'clock I got
6 over into Unit 2 and I took a set of readings of those instruments that
7 were on scale at Unit 2 and I don't know if you want to...

8
9 ESSIG: You said you jumped ahead to seven o'clock? I believe you had left
10 off at 11 to 12. Were you on duty all night then?

11
12 PLUMLEE: Yes. Yes we were on duty until nine o'clock in the morning of
13 the 29th. As my notes indicate and I can't be sure of exactly the time
14 that we left the facility. At roughly seven o'clock in the morning I got
15 into Unit 2 control room. I don't know if you want those readings put on
16 tape or not. I took a set of readings as they were called in from Unit 2
17 to the Region at 7:30 a.m. roughly. At roughly nine o'clock in the morning
18 we left and got into a motel 10:00 a.m. and then we reported back at roughly
19 2:00 p.m. I think you want to terminate the tape now. Is that right?

20
21 RESNER: If we are going to get into anything at length, we'd do well to
22 terminate here and change the sides. Yes. So will we do that, the time
23 now is 12:37 p.m.

1 RESNER: The time is now 12:43 p.m. and Mr. Essig has some additional
2 questions for Mr. Plumlee.

3
4 ESSIG: Karl I'd like to get your opinion as to whether or not during your
5 observation of the licensees activities during that first day and having
6 accompanied the licensee on sort of looked over their shoulder as to what
7 they were doing with respect offsite surveys as well as making some of your
8 own. What was your general impression of the type of survey in terms of
9 the adequacy of the survey that the licensee was making? In other words,
10 did he appear to be on top of the situation as far as getting instructions
11 from the emergency control station as to where to go and did he proceed to
12 go to that place or did you encounter any problems where the person making
13 the survey didn't agree with where he was told to go by the observation
14 center people? Excuse me, the emergency control station.

15
16 PLUMLEE: I didn't encounter any specific cases where I would even have
17 known whether the people were going where they were told. I would guess
18 from the problems we had with telephone communications at any time they had
19 to make a phone call by late in the day, it was very difficult to get a
20 call in or out and so the first point is that anything that could be handled
21 by radio probably went all right. Anything that could not be handled by
22 radio probably didn't make contact but the general impression I got was
23 that the licensee was following a preset list of monitoring points which
24 where sort of routine set and I don't know whether they generated them at
25 this time during the accident or whether they had a preselected set from

1 their plan as to what they would monitor. And as far as I can determine
2 the chance of a preselected monitoring point happening to be at the location
3 of plume is next to zero. At the time anybody happened to be there to take
4 a reading, my impression is you have to track the plume, you have to get
5 out on foot or in a helicopter or in a vehicle if it's possible to get to
6 the plume in a vehicle and work your way with the plume. It wanders
7 around very irradically and there's no way you can even with the benefit of
8 a wind vane and knowing the wind direction in the plant, know where that
9 plume was going to be -- a mile or two away from the plant. Does that
10 answer your question?

11
12 ESSIG: Yes it does Carl and I just want to make sure I understand your
13 comment as you intended it. Is it your opinion that the licensee at lest
14 during the first day was focusing more on making surveys at points which
15 either had been preselected or were selected at some time during the course
16 of the event rather than what we would call plume chasing? Did I understand
17 it correctly in that regard?

18
19 PLUMLEE: That's true. As far as I'm aware the licensee had never thought
20 in terms of following the plume and having the people on the survey teams
21 go out and look for the plume and identify the plume and take reading as if
22 they were chasing it or following it around.

23
24 ESSIG: Another question related to another -- to a different area. You
25 indicated that you came in plant about, oh right around midnight on or

1 late in the day on the 28th and that you were in plant for the remainder of
2 the early morning hours. Could you describe for us what your duties were
3 during that period of time?
4

5 PLUMLEE: Roughly at midnight things looked fairly stable around the plant
6 and as I recall took a survey outdoors in the immediate vicinity of the
7 buildings and we began to establish routine which included calling in
8 periodically to Region I the readings off the instruments in the Unit 1
9 control room and I was not able to get into Unit 2 control room until 7:00
10 a.m. on the 29th. The activities included looking at the emergency control
11 station operation and I think I have a note that indicates that one of the
12 people there had identified and estimated a source term by taking their
13 offsite readings and back calculating. I assume you have these numbers.
14 They were called in to Region I. I have them in my notes if you want them.
15 We observed that their radio contacts were going all right; they had people
16 in their staff busily calling one another and carrying out various activities
17 that are part of their effort of doing offsite monitoring and also they
18 were doing some work on the site, such things as going through the facility
19 for various chores that were too numerous to mention, let's put it that way.
20

21 ESSIG: Karl one more question along this line. Do you recall who was on
22 duty at the Emergency Control Station for the licensee during the period
23 that you were -- the early morning hours that you were observing their
24 activities. For example, who was in charge I believe you previously mentioned
25 Mr. Seelinger and could you state who else might have been or if it wasn't

1 Seelinger who it was that appeared to be in charge, who was assisting him?
2 Do you recall that?

3
4 PLUMLEE: Do you want to stop the tape a minute so I can look this up in my
5 notes? I've got some names.

6
7 RESNER: It's going to be a brief pause here. We won't stop the tape but
8 Mr. Plumlee has refer to his notes and it's going to take a few minutes to
9 find what he is looking for.

10
11 PLUMLEE: Sorry for the delay here but I have to -- ok let me...

12
13 RESNER: .We are ready to resume.

14
15 PLUMLEE: First of all when I came on site and on the 28th at something on
16 the order of 10:40 a.m. that we got into the control room. The people
17 there were Jim Seelinger and who was operating and in fact in control of
18 the Emergency Control Station. He is also Unit 1 superintendent and the
19 shift superintendent who was under him was Hitz. Hitz was not particularly
20 concerned with control station activities. He was looking after the reactor.
21 The individual who were present as I recall them I'm reasonably sure that
22 Beverly Good was present and I was surprised because she's a Reading
23 employee and not a Met Ed employee onsite. Len Landry was present as I
24 recall and he is a member of the health physics radiation protection staff
25 onsite. I'd hope to find the name of the person in my notes who'd done the

1 back calculation later in the day and I haven't found it yet. I may have
2 that in my notes; I'm not sure. There was initially an operator handling
3 the radio station. There the contacts with the people were controlled
4 offsite by radio contact. As the day progressed Sid Porter, who is the
5 consultant, appeared and as I recalled Sid was on the telephone several
6 times threatening and exhorting the contractors whom they were trying to get
7 to bring equipment onsite, such things as whole body counter, mobil labs
8 and other equipment. He was very busy on the phone and he had apparently
9 taken upon himself whether by direction or because it wasn't being done
10 otherwise the lineup of materials which they were needing and one of the
11 very big shortages was masks. He was busy running down respirators and I'm
12 not sure what I should mention here but he was on the phone continually
13 trying to round up the things that were needed. Porter was also present
14 and involved with the Emergency Control Station activities shortly after he
15 arrived and I would guess somewhere around 3:00 p.m. or 2:00 p.m. but I
16 don't really know when he showed up.

17
18 ESSIG: I think what we will do now is to turn it over to Ron Nimitz and
19 have him pick up. I guess Ron we can probably pick up when you arrived on
20 site with Karl Plumlee and I think Karl indicated that he arrived or that
21 you and he and others arrived at the north gate at about 10:10 and shortly
22 there after arrived in the Unit 1 control room. So you can pick it up from
23 the time you arrived in the Unit 1 control room.
24
25

1 NIMITZ: As Tom indicated we arrived slightly after 10:00 in the Unit 1
2 control room. Myself and the other members of incidence response team were
3 briefed by Jim Seelinger. He gave somewhat of a brief rundown on the
4 situation and what type of air activities we had, etc. etc. At this time
5 Don Neely, who was acting at the team leader, dispatched us in various
6 areas. Myself and Chick Gallina were directed to set up a command post in
7 Unit 1 shift supervisor's office. From here we tied into the regional
8 office to maintain a direct contact with the Region. Don Neely assigned
9 Karl to do some offsite survey and some general surveys in the area. At
10 that time, it was approximately 11:30. He and Jim Higgins, operations type
11 from Unit 1, from Region I proceeded to Unit 2 to assess the situation
12 there. During the time I was on the site from 10 a.m. of the 28th till
13 approximately 1330 of the 29th. At this time I assisted Chick Gallina who
14 was directed to man the phones to relay any messages, relay any information
15 to the Region. During this time from approximately 11 o'clock 11:30 a.m.
16 till approximately six maybe seven o'clock in the evening I acted as an
17 intermediary between Chick Gallina and the Emergency Control Station in the
18 Unit 1 control room. I collected survey data, wind speed, wind directons,
19 etc., etc, and passed this information onto Chick Gallina who relayed it
20 back to the Region. At approximately six or seven o'clock we got directions
21 to do some offsite surveys. This came over the telephone. At approximately
22 perhaps eight o'clock I left the site and went to the processing center
23 where another control center had been set up. At this I talked to Phil
24 Stohr. This was approximately eight o'clock, nine o'clock in the evening.
25 At that time he indicated that myself and Jim Kotton, who had arrived in

1 the emergency van in the mobil lab rather, to take the lab and do some
2 offsite collecting of soil sample, water samples, and air samples. This
3 was -- he would have liked for us to do this because the mobil lab had the
4 capabilities for AC where as we had no method of collecting air samples
5 offsite for we had no portable generator. When we attempted to take the
6 mobil lab and perform the offsite surveys we noticed that the lab had
7 several problems with the tires, that one tire was flat and the other tire
8 was bald. This was approximately 9:30 p.m. on the 28th. At this time I
9 reported back to Phil Stohr who indicated I should perhaps get with the
10 licensee survey teams and do some offsite surveys with the licensee survey
11 teams. At approximately 10 o'clock I got Dave Limroth and asked his permis-
12 sion to accompany some of his survey teams to do offsite surveys. I accom-
13 panied two survey teams from approximately 10 p.m. on the 28th till approxi-
14 mately one, two a.m. the morning of the 29th. My first survey team I
15 accompanied we just essentially drove towards the Middletown and the High-
16 spire area. We stopped at the Olmstead shopping plaza which was located
17 between Middletown and Highspire. I attempted to collect air samples using
18 our radeco air sampler. The licensee had the capability at least to -- had
19 a AC converter that when I tried to hook my apparatus up to it. It would
20 not work; it kept tripping the unit off. So, therefore, I was not able to
21 obtain any independent airborne surveys at that time. However, I was able
22 to make dose rate measurements at the area of Olmstead shopping plaza. It
23 was approximately three mR per hour. This is open window reactor experiments
24 digi-master readings. This was GM2 without open readings and the reading
25 range from approximately one... beta dose is approximately one to three

1 times the gamma dose. It was at this time that I noted that the licensee
2 did have the capability to measure beta and I brought this... upon returning
3 to the site with that survey team terminated approximately 12 p.m. that
4 night. I brought this up with licensee representatives as to how they are
5 performing beta surveys offsite. They were apparently using the Pic-6's
6 which had the gamma capabilities but did not have beta capabilities. I
7 subsequently brought this up to a Mr. Tom Mulleavy who's the Unit 1 Health
8 Physics Supervisor and he indicated that he had some rad owls which had the
9 capability, which would be distributed to be used for offsite surveys. I
10 accompanied a second survey team from approximately 12 midnight til 1, 2
11 o'clock in the morning of the 29th. During this time I had called into our
12 command post in the Unit 1 control room and ask for wind speed and wind
13 direction so that we may procede to the plume location. It was at this
14 time that I ask the licensee offsite survey team to perhaps drive to this
15 area so we may get a reading of the plume. They said that they had no --
16 they were not suppose to anywhere that was not a designated location. They
17 really did not appear to essentially go plume chasing but they had a spot
18 set and they were to procede to the spot and make readings at these desig-
19 nated locations. So prior to leaving I discussed this with Dave Limroth
20 who subsequently asked his offsite survey team to essentially proceed in
21 the direction of the plume and plume locations. It was at this time I
22 called the Unit 1 NRC command post again and got the wind speed, and wind
23 direction and we essentially went plume chasing. At that time which is
24 approximately 1 o'clock in the morning, 12:30 in the morning we proceded
25 north through Middletown past the Olmstead shopping plaza again through

1 Highspire on Route 441 north. It was at this time we could not find anything
2 above background. It was at this time I also noticed that the licensee was
3 having problems communicating back with the command post. The radios were
4 apparently -- did not have the capabilities to -- were not good for more
5 than 10 miles, so I brought this up to the individuals that were making the
6 surveys and I said, "Well what are you guys do when you are 10 miles out or
7 something like that" he said, "Well we don't see anything we don't have any
8 problems." The essentially swept it under the rug and I brought this up to
9 licensee representatives also, with the problem with the radios. I had
10 mentioned it to the health physics supervisors. I think the individuals
11 Mulleavy and also Dick Dubiel this to had problems with this. I returned
12 from that survey team approximately two, three, o'clock in he morning and
13 reported my results to Phil Stohr who was heading the environmental group
14 for the NRC there. It was at this time that I returned back into the
15 Unit 1 NRC command post to continue acting as a data taker or intermediary,
16 etc., etc. And I subsequently debriefed with Don Neely at the time and
17 left the site at approximately 1330 on the 29th. Tom do you have any
18 question for that day?

19
20 ESSIG: Let met understand Ron you went back to the Unit 1 command post,
21 which was in a ship supervisors office adjacent to the Unit 1 control
22 room at somewhere around 0200 to 0300 and you remained there until and
23 about 1:30 p.m. on the 29th. Is that correct?
24
25

1 NIMITZ: Approximately, yes.

2
3 ESSIG: Ok. Just one question on the survey that was -- the second survey
4 that you indicated -- I have in front of me the ECS survey log into which
5 the survey results that were radioed back to the ECS were recorded and I
6 note in here one of the problem areas that I have been previously discussing
7 with the licensee was related to the lack of a survey and apparently occurs
8 immediately after the second survey that you had made. That is the survey
9 from about midnight or so until you came back in about roughly 0200. You
10 indicated, I think, that you were surveying at -- well I have some survey
11 points down here and I'll just read them to you and let me know if these
12 were about the same points that you had -- were participating with the
13 licensee as far as making surveys. At 0100 I have less than .1 mR per hour
14 the Honda dealer on route 230, 0107 one mile outside of Middeltown on
15 Eisenhower Boulevard less than .1 mR per hour, 0115 less than .05 mR per
16 hour and Steelton, and 0130 less than .1 mR per hour on Fullingmill Road
17 and Route 441. Do all those points sound like the ones that you...

18
19 NIMITZ: That sounds like the area I covered.

20
21 ESSIG: Ok. What I am trying to determine is, in discussing with one of
22 the nuclear engineers, there seems to be a gap from about 0130 -- a gap in
23 the licensee survey from about 0130 to approximately 0600 as far as the
24 offsite surveys were concerned. They were surveys made on the island
25 during that time. At the predesignated points GE series 1 through 10 but

1 after that survey at Fullingmill Road and Route 441 at 0130 there don't
2 appeared to be only additional surveys. And one thing that the licensee --
3 the nuclear engineer for the licensee was trying to recall. He seem to
4 recall one of their vehicles breaking down in Middletown in fact it was the
5 Middletown... the Hardy's and I think he said in Middletown and that they
6 had to send out their emergency vehicle to effect repairs on this other --
7 on this survey vehicle. And I am in the process of checking out through
8 the licensee's transportation people to see if there is a reasonable explana-
9 tion for this failure to make a survey during a several hour period. And
10 incidently during that several hour period the plume appeared to be or at
11 least the wind was blowing fairly steadily into the northwest to west
12 direction was heading from the plant in that direction. Because by 0600 it
13 was blowing directly toward Goldsborough. So during that period of time it
14 would appear to me that the licensee should have had somebody on the west
15 shore from working his way down from the northwest toward the west during
16 that period of time. As soon as I can tell there weren't any surveys made
17 after 0130, are you able to -- when I mentioned the breakdown licensee's
18 vehicle does -- where you aware that that had occurred and if so is period
19 of time that is about 0130 or 0200 on the 29th, is that about the right
20 period of time for that to have occured?

21
22 NIMITZ: I was not aware of any vehicles breaking down at that time. As I
23 indicated I accompanied the survey team to approximately to 2:00, 2:30
24 perhaps even 3:00 and then I returned on site and continued taking data
25 from the emergency control station personnel. And the data that I was

1 relaying appeared to be complete from the experience I've had in terms of
2 environmental surveys. It appeared to me that they were getting the proper
3 data and I had been relaying this to Mr. Gallina. As far as recalling a
4 problem with the emergency vehicles, I was not aware of that.

5
6 ESSIG: I think what we've done now is to take you around up through 1330
7 and on the 29th and I believe that at that time then you went to get some
8 rest did you not? And I think what we will do now is pick up with Karl
9 Plumlee once again when he next came on site, I believe it was on the
10 afternoon of the 29th.

11
12 PLUMLEE: That's correct I came on site at the Observation Center really
13 rather than onsite at about 2:00 p.m. There was a significant delay in
14 getting into the facility. As I recall it was on the order of 1600 or
15 later before I got into the facility and I believe we were required to wear
16 respirators at that point in the facility. Everyone wore a respirator or
17 kept a respirator with him, one or the other, for a good part of that time
18 and then there was some difficulty in establishing what the airborne levels
19 were in the facility. The work that I did during that period included
20 setting, or continuing, a set of surveys which we'd commenced around the
21 outside of the buildings and secondly, we did look at the instruments in
22 both Unit 1 and Unit 2 and call in readings one way or another to Region I.
23 I'm not sure what Region I did with all this information but that's what we
24 were doing -- was feeding information in. And we observed the survey data
25 and air sample data that licensee was managing. We did not have anything

1 of any consequence during that shift that I am acquainted with in terms of
2 exposure to personnel. I don't recall whether that was the shift when they
3 had a problem with the release from the industrial waste treatment plant
4 but that became an issue which we looked at either on the evening of the
5 29th or the next day. At that time that became an issue it was already
6 overflowing the facility itself and running outdoors. One of the things I
7 did when that issue came up was to look around a little bit at the routes
8 where the water drained outside the facility and I am not sure whether it
9 was that night or not that I took a look at the hole in the dike where the
10 water drains from the site out into the river. But this is typical of the
11 things that I did, was to survey around the facility and to take readings
12 off the instruments inside the facility and relay that information back
13 into King of Prussia. I don't know what else I can tell you. That's about
14 it.

15
16 ESSIG: Karl do you recall how long -- you came on duty then at 1600 and
17 did you go off duty then roughly at 2400 or was it....

18
19 PLUMLEE: It was 1:00

20
21 ESSIG: 0100 on 3/30 then?

22
23 PLUMLEE: That's correct.

24 000 209
25

1 ESSIG: Did you then come back on duty at 1600 around 3/30?
2

3 PLUMLEE: No we were called in early, I think I was called back to again at
4 2:00 in the afternoon on the 30th and the problem was that they had to
5 transfer water early on the morning of the 30th and this caused the release
6 of the airborne activity which the helicopter had identified something like
7 2:30 or 3 a.m. in the morning and there was a good deal of problems there
8 were they held over the people from one shift and everybody was wearing
9 mask in the facility. And things were kind of sticky. It is hard to get
10 around and make your phone calls when you are wearing your respirator. Do
11 you want this back?
12

13 ESSIG: Ok. Why don't we run through then what your duties were if, well
14 in the area of - on either day did you attempt to assess any actions by the
15 licensee in terms of control of the inplant radiation exposures. Did you
16 oversee what was going on in that area and if so would you make any observa-
17 tions with regard to the -- would you perceive to be the control exercised
18 by the licensee over those exposures?
19

20 PLUMLEE: The licensee's inplant exposure control, first of all, was based
21 on a effort to get certain jobs done which were defined by the people in
22 the control rooms. And as I understood their attitude, they felt that the
23 urgency of getting to a certain piece of equipment and getting on with the
24 job of saving the facility, if you would like that terminology, was such
25 that on the 28th they had unlocked all the doors throughout the facility,

1 including the doors leading outdoors. I believe you could have gotten into
2 any area in either Unit 1 or in Unit 2 except the containment buildings
3 without a key, as the time we arrived on site on the 28th and the first
4 discussion I had on the subject was first with Tom Mulleavy, as I recall
5 and secondly with Dick Dubiel and I think the discussion with Dubiel was on
6 the morning of the 29th, something like 6:00 or 7:00 a.m. or in that
7 period of time. And he says, "Well ok what are we going to find here, a
8 citation for leaving the high radiation doors unlocked and working without
9 RWPs?" And at that point I said, "well! I don't know that it will amount to
10 very much, it looks kind of trivial, if you do get a penalty for that kind
11 of thing, compared to the overall problems and costs that are involved in
12 the incident." And that was the last I heard from him on that subject. We
13 did discuss the need to get back to standard issuance of RWPs and surveying
14 and locking doors and such. And I suggested to him that as soon as possible
15 he certainly should go back to regular operating health physics practices.
16 And it wasn't up to me, it was a determination from somewhere at higher
17 levels in NRC and in Met Ed that had brought them to this situation and I
18 didn't feel that it was my problem to do anymore and say, well, you know
19 you have these procedures, practices and regulations which are intended to
20 keep people from having overexposures and unnecessary radiation isotopic
21 intakes, and things of that sort. And that's were it was left. I was no
22 longer the health physics inspector responsible for the facility in that
23 respect. It was Neely's responsibility and that's as far as I took it. I
24 did relay the information to Don Neely. The controls included problems
25 that made it very difficult. They could not get good survey information

1 because of the activity levels in their counting rooms. The information
2 they were getting on the 28th and 29th was very poor and as soon as the NRC
3 Mobil Lab was set up the NRC mobil lab began providing them accurate accounts
4 of survey information, like if they took an air sample they could count the
5 cartridge and give them some indication of what the activity was in it.
6 But all the information prior to NRC's Mobil Lab being set up and coming in
7 operation was very rough, based on measurements made in high backgrounds
8 and made with equipment that wasn't very accurate for the type of measure-
9 ments they were attempting to make. And the licensee had no way available
10 to him to make good determinations on the 28th and early on the 29th. The
11 effort was made on the part of the licensee to orally set up the jobs that
12 they were doing and that was clear from Unit 1 control room on the 28th.
13 It was clear in 29th in Unit 2 control room. They didn't write down the
14 formal radiation work permit but orally they did attempt to preview the job
15 and plant it out and set the conditions under which the job was going to be
16 carried out. And typically they had a man, a health physics tech go along
17 on each job where there was high radiation exposure.

18
19 RESNER: The time is now 1:24 p.m. and we will break to change the tape.

20
21 RESNER: This a continuation of the interview with Mr. Karl Plumlee and
22 Mr. Ronald Nimitz. The time now is 1:29 p.m.

23
24 PLUMLEE: I'm continuing with the subject of in-plant Health Physics
25 practices. The main activities on the 28th in terms of jobs that involved

1 radiation exposures were entries into areas such as the auxiliary building.
2 One of the jobs that they sent people in was to determine where there was
3 water, and how much water, and get some idea of the radiation levels on it.
4 Later in the day, they attempted to cover the water with plastic in several
5 areas in the Unit 2 auxiliary building, and these were fairly difficult
6 jobs, and the people did these in full plastic suits and they used Scott
7 air packs for the jobs. Another job that caused a lot of exposure and also
8 contamination in Unit 1 area was the taking of a Unit 2 primary sample.
9 The sample of primary water is done in the same room as was originally set
10 up for Unit 1 sampling, and the tubing that carries the water over to
11 Unit 1 was quite long and it caused a high radiation area that extended
12 right on through a hot machine shop in Unit 1 because the tubing ran through
13 there. This is one job that over a period of 3 or 4 days they finally did
14 alleviate it to some extent by putting shielding over the tubing and things
15 of that sort. But I've forgotten whether it was on the 28th that they took
16 the sample, the first sample, but they obtained a sample and the individual
17 who took the sample got something on the order of 3 rems whole-body exposure
18 in getting the sample. A day or so later they decided that this was too
19 hot for some of their use, even though they managed to get the sample
20 shipped out. They also wanted to dilute the sample, and the man who did
21 the dilution got substantial contamination; he ended up with 10 mR/hr of
22 measurable contamination on him, after he'd peeled his protective clothing
23 and reached the nearest monitoring point, which at that time was Unit 1
24 control room. I had intercepted this man before he disrobed, and pointed
25 out to him that he had a lot of contamination on his protective clothing.

1 I've forgotten the man's name; I probably could come up with it, but right
2 now I can't come up with it on this short notice. The complications they
3 got into in sampling included the fact that their ventilation was not
4 properly balanced in the area where the sample sink was located, and this
5 is an old problem that had come up in the inspections as far as a year and
6 a half back, and the licensee had made several efforts to correct it and
7 had never been very successful. The last time it was brought up with the
8 licensee was on the exit from an inspection, and I believe it was March 2
9 that we discussed this. At that time the licensee representative had said
10 they had difficulty in lining up the ventilation and balancing it. The
11 result of this was that the first sample had caused some contamination to
12 spread out into the Health Physics lab and the corridor between the chemistry
13 room and the Health Physics lab, and this was the item that I believe
14 caused the initial control station move from downstairs to upstairs in
15 Unit 1. The result of all this was that there was contamination on the
16 horizontal surfaces a couple of days later. You could smear it; enough of
17 this stuff had come down on the horizontal surfaces that you could smear it
18 and get a roughly 1000 d/m reading off the smear. They later intended to
19 cut off one of the, ...or maybe all of the, intake supply fans for that
20 system, ...and the next time they took a sample they found that, even
21 though they had cut off the supply fans and this air was circulating in the
22 right direction, someone unknown apparently (at least no one ever admitted
23 who it was) had seen the supply fans off and he went back i the control
24 room and kicked them back on, and he essentially repeated the same operation
25 on there after they'd attempted to make this temporary correction to the

1 problem. So this is one of the areas where they did not ever fix up and
2 correct the problem that had been identified to them well over a year
3 previously. It had been brought up to them during an inspection in February
4 and March of this year (1979). The overall problem of health physics
5 practices: there was a period of time when people were arriving onsite
6 from offsite; some of them had apparently not been there for several weeks
7 or months, and these people were permitted onsite without the usual in-
8 doctination and training that is required of personnel before they are
9 allowed onsite. The licensee did make a reasonable effort in that the
10 people who were contract health physics technicians and also other contract
11 personnel who were present in Unit 1 during the refueling, during January
12 and February, were generally recalled. Insofar as they were brought back,
13 they had had the proper training for the conditions that were present
14 during refueling. There should have been some additional information
15 supplied to them when they were brought onsite during this accident. I'm
16 not aware of this additional information being supplied to them in any
17 formal way. I think they were brought onsite with the feeling that they
18 were experienced radiation workers and would somehow look after themselves
19 to a considerable extent. I believe that's about all I have to say on this
20 subject.

21
22 ESSIG: Let me just come back to one area, Karl. You indicated from about
23 the time that you first arrived onsite that the doors which normally require
24 an access card or some means to... like a key to get in, that these doors
25 were... you could get in without a key; in other words, anybody could get
in to just about any place except the Unit 2 containment.

1 PLUMLEE: Unit 1 and Unit 2 containment.

2
3 ESSIG: Would you comment on what you... before I ask you that question,
4 let me also state what I, or restate, what I think you said earlier that
5 the licensee had been giving,... had been providing somewhat of an oral
6 instruction as far as the, in lieu of a written RWP, so that there was, in
7 your opinion, some control or perception of what the individual that was
8 going to do a specific job was to do and I gather in that briefing that he
9 was somewhat made aware of the radiation conditions that he might encounter.
10 My question is, was that in fact that case? Was the individual reasonably
11 apprised of the radiation conditions that he would be encountering during
12 the particular job, and if you stated before, I don't recall, but, what
13 types of surveys, what types of health physics coverage, were made in
14 support of each of the major jobs which were tackled during the first
15 3 days?

16
17 PLUMLEE: First of all, the people who were in charge attempted to have
18 specific control over every job that was performed in the areas like the
19 auxiliary building of Unit 2. Their attempt included such things as the
20 site evacuation; they did not have people onsite that they did not speci-
21 fically authorize onsite. They attempted to know who was onsite; they did
22 not have people onsite that they felt they could not control in some form.
23 Their intent was that the people such as Seelinger and Miller would know
24 each job and direct each job and nothing else was to be done. This didn't
25 follow exactly that way; there were people who were doing things they

1 weren't aware of. Their intent was that nothing would be done without a
2 direct instruction from Seelinger in Unit 1 or his second in command as far
3 as Unit 1, Hitz on the first day shift. I would assume the same thing
4 occurred over in Unit 2, although I wasn't present in Unit 2 until 7,
5 roughly, on the 29th. But as of the 29th, that was what they were trying
6 to do in Unit 2, and I can't say that the formality was there; the effort
7 and the intent certainly was there, but these people did attempt to eliminate
8 everything except the jobs they wanted done and felt were essential to the
9 operations that they were trying to carry out. The surveys were generally
10 made on the entries. There were exceptions to that, but it took 500 mR
11 exposure to a man to make a survey. They generally felt that in areas of
12 that nature they would send the guy in to do the job along with the Health
13 Physics technician to conduct the survey and provide him information as he
14 performed the job. I understand that there were cases where the Health
15 Physics technician didn't actually go all the way in with the man who was
16 doing the job, but they used like a teletector where they could extend the
17 probe and get some indication of what the man's exposure was on these jobs.
18 I believe that their TLDs were reasonably conservative; the dosimeters that
19 the people wore... I have one comment there, that the one I wore indicated
20 450 mrem exposure; the Landauer film badge, that NRC provided me, which I
21 wore essentially right alongside it gave only about 115 or so that I could
22 attribute to that day and had a total of less than 150 for the month of
23 March. I've had some time onsite at Three Mile and some at Indian Point on
24 that badge. So there's a factor of about 3 higher exposure indicated on
25 the TLD badge that I wore at Three Mile than was indicated on the Landauer

1 badge that NRC supplied me. The Landauer agreed with the pocket dosimeter
2 self-reader dosimeter that Three Mile provided; it indicated that I had
3 about 115 mR exposure total of all the self-reader dosimeter information
4 that I collected there. Getting back to individuals... I understand that
5 they had three or four people who exceeded the 3 rem quarterly limit as a
6 consequence of the accident. Most of this was incurred the first 3 days.
7 The man who accompanied me, Joe Manoskey, I think picked up 1500 mrem on
8 the 28th, so about a third of his exposure apparently occurred while he was
9 with me. They had some problems with their dosimeter information; there
10 was one NRC employee who indicated 1100 mrem and if he really remembered
11 where he had been, and really had stayed with the people whom he claimed he
12 was with, it's most unlikely that he got more than couple of a hundred
13 mrem. But that's what they recorded for him. So there were some problems,
14 and I can't tell you how well the licensee could have handled them under
15 the situation where they had a lot of people coming in and their records
16 were still in Unit 1. They were having to issue their TLDs over in the
17 Observation Center and other sites; they were separated from their records.
18 The second problem that came up: it developed that the extremity dosimeter
19 data had not printed out for quite some time. Two weeks later the licensee
20 apparently wasn't aware, in talking with Mike Buring, that their dosimeter
21 extremity data was not printing out on their summaries. This was a problem
22 in the computer. They had the data, and I don't know how that came out,
23 but at the time I saw him they had not succeeded in printing it out during
24 the accident. O.K.?

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1 ESSIG: Karl, you mentioned extremity dosimeters. Were you aware of any
2 dosimeters that may have been worn by individuals who were involved in the
3 initial collection of the reactor coolant samples and subsequent dilutions
4 that were made?

5
6 PLUMLEE: I believe that the people involved in the sampling did wear
7 extremity dosimeters; however, the data wasn't printed out, and the data
8 from this information was not readily available at the time I was out
9 there. There is a good possibility that these people got high extremity
10 doses. This is some information that should be followed up and make sure
11 that it's in their records. The people who were walking around in the
12 auxiliary building were... after some delay provided extremity dosimeters,
13 and they put on ankle badges. The reason is that the radiation level on
14 the floor was higher typically than anywhere else, and there was some
15 effort necessary by NRC people to get them to routinely supply the TLDs for
16 ankle badges. The problem was partly a matter of supply, and partly a
17 matter of having a little difficulty getting set up and able to read out
18 this information. The licensee's established equipment was in an area
19 where it wasn't particularly satisfactory to try to read out the TLDs. It
20 was up close to the reactor buildings, it was in a trailer, and there were
21 times when the radiation level was as high as 40-50 mR/hr out in that
22 general direction, so that taking TLDs out there to read the TLDs might
23 cause some pickup of exposure at the time you're just sitting there trying
24 to run them through the machine. It also it exposed the person involved,
25 and would give you a problem getting them back into service. You know, you

1 would be exposing the badges that you had run through the machine and
2 intend to issue back to personnel if you did the work there, so they had a
3 problem of relocating their TLD evaluation equipment and the problem of
4 records; it's about like being dispossessed from your home: you don't know
5 where your razor is and things of this sort.

6
7 ESSIG: One further question, Karl, with respect to the in-plant health
8 physics coverage. You indicated that Seelinger and Miller attempted to be
9 aware of each job that was going on in the facilities and exercised some
10 sort of control over it administratively. Would you comment on the involve-
11 ment of Mr. Richard Dubiel and Mr. Thomas Mulleavy in the assessment and
12 control of in-plant radiation exposure, if there was any? I assume there
13 was some that you observed.

14
15 PLUMLEE: First of all, I believe that the attitude on the part of Seelinger
16 and Miller was that above all else they were there to save the facility.
17 They might have overridden Mulleavy and Dubiel if they had gotten in the
18 way of anything that was judged to be highly necessary and urgent. On the
19 other hand, Dubiel and Mulleavy were there, and I believe they were consulted.
20 I don't believe they would have had the leverage and the influence that you
21 would have under normal circumstances where a health physics signature is
22 necessary on an RWP. I believe, however, that there was full cooperation
23 in that, wherever Dubiel and Mulleavy could point out that the exposure due
24 to a certain job could be minimized or where they could point out that it
25 was too much, their assessment was taken into account. In terms of running

1 roughshod over them, I don't believe that actually occurred. I do believe
2 that there was a problem that showed up a lower levels, especially at the
3 foreman's level, and that is that they weren't used to working in a job
4 where there were all kinds of people coming up with information and all
5 kinds of people coming up with items that they wanted performed. They
6 weren't necessarily used to cooperating in directions other than through
7 the established chain of command. The established chain of command wasn't
8 always evident; I'm sure that in general nothing got done over the first
9 2 or 3 days that was not approved by whoever was in charge in each of the
10 control rooms, but it may not have been evident to the foremen of the
11 health physics setup that, in fact, these things were in some form approved
12 and in some form had the priority assigned to it to get it done. They were
13 getting words from people like Sid Porter as a very clear example whom they
14 may never have seen before as a member of their chain of command. I'm sure
15 that Sid Porter had the full authority to move some of these jobs that he
16 was trying to push, and he was calling up people, you know, vendors, con-
17 sultants, and such and acting for the licensee. As far as I know, he had
18 that authority, but I don't know if he had it in writing or not.

19
20 ESSIG: One further question along this same line, Karl. Were you aware
21 during this period of a question that may have been asked of any of the
22 people who were involved in some of the more high-exposure jobs--was the
23 question asked of the individual "do you wish to volunteer for the job" in
24 view of the fact that it was a very... you know, could involve some signi-
25 ficant radiation exposure. Do you recall if that question was ever asked?

1 PLUMLEE: A specific case: the taking of the primary water sample. I have
2 heard--I was not present--that this was voluntary. The individual said he
3 could take the sample and that he believed he could stay within this 3 rem
4 quarterly limit; he didn't quite make it, but he came close.

5
6 ESSIG: I think what we'll do now is turn back to Ron Nimitz and pick up...
7 I believe we left off with... Ron, you were back at your motel at about
8 1330 hours on the 29th, or at least you left the site at that time. Would
9 you pick up from there and tell us when you came back onsite and what you
10 did after that point?

11
12 NIMITZ: I came back onsite at 1830 hours that day, and stayed until 11:00
13 Friday morning of the 30th. From approximately 1830 hours until 12 midnight,
14 I essentially acted as somewhat of a rover, looking at general in-plant
15 health physics, respiratory protection, assessing new contractor health
16 physics types that were coming onboard, and essentially trying to get an
17 overall picture of what was happening in-plant. The prior day I had been
18 primarily involved with offsite activities and had no idea what was essen-
19 tially going on in-plant. So for the first several hours of my second day,
20 I essentially just looked at areas and turned over specific problems to
21 Don Neely or to Karl Plumlee. Some of the problems that Karl has already
22 identified, such as individuals making entries into RWP areas, excessively
23 high radiation areas without RWPs, free access to essentially any area
24 within the plant, lack of airborne surveys, prior to individuals entering
25 an area, things of this nature. This occurred several times; all the

1 entries that I was aware of... it was a plant health physics technician who
2 made an entry with an individual; these individuals still did not have an
3 RWP. I expressed my concern for this to the individual, Fred Huwe, who...
4 his response was "we're trying to save the plant"--essentially, who needs
5 an RWP. I discussed this with his supervisor, Mulleavy and Dick Dubiel,
6 and they indicated that they were going to talk to the technicians in
7 trying to get back on the RWP procedure and try to get the in-plant health
8 physics squared away again. Don Neely essentially followed up on this, and
9 he met with the appropriate people and what have you. At approximately
10 12 midnight of the... 2400 hours I guess it is of the 29th, we got a request
11 from Region I to do an offsite survey. Essentially, this was an isodose
12 profile, 360 degrees around the plant. Myself and Ray Smith, a security
13 investigator from Region I, performed this survey. This was an offsite
14 survey; it was essentially 360° around the plant; it ranged from 5 miles to
15 10 miles away from the plant, and covered 360 degrees. The surveys commenced
16 essentially 0030 hours of the 30th, and ran until approximately 6:00 in the
17 morning. We documented our results and took both beta-gamma readings and I
18 collected soil samples and water samples where I felt it was appropriate.
19 All my results and readings... do you want to turn this over?

20
21 RESNER: We'll take a break to change the tape. The time is now 1:59 p.m.
22 We'll resume when we pick up.

23
24 RESNER: The time now is 2:00 p.m. Mr. Nimitz will pick up where he left
25 off.

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1 NIMITZ: As I indicated, myself and Ray Smith performed an isodose survey
2 around the plant. We were directed to locate a 0.5 mR/hr line. The
3 highest reading we got was approximately 0.2 mR/hr open window, and this
4 was located in a little town called Cly, which is approximately west of the
5 Island. This survey continued until approximately 5:00 in the morning,
6 6:00 in the morning. One interesting comment: during the survey, myself
7 and Ray Smith had stopped at a little town south of Cly and were collecting
8 soil and water samples when a PPL truck stopped and wanted to know what we
9 were doing. These fellows looked like they were individuals directed by
10 the licensee to take offsite surveys. Well, they asked us what we're
11 getting, and I indicated, "oh, about 0.2, 0.1," and the individual was
12 saying "well, yeah, that's about what we're getting," so I naturally asked
13 them what type of instrument and what his beta readings were. He gave us
14 somewhat of a concerned look and didn't know what we were talking about.
15 This was about 3:30 in the morning. We asked to see the individual's
16 survey meter, and so here he pulls out a pocket dosimeter. This is what he
17 was apparently doing his offsite surveys with. But this was somewhat
18 interesting. We continued the surveys until, as I indicated, about 5:00,
19 6:00 in the morning, at which time myself and Ray Smith returned back to
20 the Unit 1 NRC command post. It was at this time when I was requested to
21 look at the effluent releases by the licensee. If I'm not mistaken, a
22 Mr. Bill Fisher, Section Chief from Region III if I'm not mistaken, asked
23 us, or at least asked me, to take a look at this. I proceeded to the waste
24 treatment area, and took a look at how they were logging the releases and
25 the volumes, etc., and I got two conflicting stories as to how the total

1 volume is logged that goes out of the plant. The individual who was manning
2 the control point, or manning the waste treatment center, indicated that he
3 uses the flow totalizer readings. You subtract the flow totalizer readings
4 and multiply it by a magic number and you get the total flow that's going
5 out over some period of time. So I naturally looked at this and then
6 talked to Bernie Smith, the Unit 1 supervisor, as to how they do it. He
7 indicated that they do it via pump head. I worked it out and got two
8 different readings, ...the readings were essentially off by 100,000 gallons.
9 I brought this to Bernie Smith's attention, and they right away sent several
10 people down to look at what was going on. It turned out that apparently
11 the individual at the waste treatment center was logging the totalizer
12 readings incorrectly. This was subsequently, corrected and I brought
13 this to the attention of Bill Fisher, the in-plant health physics leader at
14 the time.

15
16 ESSIG: Let me just clarify one point here, Ron. When we're talking about
17 effluent releases, we're talking about specifically liquids and specifically
18 would it be the industrial waste treatment system, the so-called IWTS?

19
20 NIMITZ: Yes. These releases I'm talking about are liquid releases and
21 they are primarily from the IWTS. This problem was resolved within approx-
22 imately about an hour, hour and a half. At approximately 0850 hours or
23 0900 hours, I was notified again by Bill Fisher that they were attempting
24 to ship out a primary coolant sample which had been drawn during the time I
25 was out making offsite surveys. I was directed to follow up and see what

1 type of licensee controls were on this sample that was to be shipped to the
2 Columbia hangar of the Capital Airport, and from there it was apparently to
3 go into Allegheny and be picked up by B&W or Westinghouse. When I went to
4 look and follow up on this sample. It turns out they were trying to ship
5 this sample that had approximately 150 mR/hr on contact and 15, 20 mR/hr
6 through the side of the shield. Looking at the sample, they had it in a
7 little plastic bucket, which to me does not meet any type of DOT specs
8 whatsoever. So I essentially put a stop on this sample until they got some
9 appropriate... I discussed this with Bill Fisher first and together we
10 indicated to the licensee that they should have some type of container or
11 should be shipping out at least a DOT spec container. They rounded up a
12 55-gallon drum and packed it with appropriate packing and material and
13 labelling, etc., etc. I accompanied the sample to the airport with two
14 licensee representatives, and we turned this sample over to an Air Force
15 helicopter crew which apparently had been trained in some type of health
16 physics procedures; they apparently knew how to handle the sample properly.
17 After dropping this sample off at the airport, I returned back to the site
18 which is essentially 11:00 Friday morning and left site that day and remained
19 offsite until approximately 2130 hours Friday evening, at which time I
20 commenced working midnight shifts from essentially 2100 hours to 0900 hours
21 for the next week or so. Do you have any questions, Tom?

22
23 ESSIG: No, I don't believe I have any further questions on your activities
24 on Friday. There was one point that I'd like to just throw out for either
25 one of you to address, and it comes back to the offsite surveys that were

1 made during the first 3 days. The licensee's records, specifically I'm
2 referring to the ECS log of surveys that was maintained, indicates that
3 apparently about 20 or so air samples were collected on the first day, on
4 the 28th, and were counted with the so-called SAM-2 (SAM standing for
5 Stabilized Assay Meter for the record). The licensee has indicated in
6 interviews with various people that were involved in that day that there
7 were a number of problems involved in using the SAM-2 because of the xenon
8 that was collected on the charcoal that was being, in fact, counted as
9 iodine. Apparently, on day 2 and day 3, there were only two samples each
10 day that were collected and that were assayed by the SAM-2, but I'm aware
11 from other records, both from our own NRC laboratory log and from the RMC
12 laboratory log, that there were samples collected and analyzed. My question
13 is: were either one of you gentlemen aware of a conscious effort by the
14 licensee to discontinue the use of the SAM-2 on the second and third day on
15 the basis that it was ineffective or discontinue it on some other basis,
16 just because of the xenon or some other reason, or was there some other
17 reason for his apparently discontinuing the use of the SAM-2? Would either
18 one of you care to speak to that?

19
20 NIMITZ: I've used the SAM-2 for uranium assay and have had some experience
21 with it, and from what I gathered there was no conscious effort to essentially
22 stop counting samples with the SAM-2. I was aware of the problem where
23 they apparently were labelling xenon activity on the charcoal as iodine,
24 and myself and Karl and Don Neely had discussed this and we were considering
25 suggesting to the licensee that he perhaps use some sort of ratio technique

1 where he can at least,...not having had calibrated the SAM-2 with a barium
2 source to essentially the iodine peak, to at least maybe ratio it so that
3 he can at least see a trend or see some type of trend analysis. But as far
4 as consciously slacking off from the samples, I really didn't see any
5 conscious effort on them. One thing... one comment just to get off... not
6 to get off the track here... in terms of the two control centers: I under-
7 stand they had an emergency control station in Unit 1 control room, but at
8 the same time they were maintaining a control center at the Processing
9 Center, and there were times during my collection of data during the first
10 day where these two control centers seemed to be in conflict as to who's
11 directing what and who isn't, etc., etc. That's one point I just noted.

12
13 ESSIG: Let me ask you one... a specific question along that line, Ron,
14 since you brought it up. When you refer to the Processing Center, are you
15 referring to the buildings on the north end of the site, that is, the
16 entrance to Unit 1 complex, or are you referring to the Observation Center?

17
18 NIMITZ: I'm sorry. It was the Observation Center. They had an isodose
19 plot and wind speed and direction, etc., etc., set up there, and there were
20 times where apparently the offsite teams didn't know who was directing
21 whom, whether it was the Unit 1 emergency control station or whether it was
22 the control station or control center set up at the Observation Center.
23 There was a little bit of consternation from what I understand on the part
24 of the survey teams as to who really they're getting direction from.
25

1 ESSIG: I believe that concludes the...all the questions I had on your
2 involvement each in both cases for the first 3 days following the event.
3 I'd like to now give each of you the opportunity if you so desire to make
4 any comments in the way of observations in terms of lessons learned, things
5 that you think the NRC did well, that the NRC did poorly, that the licensee
6 did well, that the licensee did poorly, things which might have been better
7 in terms of training, personnel, numbers of personnel, equipment, any
8 observations that you'd care to make of that nature. I'll turn the micro-
9 phone over to Karl if you have any...

10
11 PLUMLEE: First of all, I doubt that any equipment that one would assemble
12 onsite would be of much help in an accident of this sort because there is
13 always the risk that if the accident had been a little worse you would have
14 had no use of any equipment that you had stocked onsite. I would assume
15 that in my own simple way of looking at it, that you'd better keep a reserve
16 set of equipment, perhaps on a national basis or regional basis, that you
17 can move in when an accident occurs, and not bank heavily in terms of
18 supplies and equipment that you put in the individual facilities. The
19 reason for saying this is that, in this particular case, if there had been
20 a little worse leakage or little worse accident, the accessibility to
21 equipment that you stash onsite in an effort to prepare for an accident
22 would have been wasted; you would not have been able to get to that equipment.
23 In terms of training, the Three Mile Island facility particularly has a
24 progression of personnel dictated by union contracts that leads to cycling
25 people in and out of the plant, and to various jobs within the plant, and

1 training is of some limited value. You would be continually training
2 somebody for emergency situations that might never occur in the view of the
3 management, and this person might not be available after you've trained
4 him. He is a radiation protection technician for a while, then he moves up
5 to a better operating position, or he moves out of the plant, and things of
6 this sort. The personnel there are not permanent in the usual sense that
7 one tends to conceive of a staff of a plant. The management is semi-
8 permanent, but the people below the management level, because of various
9 considerations, are not permanent personnel in the sense that you can train
10 them and then forget about it for a year and come back and they're all
11 there the next year.

12
13 ESSIG: I'll now turn the microphone over to Ron Nimitz in the event that
14 he has any observations he wishes to make.

15
16 NIMITZ: Really, the only observation that I have to make is that the
17 incident response team could have been much better stocked in terms of
18 instruments, in terms of making offsite surveys and iodine measurements and
19 what have you. We really didn't have the necessary instrumentation and
20 survey meters and we were somewhat lacking in this. But, in terms of the
21 overall reaction and what have you, I think we did as... very well or as
22 best as we could. Other than the fact that we should be a little more
23 stocked in terms of instrumentation, I really don't have any other comments
24 outside of that.
25

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1 RESNER: This concludes the interview with Mr. Nimitz and Mr. Plumlee. The
2 time now is 1:17 p.m., excuse me, 2:17 p.m.
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