

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

1 In the Matter of:

2 IE TMI INVESTIGATION INTERVIEW

3 of

4 James L. Seulinger
5 Unit 1 Superintendent

6
7
8
9 Trailer #203
10 NRC Investigation Site
11 TMI Nuclear Power Plant
12 Middletown, Pennsylvania

13 May 8, 1979

14 (Date of Interview)

15 June 27, 1979

16 (Date Transcript Typed)

17 169, 170, 171 and 172

18 (Tape Number(s))

19
20
21 NRC PERSONNEL:

22 Dale E. Donaldson, Radiation Specialist

23 Dorwin R. Hunter, Inspection Specialist

24 Donald C. Kirkpatrick, Nuclear Engineer

25 John R. Sinclair, Investigator

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1 SINCLAIR: The following interview is being conducted of Mr. James L.
2 Seelinger. Mr. Seelinger is the Unit 1 Superintendent at the Three Mile
3 Island Nuclear Power Facility, the present time is 9:33 a.m. eastern
4 daylight time today's date is May 8, 1979. The place of the interview
5 is trailer 203 which is located immediately outside the south gate to
6 the Three Mile Island site. Individuals present for the interview will
7 be Interviewers Mr. Dale E. Donaldson, Mr. Donaldson is a Radiation
8 Specialist for Region I. Also present will be Mr. Dorwin R. Hunter. Mr.
9 Hunter is an Inspection Specialist. Performance Appraisal Branch, I&E
10 Reactor Construction Inspection. Also, there will be Mr. Donald C.
11 Kirkpatrick, Nuclear Engineer, I&E Headquarters U. S. Nuclear Regulatory
12 Commission. My name is John R. Sinclair. I am an Investigator, Office
13 of Inspector Auditor, U. S. Nuclear Regulatory Commission. Prior to
14 the interview being recorded, Mr. Seelinger was provided a copy of the
15 document explaining his rights concerning information to be obtained
16 regarding the incident at Three Mile Island. In addition Mr. Seelinger
17 was apprised of the purpose of the investigation, its scope, and the
18 authority by which Congress authorizes the Nuclear Regulatory Commission
19 to conduct the investigation. On the second page of the advisory
20 document, Mr. Seelinger has answered three questions, the questions and
21 Mr. Seelinger's replies will now be recorded as part of the interview.
22 Mr. Seelinger do you understand the above?

1 SEELINGER: Yes I do.

2
3 SINCLAIR: Do we have your permission to tape the interview?

4
5 SEELINGER: Yes.

6
7 SINCLAIR: Do you want a copy of the transcript?

8
9 SEELINGER: A copy of the transcript, please.

10
11 SINCLAIR: Allright, fine. At this time Mr. Seelinger we'd would like
12 to ask you to provide briefly your employment history and academic
13 training as it relates to the Nuclear power field. Would you give us a
14 brief synopsis?

15
16 SEELINGER: I am a graduate of the United States Naval Academy. I
17 graduated in 1967. I received a Master's degree in Mathematics from the
18 United States Naval Postgraduate school in March of 1968. I entered the
19 nuclear power field, nuclear power school of the Navy in 1968, May of
20 68, Valeo, California. I went through prototype training on the S5G
21 Reactor in Idaho Falls, Idaho. In the fall of 1968 and spring of 1969 I
22 served aboard the USS Henry L. Stinson, qualified as Engineering Officer
23 of the Watch. A portion of that time was as the Reactor Division Officer,
24 Reactor Control Division Officer. I served aboard the Stinson from 1969
25

1 through 1971. I made four patrols on the Stinson, FPM patrols, duration
2 of 3 months each. I attended the advanced submarine school for six
3 months, time frame 1971-1972. I served aboard the USS Trapang, SSN 674
4 for 2 years from 1972 through April of 1974 as Weapons Officer and was
5 qualified as Engineering Officer of the Watch on the USS Trapang. I
6 left the Navy in April of 1974 and joined Metropolitan Edison in early
7 June of 1974. My initial position on coming to Metropolitan Edison was
8 Training Engineer, assigned to the Training Department. I was promoted
9 to a Supervisor of Training in September of 1974. I served in this
10 position for approximately a year and a half. In June 1975, I was
11 promoted to Engineer Senior 1, and was on the staff of manager, Nuclear
12 Operation, who at that was Jack Herbein and Jack was also assigned to
13 site at that time. I served in that position performing Engineering
14 Managment type tasks, in addition to being Supervisor of Training
15 until the end of 1970. Excuse me, let me back up, I served in the
16 concurrent position until sometime 1976, at which time we hired a new
17 Supervisor of Training and I just served in the position of Engineering
18 Senior One working for Mr. Herbein. In 1977 I was promoted to Unit 2
19 Superintendent Technical Support. I served in that position from 1977,
20 January 1977 through November 1978. In December of 1978 I was promoted
21 to Unit 1 Superintendent and have served as Unit 1 Superintendent from
22 December 1978 to the present. I hold a Senior Reactor Operators License
23 on Unit 1 which I obtained in December 1976-January 1977. The license
24 examine was in December. The license was granted in 77. I received a
25

1 Unit 2 license in Senior Operators license in mid 1977. I don't remember
2 the exact date, July, August, about that time frame. I hold a current
3 Senior Operators license on both units at Three Mile Island.
4

5 SINCLAIR: Ok, thank you very much, I'm not sure which of the inter-
6 viewers, Mr. Donaldson are you going to start? Okay I will turn it over
7 to Mr. Donaldson.
8

9 DONALDSON: Jim what I will do is just cover my areas of interest in
10 terms of emergency plans and some of the as Radiological areas and
11 again as Dorwin mentioned before our period of interest is from the
12 28th through about midnight on the 30th, so if I could I'll run through
13 those and then I'll leave and let these two gentlemen take over the
14 operational area. I will try to get through these fairly quickly. I
15 wonder if you would start just by giving me a brief run down on when
16 you arrived, where you reported and take me up to the point of time
17 when you became integrated into the responsible organization?
18

19 SEELINGER: Ok, I received a call at 5:45 in the morning at home from
20 Gary Miller, saying that Unit 2 had tripped and that there were some
21 complications, but he did not go into any detail other than saying
22 there were some problems with pressurizer level and told me not to give
23 Unit 2 any trouble about steam. The Aux boilers supply both Units,
24 there are two Aux boilers but both are located in Unit 1 and supply
25

1 steam either to Unit 1 or Unit 2, but both can not feed water heat
2 concurrently, there isn't enough steam to do that. Unit 1 at that time
3 was about, was nominally, a few hours away from criticality in recovering
4 from it refueling outage, so we were hot, feedwater heating was on and
5 we were performing final checks prior to going critical. So from his
6 call I understand that the priority was definitely with Unit 2 at that
7 point in time, and so I called the Shift supervisor or tried to call
8 the shift supervisor and that time because the Unit 1 outage there was
9 a shift supervisor in both units. On calling Unit 1 Control Room, I
10 learned that the shift supervisor was down in Unit 2 and no more than
11 that but I assumed from that call that the shift supervisor from Unit 1
12 had gone to assist the shift supervisor in Unit 2 with his problem, and
13 I also assumed that it would only bother him if I called him in Unit 2
14 at that point because if there was confusion the last thing he needed
15 was a third wheel calling from the outside, and my involvement was not
16 directing Unit 2 at that point of the day so I did not call that shift
17 supervisor, for that purpose but decided to wait maybe ten or fifteen
18 minutes and wait until my supervisor of operations arrived in the
19 morning because he usually arrives between 6 and 6:30. Call him in the
20 Unit 1 control room and tell him Unit 2 gets the steam. I called back
21 in fifteen minutes or so, I think I called about ten after six or six
22 fifteen, and found out that he had arrived, but he was also in Unit 2.
23 And on learning that I figured Unit 2 has really probably got some
24 problems that are significant, and so I decided I had better head into
25

1 work and at least make sure that the steam concern, steam goes to Unit
2 2, again I had no idea what the magnitude of the problem was at that
3 point in time. I drove into work and arrived at 6:45, and when I was
4 walking from the Processing Center into the service building in Unit 1,
5 I heard words on the Public Address System that a site emergency had
6 been declared and so I immediately knew, my gosh we really, we really
7 got a problem.

8
9 DONALDSON: Was that announcement the usual?

10
11 SEELINGER: That announcement was the usual site emergency in Unit 2
12 and I mean you know it had the, I don't want to use the word PANIC, as
13 such, but it had the kind of thing if you have a reactor tripped the
14 word gets passed over the paging system, reactor trip, reactor trip and
15 you know from just the cadence of the sound that you're dealing with
16 something, if nothing else. When I heard site emergency in Unit 2, site
17 emergency in Unit 2, and I don't remember if it was even repeated twice
18 but probably was, you could tell that putting two and two together the
19 fact we had had some problems with pressurizer level and now we had a
20 site emergency, I immediately knew the two were connected, that it was
21 coming from Unit 2 and that we had a big problem on our hands.
22
23
24
25

1 DONALDSON: Was it the standard announcement, the paragraph out of the
2 procedures, you know no smoking, eating or drinking until further
3 notice, all nonessential personnel?
4

5 SEELINGER: I don't remember, I think it was shorter than that. I think
6 it was shorter because I, having looked at that since the standard
7 announcement goes this is a drill, this is a drill, site emergency has
8 been declared. It could have been that I just don't remember, I do know
9 where I was physically when I heard that, and it was very close to the
10 turn style and I think I had just gone through it. I was carrying a big
11 load of books into my office, went into my office, dropped them ran
12 into my office in fact, dropped those back, realized that I had left my
13 TLD out on the rack in the processing center and realized from the fact
14 that we had a site emergency, I may not see that during the day, so I
15 ran back to the processing center and got my TLD and ran to the Unit 1
16 Control Room. Now two things, one thing personally significant is it
17 the first time I had run since the fall because I had had a back opera-
18 tion from which I was recovering and I had not yet tried to run and so
19 I did that for the first time that day and found I could still do that
20 but I was a little worried about that, and secondly, didn't cause me
21 any problem which was I really very grateful for, secondly I had noticed
22 when I came in that Joe Logans car was in the parking lot so that meant
23 to me that the Unit Superintendent for the effected Unit was on site
24 and in that case my job as the Alternate Unit Superintendent was to
25

1 proceed to the Alternate Unit's Control Room and take charge in the
2 Alternate Unit's Control Room. So I ran, didn't wait for the elevator,
3 I decided that the elevator is typically slow, so I ran immediately
4 just up the stairs to the fourth floor huffing and puffing ran to the
5 Unit 1 Control Room and stationed myself in the Unit 1 Control Room
6 I'd expect that arrived in the Unit 1 Control Room, sometime between
7 ten minutes to seven and five minutes to seven in the morning.
8

9 DONALDSON: Allright, now when you say other Unit, in this case would
10 be unaffected Unit, unaffected Unit 1 is that correct?
11

12 SEELINGER: That's correct.
13

14 DONALDSON: That's your normal station. On your arrival in Unit 1 had
15 communications been established with Unit 2 control room?
16

17 SEELINGER: Communications on what I will call the red-white phone
18 circuit had been established which is the hot line between Units, and
19 we were talking between Units on those phones. The emergency as you
20 have heard, I'm sure you have heard in previous interviews, was first
21 really detected when a Unit 2 sample was drawn and those sampling lines
22 come over into Unit 1. So there were alarms on the Unit 1 instruments
23 that would reflect the areas where the sampling lines were and it
24 wasn't immediately clear when I went into the Unit 1 Control Room when
25

1 we saw the monitoring equipment and saw that there were high radiation
2 levels in the hot machine shop, it doesn't immediately hit you over the
3 head that why that was Unit 2 unless you had followed the sequence up
4 to that point. I knew it was coming from Unit 2 but it just wasn't
5 immediately clear as to why it was in the hot machine shop. My initial
6 thought was the ventilation system is being cross connected between
7 Unit 1 and Unit 2 through the fuel handling building, however, it was
8 due to the sampling lines and in relatively short period of time and I
9 can't give you time frame and that was pretty much clarified at the
10 situation started to unfold at that point in time. What we did at that
11 point, in Unit 1 Control Room, was we established the communications
12 between Unit 1 and Unit 2. It did take sometime to get people on headsets
13 as such, just to try to get those communications established, however,
14 we used the hot line extensively between the two Control Rooms to try
15 to talk and that seemed to work better than anything else at that
16 point. The other thing that we did is we broke out the isotopleths,
17 started to look at, trying to lay out the plume as it was going.

18
19 DONALDSON: Can we just stop you for a second?

20
21 SEELINGER: Yeah.

1 DONALDSON: The area radiation monitors in Unit 1, were they high alarm
2 or were they alert?

3
4 SEELINGER: I don't remember.

5
6 DONALDSON: You don't remember?

7
8 SEELINGER: No.

9
10 DONALDSON: Did you glance at the panel at all?

11
12 SEELINGER: I didn't physically go over to the radiation, I didn't go
13 any closer to the panel than say from here to the window which is eight
14 feet or so. I, you know, I saw some lights on the panel, there were two
15 people standing at the panel watching it, I directed that people stand
16 at the panel and monitor any increases or any changes in the panel, but
17 I did not physically do that.

18
19 DONALDSON: Now the sampling station, the ARMs for the Unit 1 sample
20 station, you don't have redundant monitors for that location in the
21 Unit 2 Control Room do you?

22
23 SEELINGER: No.
24
25

1 DONALDSON: Okay, now am I correct in assuming then that the first
2 indications of local increases in radiation levels would have been
3 received by the Unit 1 Control Room then, is that the sequence?
4

5 SEELINGER: I don't know that Dale, for sure, I think that we probably
6 had concurrent, pretty much concurrent increases the first thing that
7 was simultaneously detected was when Dick Dubiel and his Rad Chem Techs
8 were out in the Aux building in Unit 1 and, right as you go through
9 the, I shouldn't say Aux building, I should say fuel handling building,
10 and left the HP Control point, when into the fuel handling building and
11 they heard one of local RMG alarms go off and I think it was RMG 4, I
12 could be wrong on the number but it's the RMG that's right by the hot
13 machine shop. They heard that local alarm, they had a meter with them,
14 they pointed the meter toward the sampling line and saw an increase in
15 the meter. Dick called the Unit 2 Control Room and concurrent with that
16 the alarms in Unit 2 started to go up and the lights started to light
17 on the RMS to the point where in a relatively short period of time
18 things were off scale.
19

20 DONALDSON: I guess what I'm trying to get, did anyone in the Unit 1
21 Control Room make a grab for the phone to declare an escalated emer-
22 gency or did they respond to the ARMs from your site? I know this
23 occurred pretty close together.
24
25

1 SEELINGER: Very close together, Dale, so close together that I would
2 not have expected Unit 1 to have done anything other than call Unit 2
3 and say what's happened over there, you know, what have you guys got
4 because we are seeing something we don't understand.

5
6 DONALDSON: Now you mentioned that you started tracking the plume. At
7 this point of time, were you getting readings on HPR-219 from Unit 2 or
8 were you getting readings on, I believe it's RMA-5, 6, or 4, from Unit
9 1, how would you track a plume? What indication?

10
11 SEELINGER: By tracking a plume, what I'm really trying to say Dale is
12 not so much track the radiation readings from the plume as tracking the
13 meteorological readings of the plume because we did have an extreme
14 amount of difficulty in tracking the radiological readings of the
15 plume, and one of the reasons for that was because all the monitoring
16 equipment was off scale.

17
18 DONALDSON: I guess what you are saying is, if...you had no indication
19 that was in fact a plume at that point in time?

20
21 SEELINGER: Well maybe we're talking about something different when we
22 talk about plumes. What we try to do is establish which way the wind
23 was blowing and what the range of the wind was to determine what isopleths
24 to use and then of course in the classical sense one goes back and
25

1 computes the source term based on his ventilation flow rates and based
2 on the RMS instrumentation, however, we had a good deal of difficulty
3 with that because the, from the Unit 1 stand point, one, A, in order to
4 compute that we needed the readings from Unit 2 because it is the
5 composite ventilation flow rates in Unit 2 going out the Auxiliary
6 building stack that we needed in order...and the readings on HPR-219...to
7 compute a source term. From the Unit 1 standpoint, I just plain don't
8 remember if we had RMA 8 alarming, but I don't think we did have RMA 8
9 alarming, now memory could serve me wrong and we could go back and see
10 if we did but I don't think RMA8 ever alarmed to the point where we
11 would try to compute a source term off any RMA8 numbers. And RMA8 for
12 those of you who don't know is the radiation alarm in the Unit 1 auxi-
13 liary building. The RM9 in the reactor building did not but we tried to
14 do, we try to do two things out of the emergency plan. There are two
15 stock cases if you will. Stock is the wrong word. Two classic cases.
16 You may be able to help me with the word Dale. One is for a steam
17 generator tube leak, and the other one is a case where you take your
18 dome monitor and extrapolate from the reading on your dome monitor with
19 an assumed building leakage, you come up with postulated readings. We
20 tried to run both of those calculations from the emergency plan to see
21 what kind of numbers we would come up with. Neither represented realistic
22 numbers from what we measured offsite, they were way, way high, from
23 anything that we saw. One of the reasons was that the building never
24 really had any pressure in it, so the building never experienced the
25

1 assumed kind of leakage. In addition to that, we weren't steaming to
2 atmosphere the B steam generator, and because of not steaming the B
3 steam generator we really weren't releasing anything other than what
4 got dumped into the Aux building.
5

6 DONALDSON: I guess the point I wanted to make here is that, or make
7 clear for the record, is that when you began to set up to perform
8 backup calculations and, you said, started to track the plume, did you
9 or did you not have an indication that there was a plume at that time
10 or were you merely getting set up in the event there was an indication
11 that a plume, or a release to the environment did occur?
12

13 SEELINGER: I guess Dale I'll have to say that we were getting set up
14 but that's looking at it in retrospect. At the time we assumed with all
15 the alarms that we had that at the time we assumed we are going to have
16 some radiation. The thing that triggered Unit 2 to call the emergency
17 was all of a sudden they got one of the criteria for site emergency is
18 two or more RMS alarms in different buildings. They all of a sudden had
19 that and when you got that and you have a ventilation system that going
20 the chances are pretty good that you going to spill it out in the
21 atmosphere in one way or another. And when I got to the Unit 1 Control
22 Room and saw the RMS alarming and knowing that a site emergency had
23
24
25

1 been declared the drill center area took over if you will, and you
2 virtually always track a plume and we assumed there was a plume and we
3 started tracking.

4
5 DONALDSON: Now my understanding was that initially the scenario that
6 was believed to be, in effect was the steam generator, a primary to
7 secondary leak through the steam generator.

8
9 SEELINGER: We initially, early on that day knew that we had primary
10 secondary activity because of HPR-748 in Unit 2 having alarmed, so we
11 did know that yes there was at least one steam generator that had
12 primary to secondary leakage. That was, I don't think that ever crossed
13 my mind as being the totality of what we were dealing with, because
14 that would be one alarm. We had enough abnormal in terms of other
15 indications that never did I assume that was the only problem. That was
16 one of the problems.

17
18 DONALDSON: You mentioned that when you came in, that there are some
19 standard calculations in the back if your monitors are off scale or
20 inoperable. Did you, which calculations or which gap bridging procedure
21 did you use. Did you use the one for OTSG rupture? Or did you use one
22 for which is the case 1 or case 2 LOCA as it is listed in the pro-
23 cedure. At that time, what information did you have and which standard...
24
25

1 SEELINGER: Dale, I think we used both. I think we did both. I don't
2 remember the numbers that spilled out of either one other than, in
3 retrospect we know, they were quite high. They caused a great amount of
4 initial alarm. In my mind, it crossed my mind, my goodness, we were
5 really dealing with something that was going to be tremendous in terms
6 of radiation dosage if what I was seeing was true. And they perhaps
7 increased, if anything else, our adrenalin flow and perhaps tended to
8 even increase our initial response time if that was possible, I don't
9 think we could have moved any faster than we did because we knew what
10 we had was real and we dealt with it as quickly as I could ever have
11 imagined dealing with it.

12
13 DONALDSON: So you were going through the backup calculations and
14 covering all bases?

15
16 SEELINGER: That's exactly right. The first, I would like to add though
17 Dale, the first...anything that we had that was, there well, were two
18 things significant here, one is the fact that meteorological conditions
19 as you well know from that day was extremely stable. The wind whirled
20 about Three Mile Island pretty much circumferentially during the day.
21 During the initial stages of the incident the wind was blowing from
22 east to west and blowing toward Goldsboro. Having been involved in
23 1974, setting up the emergency drill practice, and participating in two
24 or three since, I always remember that east to west winds that we
25

1 postulated was always the most difficult to handle because to get
2 across the river from this vantage point is hard and I thought Miller
3 showed tremendous presence of mind during, from the period 7:00 to 7:30
4 when very early on when we decided yes the wind is blowing in that
5 direction, how are we going to get there? He took two parallel paths to
6 get there, one he said he told, I don't remember how he got it, if he
7 told me to get it or if he told somebody else to get it but we got a
8 State police helicopter and we had that effort under way prior to 7:30
9 to fly to Goldsboro to start monitoring in Goldsboro. And we also
10 dispatched a team to drive to Goldsboro. And of course at that time of
11 the morning that is going to take a period of time to get there, and I
12 would judge to get directly to Goldsboro at that time of the morning
13 would take an excess of a half hour. So I thought the helicopter it was
14 a really a good idea and I asked him afterwards you know how did you
15 show that much presence of mind because that had never crossed my mind.
16 He said that last years drill, we had thrown that scenario in and
17 practiced the helicopter. He said it was something you know we had
18 thought of, prethought of and it was a real good idea. I think that
19 helicopter was dispatched by 7:30 and it was, to fly, and had gotten
20 the instrumentation moved over to, towards Goldsboro right around that
21 time frame. The other thing is when the readings came back and I don't
22 remember the time frame there and I think it was prior to 8:00 in the
23 morning, we got very low readings and my thought from the calculations
24 that we had run versus the readings from the helicopter were we beat
25

1 the plume because I expected these horrendous readings and didn't see
2 the horrendous readings. And I thought geaming Christmas we're way
3 ahead of it you know all we have to do is wait and it's going to get
4 there but then the wind started shifting and shifted virtually all day
5 long such that really the plume stayed over the Island from almost the
6 entirety of the day.

7
8 DONALDSON: Now after you phoned your setup and began implementing your
9 duties under the plan, did you remain in the Unit 1 Control Room for
10 some period of time or were you called to another area?

11
12 SEELINGER: I was called to another area but something I should perhaps
13 cover in the meantime, two other things we did that were not really
14 included, directly included in the plan, that I did from Unit 1 Control
15 Room in addition to getting setup from the Unit 1 Control Room, is one
16 since I had gotten there right about 7:00 I realized that shortly the
17 day shift was following me, which was of course are largest shift by
18 far, and I realized we're gonna have to divert them somehow and so I
19 took the necessary steps to divert the day shift at the gate. And I
20 think, I know I closed the north gate for sure, I thought I had closed
21 the south gate but I heard in retrospect people got through the south
22 gate so maybe I didn't close the south gate but I thought I had at the
23 time. I also made sure that somebody, I made it official and I asked
24 for Bill Parker specifically, to go to the observation center, be
25

1 called at home, go to the observation center take charge there in terms
2 of controlling our people, telling our people what to do so from him
3 the management-union relationship we knew where our people were, what
4 to do with our people, made sure our people stayed at that point in
5 time and were available to us as we needed them. The other thing I
6 recognized early on, it was about 7:15 in the morning from Unit 1
7 Control Room is I knew from a phone stand point our switchboard is
8 normally not manned until 7:30 in the morning. I think that's the time
9 we open it up. At any rate I recognized we're gonna have to man that
10 switchboard because if you don't there are six incoming lines and the
11 lines que on each other such that only one person can call in at a time
12 during, unless you can get the switchboard open on the normal 944-4401
13 number otherwise you don't get a busy signal but you just get a ring
14 signal and nobody picks it up because it doesn't ring anywhere that it
15 can be heard. So I recognized the need to open that up because of the
16 large influx on incoming calls on the switchboard we were gonna have,
17 and one of the Aux operators had previously been a clerk and operated
18 the switchboard so I dispatched her down to operate the switchboard. So
19 we got the switchboard open in a fairly timely fashion that morning
20 relative to what I knew we were going to need. I was in the Unit 1
21 Control Room until somewhere between about a quarter to 8, 8:00 in the
22 morning.

1 DONALDSON: Jim let me just ask you a question before we take you out
2 of the Unit 1 Control Room, have you discussed anything with Unit 2 as
3 to what the status of Unit 1 should be or what direction Unit 1 should
4 take?

5
6 SEELINGER: No but I'd made that decision, and the decision was Unit 1
7 was going to stay right where it was, and the reason for that was that
8 it would take people and planning and put Unit 1 some place other than
9 where it was and where it was, was hot, 532 degrees, and shutdown.

10
11 DONALDSON: Now this the normal consideration that you, you would make
12 under the emergency plan is it not?

13
14 SEELINGER: Yeah.

15
16 SINCLAIR: Excuse me I'm gonna have to back us up on that particular
17 point, I'm going to break the tape here so that we could change it
18 over, ok the present time is 10:03 a.m.

19
20 SINCLAIR: The time is still 10:03 a.m., we are now continuing the
21 interview with Mr. Seelinger.

1 DONALDSON: When we switched over Jim you were mentioning that you had
2 decided to make the decision to keep Unit 1 on hot standby I believe.
3

4 SEELINGER: That's correct Dale, I decided that very early on. I decided
5 that because again, let me say it this way, I decided it early on
6 because I knew what we were into in Unit 2, was gonna take a large
7 manpower resource, was going to very confusing for some period of time
8 that undefined at that time, and I also knew to shut Unit 1 down it was
9 going to take people and planning, and because of that fact it was
10 obvious to me Unit 1 should remain right where it was and that was when
11 I elected to do. I might also add that what we did in Unit 1 and in
12 Unit 2, is we executed our emergency plan at a very formal kind of
13 fashion. Dale you'd observed our drills before but we executed it just
14 as we drill, with the Senior Management people in the exact positions
15 they have been when they had drilled. I came in the Unit 1 Control
16 Room. I said I'm Jim Seelinger, I am the Emergency Director for the
17 purposes of Unit 1 during this emergency and I said the following
18 people will talk to me and I rattled off the names of the people that
19 would talk to me, which were three or four, one was my Shift Supervisor,
20 one I think was one of the Engineers who was I think, had a Nuclear
21 Engineer in the Control Room because of the fact that they were there
22 for the purpose of the startup which was quite convenient, he was
23 already in place for doing the same kind of duties he'd be doing during
24 the emergency drill, or during the emergency. That's correct during an
25

1 emergency drill and in this case, during an actual emergency. I might
2 also add that early on and I can't give you time frame for this, the
3 emergency control station ended up in the Unit 1 Control Room. And it
4 ended up there kind of by default, and I have not been able to firmly
5 cement in my mind the time that that happened. It ended up because of
6 the fact that the sampling, when Unit 2 was sampled, from a radiological
7 standpoint the areas that the Unit, that the ECS, normally occupies was
8 pretty much wiped out from a radiation standpoint. Wiped out may be an
9 over statement but there was an initial reaction because of the levels
10 in those areas to clear people out, I'm convinced in retrospect they
11 probably could have remained at the ECS but we had alarms going off in
12 that area and people were cleared out of that area. Now that's just
13 kind of foggy and reconstructed in my mind. I have no idea of the time
14 frame other than I know it happened relatively early in the morning so
15 that the Unit 1 Control Room really became the ECS and I was consequently
16 in charge of the ECS during the periods of times that I was in the Unit
17 1 Control Room in addition to being in the alternate Unit or unaffected
18 Units Control Room. It was also the ECS and remained so through a good
19 deal of the casualty.

20
21 DONALDSON: Let me back up and just clarify two points before we move
22 on, One, the evaluation of what should be done with the unaffected
23 Unit, is that a decision point or a point that's called out in the
24 emergency procedures?
25

1 SEELINGER: I believe it is Dale.

2
3 DONALDSON: Secondly you mentioned that an Auxiliary Operator had some
4 experience in operating the Switchboard and she was able to go down and
5 open it. Could you give me her name please?
6

7 SEELINGER: Her name was Barbara Keller.

8
9 DONALDSON: Spell it.

10
11 SEELINGER: B A R B A R A K E L L E R.

12
13 DONALDSON: Allright now we got, I guess, when did you leave the
14 Unit 1 Control Room if you did?
15

16 SEELINGER: I received a call from the Unit 2 Control Room, I think the
17 time was between 7:45 and 8:00 I could be off by a half hour, if I'm
18 off by a half hour it would be later so maybe a better time would be
19 7:45 to 8:15 in that neighborhood, requesting that I come to Unit 2
20 and, don't remember who called, but I proceeded to Unit 2 at that point
21 in time and I left the Shift Supervisor in charge of the Unit 1 Control
22 Room and as I left I had told that I had been requested to go to Unit
23 2, told the people in the Control Room in a loud voice what I knew of
24
25

1 the Unit 2 situation from the communications up to that point; told
2 them what the situation was in Unit 1 in a very formal fashion and told
3 them that the Shift Supervisor was in charge in my absence and left and
4 proceeded to the Unit 1 Control Room.
5

6 DONALDSON: Unit 2 Control Room, right?
7

8 SEELINGER: Excuse me, Unit 2 Control Room.
9

10 DONALDSON: When you arrived could you briefly describe the scene, who
11 was in charge doing various things, the number of people in the Control
12 Room, and so on?
13

14 SEELINGER: I estimate that the number of people in the Control Room
15 was maybe 30. That could be high it may have been more like 20. I saw
16 George Kunder in the Control Room, Joe Logan in the Control Room, Gary
17 Miller in the Control Room, Dick Dubeil in the Control Room in addition
18 to, I'm sure there was Bill Zewe in the Control Room who had been the
19 Shift Supervisor during the accident itself. In addition to that there
20 were Control Room operators in the Control Room, I think there were
21 Auxiliary Operators off to the side in the Control Room and I think Dan
22 Shovlin was in the Control Room when I was in the Control Room. It was
23 obvious with Gary in the Control Room when I arrived there, I knew he
24 was the Emergency Director at that time, when I, I don't remember at
25

1 all the exact sequence of what happened when I got to the Control Room,
2 but I do know fairly early on we had a meeting with the key people who
3 were in the Control Room. We huddled in the back of the Shift Supervisor's
4 office, in the corner of the Shift Supervisor's office, Miller, Logan,
5 myself, Dubeil, I think the Shift Supervisor and I, I think Shovlin and
6 discussed our strategy to a certain extent of where we were gonna try
7 to go, in fact we were gonna try to put the plant in a safe condition,
8 in fact we were gonna try to minimize radiation releases to the public
9 and what we did at that time is Gary went out and again announced he
10 was the Emergency Director, made it very clear that he was the Emergency
11 Director and that certain people would talk to him, just as I had done
12 in the Unit 1 Control Room. Whether that happened before I got to the
13 Control Room at all or not, I don't know but it did happen after I got
14 to the Control Room, and we implemented our emergency plan, again from
15 that point on just as we had practiced and with a high degree of for-
16 mality. Frankly without confusion or panic whatsoever. We, I must say
17 we had, what I'll call ashen faces because of the seriousness of what
18 we all knew we were into, but we all had practiced for it and I felt
19 and made the comment to Miller afterwards that we never had executed
20 any better than we did, and I always felt in our drills we had done
21 quite well.

22
23 DONALDSON: Did you remain in the Unit 2 Control Room?
24
25

1 SEELINGER: I was in the Unit 2 Control Room for about an hour and a
2 half and my job in the Unit 2 Control Room varied much as it had during
3 the drills in the Unit 2 Control Room, I guess I'd have to say that I
4 was kind of, kind of Millers backup or QA man during the drills and I
5 was kind of that during the, during the emergency also. My specific
6 task at various times was to insure that everything in the plan was
7 being carried out, so I went to the procedure, brokeout, or went to the
8 plan procedure combination, insured that we were following the parti-
9 cular ones that we were into, and insured that the necessary notifi-
10 cations had been made.

11
12 DONALDSON: Now just to clarify this, this I believe is a normal tech-
13 nique that you've employed here at the station, that is that one person
14 cracks the procedures and follows one by one right down the line.

15
16 SEELINGER: That is correct.

17
18 DONALDSON: Then am I correct in assuming you were the one that Gary
19 had assigned to ensure that everything was being done, coaching him
20 along the way.

21
22 SEELINGER: The coaching, yes, I did coach him along the way at several
23 points in terms and I don't want to over emphasize that cause I think
24 maybe I have, but 3 or 4 things, definitely, as I could sit back and
25

1 not was directly involved with plant control, I was more involved with
2 emergency plan control, I coached him for I thought we needed beefing
3 up this area, that area and so forth and things that he ought to do
4 relative to that. Both Joe Logan and I at various times had been assigned
5 to look at the plan and made sure we were doing everything. I was
6 called away from that duty for something and I don't remember what, and
7 I left someone else in charge of reviewing step by step I think it was
8 the Shift Foreman and he got back to me and said yes we have gone
9 through this step by step and everything is in fact in progress. Those
10 things included the communications between the respective Control Rooms
11 again, the plotting and the isopleth and the communications with the
12 State, all the, all the communications scenario which, by the time I
13 arrived in Unit 1, Unit 2 Control Room had already been carried out in
14 terms of all the initial notifications. Those were basically completed
15 shortly after 7:30, within a few minutes after 7:30 and they had been
16 conducted between the time of about 7:00 and 7:30. A couple of the
17 things that I specifically remember doing is, I had the accountability
18 under me in terms of making sure that we had the accountability in so
19 doing we had assembly areas at the 305 elevation of the turbine building
20 in Unit 2, we had an assembly area at the warehouse in Unit 2 and we
21 had the north assembly area in the, excuse me, auditorium in Unit 1.

1 DONALDSON: Since you were following this through, did you verify that
2 there were monitors, radiation monitors, monitoring people in each of
3 those locations?
4

5 SEELINGER: Dale I think there were, I can't specifically remember that
6 we had one in each. One other thing I did do though is I did dispatch
7 an operator I won't say it's an operator, I dispatched a person on at
8 least two occasions to go through that morning while I was in the Unit
9 2 Control Room, to go through the various construction buildings, there
10 of course are more here now because of the trailers, but there are some
11 of those buildings in which I was concerned that the public address
12 system may not have been heard, there may have been somebody in here
13 early and not know the situation that we had and so I dispatched basically
14 a runner to go through and ensure that everything, everybody was cleared
15 out of the buildings, knew what the situation was, the other thing I
16 tried to do is I tried to make sure that we were talking to two different
17 groups. One, talking to the people in the plant on the public address
18 system with periodic announcements as we try to do during our drill.
19 Our situation as such, that was hard and that was hard because, it was
20 hard to ascertain what our situation was at the point in time. The
21 plant had really not changed, all the radiation monitors, off scale for
22 the most part, and source of leakage at that point unknown. As a result
23 of that it was real hard to say the plant is now stable and we got this
24 under control because we didn't have that, by the same token from the
25

1 radiation readings that we were getting from our offsite team at that
2 time, we didn't want to put people in a panic. We had not reached any
3 radiation readings that would have caused us to evacuate the site at
4 that point. In fact I made the conscious decision not to evacuate the
5 site somewhere around a period of time, 9:00 to 9:30. Our radiation
6 readings were still low. Dick Dubiel and I talked, we said we will not
7 evacuate the site right now, we will keep the people onsite because we
8 felt that they were virtually safer where they were, based on the
9 radiation readings we are seeing, no higher than nominally 1 to 2
10 millirem in any of the assembly areas.

11
12 DONALDSON: I believe that Jim, there is a criterion that where you to
13 initiate site evacuation of non essential personnel if gas and station
14 vent exceeds high alarm setpoint and 2 ARMs exceed 10R per hour. Was
15 that particular criterion?

16
17 SEELINGER: As I remember, Dale we looked at that specific criterion.

18
19 DONALDSON: You did look at that criterion.

20
21 SEELINGER: Yes, and the, when you say ARM I think we call it an area
22 monitor, I think that's an area monitor.

1 DONALDSON: Yes, Area Radiation Monitor. And as I remember on the Area
2 Monitors at that point we didn't have any area monitors that were up in
3 those kind of readings, outside the reactor building at that time of
4 the day, but I do remember looking at that particular criterion and
5 that we felt that we had not come close to that criterion at that
6 point. Allright now during the period...let me ask you some questions,
7 just some general questions about, that you might have some knowledge
8 about while you were in, in the Unit 2 Control Room, that's primarily
9 were my interest is centered at right now. In establishing or setting
10 up the organization did Gary Miller or yourself or anyone reinforce or
11 establish any kind of exposure control program?

12
13 SEELINGER: Well one thing we did is of course we passed out the, we
14 passed out the dosimeters that are in the emergency kit in the Control
15 Room, and I can't remember if they were passed out before or after I
16 got to the Unit 2 Control Room but I remember asking the question and
17 being told that they had been passed out. Also since it's on my mind
18 and you keyed my mind to the fact on the second time through the ac-
19 countability, we had tried accountability with a list. The first time
20 we had shot for the accountability, when we had the site emergency, it
21 is just one of the automatic actions to get a list of everybody who is
22 on site, the past time that we had done that we had practiced and we
23 had just done it and found out that it is so difficult with a list that
24
25

1 the only way to do it was to turn in the badges. And so when we got to
2 the Unit 2 Control Room, when I got there we collected the badges on
3 the second time through to insure of the accountability, I think that
4 helped us with the accountability as a matter of fact, helped signi-
5 ficantly in making sure we had everybody as far releasing them goes.
6

7 DONALDSON: Did one person take the badges and write down the names and
8 numbers?
9

10 SEELINGER: Yeah, one person collected the badges and took the badges.
11

12 DONALDSON: Took the badges where?
13

14 SEELINGER: To security.
15

16 DONALDSON: In the north auditorium?
17

18 SEELINGER: I don't know where they were delivered in security.
19

20 DONALDSON: Someone did collect the badges.
21

22 SEELINGER: We collected badges and delivered them to security.
23
24
25

1 DONALDSON: Do you know whether they collected badges in the Unit 1
2 Control Room also?
3

4 SEELINGER: I believe they were but not prior to my leaving.
5

6 DONALDSON: At anytime on the 28th did ah...
7

8 SEELINGER: I didn't answer your previous question.
9

10 DONALDSON: Let me reask it.
11

12 SEELINGER: Ok.
13

14 DONALDSON: What I'm looking for here is did you see any kind of organi-
15 zation involving where either Gary or yourself or someone was assigned
16 the responsibility for reviewing potential exposures or briefing the
17 individuals before they made tours through various areas of the plant
18 or performed any type of maintenance or repair activity?
19

20 SEELINGER: Well Dale we did that during the day, we didn't send anybody
21 into the Aux building, take that back, there was an Aux building entry
22 made nominally in the neighborhood at 7:30 by Mike Janouski who went
23 through the Aux building and didn't see any water that was later reported
24
25

1 on the Aux building floor. I'm pretty sure Mike had a meter with him
2 when he went through the Aux building, I can't specifically say that he
3 did, I just can't imagine a Rad Chem Tech without one at that point. We
4 made no further Aux building entries other than the one that I had made
5 and coordinated from the Unit 1 Control Room, I should say the next one
6 we made, that I specifically know of was one that was made in the
7 afternoon, nominally around 1300. I may have missed one or some but I
8 don't think I did and that was made by Greg Hitz and Karl Myers and
9 that was somewhere in the neighborhood of 1:00 or 2:00 in the afternoon
10 and I coordinated that from Unit 1. We talked about exposure control,
11 we had, where our people were we had instruments, we had dosimeters, I
12 don't think we had enough dosimeters, pencil type readers, to go around
13 in the control room when we distributed them, but I really was not 100%
14 concerned about that situation because I had other people in virtually
15 the same area that would receive, be receiving, the same kind of thing
16 in the Control Room, I might also add that at sometime during the
17 morning and as I remember it was about 10:00, we ended up having, and
18 this is why the ECS time is confusing, people from the emergency repair
19 party end up in the Unit 2 Control Room, and they ended up in the Unit
20 2 Control Room, and I don't know if they came from Unit 1 Control Room
21 or if they came from the Unit 1 HP area.

22
23 DONALDSON: Now...
24
25

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1 SEELINGER: And they came because of the radiation situation.

2
3 DONALDSON: Now Myers and Hitz you say they made an entry sometime
4 later in the afternoon.

5
6 SEELINGER: That's correct.

7
8 DONALDSON: And you mentioned that you discussed exposure. Was Dick
9 Dubiel or one of the Rad Protection Foreman or anyone else involved in
10 the area, in other words did someone specify protective clothing give
11 them results from perhaps a survey may have been conducted, specified
12 stay times, dose limits, anything of this nature?

13
14 SEELINGER: Dale, I don't know the answer to that, in terms of all the
15 explicit things that you just went through you have got to remember
16 that this was the initial entry afterwards, after the specific thing.
17 We were not at the level of sophistication on the 28th where we were
18 able to, do a a great deal of specification of you only receive 40
19 millirem, or you only receive 20 millirem on this entry, we were at a
20 level of sophistication to try to find out what in the hell we had and
21 I do believe that when the people were in, but you'd have to interview
22 them that they carried instruments with them to the point of having
23 both high and low range instruments. I think that they probably went in
24 in wet suits but I don't know the point from which the actual entry was
25

1 made. I was more involved in scouring up the people and making sure
2 that, told them what to look for, and we talked some about the areas
3 that they would go into based on radiation readings. We also tried to
4 scour up experienced people at that point, that would know Unit 2, as
5 opposed to sending Unit 1 people in, and that's one of the reasons Hitz
6 went in.

7
8 DONALDSON: You mentioned that a repair party had assembled in Unit 2,
9 would the entry of the type you mentioned, Mr. Hitz I believe is a,
10 what's his position?

11
12 SEELINGER: He's a Shift Supervisor.

13
14 DONALDSON: Shift Supervisor and Mr. Myers is a...

15
16 SEELINGER: Rad Chem Tech.

17
18 DONALDSON: Right, normally under the repair party would not they make
19 those kind of entries?

20
21 SEELINGER: Normally you'd made the entry with your most experienced
22 person and that's what we did. The repair party would go fix it once we
23 found it, but as you know we still haven't found it, we could'nt send
24 them to fix it until we found it, and that's what the function of the
25

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1 repair party would be, this was an initial reconnoitering party, if you
2 will, to try to ascertain what's the situation was and of course our
3 thought was from our drill scenarios is you go out and find, you go out
4 and find what's leaking, and it immediately hits you over the head,
5 that there it is, water spraying ail over, and that's it, we'll go shut
6 the valve and it'll be over with or, I'm making this over an simplistic
7 but I must say that in our drills the cause of the malfunction in
8 retrospect has been very simplistic because it's been able to be corrected
9 in a, what we consider prior to this to being a realistic time frame.
10 Now I don't know that we knew what a realistic time frame was before
11 TMI-2.

12
13 DONALDSON: Let me ask you this context. In past drills that you conducted
14 under whose authority or direction did people made various entries to
15 do various things such as reconnoiter, repair?

16
17 SEELINGER: Emergency Director, and I must say that the entry was
18 completely coordinated with Unit 2. You had asked me did I ever leave
19 the Unit 2 Control Room and yes I did, nominally about 10:00 in the
20 morning I left the Unit 2 and returned to Unit 1 and I was in Unit 1
21 until sometime around 3 in the afternoon, back basically in charge of
22 the ECS. I had a pool of people in the Unit 1 Control Room and was
23 trying to coordinate the kinds of activities we could do from Unit 1 to
24 support Unit 2. Unit 2 in that I was now the ECS in Unit 1, I basically
25

1 had a pool of people and I don't know frankly if I had the repair
2 party, designated repair party or, not, or if they had remained in the
3 Unit 2 Control Room. I think they had basically remained in the Unit 2
4 Control Room.

5
6 DONALDSON: You say in the ECS later you took over the ECS.

7
8 SEELINGER: Remember as I said earlier the ECS somewhere in the morning
9 got moved from the normal ECS to Unit 1. I went back to the Unit 1
10 Control Room about 10:00 in the morning to again resume control of the
11 ECS with a Senior Management kind of person at the ECS. Greg Hitz what
12 happened to be my shift Supervisor in Unit 1, and he and I talked about
13 the entry prior to making it, and who should go on the entry. I think
14 that entry was made from the Unit 2 side, he proceeded to Unit 2 and
15 made the entry there but, you would have to ask him specifically if
16 that's the way the entry was made, or if it was made through Unit 1 to
17 Unit 2.

18
19 DONALDSON: When you returned to Unit 1 side were there any other
20 entries in any parts of the building for either made with your knowledge
21 or authorized by you?

22
23 SEELINGER: No. Not during that time frame.
24
25

1 DONALDSON: I believe Gary Miller was called from the site in the
2 afternoon.
3

4 SEELINGER: That's correct. I might also add since we are kind of going
5 chronologically, that at about that period of time, about 10:00 in the
6 morning it was necessary to go into respirator type masks in the Unit
7 2, right about the time I was leaving the Unit 2 Control Room. It was
8 also about the time that the NRC I&E group showed up on site and I
9 directed them to proceed to the Unit 1 Control Room. When I arrived in
10 Unit 1, they either got there about the same time or had just arrived,
11 I think nominally there were 5 people and I told the NRC that I would
12 allow two of them to go into the Unit 2 Control Room and keep the other
13 three in Unit 1 because the respirator type situation and the confusion
14 that still reigned type situation. Confusion maybe is a bad word
15 because I must say we were calm in what we were doing, but the more
16 people you get lends to or breeds the confusion type of situation, we
17 needed the observer, we knew they wanted to observe, we had no problem
18 with them observing or whatever. Several times during the day I talked
19 to Mr. Callina of the NRC and told him if he saw anything at all that
20 he thought we weren't doing, please come forward and tell us, because
21 we were certainly amenable to any suggestions. We had done everything
22 in our plan and obviously we hadn't stopped radioactive releases. We
23 were doing a fine job of tracking them but we weren't stopping them,
24 that was our interest. At any rate two people proceeded to Unit 1,
25

1 three people remained in, two people proceeded to Unit 2...three people
2 remained in Unit 1. About that time Unit 1 also had to go on respirators,
3 so my initial reasoning perhaps was not correct for letting them go, no
4 longer remained valid for not letting them all go to Unit 2 but they
5 seemed very content tester in Unit 1 because that was the emergency
6 control station at that point.

7
8 DONALDSON: I wonder if we could digress on this control room ventilation
9 for awhile. I have talked to a number of people about this and I'm not
10 sure I have got a clear picture yet, how the alignment of the ventilation
11 took place in both the control rooms and why you eventually had activities
12 in the Control Room, now what I heard at least from the Unit 2 side
13 that there is an automatic function on HPR-219 that causes the Control
14 Room to go on recirc, is that....

15
16 SEELINGER: That's not correct, there is an automatic function on each
17 HPR-220 that causes the Control Room to go on recirc.

18
19 DONALDSON: So it would have been in recirc?

20
21 SEELINGER: If it had not been placed there previously Dale, it would
22 have been in recirc. If 220 had alarmed and I don't know the answer to
23 either of the questions.
24
25

1 DONALDSON: If you declare a site emergency or a general emergency, is
2 it a normal practice to automatically, either manually if it has not
3 done so automatically, to place the Unit 2 Control Room on recirc?
4

5 SEELINGER: I don't believe it is, no.
6

7 DONALDSON: Now was the Unit 1 Control Room placed on recirculation
8 either manually or automatically required to the time when activity
9 levels began to increase?
10

11 SEELINGER: I don't know.
12

13 DONALDSON: The reason I asked is that there was, I guess you call it
14 some contention or some information that there had been some difficulty
15 in the past with cross connection of ventilation of various areas, and
16 that the Unit 1 Control Room had experienced some similar problems in
17 the past and that you had consultants in looking at this problem but it
18 had not been resolved.
19

20 SEELINGER: Well the Unit, the Unit ventilation systems are cross
21 connected through the fuel handling buildings which is common and we
22 have seen activity in Unit 1 from Unit 2, and really perhaps more so
23 vice versa, if one would turn the fans in Unit 1, in the Unit 1 auxi-
24 liary building and fuel handling building and had a release in Unit 1
25

1 and left the fans on in Unit 2 you'd see that release in Unit 2 because
2 you'd suck in out of Unit 1 over in to Unit 2. The same would be true
3 going the other way. Now with respect to where the Unit, the Control
4 Room ventilation takes a suction in Unit 1, I physically just don't
5 remember if it's taking a suction out of that area or not, I think it
6 takes a suction directly on the intake.

7
8 DONALDSON: Are you talking about Unit 2 now.

9
10 SEELINGER: I'm talking about Unit 1, and because it's taking a suction
11 directly on the intake, if it's taking in outside air it really shouldn't
12 happen in that particular area. Now, you got to remember that a primary
13 sample had been drawn, and when a primary sample is drawn that you will
14 have contamination of the Control building ventilation system in Unit 1
15 and if you have that and depending on whether the ventilation system is
16 in recirc or not you could spread activity to the Control Room.

17
18 DONALDSON: And that is because I guess the HP Control point in Unit 1
19 and the Control Room are both on the same internal recirc...

20
21 SEELINGER: They both are part of the Control building ventilation
22 system. I won't go so far as to say they are on the same recirc cause I
23 wouldn't say that without the print in front of me, because I just
24 don't remember physically all the details of that print.
25

1 DONALDSON: When Gary Miller left to go to the Lt. Governors office did
2 he appoint you or anyone else to take over for him?
3

4 SEELINGER: When he left he called me before he left and I was in Unit
5 1 Control Room at that time still handling things from the Unit 1 side,
6 basically the ECS, the offsite teams, where the teams were, what kind
7 of readings we were getting from those teams and I had an open line
8 with the Bureau of Radiological Health for the State. I believe Unit 2
9 had an open line at the same time that we did. He told me he was leaving,
10 gave me his beeper number, and told me to get in touch with him if I
11 needed him, however, I was not in the Unit 2 Control Room at that time.
12

13 DONALDSON: He did not designate or leave you as the Emergency Director.
14

15 SEELINGER: No he did not.
16

17 DONALDSON: So you remained in the Unit 1 Control Room.
18

19 SEELINGER: No I did not. I was called, Mike Ross who is the Unit 1
20 Supervisor of Operations had been in Unit 2 for the duration of the
21 casualty, called me on the phone and told me that he thought we needed
22 assistance in the Unit 2 Control Room and asked me to come over to Unit
23 2 Control Room sometime after Garys departure. So I proceeded to do
24 this on Mike's request, I again appointed either an Engineer or a Shift
25

1 Supervisor and I don't remember the second time, which one, asked one
2 of them to take charge of the, I told one of them, put it that way to,
3 take charge of the ECS, again with a very formal statement to all of
4 the people in the ECS I told them who was in charge and what his duties
5 were and left and went to the Unit 2 Control Room.
6

7 DONALDSON: What were the duties, what did you tell him the duties
8 were?
9

10 SEELINGER: Well I don't remember specifically what I told them his
11 duties were, I'd have to reconstruct what I think I would of told him
12 now had I gone because...
13

14 DONALDSON: Let me lead you a little bit, the ECS is normally...
15

16 SEELINGER: Well I could tell you what I think I told him, I don't know
17 if that's what I told him.
18

19 DONALDSON: Well let me do it by setting the stage rather, the ECS is
20 normally under the guise in control of who?
21

22 SEELINGER: Normally is it under the guise of Radiation Protection
23 Supervisor.
24
25

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1 DONALDSON: Alright in this case it was Mr. Mulleavy I believe.
2

3 SEELINGER: Tom Mulleavy is the Radiation Protection Supervisor, I
4 don't remember if he was in Unit 1 at that time and I don't he was.
5

6 SINCLAIR: I think we'll break at this point to start a new tape, the
7 time is 10:34 a.m.
8

9 SINCLAIR: The time is 10:34 a.m., we are continuing the interview with
10 Mr. Seelinger.
11

12 SEELINGER: Ask the question again please Dale, because I want to
13 expand on the answer.
14

15 DONALDSON: Good, I had asked you whether or not you remember if Tom
16 Mulleavy was in the Unit Control Room in the ECS?
17

18 SEELINGER: Tom was although I did not leave Tom in charge of the Unit
19 1 Control Room. At that point I left the shift supervisor in charge of
20 the Unit 1 Control Room.
21
22
23
24
25

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1 DONALDSON: Now that's understandable, you leave somebody in charge of
2 the operational end, now the person that you left in charge, was he
3 also in charge of the ECS functions, that is onsite and offsite monitoring
4 team operations, dose assessment, things of that nature?
5

6 SEELINGER: In my mind he was, and he was because in my mind he was the
7 senior individual present.
8

9 DONALDSON: Now would this individual, was he directing survey teams or
10 telling Mr. Mulleavy where to dispatch survey teams and getting involved
11 in the technical end of the offsite monitoring?
12

13 SEELINGER: As necessary, yes. He should have been. I was, as necessary.
14

15 DONALDSON: What kind of things were necessary, give me a feel for
16 that?
17

18 SEELINGER: What I felt was necessary, it was try to know at all times
19 where the wind was going, what direction the wind was going. What
20 basically the stability of the wind was, if it was shifting around an
21 awful lot, to determine what my levels were on and off site from a
22 protection standpoint of onsite and from the potential consequences
23 offsite, to try to ascertain from the curves in our procedures, that
24 you probably remember Dale, what the expected dose to the public would
25

1 be, as opposed to dose rates, and at that point that was a very hard
2 kind of thing to do because we were just physically unable to determine
3 what the duration of the release was anticipated to be and we didn't
4 know at that time where it was coming from. So we also at that time I
5 might add we were trying to use the conservative dose, the dose to a
6 child, from our plot but we were unable to quantitatively say here's what
7 we claim this man to be because we are going to have this thing secured
8 in ten hours. In that point in time it was not apparent that we already
9 to wrap it up and we had the thing licked. So that there was a signi-
10 ficant cause for concern with respect to offsite doses as the day was
11 unfolding and we relayed those concerns in terms of our readings to the
12 Bureau of Radiological Health.

13
14 DONALDSON: I believe Mr. Crawford and, I forget the other gentlemen's
15 name, were doing some of the dose calculations in the ECS at this time.
16 Is that correct?

17
18 SEELINGER: I would say that's correct, Dale. We did have nuclear
19 engineers there, Howie's one of our nuclear engineers, I remember
20 interfacing with Howie, I remember interfacing with, now that you
21 mention it, Tom Mulleavy, I remember interfacing with Mike Benson but I
22 don't know the day I interfaced with Mike Benson.

23
24
25

1 DONALDSON: Then you all met, and you discussed projected doses based
2 on the changing situation and you in turn contacted the Bureau of Rad
3 Health, and you either discussed or passed on various recommendations?
4

5 SEELINGER: I tried, as the person in charge of ECS, to make sure that
6 that had happened as opposed to physically being the one to do the
7 discussion. I tried to make sure that we had talked to the Bureau of
8 Radiological Health and that we had conveyed everything that we had to
9 the Bureau of Radiological Health. I might add also that our most
10 experienced guy, Dick Dubiel, was in the Unit 2 control room, and the
11 Unit 2 Control Room was also talking to Bureau of Radiological Health,
12 so we didn't want to do a double type of communication on the thing and
13 cause anymore confusion than already existed.
14

15 DONALDSON: Now I have other information that indicates that when the
16 ECS moved to the Unit 1 control room that there was a shifting of
17 responsibility. Mr. Dubiel was supposedly maintained in plant Health
18 Physics type function, and that all of the offsite type things moved
19 right over with the ECS. Now...
20

21 SEELINGER: I would say that definitely happened, Dale, whether or not
22 we made that as quantitative as you just stated it and is clearly
23 defined as you just stated it. I don't know at the time that we did
24 that. In other words it happened that way but whether we said all
25

1 right Dick, you are onsite, Tom you are offsite, that's the way it is
2 going to be, we'll talk to the Bureau of Radiological Health from here.
3 That could have happened and it may have happened while I was in Unit
4 2, it may have happened while I was in Unit 1 on the other end, but I
5 don't specifically remember that conversation.
6

7 DONALDSON: As far as you know though, you didn't specify that or you
8 were not aware that that clean break had made or if it did come about
9 it kind of merged to that?
10

11 SEELINGER: In my mind it was merging to that. If I was a party to one
12 of those conversations it doesn't stand out.
13

14 DONALDSON: I am not implying that you were.
15

16 SEELINGER: I kind of vaguely remember it but I don't remember with the
17 clarity that you have now reminded me that Tom Mulleavy was in the Unit
18 1 control room. In other words that, I can remember that now, I can
19 remember our conversation with Tom, but I don't remember the other.
20

21 DONALDSON: Let me address a few of the items just to see if you have
22 any information on these. We are trying to verify, of course, that
23 various aspects of the plan were implemented so these may sound like
24 ridiculous questions but again you may have, it may jog your memory to
25

1 something else that's significant. Now when you recall people in you
2 use a duty section kind of a recall. Do you know if the duty section
3 head was notifying personnel assigned to his duty group to pull them
4 back in?

5
6 SEELINGER: Well that is a kind of ridiculous question for the situation
7 because it was unnecessary in this situation. The time that the site
8 emergency was declared ten minutes to seven in the morning and people
9 were on their way to work at that point in time. It was a normal day.
10 People had been called earlier, but not to respond to the site emergency,
11 to respond to an abnormal plant condition, and George Kunder had called
12 people in for that, but not for this. In this it was unnecessary.

13
14 DONALDSON: Bear with me, I want to make it clear for the record.

15
16 SEELINGER: Yea, just it would have been a waste of time under the set
17 of circumstances. We had more important things to do at that point.

18
19 DONALDSON: To your knowledge, whenever people made entries or were
20 performing any kinds of actions, Mr. Hitz making entries, any kind of
21 sampling that you were aware of, were the individuals who performed
22 these functions volunteers? Let me phrase it a little differently.
23 Was anyone ever directed to do something and not asked if he would do
24 it?

1 SEELINGER: I don't know. I do know that Greg Hitz pretty much volun-
2 teered. I don't know if Carl Meyers volunteered or not. I don't think
3 there was any objection to any of the people that performed some of
4 these tasks during the first day or two of the event. I do know that
5 it certainly crossed our mind in terms of the morality or ordering
6 persons, but whether that crossed our mind the first day or the second
7 day I don't remember but we did have, there was one discussion I remember,
8 where we talked about doses and so forth with respect to whether we
9 would order a person into that or for a volunteer or whatever but it
10 was strictly qualitative my mind right now I don't remember where the
11 discussion was, who were parties to that or so forth. All I can offer
12 is that it was in our minds, that it was a significant kind of situation
13 and abnormal from the standpoint of whether you order a person or not,
14 to do that kind of job.

15
16 DONALDSON: Let me run down as far as your knowledge can fill these in
17 and just give me an operational status of the various station communi-
18 cations. I'll list them and you can tell me whether it was operable or
19 not, or whether you had any difficulties with it in the early stages
20 of the event? First thing would be the radiation emergency alarm.

21
22 SEELINGER: I heard that on the way into the building so it must have
23 worked.
24
25

1 DONALDSON: Public address system, that would be the plant page or the
2 Gatronics?

3
4 SEELINGER: Yes, the same difficulties that we have periodically experi-
5 enced when one unit pages sometimes it is not as clear in the other
6 unit as it ought to be. As a result of that when we had paging announcer-
7 ments that were general interest kind of announcements that we wanted
8 to make sure everybody was informed of, I made sure those were made
9 from both control rooms.

10
11 DONALDSON: How about the Met Ed tie-line telephones?

12
13 SEELINGER: I am not sure what communications system that is, Dale.

14
15 DONALDSON: Do you have, I believe a tie-line that will put you in the
16 Met-Ed system?

17
18 SEELINGER: Okay, tie-lines, no they worked. I used them once up there
19 for something.

20
21 DONALDSON: You didn't have any phones or any power failures where you
22 had to use the battery operated sort of things?

1 SEELINGER: No.

2
3 DONALDSON: Allright, any problem with the Bell Telephone system?

4
5 SEELINGER: No, not other than the NRC wanting lots of telephones which
6 irked us at that place and time. I say that kind of as a sideline.
7 That was not really a significant problem the first day at all. That
8 became a problem later on though, in terms of number of telephone lines
9 into the control room when various groups such as B&W, NRC, and other
10 GPU, all wanted an open line. When everybody wants an open line it
11 does restrict the amount of communications you could do on lines that
12 are not open. That's one of their busy lines.

13
14 DONALDSON: Did you have multiple open lines requested from the same
15 agencies.

16
17 SEELINGER: No I can't say that I was a party to too much of that.

18
19 DONALDSON: Now you mentioned there were, that the Bureau of Rad Health
20 had two open lines, one to Unit 2 and one to Unit 1.

21
22 SEELINGER: At various time during the thing that existed yes.

23
24 DONALDSON: Allright, moving down, there is also a Met Ed system radio
25 on a Lebanon frequency, was that used at all.

1 SEELINGER: Yes, that was used at least on one occasion because when
2 Miller proceeded to Harrisburg, he had one of those type radios in his
3 car. I think we had one communication between that car.
4

5 DONALDSON: So as far as you know it was operable.
6

7 SEELINGER: Yes.
8

9 DONALDSON: The Dauphin County monitor radio, radio monitor.
10

11 SEELINGER: That was a problem in the Unit 2 control room and I found
12 out about that about a week ago or so. That, see if I've got this
13 right, the scanner in the Unit 2 control room, on which you receive
14 civil defense communications, not which you talk to them, was out of
15 service and had been taken out about three days before the event happened.
16

17 DONALDSON: Was that on a maintenance work order?
18

19 SEELINGER: Yes.
20

21 DONALDSON: Was not repaired?
22

23 SEELINGER: It had not yet been repaired. It had gone out of service
24 about three days prior to the incident.
25

1 DONALDSON: What kind of priority is assigned to repair of emergency
2 communications?
3

4 SEELINGER: Dale, it is a good question and I don't specifically know
5 the answer. I would hope that the priority that is high is assigned to
6 it. When you deal in terms of a thousand work requests, sometimes it
7 may not be high, I don't know if it was high or not.
8

9 DONALDSON: Do you maintain that system yourself or do you have to
10 rely on Dauphin County or someone else to provide the maintenance on
11 that system?
12

13 SEELINGER: No I think we maintain that. This was not the NAWAS
14 system, did I get the designation right?
15

16 DONALDSON: No this is, your monitoring Dauphin County Civil Defense.
17

18 SEELINGER: This is the monitor with the scanner that we are talking
19 about.
20

21 DONALDSON: That is correct.
22

23 SEELINGER: It was the scanner portion that was out of service.
24
25

1 DONALDSON: Allright.

2
3 SEELINGER: You probably heard that before in other interviews.

4
5 DONALDSON: Negative.

6
7 SEELINGER: You didn't know it?

8
9 DONALDSON: No.

10
11 SEELINGER: Okay.

12
13 DONALDSON: I never asked these before.

14
15 SEELINGER: Okay I found that out about a week ago, I didn't realize
16 that was out of service from the Unit 2 control room.

17
18 DONALDSON: Okay how about your utility frequency, the transmit fre-
19 quency for Dauphin County. Did you use that, do you recall.

20
21 SEELINGER: I don't know.

22
23 DONALDSON: Any particular difficulties with the FM radio walkie talkies?
24
25

1 SEELINGER: No, not to my knowledge. I can't say that we had any
2 unexpected difficulties, and usually out of the drills that one thing,
3 we couldn't hear the guy on the walkie talkie, we lost communications
4 with walkie talkies, but not unexpectedly and it such a minor item in
5 terms of the major thing that we were dealing with, we lost communica-
6 tions when were out at far reaching places during which hills and so
7 forth would have blocked the normal communications with those walkie
8 talkies.

9
10 DONALDSON: What backup provisions have you instructed your teams or
11 various people to use in the event they cannot raise communications on
12 the walkie talkies?

13
14 SEELINGER: What the team should do is they should go to a phone and
15 call but what made it kind of nice the first day that alleviated some
16 of the need for that was helos that we had airborne because once airborne
17 you don't have that problem and so we usually had as much, we had a
18 good share of data coming in such that we didn't have any of those long
19 blank periods where there was no data flow. There may have been data
20 flow from not been data flow from selected points where we periodically
21 would lose the communications with an offsite team but I can't say it
22 was noticeable to the point that it was a major kind of item, in light
23 of the other items.

24
25

1 DONALDSON: Now moving down to the system you referenced before, the
2 NAWAS system, was that used for any notification?
3

4 SEELINGER: I don't know.
5

6 DONALDSON: Normally, would it be used for a notification or how would
7 it be used?
8

9 SEELINGER: Normally, it is not used for that kind of notification.
10 Normally, we use the black phone for that kind of notification which is
11 what we did this time, to call the civil defense on the black phone.
12

13 DONALDSON: This is a backup means of communication?
14

15 SEELINGER: Yes, it is a means of communication in which the State and
16 National Civil Defense can be tied together and we had not previously
17 used that means of communication other than to verify that we can get
18 parties on the other end of that particular communication and the
19 checks are made one way if you will, they are initiated by the people
20 who are on the other end of the NAWAF system as opposed to our end of
21 the NAWAF system. I would like to stop and make a recommendation, I
22 don't know that I have that liberty in this discussion, but I think
23 that certainly communications ended up, in retrospect, being one of the
24 weakest points of the thing, looking from an objective standpoint, it
25

1 was very weak and that's one system that should certainly really be
2 expanded on and should be used under this set of circumstances and
3 should be tied together in the various agencies that all require infor-
4 mation at this time, at a time like this should all have the ability to
5 be tied into an information source, all hear the same thing at the same
6 time. Without question that should happen. Because no matter how you
7 do it, if you sat and talked to me for two more hours, two hours from
8 now it would come out just a little bit different and under this set of
9 circumstances that would be unexceptionable.

10
11 DONALDSON: Let me lead you a little further on this if I could. If
12 such a system were established, that is you were able to put the cognizant
13 agencies on an NAWAF system, do you think it would also be beneficial
14 that the agencies developed a common format under which they receive
15 initial notification?

16
17 SEELINGER: Absolutely, and further there ought to be established a set
18 methodology of communication in this set of circumstances, whereby we
19 on the site would have a very senior level kind of communicator who
20 would be a person of perhaps my seniority who didn't have the event
21 happen in his unit, however, knows the unit and the plans and could
22 speak for the company enough, that he would be designated a communicator
23 and he would be the person to communicate with both our management and
24 the outside agencies for more than routine data flow, recommendation
25

1 type of communication of significant plant status change, that sort of
2 thing. This would allow the emergency director time to function on the
3 plan emergency up to this time in our drills, and I think you would
4 corroborate this, the emergency director has been the person who has
5 concentrated his efforts on what's happening offsite. The scenerio we
6 saw here forced the emergency director to concentrate much of his
7 effort on what is happening to the plant because the plant was causing
8 what was happening offsite. The drill scenario that's the shift foreman's
9 team, he will go handle the plant, but what we have seen with this
10 plan, and you can still see today, that's much higher than a shift
11 foreman's able to handle, and so consequently the division of responsi-
12 bility needs to be there. Further early on in the situation within
13 hours there should be one central designated outfit, I think should be
14 NRC, and they should be talking to the press, because it is obvious it
15 is going to be in the press and it is obvious that anytime you have
16 more than one person talking to them you are going to have conflicts,
17 you are going to have conflict with only one person talking to the
18 press and I think that it injured the thing, the progress of it greatly,
19 certainly damaged both Metropolitan Edison and the NRC by various
20 people talking to the press. And I really feel strongly about the
21 communications that, of how that should work. I think from a communications
22 standpoint, from the point of the emergency plan itself, that Met Ed
23 did fairly well. In fact we did everything we should have done from
24 the emergency plan itself. It was when it went beyond the emergency
25

1 plan, when we had to dip into if you will the NRC's emergency plan,
2 State's emergency plan, all the backup agencies' emergency plans, I
3 question how well they performed with respect to their plans and if
4 their plans went far enough, it is obvious that Met Ed's plan didn't go
5 far enough because one big item that it does not have is talking to the
6 press, and that should be established like every other thing should be
7 established. I've run on enough on that particular item.

8
9 DONALDSON: Carry on.

10
11 SEELINGER: Everybody was quiet, but I feel very strongly about that.

12
13 DONALDSON: I think your comments are well taken and that's kind of
14 feel we have to have from the people on the front lines is if anything
15 is to be improved and coordinated, so I don't think you ought to feel
16 like you are just running on. It is extremely important.

17
18 SEELINGER: I watched the emergency director, Gary Miller, do his job
19 that day and tried to help him insofar as I could, but I must admit
20 that if you are ever going to take a person to the breaking point, that
21 is about as close as you can take a person. Gary performed very confi-
22 dently and showed no evidence of breaking but the management pressure
23 he was under that particular day and the outside pressure that he was
24
25

1 under and to try and run the plant under that set of circumstances was
2 an extreme situation. An extremely physically and mentally demanding
3 situation.

4
5 DONALDSON: That leads me to one of my other questions. I think you
6 may have addressed some of it already and that is, I want you to discuss
7 the interface that your emergency plan you had with various other
8 agencies. I would like to do it in somewhat of an orderly fashion. We
9 know how your plan is developed and we also know of course that it does
10 provide for division support as it is called. Now that division support
11 is outlined to be radiological in nature primarily. Now at some time
12 or another both Met Ed and your holding company, GPU, had individuals
13 who began interface with the site organization. Correct?

14
15 SEELINGER: That is true.

16
17 DONALDSON: What I would you to do is start by discussing the Met Ed -
18 GPU interface, and what I am really interested in is the command and
19 control, who was running the show in the plant and if you can give me a
20 break point on when command and control switched, I am really trying to
21 get a handle on what effect the influx of all these various agencies
22 had upon your ability to deal with the continuing situation in the
23 plant in that context. Whether it prevented you from doing things,
24
25

1 whether you were directed to do things in the plant by people outside
2 of your response organization, that may have lead to situation of some
3 difficulty or made your own command and control within the organization
4 weaker.

5
6 SEELINGER: I can address some portions of that that I saw. A good
7 share of it having been in the Unit 1 control room for much of it, and
8 Miller being the emergency director in the Unit 2 control room could
9 answer the question better and saw much more of it than I saw.

10
11 DONALDSON: Please address it from your own first hand knowledge, not
12 hearsay.

13
14 SEELINGER: I do know that from my subsequent conversations with Miller
15 that he had a conversation at 6:00 in the morning prior to the emergency,
16 if you will, nominally 6:00 in the morning, with Herbein and with B&W
17 representatives to discuss the plant status and discuss what the situation
18 was in Unit 2 at the time, to try to figure out where the plant was and
19 what we were doing. That happened as I say about 6:00 in the morning.
20 I know that during the periods of time that I was in the Unit 2 control
21 room, I remember Gary trying to get ahold of Jack, telling Jack to come
22 down to the site. I don't know the time frame of that but I think that
23 was nominally 9:00, 10:00 in the morning and I remember hearing that
24 the helicopter was on its way and bringing Herbein down to the site.
25

1 Jack stationed himself in the Observation Center and it was obvious
2 that one of his principal functions for us at that time was to be try
3 the handle the communications with the press which were quickly mounting
4 in terms of significance as the fact that we had a problem became
5 known. I remember on one occasion during that day responding to an
6 outside pressure, well there were two occasions, one was a State pressure
7 which said stop steaming through the atmospheric release and at that
8 point in time that was the only method we had of heat rejection luckily
9 and coincident with pretty much the State's extreme desire to stop
10 steaming through the the atmospheric release, we regained vacuum and
11 were able to steam to the condenser. It was when we were able to
12 secure that path, it was not at the, totally at the State's insistence,
13 however, because we really didn't have an option if we didn't have any
14 vacuum. It was our method of heat rejection. It was of course very
15 disturbing and disarming to the people who lived across the river here
16 to see steam billowing up and know that there was radioactivity coming
17 from the plant. I mean its obvious when you look at it that the steam
18 is therefore coming from the radioactivity, excuse me radioactivity is
19 coming from the steam which was not in fact the case. We had been very
20 careful that morning to make sure that we had the steam generators
21 sampled, that we knew which steam generator was contaminated, which
22 steam generator was not contaminated and that we wouldn't be releasing
23 radioactive steam into the atmosphere and in fact we were not, but none
24 the less, we did receive that direction from the State. One other
25

1 direction we received and responded to which was in house pressure, but
2 I know originated at the State or NRC level and suspect the State level
3 was to turn off the ventilation flow within the plant. That happened
4 in the evening sometime I think around 7:00 or 8:00 but I don't remember
5 that for sure and the Unit 1 specifically became quickly uninhabitable
6 when the ventilation flow was turned off. The control room in Unit 1,
7 the area outside the elevator on the turbine floor became uninhabitable.
8 I really don't know specifically why, because I don't know what we had
9 going on at that time although I do remember that right prior to that
10 time the plume was such that it was proceeding in a northerly direction
11 and the readings an hour before that were high. They were the highest
12 on site readings seen, from 150 to 210 millirem per hour on site and
13 they were areas, they were seen, up essentially along the road from the
14 North Bridge on in and pretty close to due north of the plant. So all
15 I can figure is we had enough of a plume to pass over the Unit 1 intake
16 structure over here on the east side, with the swirling wind at that
17 point in time, that we sucked a lot in and we essentially weren't
18 putting it out. When we secured the ventilation flow and of course also
19 securing I didn't probably say it right, but the isotopes, they're
20 going to go wherever they will as opposed to being sucked and directed
21 in a given direction and that's also a good reason why Unit 1 probably
22 went where it did. It could have well come from the sampling in the
23 area and just gone out. That was one pressure we responded to. We
24 quickly realized within a half hour to forty-five minutes that there is
25

1 no way that we are going be able to respond to this. We've got to
2 inhabit the place, and we started ventilation back up and within a
3 couple of hours it was back down to where it had been before.
4

5 DONALDSON: That then would be limit of the ones you had first hand
6 knowledge of.
7

8 SEELINGER: Of the first day. That's correct. I do know there were
9 several conversations between our management and Gary and, you know,
10 its difficult to manage something when you are not directly there and
11 it is also difficult for the person directly there to appreciate what
12 kind of pressure is coming from the outside world. So there is a lot
13 of give and take there and that give and take has to be metered with
14 good sense. I think it was and I think it took a lot of courage to do
15 that.
16

17 HUNTER: Dale, excuse me, Hunter speaking, the first case of steaming to
18 the atmosphere as you indicated that you were aware that it was State
19 pressure?
20

21 SEELINGER: That it was what?
22

23 HUNTER: That it was State pressure, outside communications?
24
25

1 SEELINGER: That was about 2:00 in the afternoon.

2
3 HUNTER: Okay, now the second case was where there was words of securing
4 the ventilation.

5
6 SEELINGER: That's right.

7
8 HUNTER: About what time was that?

9
10 SEELINGER: That was in the evening, I would guess that was 7:00 o'clock
11 or so in the evening.

12
13 HUNTER: Okay and who, and are you aware of where that came from speci-
14 fically.

15
16 SEELINGER: No I know that we were directed by our management, Jack
17 Herbein, to do it.

18
19 HUNTER: Okay, it came to you from Jack Herbein.

20
21 SEELINGER: Where it came to him from I don't know.

22
23 HUNTER: Thank you.
24
25

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1 DONALDSON: Okay, let me ask you another question here. At any time
2 when you were operating or directing the ECS activities was there any
3 shortage of vehicles for your offsite survey teams.
4

5 SEELINGER: No. We also knew that we would take, I don't know if we
6 did take or had to take, we had no reservations about taking personal
7 cars under the set of circumstances, which we always knew we'd do if we
8 had to and there were certainly no reservations to do that.
9

10 DONALDSON: Right, let me address that for a minute.
11

12 SEELINGER: I don't know if we did it.
13

14 DONALDSON: There have been discussions that the taking of personal
15 cars under this condition was discouraged because of either inability
16 to reimburse the individuals for the use of their car, but the contention
17 was that this option was not one that was considered to be viable for
18 this time.
19

20 SEELINGER: No that's incorrect.
21

22 DONALDSON: Then it is your policy then to have individuals use private...
23
24
25

1 SEELINGER: No it is not our policy to have individuals use private
2 vehicles, but it is not our policy to have radiation accidents, either,
3 and under the accident scenario there was no hesitation on our part if
4 we didn't have adequate vehicles, to use personal cars. I had several
5 volunteers saying gee, if you don't have transportation use my car.
6

7 DONALDSON: It was not a problem.
8

9 SEELINGER: It was not a problem.
10

11 DONALDSON: Okay, I would like to go to Friday now very briefly. From
12 your standpoint Friday there were, you mentioned you were the ECS
13 director, is that the title I think you were sort of using at the time?
14

15 SEELINGER: No, I went back to try and look to see where I was on
16 Friday and as best as I can determine, on Friday I came in during the
17 day for a period of time, I think I was here from about not only, wait
18 a minute, I think I came in to serve as one of the shift superintendents
19 and I thought I was going to be on the 12:00 noon - 2400 shift on
20 Friday, however, shortly after I came in, this is reconstructing what I
21 think happened, are you ready to shift tapes?
22

23 SINCLAIR: The time is 11:05 a.m. We have to break and change the tape.
24
25

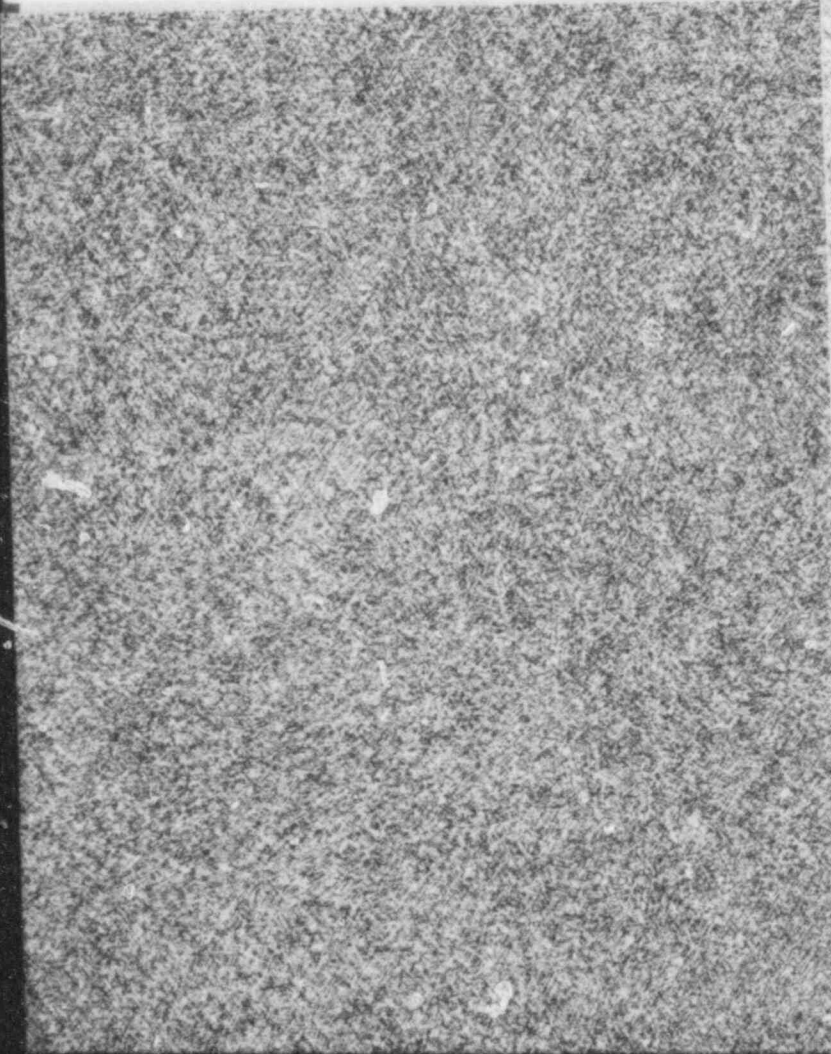
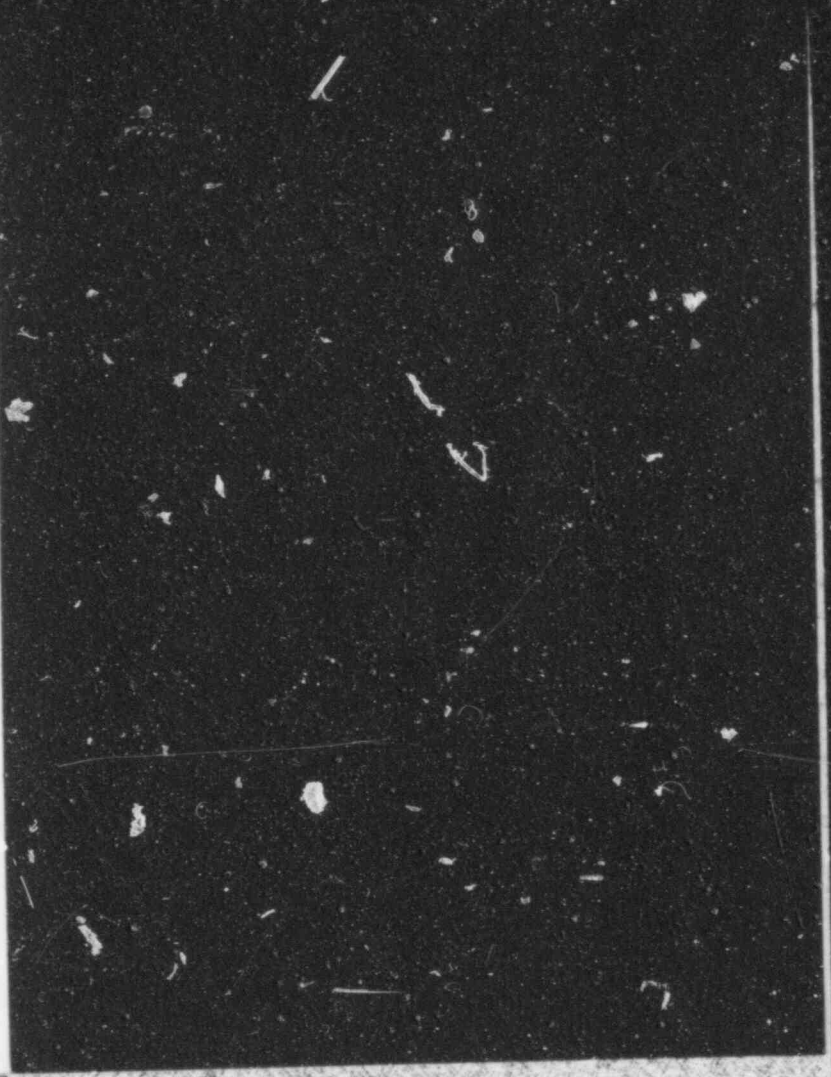
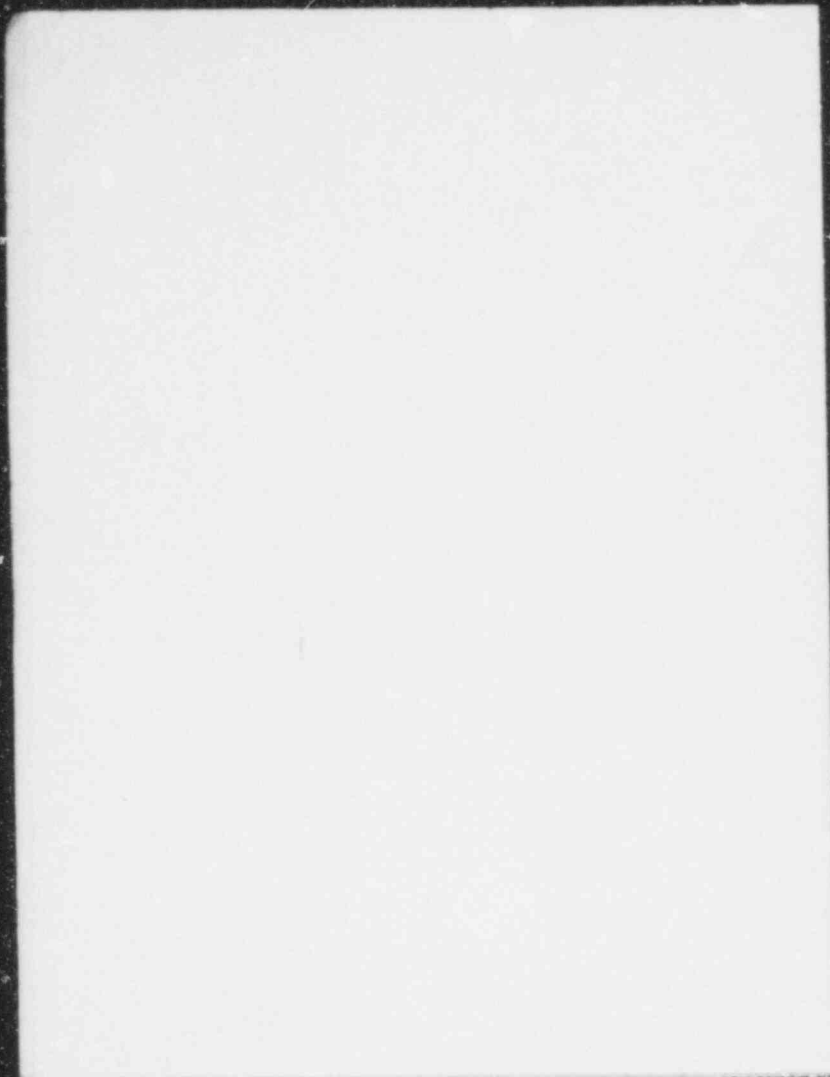
1 SINCLAIR: The time is 11:06 a.m. We are continuing the interview with
2 Mr. Seelinger.

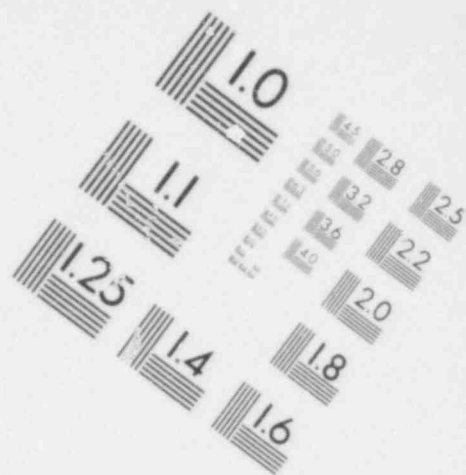
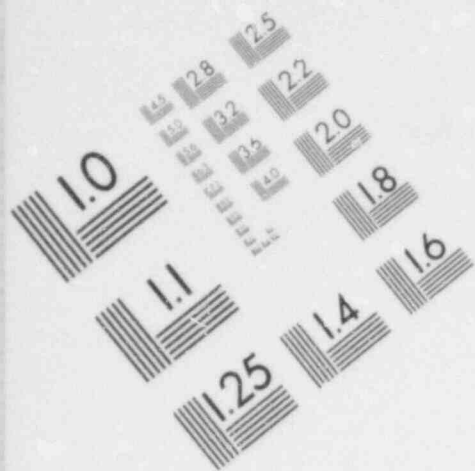
3
4 SEELINGER: Go ahead and ask your question again, please Dale.

5
6 DONALDSON: You arrived Friday afternoon is that right?

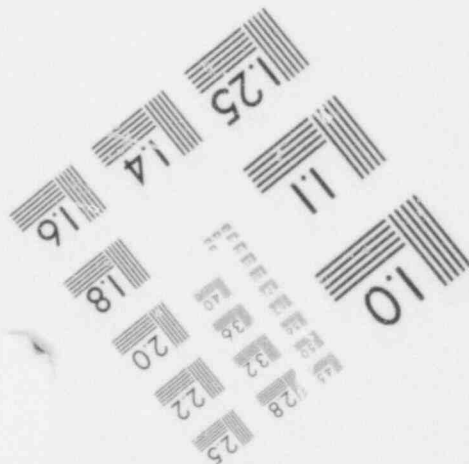
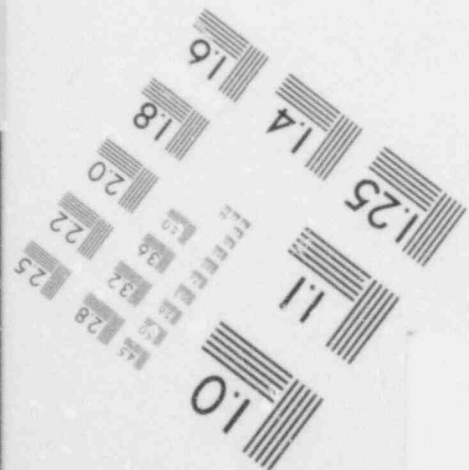
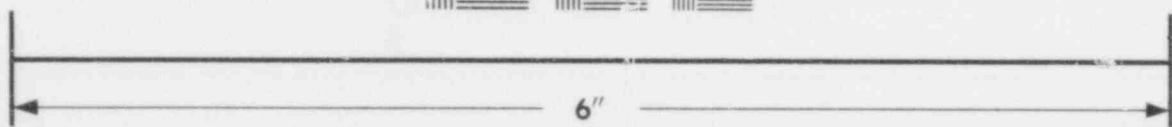
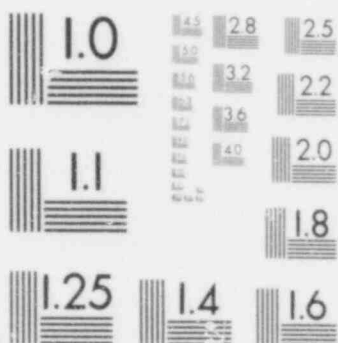
7
8 SEELINGER: I don't know the time I arrived on Friday but I think I
9 was, as I remember it I was assigned to the 12:00 noon to 2400 shift on
10 Friday, however, after arriving on Friday, I think I was here a short
11 period of time and then told to go home and essentially take the shift
12 that would go from midnight to 8:00 on Saturday morning and then I
13 think that I was on that shift, and on Sunday I was on the same shift
14 from 8:00 to 8:00 and then finally on Monday we settled on what shifts
15 we would be on and I was on 6:00 at night till 6:00 in the morning.

16
17 DONALDSON: Let me just ask a question. Are you aware of any time on
18 the period of the 28th through the 30th when the facility or anyone
19 either directly or indirectly made any recommendation to the State for
20 the implementation of protective actions in the environment, based on
21 any data or information that you had available?





**IMAGE EVALUATION
TEST TARGET (MT-3)**



1 SEELINGER: No, not from that time, I was not involved in any recommend-
2 ations of that sort whatsoever and when we would have had access to
3 that data afterwards and looking back over ECS data at that time.
4

5 DONALDSON: Jim, do you have any provisions or recording methods for
6 phone calls?
7

8 SEELINGER: We do not.
9

10 DONALDSON: As a result of past drills or anything had you considered
11 the installation of that kind of equipment, multi-channel recorders?
12

13 SEELINGER: I don't think so Dale, in retrospect though, it is an
14 excellent idea. It's been an idea that has been proposed as a result of
15 this, in in-flight tape recorder type system like the airplanes use.
16 It certainly would have a great deal of merit. I instructed on the
17 first day to people who were on the phones in the control room to write
18 down everything that they heard because it is extremely difficult to
19 keep a log when you are trying to do a hundred things at once.
20

21 DONALDSON: To your knowledge were people then maintaining these logs?
22
23
24
25

1 SEELINGER: People were maintaining logs, the phone talkers I specifically
2 directed to maintain logs.

3
4 DONALDSON: Could you give me some names of the phone talkers on the
5 first day?

6
7 SEELINGER: No I couldn't, I don't remember who they are.

8
9 DONALDSON: There, as we understand it now, there appears that there
10 was a cross-up of the marking of the sample lines for the steam gener-
11 ators in the Unit 1 chem sampling area. Indications are that the
12 sampling stations in Unit 2 where the Unit 2 steam generators were
13 originally also crossed but they got them properly marked because they
14 had found out that they were marked improperly. Now are the one in
15 Unit 1 correctly marked properly, well not currently, on the morning of
16 the event were they marked properly?

17
18 SEELINGER: I believe they were marked properly on the morning of the
19 event because I think prior to the event all the sampling of the, and I
20 heard this in retrospect, so this is second hand knowledge, I had heard
21 that in Unit 1 that the sampling lines were originally crossed in terms
22 of the way they were marked and that we found that out, not the morning
23 of the event, it had been found out before that time, and then we had
24 the concern in Unit 2 that we had not used the Unit 2 sampling process
25

1 on a regular basis but when we drew samples in Unit 2 we were aware of
2 the problem that Unit 1 had at some point in the past experienced and
3 so we were concerned about that particular problem when we did the
4 sampling and frankly I don't know how, Dale, the specifics of how that
5 was straightened out. But I do know that we felt quite confident when
6 our chemist, and I was in the Unit 2 control room when that happened,
7 the chemist came up, said he had taken the samples, he had confirmed
8 it, he was certain that he knew that the B steam generator was contaminated
9 and that the A steam generator was not contaminated from the standpoint
10 of primary leakage, that he did base that on samples and he did mention
11 there were some problems with the sampling lines but he felt confident
12 he knew which one.

13
14 DONALDSON: He based that on samples that he had taken from the Unit 2
15 sampling station or the Unit 1?

16
17 SEELINGER: I believe from the Unit 2 sampling station but they may
18 have been, his Unit 2 samples may have been corroborations from previously
19 taken samples on the Unit 1 side.

20
21 DONALDSON: Okay, that's not the case. The Unit 1 samples, the lines
22 appear, well the markings appear to be reversed, is that your under-
23 standing or is your understanding different than that, that they are
24 properly marked?
25

1 SEELINGER: My understanding is they were originally improperly marked
2 and that we discovered they were improperly marked at sometime prior to
3 the accident. And because of that particular situation we were concerned
4 when we sampled the steam generators in the Unit 2 secondary lab, for
5 fear they may also have been improperly marked. We did sample them in
6 the Unit 2 secondary lab. I have a feeling they were also improperly
7 marked on that side, I don't know that for a fact. I heard my story
8 from Dick Dubiel. You may have interviewed Dick and heard something
9 like this. Dick could give you more details than that. Kerry Harner
10 was the individual that came in and could give you the exact details of
11 how he specifically determined that the B steam generator was the one
12 that had the primary to secondary leakage, the A did not, but he felt
13 very vehement that he had taken the necessary steps to insure that and
14 at that point in time we needed the steam. We went ahead and we steamed
15 the A steam generator based on our chemist's recommendations, that he
16 had done an adequate sampling, and we didn't go into all those details
17 at that point in time.

18
19 DONALDSON: Can you fix a point in your mind somewhere when perhaps you
20 moved from a response posture to more of a recovery type of phase and
21 what I would like you to key on is a time at which control of, sole
22 control of, operation of the station, maybe shifted from your emergency
23 organization, namely Gary Miller, to more outside, to a higher level
24 say Met Ed or higher.
25

1 SEELINKER: Well I think Gary could do that better than I could in that
2 he was the emergency director.

3
4 DONALDSON: From your position, it was not obvious when that occurred.
5

6 SEELINGER: No I can't say there was a total clean break, Dale, however,
7 I would say that by the time that we left the station at 3:00 in the
8 morning on the morning of the 29th, Gary + myself and I think Lee
9 Rogers from B&W left at that time, it was pretty clear in my mind at
10 that time that the management across the river in the Harbein's organi-
11 zation was pretty well in control of the situation in terms of who had
12 called all the shots from that point in time. Other than the specific
13 newly developed emergency situation that the plant always would respond
14 to. Actually I would in retrospect have to say that that happened
15 earlier in the evening, that that organization was in place but I will
16 say that by that time of the evening we knew that we were going to have
17 go get some sleep so we could do it again the next day and it was clear
18 by the time I got in the next day that that was very well established
19 and that we were not in the same emergency posture we had been in
20 before.
21

22 DONALDSON: I believe after the last drill or shortly before the last
23 drill in November that you issued a memo for discussing communications
24 and I believe in the text of the memorandum was something to the effect
25

1 that our communications are not going to be taken care of for 78 drill,
2 it looks like it'll be like it was again, before, maybe next year we'll
3 be able to get it in. Can you expand on that and just discuss what
4 that memo was about and maybe relate it back to your earlier comment
5 that communications was probably the weak point, supply some facts
6 surrounding it?

7
8 SEELINGER: Not without looking at the memo.

9
10 DONALDSON: Okay. Unfortunately I don't have it, I just happened to
11 glance through it. You mentioned that there were communication problems.

12
13 SEELINGER: I remember the memo. I had received a copy of it back in
14 the mail through one of our tickler systems. It was on my list to
15 followup on as soon as we finished with the refueling outage, but we
16 were not devoting significant effort, I can't say that, because all
17 those things had tarked out, but the items, I can say I don't think had
18 been completed for the most part prior to the emergency drill.

19
20 DONALDSON: Let me ask you in this context was it a followon item as
21 a result of a previous emergency drill?

22
23 SEELINGER: No.

1 DONALDSON: It was outside of that?

2
3 SEELINGER: Yes. As far as I know it was, Dale. These were items that
4 were raised in-house with respect to, we have problems communicating,
5 at times we lose walkie talkie communications, and so forth. Let's
6 make sure that we don't have that problem in the future and here's what
7 we're going to do about it.

8
9 DONALDSON: I think it is important for anybody who happened to hear
10 what we are talking about now. Would you ever expect to have 100
11 percent communications through radio?

12
13 SEELINGER: No.

14
15 DONALDSON: Can you expand on that and just say why?

16
17 SEELINGER: Well sure, you're going to have the natural topography of
18 the country. With the kind of powers you are dealing with in a walkie
19 talky, you get in the way of that kind of communication. So consequently
20 your radio communications, you are always going to have some problems
21 with radio communication. I am not convinced that radio communications
22 is the be-all and end-all to the whole thing. If you look at the time
23 frames involved I think that in retrospect people will look at this and
24 study this forever but the one thing to be learned from this is an
25

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1 emergency drill lasts two hours. TMI emergency has now lasted a month,
2 and going on a month and a half. We all knew that, but we all tend to
3 in our drills respond very quickly to lets show we can simulate every-
4 thing and then the NRC will, you know, complete their evaluation of
5 what've done and we will complete our evaluation of what we've done and
6 we'll do our best to make sure that our concerns and their concerns are
7 satisfied. But it doesn't happen fast. It plain takes time to get your
8 readings and you have got to put those in a time frame that takes to
9 make it realistic. If I get a reading and call back in five minutes or
10 of I get a reading and call back in a half hour, chances are it is
11 really not going to be tremendously significant because there is still
12 some evaluation time on the end of that. I don't mean to say it couldn't
13 be, but with the levels we had in this set of circumstances it was not.
14 The levels had been multiplied by a factor of ten, then it may have
15 been.

16
17 DONALDSON: Did you...

18
19 SFELINGER: In that case Dale.

20
21 DONALDSON: Right.
22
23
24
25

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1 SEELINGER: What I would expect...okay I would expect that we would
2 utilize alternate methods of communication. If I were a man on the
3 team and all of a sudden I went out and I got a reading of 300 to 500
4 millirem as the offsite team, and all of a sudden I couldn't raise
5 anybody on my walkie talkie, you know, I certainly wouldn't go on to my
6 next point. There is nothing else I'd drive back and say I've got a
7 problem out here folks and here is what it is.

8
9 DONALDSON: At any time have you prepared testimony, written document
10 of your viewpoint of what went on...recommendation and so on for Metro-
11 politan Edison?

12
13 SEELINGER: I had written some things down. I would not call it testimony.
14 I've written down...I took very sketchy notes during the first two days
15 of this and I through all my notes in a pile and somebody came by one
16 day and sorted my notes for me. I arranged those in chronological
17 order. I rewrote the first days notes just so I could understand my
18 notes. I have not rewritten other days notes and I have prepared at
19 Gary Miller's request a set of recommendations which I did approximately
20 two and a half three weeks ago based on my vantage point at that time
21 of things that I saw that we could do that would be different.

1 about communications hardware, the ability to have, at the touch of a
2 button civil defense, the Governor's Office, the Bureau of Radiological
3 Health, the 'C:IE, the NRC:NRR, all on the phone at one time and I
4 might mention that it was obvious to me during this emergency and I
5 don't want to take a cheap shot but I will, that the NRC had as much
6 difficulty with communications as we did, perhaps even more so and it
7 was obvious that IE and NRR don't talk to each other, you know, that
8 situation is no more excusable than our inability to communicate with
9 each other and, as a result of that, and I try to keep that objective,
10 by the way, we need to be able to talk to both groups because I don't
11 foresee you people in the NRC being any more able to straighten out
12 your in-house communications than we will be able to, so in an emergency
13 I don't want to rely on you being able to clean your house totally. I
14 would like to be able to talk the head IE guy and I would like to be
15 able to talk to the head NRR guy and I would like to tell them both and
16 then I don't have any doubt of did you guys get together and talk. The
17 same goes for the State, so I want to be able to push a button, have
18 all those people at the other end of the phone and I want to tell them
19 once and let them all take shots in terms of what we got and so forth.
20 If you get the right people on the phone at the same kind of level, I
21 think it could be done very responsively and in a timely fashion. Many
22 of the questions that we now ask and so forth, who were you told, who
23 did you tell, what kind of timetable did that happen, all of that,
24 while very important, all points, all we are really going to get out of
25

103-012

1 that is what should we do differently, you know, and this is the kind
2 of thing we should do differently, very important. We tend to operate
3 a lot within Met Ed on conference calls and there would be a lot of
4 merit to a conference call in this situation. Okay so much for that.
5 Another recommendation I made and we kind of covered that as well was
6 that we should train, make sure our Aux operators are trained in using
7 the switchboard. Luckily I had the right person at the right time. I
8 knew I needed to open that switchboard and very early it occurred to me
9 I am going to have all kinds of phone calls today so I had somebody
10 that I could put on the switchboard. If I hadn't had that Aux operator
11 there would have been a delay in that and so I was fortunate but because
12 of that recognized the need to do that. Press communications, I think
13 I mentioned that too. I think that the NRC should communicate with the
14 press totally, I think the NRC should almost have a swat team that is a
15 communications team. They should go to the site, their senior swat team
16 guy should be briefed by the senior guy on site, here's what our situation
17 is and the NRC should be talking to the press. Reason - whatever Met
18 Ed said that day, right or wrong, it was wrong, we were in a totally
19 indefensible position. We had let radiation leak out to the public. I
20 think both objectively and subjectly that's totally indefensible. I am
21 a part of the public too, I have a family that lives out here and
22 radiation should not leak out from a nuclear plant, period. It is,
23 that's not right, and if I were the, totally the public and as unin-
24 formed or had as many confusing reports as they had I think that that
25

1 is the improper kind of thing to let happen and true it did happen but
2 I think we were within the state of the art quite well prepared for
3 this thing, I think the state of the art is is ill prepared for it.
4 Nonetheless, because of the indefensibility of our position, whatever
5 we said to the press was wrong because we had done a wrong thing on the
6 front end. We had let it leak. So in terms of being totally honest,
7 there is no way that whatever we said would be believed and if you
8 throw that into the context of different people talking to the press
9 the only way that the NRC finally can solve the thing is by sending one
10 guy and let him do the talking, and even now, as you read the papers
11 and you find that Abrams that did some communication and that Stello
12 did some communication and that another spokesman did this, and then we
13 have several spokesmen and so forth. It becomes highly doubtful and
14 dubious what you are receiving unless you are talking to one person all
15 the time. NRC needs to have a team and to be able to deploy that team
16 and to take that burden off the utility's back because the utility
17 won't be believed no matter what they say. I feel very strongly about
18 that. I think outside organization emergency plans need a very hard
19 look. I think the NRC better look real hard in-house at their own
20 emergency pla. I don't know what that is, I don't know if they have
21 one, I assume they do. I think the State should look very hard at
22 theirs. The fact the State has DRAFT on their emergency plan is in-
23 excusable, they had DRAFT on it in 1974. I think it still has DRAFT on
24 it, Dale, can you help me there. Does it still have the big word DRAFT.
25

1 DONALDSON: Yes.

2
3 SEELINGER: Across it, that's inexcusable kind of a situation, and the
4 State should be brought to task in that particular set of circumstances.
5 I, whether they get DRAFT off it or not, may not change the actual kind
6 of a situation, nonetheless each organization ourself and the outside
7 agencies, I feel very strongly about to need be able to take their
8 organization plans to conclusion. The state of the art needs to be able
9 to take something to conclusion. We have learned enough now that we
10 have been through one of these that we ought to be able to do that.

11
12 DONALDSON: I am assuming your answer in or this, or making this recom-
13 mendation in the context that the lack of formal plans or fully developed
14 plans in these other agencies impact on your ability to respond to the
15 event, is that what you are saying?

16
17 SEELINGER: Yes, I am. And I am saying that we are the guys that
18 leaked it out and we have to bear the responsibility of that but I
19 think that the way it was handled from a media standpoint could have
20 been significantly changed and the level of panic and so forth been
21 significantly changed if the other agencies had had emergency plans
22 that would have carried this further into conclusion. We followed our
23 emergency plan. It also would have helped if ours went further.

1 DONALDSON: Let me just try to put this again, pinpoint a little more.
2 What we are really looking for within the context of our investigation
3 is I would like you to maybe give us your feelings on this, these other
4 plans whatever they were, whether they be Met Ed division, State, NRC,
5 the way they were implemented, did that have an impact on your ability
6 to implement your plans, as it was written. Did it adversely affect
7 your performance and ability to implement?
8

9 SEELINGER: Our performance, yes, our implementation, no. Our perfor-
10 mance, let me go the other way, our implementation no because our plan
11 was implemented quickly and efficiency and as well as we have ever done
12 it in any drill but where that plan left off is where we needed help.
13 Our plan didn't cover how you communicate with the press and it should
14 have, it should have said who talks to them, under what kind of framework,
15 and how are we going to drill and practice for this, what kind of a
16 school are we going to go to now if they send me 70,000 protesters that
17 were down in Washington here last week. We've got to as an industry be
18 able to respond to that kind of scenario and situation. That is very
19 important because we are going to face that from here on.
20

21 DONALDSON: Right but the point I want to make clear is that the way
22 that these agencies interacted with you either in the manner or the
23 numbers interaction did or did not cause your performance or ability to
24 deal with the situation to degrade?
25

1 SEELINGER: I don't think it degraded but I think it did not degrade
2 because of the amount of practice that we went through and because of
3 the competency of our people. and I'll give you a very good example
4 where it could have degraded, and that situation would have been the
5 first day when three very key individuals were taken to the Governor's
6 Office. I don't think it did degrade during that period because I
7 think that we knew what our situation was at that time and we were well
8 implemented and so forth. That's not covered in any plan, let's take a
9 trip up to the Governor's Office, explain to Mr. Scranton or Mr. Thornburg
10 what's going on. I am not saying that's not necessary, please don't
11 get that wrong, I think that probably is necessary, but I think our
12 plan should include that and it should include the individual that
13 should talk to them.

14
15 DONALDSON: Yes, I think that's a valid plan. I just wanted to make it
16 clear that from our perspective we're dealing more from what effect did
17 these outside organizations have on your performance, that is were
18 they requesting, asking, ordering, suggesting things for your to do
19 that were perhaps outside the bounds of what you had planned for and
20 did those requests, directions, actions have any adverse affect ulti-
21 mately on the course of the event.

22
23 SEELINGER. Ultimately no but it certainly did make it harder to carry
24 it out.
25

1 DONALDSON: Okay, good. I want to make that context clear because I
2 don't want to leave the impression that we are trying to go beyond what
3 the scope of our particular investigation is. I think what you have to
4 say is worthwhile but I want to put it in perspective as we go if we
5 can do that.

6
7 SEELINGER: A couple of other things that I had and since you wanted
8 these I think that we need to look at system designs in future plants
9 that certainly allows the ability to cool down without bring significant
10 quantities of reactor coolant out into the buildings other than the
11 containment. Case in point are the decay heat system, pretty well
12 known type of situation. When all the radiation monitoring equipment
13 went off scale it seemed to me it would have been nice to have had a
14 high range dosimeter concept, in other words high range radiation
15 monitoring equipment, if you will.

16
17 DONALDSON: You are talking about now, decades of above...

18
19 SEELINGER: Yes.

20
21 DONALDSON: I think your normal range is like 10 to the 6 on your
22 critical monitors that you are using for offsite releases like HPR219
23 and RMA8 is that right?
24
25

1 SEELINGER: I am just saying that would have been a very nice thing to
2 have had. I don't know if it would have worked, I have not done enough
3 research to be able to tell.
4

5 DONALDSON: To tell whether it is technologically feasible?
6

7 SEELINGER: That's right. I don't know if it is. Two other things
8 relative to the emergency, relative to the emergency plan and that was
9 the wash down areas, I think the wash down areas need work and further
10 thought, and the reason for that is where would the run-off go of the
11 water, because that would certainly become an issue. We did not end up
12 having to use wash down areas. I think that was probably fortunate. I
13 think they may have raised more questions than they would have answered.
14

15 DONALDSON: Now isn't it a provision that if individuals are contaminated,
16 upon evacuation from the site, that they go to a wash down area?
17

18 SEELINGER: That is correct.
19

20 DONALDSON: And I believe that while you did not use the designated
21 wash down areas...in the north and south areas, you did use or develop
22 an alternate location at the 500 KV substation. Is that correct?
23
24
25

1 SEELINGER: That is correct. On the first night the area that was used
2 was the Observation Center itself.
3

4 DONALDSON: Could you just offhand comment on whether or not the 500KV
5 substation is as equally well prepared or is it equal to the other two
6 wash down areas that you have established. Was it better, worse or
7 does it need to be better too if you are going to use it?
8

9 SEELINGER: All need to be better in my mind. What I am trying to say
10 I think is that I think we need to look at the wash down areas pretty
11 hard. We did not have to use them. We need to look at things like
12 run-off of the water, we need to look at what size fittings and so
13 forth, where the water comes from and so forth, just to make sure that
14 everything that we have thought about and talked about is totally
15 feasible.
16

17 DONALDSON: Let me ask you another question in regard to that and it is
18 really outside of wash down areas but in terms of coordination areas
19 offsite I know that the Observation Center is designated as an alternate
20 emergency control station and the plans are to move equipment from
21 within the plant to that location. In the same context could you
22 comment on, in that area, on whether it was ready, whether the having
23 to move equipment in slowed things down or had any negative impact?
24
25

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1 SEELINGER: I don't think it did. I think the Observation Center in
2 retrospect performed better than I assumed that it would be able to
3 perform. I think it geared up quickly considering the situation and
4 performed very well. One other area that I have is the movement of
5 trains and planes, and we had several instances during the first day
6 where trains did go through on the tracks on the east side of the
7 river. In at least one instance a train was stopped and monitored.
8 Dick Dubiel and I did have or Tom Mulleavy, I don't know which, had a
9 conversation on the trains and we did determine that the passage to the
10 train through the area based on what we were seeing was not going to
11 pick up any significant contamination, but we need to be able to come
12 to some kind of agreement or arrangement, I think with the train dispatcher
13 to make sure that we are able to take adequate control and protective
14 measures of those kinds of situations. Much as the State Police could
15 set up a road block, we need to be able to set up a train block. I
16 don't know that we have that ability right now, or that degree of
17 control, and that was a situation that did arise. Those pretty much
18 cover the recommendations.

19
20 DONALDSON: Two final short questions. If you had ever become aware
21 that there was an expected increase in gaseous releases do you know
22 whether or not the State or NRC or somebody was being apprised that
23 increased activity was expected to occur? Were you notifying the State?
24
25

1 SEELINGER: Well Dale it is hard to put your question in the context of
2 time.

3
4 DONALDSON: At any time during the period of interest, the 28th through
5 the 30th, whenever, at any time when you were aware that there were
6 expected to be increased amounts of material released, were you sort of
7 mentally checking and telling someone hey, let the State know?

8
9 SEELINGER: Yes that definitely went on. To give you an example, we
10 drew a primary sample somewhere in that time frame, and I don't know
11 the day, but it was drawn with a man drawing the sample and I think
12 that it was drawn on the 29th, I can't say for sure, but I do remember
13 asking NRC, the IE people to help us. Say if we draw the sample you
14 guys figure out where it can be analyzed and I think Chick Gallina.

15
16 SINCLAIR: It is 11:36. We have to break. We are almost at the end of
17 the tape.

18
19 SEELINGER: As I was saying the, this is relative to any expected
20 releases of more magnitude than what was normally in progress. With
21 respect to the sample, I specifically remember getting permission of
22 all agencies, in all agencies on board to let them know exactly what we
23 anticipated to happen during that period of time. In terms of other
24 releases throughout that period, in so far as we had, so far as I knew
25

1 where we anticipated things to happen at that point in time, we tried
2 to let agencies know. It's important to note though that, by that time
3 our data base was not built up to the point where we had a real good
4 handle on what evolutions in the plant seemed to change the offsite
5 release rate? An example would be moving water around from tank to
6 tank at times seemed to cause the release rate to increase. I don't
7 know that by the 30th, we had a handle on that specific thing yet.
8 Increase in the pressure in the makeup tank had the same effect, I
9 don't think by that time we had yet locked onto that fact, that look at
10 the correlation between these two items. I think that took a little
11 bit more data to make ourselves aware of that fact.

12
13 DONALDSON: I believe Monitor RML-7 reads out in the Unit 1 Control
14 Room.

15
16 SEELINGER: That's correct. Yes.

17
18 DONALDSON: At any time, did you ever happen to note or hear of that
19 alarm was in alert or in a high alarm condition?

20
21 SEELINGER: I do not remember that alarm being in alert or alarm condition.

22
23 DONALDSON: Okay. Jim ...
24
25

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1 SEELINGER: Was there, let me ask another question. Did you hear from
2 anybody else that it was?
3

4 DONALDSON: It's just a question we're asking. Now we have, I don't
5 have any particular ...
6

7 SEELINGER: I'd be interested to know if it was. I don't know that it
8 was.
9

10 DONALDSON: Well Jim it's been about 2 1/2 hours I appreciate giving
11 all the information and taking the time to talk to us at least in the
12 area of emergency planning end, and especially your candor and if
13 anything should come to mind later and that you want to pass on, you
14 can contact myself or really anybody and give it us.
15

16 SEELINGER: Did any other gentlemen, or do I turn over to you guys now,
17 is that oh my.
18

19 SINCLAIR: Do you want to take a short break?
20

21 SEELINGER: No, no, let's keep going, I have bunch of things I've got
22 to do so.
23
24
25

1 HUNTER: Okay Jim, let's, I want to start at some particular times and
2 hopefully go through a couple of key points and some of the items that
3 you have in fact touched base on, get you back in the frame of mind of
4 more operational items rather than the health physics aspects. You
5 were notified by Gary Miller early in the morning.

6
7 SEELINGER: That's correct.

8
9 HUNTER: And you indicated that he didn't give you any real detail
10 except that they were having a problem.

11
12 SEELINGER: He said a problem with pressurizer levels. He told me they
13 had tripped and they were having a problem with pressurizer level.

14
15 HUNTER: Okay, and then at 5:45, you then came onsite, approximately,
16 you heard the site emergency running.

17
18 SEELINGER: Ah ha.

19
20 HUNTER: And indicated that you realized it.
21
22
23
24
25

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1 SEELINGER: When I heard site emergency, I put, I recognized it. Unit
2 2 was having some kind of a problem and now as there was, it had some-
3 thing to do with pressurizer level, and now there was a site emergency
4 it was pretty obvious from the Unit 1's condition that the problem was
5 in Unit 2.

6
7 HUNTER: Your okay. Your understanding the plant status then, that it
8 was a trip and they had a pressurizer level problem.

9
10 SEELINGER: That's correct.

11
12 HUNTER: Is there any other, does your understanding go any further
13 than that at that time?

14
15 SEELINGER: No. Gary mentioned also in the morning something to the
16 effect that the pressurizer was indicating full.

17
18 HUNTER: Okay, so you had, okay, at that time.

19
20 SEELINGER: But didn't give any indication you know whether it was a
21 real situation or whether there was an indication problem or what it
22 was.

23
24
25
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1 HUNTER: Okay so you drove in with that on your mind then. Did you
2 ask him any questions at that time or it was strictly just receiving
3 the information?
4

5 SEELINGER: No, it was just strictly receiving the information and the
6 information was such that I could from that, from my job, to be making
7 sure that Unit 1 supported Unit 2 and anything I had going on but I had
8 not been directly involved in Unit 2 operations since Thanksgiving
9 time, and so consequently the Unit 2 Superintendent was basically in
10 the area and I had no reason to believe, it was a week day, that he
11 would not be at work or anything like that so.
12

13 HUNTER: Did you know that you saw his car on the way in?
14

15 SEELINGER: His car was in the parking lot when mine arrived so I knew
16 that he was undoubtedly in the Control Room.
17

18 HUNTER: Allright, then you proceeded to the Unit 1 Control Room to
19 assume your responsibilities at that point.
20

21 SEELINGER: That's correct.
22
23
24
25

1 HUNTER: At that time, you commented that you were dealing with radiation
2 alarms and assuming the responsibilities at the backup, for Unit 2.
3 And then at, was anymore information relayed to you during that timeframe
4 of the conditions of Unit 2 as far the physical plant itself other than
5 a radiation problem?
6

7 SEELINGER: Sometime during the morning prior to my going over to Unit
8 2, I got a report basically that the, you know said that Unit 2 it had
9 had an ES, Emergency Safeguards Actuation, that they were on natural
10 circulation and the "A" Steam Generator was steaming on the atmospheric
11 release.
12

13 HUNTER: Okay, so then that was your understanding at that time. Okay,
14 then at 7:45 til 8:15 you then proceeded to Unit 2 Control Room?
15

16 SEELINGER: Somewhere during that period and that's correct.
17

18 HUNTER: Okay, and what was your activity, did your activity include
19 any plant interfaces at that time?
20

21 SEELINGER: A minimal amount.
22

23 HUNTER: A minimal amount of actual physical plant interfaces.
24
25

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1 SEELINGER: That's correct.

2
3 HUNTER: You were the site emergency director.

4
5 SEELINGER: That's correct.

6
7 HUNTER: Okay. I understand you were coaching, communicating, helping
8 Gary out at that time.

9
10 SEELINGER: That's right.

11
12 HUNTER: That was your major okay.

13
14 SEELINGER: That's right. However, not so much with the plant, my
15 Supervisor of Operations, Mike Ross, the Unit 1 Supervisor of Operations,
16 was pretty much the individual directly responsible for Unit 2, or the
17 Unit 2 plant, at that time.

18
19 HUNTER: Okay.

20
21 SEELINGER: He and his shift supervisors.

22
23 HUNTER: His Shift Supervisor in that area was Ken Bryan was the one
24 that was on from 11-7.

25

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1 SEELINGER: Well Ken was in Unit 1, I think. I think Ken was in Unit
2 1. I think, I don't remember who it was, it was Bill Zewe ... in Unit
3 2.

4
5 HUNTER: Bill Zewe was in Unit 2. We have Ken Bryan there also because
6 of the fact he was ...

7
8 SEELINGER: Ken was over in Unit 2 at the time.

9
10 HUNTER: Right. For that purpose.

11
12 SEELINGER: After the ... That's right.

13
14 HUNTER: Okay, no problem. Did you talk with Mike Ross at any time or
15 did you do the fairly usual things at the plant?

16
17 SEELINGER: Sometime during the incident I had talked to Mike but I
18 didn't detract him from his specific duties relative to the plant. Jim
19 Floyd, the normal Supervisor of Operations was at the Simulator at the
20 time and Mike is basically our most senior operator, if you will, Mike
21 and Jim are our two most experienced people with plain operating one of
22 these p'lants, with the physical operations of the plant, from turning
23 the switch to the effect of the thing, and had the most control room
24 experience and I felt comfortable with Mike in his position and with
25

1 Gary directing him, and my interface with him in the Control Room,
2 specifically directing the plant on plant parameters was somewhat
3 minimal.

4
5 HUNTER: Gary put his team together of people who were allowed to talk
6 to him and Mike Ross was in charge of the plant.

7
8 SEELINGER: That's right.

9
10 HUNTER: And they had a, apparently had meetings, discussions.

11
12 SEELINGER: That's right, I was a party to those discussions.

13
14 HUNTER: You were ...

15
16 SEELINGER: Yes.

17
18 HUNTER: Okay. And they were using your expertise with your license
19 and during those meetings ...

20
21 SEELINGER: Yes.

22
23 HUNTER: ... to discuss plant status?
24
25

1 SEELINGER: That's correct.

2
3 HUNTER: Okay.

4
5 SEELINGER: What we tried to do there is, is we tried to, we did it
6 about every, somewhere between half hour and hour, we as we recognized
7 things change and whatever, we tried to draw back from being up at the
8 console and moving to various areas of the Control Room, get together,
9 discuss where we were, make sure that we were still all together, going
10 down the same path and, that we agreed with the direction that we were
11 going with the plant.

12
13 HUNTER: It becomes apparent that, the, when you arrived at the Unit 2
14 Control Room that the pumps had been secured ...

15
16 SEELINGER: Which pump?

17
18 HUNTER: One pump, the reactor coolant pumps had been secured, they had
19 in fact started "A" pumps, the 2B pump restarted for 19 minutes, and
20 then took it back off and the plant was sitting on some high pressure
21 injection and the, excuse me, the 1A, the reactor coolant pump 1A, had
22 been started approximately at 8 o'clock, tripped back off and then you
23 were standing on some type of high pressure injection for a significant
24
25

1 period of time during the day. Do you recall at approximately when you
2 got there, and your first meeting and I don't know, you know, we don't
3 have any information as far as when it was, within the first 30 minutes
4 or the first 5 minutes, do you recall, can you give us an idea of what
5 your understanding of the plant status was at that time?
6

7 SEELINGER: Well, really, probably not any different than you heard
8 from anybody else, we knew that the pressurizer was full, we knew we
9 had no indication of T hot, we knew what TC was. I do remember in the
10 first discussion we had, bringing up the incore thermocouples to look
11 at for temperature, and we immediately went up to take a look at those
12 and got them back with question marks on them, out of the computer,
13 which really didn't give us any information other than that it was
14 perhaps outside the program, so we probably really did have a hot
15 condition in the core. In other words the fact that Th was offscale
16 was probably valid from the basis of what we saw on the computer. You
17 couldn't necessarily say that but it was not a normal kind of temperature
18 that were were seeing on the thermocouples. We knew we had high pressure
19 injection, we had talked some about whether we should keep those pumps
20 on the line. At one point in our group, and I don't remember the
21 particulars, we had decided to re the pumps, that decision lasted
22 only about 2 minutes I would say at the most, we said wait a minute, we
23 don't fully understand this situation and we went back and restarted
24 the high pressure injection pumps. It was a very brief period at that
25

1 point in time that they were secured as I remember, on the order of a
2 couple of minutes. Other than the incore thermocouples and the full
3 pressurizer, and not being able to get any indication of T_h , recognizing
4 that we had, undoubtedly had, a bubble on the loops, that we had no
5 bubble in the pressurizer and that we undoubtedly had a bubble in the
6 head. That was pretty much what our situation was.

7
8
9 HUNTER: And again, as you recall it, your own personal, you know
10 that's what you understood the situation at that time.

11 SEELINGER: I would say so.

12
13 HUNTER: At best that you could recall I realized I've even read a lot
14 now so I'm beginning to understand it.

15
16 SEELINGER: I understand it a lot better now than I first did at that
17 time.

18
19 HUNTER: But try to remember what you did understand at that time.

20
21 SEELINGER: I would say that perhaps my understanding at that time was
22 not as lucid as I have just described it. However I can't tell you the
23 specifics of where it lacked in that.

1 HUNTER: Well looking at your, you were being used as the key, I think
2 a person for Gary Miller, you were double licensed and I have to accept
3 that fact that you were a key individual and he was using you as a
4 consultant obviously to support him in decisions he was making.
5

6 SEELINGER: That's correct.
7

8 HUNTER: I would like to ask you, back again to, if you can recall, go
9 through what came about, what the thought process was, when it was
10 being considered to secure the high pressure injection, I think we can
11 show you that we can look back and just look at it in a timeframe, that
12 they were secured for a short while, it was a few minutes. okay. I'm
13 not interested in that from that aspect, but specifically but what was
14 the thought process at that time as far as, if in fact, you know ...
15

16 SEELINGER: I frankly don't remember. I would be making up that thought
17 process if I gave it to you at this point. I really don't, I really
18 don't know. I know we had a group together, I remember that, sitting
19 in the group.
20

21 HUNTER: I think we been through a number of interviews to establish
22 the group.
23
24
25

1 SEELINGER: But I don't remember what led us to that discussion other
2 than when we got to the point where we came to that conclusion, the
3 Shift Supervisor walked out of the room to carry out that action and we
4 started to go on and just kind of rethink what we had been through, I
5 mean we just, two or three of us in the room I think perhaps felt
6 uncomfortable about that, perhaps the most uncomfortable were Gary,
7 himself and Lee Rogers, our B&W Rep. And when they raised a concern I
8 think everybody else kind of pitched in and said we really don't under-
9 stand this, at this point, let's go the conservative route here, let's
10 get all the ES things that normally support you during ES going and
11 let's have flow through the core with the high pressure injection, and
12 let's take that method since we don't fully have a picture of what we
13 have at this point, and let's do that because from an analysis standpoint
14 we at least know that that's more correct than some way we might head
15 at this time without complete information. That was our thought process
16 in re-establishing it. What our thought process was in turning the
17 high pressure injection pumps off, and you can probably go back to your
18 logs and determine the exact time that was and my guess is that it was
19 8:30ish in the morning. I just don't remember.

20
21 HUNTER: Okay. And you were ...
22
23
24
25

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1 SEELINGER: I can tell though, I'm sure that it related to the full
2 condition in the pressurizer, without doubt, and I suspect and this is
3 strictly trying to, this is guessing it, second guessing what I did
4 then. My guess would be what we probably tried to do was, we now I
5 think at that time, and this is just from reading through logs and so
6 forth, we had the electromatic relief block valve shut by that time and
7 so now if you would letdown out of the pressurizer, theoretically
8 without understanding where the hottest part of the system is, what you
9 might think would happen would be that you would draw a bubble in the
10 top of the pressurizer, if in fact if you could letdown out of the
11 system at all. Instead of just expanding the bubble you already have
12 if you, normally under the pressurized water reactor scenario, that's
13 the high pressure point of the system and the water is going to use
14 that as the surge volume but now under with the bubble being someplace
15 else, really that water didn't have any reason to come out of the
16 pressurizer.

17
18 HUNTER: I understand that.

19
20 SEELINGER: And I suspect, I don't think this is probably worth writing
21 down because I just plain don't remember. But I suspect something that
22 could of have crossed our mind at that point without fully thinking
23 through the hottest points in the system theory and so forth that we
24 could of felt, we let's drain and then the bubble will form.

1 HUNTER: Okay. Did the ...

2
3 SEELINGER: But I don't know, I don't know if that's so for sure or not.

4
5 HUNTER: Do you recall during that timeframe looking at pressurizer
6 temperatures, that type of information?

7
8 SEELINGER: I think we had that information, I don't remember if it
9 was discussed.

10
11 HUNTER: Okay. Another question, you indicated that you looked at
12 incore thermocouples and on the computer, you know the printout, you go
13 above the 700 degree mark and you obtain bad data offscale, out of
14 range. Do you recall at that time any discussion of hooking up millivolt
15 bridges or taking direct resistance readings on the hot leg temperatures,
16 were you involved in that?

17
18 SEELINGER: Was not involved in that, I remember a discussion of that
19 fact. I know the name of the person that was involved. Ivan Porter
20 was the individual involved. Could tell you exactly what he did, and
21 what he was directed to do.

22
23 HUNTER: Okay.

1 SEELINGER: We had an awful lot of recorders and instruments going
2 that first day.

3
4 HUNTER: Okay. And you were in the Control Room Unit 2 up until 10
5 o'clock approximately.

6
7 SEELINGER: I was there nominally from about 8 to 10.

8
9 HUNTER: Okay. The and from ... basically the operating steam gener-
10 ators, the oncethrough steam generators were normal levels that was
11 being maintained, the plant was sitting at a fairly stable condition,
12 pressure was stable, they had high pressure injection when it was on at
13 that time.

14
15 SEELINGER: During most of the period of time I was in there it was.
16 One thing I'd like to make fairly clear, I think maybe it's important
17 that you understand is that, from my advantage point in the Control
18 Room, I didn't get any where near the consoles, and the reason I didn't
19 was because we already had enough people up there.

20
21 HUNTER: Yes I understand that.
22
23
24
25

1
2
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4
SEELINGER: So, I didn't, what indication that I would remember I would
of heard from somebody as opposed to physically going and looked at.

5
6
7
HUNTER: I'm interested in the information that you were aware of,
coming back to you and what, the decisions that you made, were based on
that information, obviously.

8
9
10
SEELINGER: The levels in the steam generators, I don't remember the
...

11
12
13
HUNTER: No, that's okay, that's just a point in case at this time
they weren't really the problem.

14
15
16
17
SEELINGER: I do remember the conversation though when our Chemist
Kerry Harner came in with his sample results of the respective steam
generators and we covered that when Dale was in the room.

18
19
HUNTER: Right, I understand that.

20
21
22
23
24
25
SEELINGER: And I was there when the decision was made to go back on
the atmospherics and, or on the atmospheric relief valve, and steam the
"A" Steam Generator.

1 HUNTER: I understand that. Did the group, the consensus of the group
2 indicate that or feel that they were in fact removing decay heat from
3 the "A" Steam Generator at that time?
4

5 SEELINGER: I would say that we felt like we were removing heat because
6 we were steaming.
7

8 HUNTER: Okay.
9

10 SEELINGER: You know and temperature was well, temperature wasn't going
11 up but of course there wasn't any flow so you know what I mean, it was
12 kind of, that's a hind sight thing now.
13

14 HUNTER: At that time your feeling was that you were removing heat
15 because you were steaming to the atmosphere?
16

17 SEELINGER: I'd guess I'd have to say it was. We felt like that what
18 we were shooting for was a natural circulation kind of a cooldown, that
19 our training had led us to believe that we're gonna get natural circu-
20 lation with the reactor coolant pumps off if we steam by these atmospheric
21 reliefs. Our shutdown from outside the Control Room procedure, has us
22 perform this particular evolution. With Th offscale though, and with
23 the bubble in the "A" Loop, we didn't have a whole heck of a lot of
24 natural circulation.
25

1 HUNTER: Did you feel like you were transferring some heat or a small
2 amount?

3
4 SEELINGER: I guess we would of had to say we were transferring some
5 heat but we weren't really doing a whole heck of a lot for the core
6 during that period.

7
8 HUNTER: Okay. Was there any ...

9
10 SEELINGER: I don't remember our feelings at the time, I think we
11 recognized from the fact but I can't pin it down to time period. And
12 we recognized from the fact that Th was offscale, that it was going to
13 be very, and that the incore thermocouples gave no indication of what
14 we had, that the amount of flow that we had going through the steam
15 generator from the reactor coolant system was in serious jeopardy and
16 it was an unknown quantity if there was any. And so therefore, the
17 amount of heat removed from the reactor coolant systems or from the
18 reactor itself is in serious jeopardy. You might take heat out of that
19 leg of water that is sitting in the steam generator but if you didn't
20 have anything and it's not gonna go back in the core it isn't gonna
21 help any.

1 HUNTER: Okay. There's a couple more things that happened during that
2 timeframe. During that timeframe there was a building isolation. Do
3 you recall discussing that particular situation?
4

5 SEELINGER: No, I don't. That happened while I was in the Control
6 Room, I believe from the logs, but I don't remember it happened.
7

8 HUNTER: Okay. And there was one other area that would be in that
9 timeframe, that we would be interested in, is the use of the EMOV block
10 valve as the pressure control mechanism, opening and closing it and
11 using it in, with the apparent leakage of the power operated relief
12 valve, the RV-2 valve. Were you involved in discussions concerning
13 that particular valve?
14

15 SEELINGER: Not that I consciously remember.
16

17 HUNTER: Okay. Also ...
18

19 SEELINGER: I may have been but I just don't remember.
20
21
22
23
24
25

1 HUNTER: Well that's why I want to key on at the timeframe to, that may
2 help you, any use of the pressurizer vent valve during that timeframe
3 that as a group you were aware of being used or also any use of the
4 pressurizer spray line valve during that particular timeframe in any of
5 your discussions?

6
7 SEELINGER: I don't remember from the discussions any of those.

8
9 HUNTER: Okay. At a ...

10
11 SEELINGER: While I was there we had perhaps two and maybe three discus-
12 sions that I was a party to in the morning prior to going back to Unit
13 1.

14
15 HUNTER: That maybe the best way to cover it then.

16
17 SEELINGER: And I remember the first one because we discussed that and
18 that was the one where we were talking about the makeup pumps.

19
20 HUNTER: Okay.

21
22 SEELINGER: I think we kind of met as a group on the steaming of the
23 steam generator when we decided to steam the "A" Steam Generator.
24 Anymore than that is kind of a bla . . . unfortunately.

25

1 HUNTER: Okay. Do you recall what was happening when you in fact
2 departed to go back to Unit 1 Control Room? Can you key that to an
3 event that or an operation or evolution which was in progress at that
4 time? Rather than not worry about the timeframe but maybe as you were
5 leaving you noted something that would key us more to the exact time?
6

7 SEELINGER: No I really can't, other than conditions had not changed a
8 great deal from the time that I got there until the time that I left,
9 other than, from an emergency planning standpoint, we were in a very
10 stable kind of situation. We had all the teams deployed, we had virtually
11 carried out all the actions in our emergency plan at that point that
12 could be carried out from the Unit 2 Control Room and things had quieted
13 down from the standpoint of making sure everything, all bases were
14 covered, in the emergency planning standpoint. And really my decision
15 to go back to the Unit 1 Control Room was pretty much based on that,
16 there wasn't much more I could do from that standpoint to help out in
17 the Unit 2 Control Room, and the plant had not changed significantly
18 and didn't appear to be changing significantly. There wasn't too much
19 we could do with it at that point in time.
20

21 HUNTER: Let me give you some key words if you don't mind, and maybe
22 the, and we discussed the high pressure injection pumps and the fact
23 that they were shutdown. I've mentioned the building isolation and,
24
25

1 you mentioned, you have mentioned obtaining adequate amount or some
2 amount of letdown flow at that time in an attempt to draw a bubble in
3 the pressurizer.
4

5 SEELINGER: And I'm saying that that may have been our thinking. I
6 certainly cannot say with any degree of certainty it was.
7

8 HUNTER: Okay. What about pressurizer heaters? Do you recall any
9 discussions of pressurizer heaters?
10

11 SEELINGER: It's difficult to keep these straighted out from later
12 times on shift. Not the specifics, I suspect that we talked about them
13 and suspect that we talked about how many we had and so forth. I know
14 we talked about that a great deal on later shifts that I was on but I
15 don't remember the first day.
16

17 HUNTER: Okay. What about this then, trying to remember the timeframe
18 of the discussion of the reactor coolant pumps had been turned off
19 early in the morning, finally decided yes we're gonna put one back on
20 they tried the 1A and then they tripped it after a short period of
21 time, radiation alarms went off everywhere you know it's, they had a
22 real problem. Then, what about discussions in the 8 o'clock to 10
23
24
25

1 o'clock timeframe concerning your getting the reactor coolant pump back
2 on, placing the plant into a condition of unit reactor coolant pump
3 back on. Did this ...

4
5 SEELINGER: As I remember it was our objective but again it's pretty
6 foggy because most of my efforts during that period were emergency
7 planning kinds of efforts.

8
9 HUNTER: Okay.

10
11 SEELINGER: As opposed to concentrating on the plant, and I do remember
12 some discussion there but I'd be misleading you to say that I can
13 recall any of the details of that, I just can not.

14
15 HUNTER: Allright, and at 10 o'clock you went back to Unit 1 and in
16 Unit 1 you then reassumed your, again support function duty, okay.
17 Then you indicated at 1500 you came back to Unit 2 and.

18
19 SEELINGER: That's right.

20
21 HUNTER: Approximately, okay.

22
23 SEELINGER: Yeh.

1 HUNTER: So at 1500 when you came back can you establish a plant condi-
2 tion at that time, tell us where you, what your activity, what activity
3 you were involved in at that time and what your, what the plant status
4 was?

5
6 SEELINGER: Well by looking back through my notes, at that time, we had
7 ... we've collapsed the bubble in the "A" Loop. Oh gee ... I just
8 keyed my mind to something from that earlier timeframe. One of the
9 discussions that we had, must of been in the morning, maybe in the
10 afternoon but I think it was later on in the morning, there was some
11 discussion about trying to let pressure go low enough that we would get
12 core flood into the core, and you may have heard that from other groups.

13
14 HUNTER: If you came back at 1500 then the discussion must of been
15 earlier.

16
17 SEELINGER: We had already done that by that time so that makes me think
18 that was probably earlier, and there was some thought that we know that
19 if can drop pressure down that those core flood tanks will go into the
20 core, and that will at least cover up the core and it will get us some
21 water in there that's cooler water and do some cooling.

22
23 HUNTER: Was the intent to actually go down and go on core, to dump the
24 core flood tanks?

25

1 SEELINGER: At one point in time it was, and as I remember that would
2 of been 9:30-10 o'clock in the morning that we had that intent in mind.
3 Now kind of in the back of mind is the fact that we had some intention
4 not to do that too, and I don't remember why. But I think what we
5 ended up doing is we ended up dropping pressure to the point of core
6 flood because we physically saw a level decrease in the core flood tank
7 and also in conjunction with that we feel we got some relatively violent
8 boiling when the cold core flood water went inside the reactor vessel
9 and that is in fact what freed the "A" Loop up as far as getting the
10 bubble out of the "A" Loops goes. We feel and this is in retrospect
11 now, but we feel that as when we dropped the core flood water in, that
12 we had sufficient boiling and so forth and perhaps even up through the
13 surge, the surge line on the "A" Loop, through an open pressurizer vent
14 path, we had enough flow going up through that point, caused enough
15 disturbance to the water bubble mixture that we were able to cause
16 enough flow to get the instrumentation back on scale.

17
18 SINCLAIR: I'll have to jump in here, the time is 12:08 p.m. and we'll
19 have to break to change the tape.

20
21 SINCLAIR: The time is 12:09 p.m. and going to gonna continue the
22 interview with Mr. Seelinger.
23
24
25

1 HUNTER: Okay Jim, let's see you had just mentioned that, discussed,
2 core flood tank, violent boiling, what may have been backed up through
3 the surge line through an open pressurizer vent or what the line up of
4 it was at that time that it in fact reduced the indication on the hot
5 leg temperature indicator in the "A" Loop.

6
7 SEELINGER: That's correct.

8
9 HUNTER: And it did in fact come back on scale meaning that it had
10 dropped below a super heat condition.

11
12 SEELINGER: That's right.

13
14 HUNTER: At that time okay. When you came into the Control Room at
15 around, you know, 1500 or so, do you recall the conditions that you
16 were at at that time of the plant status?

17
18 SEELINGER: Not from recall I don't, but I can give you those I think.

19
20 HUNTER: Did ...

21
22 SEELINGER: Hang on for just a second.

1 HUNTER: Right. I'm trying to key on your memory also, but obviously
2 if you set it down and recall it that's fine too, we're trying to get
3 data points. At the time apparently at 1500 when you came over, we'd
4 like to ...

5
6 SEELINGER: Other than at that point, I know we had "A" Loop temper-
7 atures in the high 500's for the hot leg, don't remember the cold leg
8 temperatures. "B" Loop hot leg was still offscale, the "B" Loop cold
9 leg I think was in the low 200's.

10
11 HUNTER: Okay, speaking more generally, when you came back, what was
12 the general, what was your general function, what did you end up doing
13 at 1500 in Unit 2 generally?

14
15 SEELINGER: Well, again, I kind of lent support. At that point in time
16 Gary was offsite in the Governor's office and my Supervisor of Operations
17 just requested that I come over because he just felt like I think at
18 that point that since he gotten the bubble reduced in the "A" Loop,
19 since he had gotten it out of the "A" Loop I should say, not to much
20 happened and I think he just felt more comfortable if I was there as
21 well, just kind of lending support and making sure things were moving,
22 so the best thing that I can say I did is I didn't come over and say
23 I'm the Emergency Director and take charge of the Control Room, I
24 didn't think that was the that was really called for at the time, but I
25

1 did kind of go over and try to ascertain that all of the duties that
2 should be being fulfilled were being fulfilled, and that we were func-
3 tioning on any information that was coming in to us from outside the
4 groups.

5
6 HUNTER: Allright. Did you have a lengthy discussion with Ross at that
7 time as far as plant status, where he was?

8
9 SEELINGER: I wouldn't say a lengthy discussion, I had a discussion
10 with him but with the particulars I don't specifically remember.

11
12 HUNTER: Okay. And then you.

13
14 SEELINGER: Other than as I basically just described to you.

15
16 HUNTER: Okay. At that time the plant was on the core flood tanks?

17
18 SEELINGER: With the drop pressure down.

19
20 HUNTER: Yeh, right I'm trying to key the events and I don't and at
21 that time it was on the core flood tanks and sitting basically stable,
22 did you end up, how long did you end up in the Unit 2 Control Room at
23 that time, till 3 o'clock in the morning?

1 SEELINGER: No, I was in the Unit 2 Control Room until I think about
2 1700. I was there from nominally 1500 until 1700, another couple of
3 hours.

4
5 HUNTER: Okay. Let me cover a couple of points during that timeframe.
6 During that timeframe, we need to talk a little bit about high pressure
7 injection flows. During that timeframe do you have, what's your recollec-
8 tion on high pressure injection systems?

9
10 SEELINGER: Don't remember.

11
12 HUNTER: Okay. And then are there any other key items in that timeframe
13 except insuring that everything that was supposed to be done, communication
14 and all was being done, was that your basic function during that time?

15
16 SEELINGER: That was basically the role that I performed, yes. Just
17 to insure that we were adequately communicating with outside groups,
18 that the plant people, I use that term kind of generically but the,
19 that Michael had been charged of the responsibility with the plant in
20 fact had that responsibility and wasn't being told by four or five
21 different people what direction to move and that, just kind of make
22 sure that all the specific responsibilities as they had been left when
23 Gary left them, were still being carried out pretty much as they had
24 been left.
25

1 HUNTER: Jim, who was actually in charge of Unit 2 when you came over?
2

3 SEELINGER: At that point in time, Joe Logan.
4

5 HUNTER: Joe Logan was. And the plant Operations Supervisor, Mike
6 Ross, was receiving his orders specifically from Joe Logan?
7

8 SEELINGER: I would have to say yes.
9

10 HUNTER: Okay. Was Joe in constant communication with Gary Miller?
11

12 SEELINGER: No.
13

14 HUNTER: When Gary was gone?
15

16 SEELINGER: No. Gary left his beeper number with us and we had the
17 ability to communicate with him if we needed to communicate with him.
18

19 HUNTER: Allright, you indicated that you had in fact communicated
20 with him at one time.
21
22
23
24
25

1 SEELINGER: I think we may have in the truck that they took up, we had
2 been informed there was a Met Ed radio in the truck. I don't specifically
3 remember the communication if it happened but I know we had a Met Ed
4 radio on the Lebanon frequency in the truck that they took to Harrisburg.
5

6 HUNTER: Okay, Joe Logan you mentioned was there. Do you recall Lee
7 Rogers being in the area at that time?
8

9 SEELINGER: Yes he was in Unit 2 Control Room at that time.
10

11 HUNTER: Was he in the area of most, you were in Unit 2 a number of
12 times, was he in the area each time you were there?
13

14 SEELINGER: Yes.
15

16 HUNTER: Okay. Then you left at 5, where did you go at that time?
17

18 SEELINGER: I went back to the Unit 1 Control Room.
19

20 HUNTER: Okay. And what was your function again at that time?
21

22 SEELINGER: Same thing I had done there during the previous time.
23 There are two things that did happen that I forgot to mention when Dale
24 was in here that my memory is keyed on but I think were perhaps signi-
25

1 ficant actions we took during that period of time. And they were, one
2 was taken during the late afternoon hours as I remember them, and the
3 other happened a little later at night. When we sent Hitz and Myers
4 out to make their tour in Unit 2, the report came back that there was a
5 significant amount of water on the floor. One of the assumptions we
6 made is that the radiation releases were being evolved out of the water
7 with a large surface area on the floor to the Aux Building. And as a
8 result of that we had to get some way to get rid of that water and
9 there were two ways that we could really go at that point. One was to
10 find a tank to somehow put the water in and the second was to cover up
11 the water. So we went down both paths and I was involved in both of
12 those paths and mostly from the Unit 1 Control Room prior to going over
13 to Unit 2 on the first one and on the path of trying to cover the
14 water, we were trying to round up some poly to lay over the top of the
15 water with the thought of perhaps that we can keep the surface just
16 essentially keep air from all over the top of it and keep evaporation
17 down so that we're not putting too much of this out in the air volatilizing
18 iodine and so forth out of the water. The other thing that we had to
19 do was find a volume to put the water in and that volume turned out to
20 be the Unit 2 Neutralizing Tanks which were at the time of the accident
21 full. In order to get that volume freed up what I had to be involved
22 in was, or what I was involved in, was trying to free up volume in Unit
23 1 in order to put the Neutralizing Tanks in. In order to do that what
24 we had to do is get some plugs, six to be exact, to put in the Bleed
25

1 Tank Room floor to dump the Miscellaneous Waste Storage Tank which sits
2 in that particular room with the Bleed Tanks in Unit 1 now, to the
3 floor and then pump the Neutralizing Tanks to the Bleed Tanks. Those
4 two evolutions happened about in parallel with each other although I
5 think we got the poly down slightly before we got all the water moved
6 around and we certainly got the water poly down before we got the water
7 moved into tanks. But by late, by 9 o'clock, 10 o'clock at night, we
8 had the water off the floor in the Aux Building. It subsequently came
9 back or water came back in later days but we did initially get that
10 initial amount of water pumped into tanks and, that was by about 9 or
11 10 o'clock at night.

12
13 HUNTER: And the, pumping the, and that would of gone out when you were
14 in Unit 1 you were setting up, then you were in Unit 2, it was still
15 going on that afternoon and later into the night.

16
17 SEELINGER: Yes I think we finished up nominally 9 or 10 o'clock at
18 night that we finally pumped the Unit 2 water from the floor into the
19 Neutralizing, we either pumped that and I don't remember the path, I
20 don't know if we pumped it from floor to the Miscellaneous Waste Holdup
21 Tank in Unit 2 and then the Miscellaneous Waste Holdup Tank, I got the
22 sequence wrong. I should of said we would of, here's the total sequence,
23 Unit 1 Miscellaneous Waste Storage Tank to the floor, Unit 2 Neutralizing
24 Tanks to the Unit 1 Miscellaneous Waste Storage Tanks and then there's
25

1 an option, but one of those options I'll go over is Unit 2 Miscellaneous
2 Waste Holdup Tank to the Unit 2 Neutralizing Tanks then the floor to
3 the Unit 2 Miscellaneous Waste Holdup Tank. That's the most viable
4 option, I'm not sure that's the one we followed. There are a couple of
5 other ways to do that but one of the logical ways.

6
7 HUNTER: You indicated that you pumped the water into tanks.

8
9 SEELINGER: Yes. And it ended up either in the Neutralizing Tanks or
10 the Miscellaneous Waste Holdup Tanks.

11
12 HUNTER: Which would of in fact would have covered it and put it on the
13 vent system, that's what you ended up trying.

14
15 SEELINGER: Not totally. It could of went into the Miscellaneous Waste
16 Holdup Tank yes, but in the Neutralizing Tanks, no.

17
18 HUNTER: It's an open vent.

19
20 SEELINGER: It's an open vent.

21
22 HUNTER: Okay good. You indicated then that subsequent to that evo-
23 lution the water did come back.

1 SEELINGER: Yes, that was in later days. The water was again on the
2 floor, we were somewhat surprised to see that. One of the reasons that
3 that may have come back on later days is because, One, we had some
4 inleakage problems in the, from the river water systems from what we
5 call the RR pump, we had significant packing leakage that went into the
6 sump. We pumped the sump to the Auxiliary Building sump tank. We
7 filled the Auxiliary Building sump tank. The Auxiliary Building sump
8 tank off the recirc pump has a blown rupture disc on it and the tank is
9 isolated from the vent header as a result of that. That was a pre-accident
10 situation. It was not a very significant situation really because what
11 perhaps is significant is that goes-in-pumps pump faster than the
12 goes-out-pumps to the tank and consequently the rupture disc had a
13 tendency to blow. If you got the water going in faster than you can
14 take it out, you can have that situation happen to you. So at any
15 rate, we may have set up ourselves a chain between the Auxiliary Building
16 sump, the Auxiliary Building sump tank, and the Miscellaneous Waste
17 Holdup Tank where we were just recircing water and ended up recircing
18 water onto the floor between those three tanks. We don't know that for
19 a fact that that's where the water came back from. One other thought
20 that water came from is the Seal Water Pumps for pumps like the Waste
21 Transfer Pumps had tripped as a result of the, basically overloads that
22 had taken out Unit substations as result of the water in the Reactor
23 Building, those pumps came off the same switch gear which had been
24 disabled when the Reactor Building sump pumps and other pumps had
25

1 tripped. Now whether that was the specific result of that I don't
2 know. Happened before I got to the plant that morning, never did hear
3 subsequent conversations, however, the Seal Water Pumps would have not
4 being running, not having been running, could have caused water to leak
5 out on the floor while these pumps pumped, waste transfer pumps, other
6 pumps in the Radwaste System. That also could of been a cause of the
7 water.

8
9 HUNTER: Okay. The, was the water apparently reactor coolant or could
10 you tell?

11
12 SEELINGER: The water was high.

13
14 HUNTER: High, real high.

15
16 SEELINGER: I won't say it was reactor coolant.

17
18 HUNTER: Okay, it was hot water though.

19
20 SEELINGER: Let's say that it originated, that we feel that at least
21 initially the water that was on the floor originated from the Reactor
22 Building. It could of been a mixture of injection water that had been
23 mixed with reactor coolant. Subsequently it ended up in the drain
24 tank.

1 HUNTER: Your understanding of the condition of the Bleed Tanks at
2 that time in Unit 2 were they fully operable?
3

4 SEELINGER: Yes.
5

6 HUNTER: No problems with the Bleed Tanks, was the only problem with,
7 the only problems that you had at that time tank-wise would of been,
8 are you aware of any other problems besides the rupture disc which had
9 been previously blown in the Auxiliary Building Sump Tank?
10

11 SEELINGER: No.
12

13 HUNTER: Maybe you, in your discussions you know, that it might have
14 come up.
15

16 SEELINGER: No, no I'm not aware of any other tank problems.
17

18 HUNTER: Okay.
19

20 SEELINGER: And that didn't disable the tank, it's a small tank 2-3,000
21 gallons.
22

23 HUNTER: I understand. It made it, it provided a flow path to the
24 Auxiliary Building.
25

1 SEELINGER: That's right.

2
3 HUNTER: Sump, floor, sump drains. Okay I understand that. Okay, you
4 went back to Unit 1 at 1700.

5
6 SEELINGER: Nominally, yes.

7
8 HUNTER: And then, yes approximately, and then what time did you end up
9 back in Unit 2 again?

10
11 SEELINGER: I don't really know. I think it was around 2200, but I'm
12 guessing it.

13
14 HUNTER: Okay, what was the plant condition when you got back?

15
16 SEELINGER: Well by that time when I was in Unit 2 I got a call from
17 Mike Ross about 8 o'clock at night or so.

18
19 HUNTER: Okay.

20
21 SEELINGER: And we had gotten the reactor coolant pump on the line, now
22 that had been our objective earlier in the day when I had been over in
23 Unit 2. As I remember it was our objective but I'm taxing my memory at
24 that point. But I think that's the direction we were trying to move
25

1 but hadn't gotten one on yet at that point, but we finally got reactor
2 coolant pump on nominally 1945, 8 o'clock, somewhere in that neighborhood
3 and when we got the reactor coolant pump on we were able to get rid of
4 the bubble in the "B" Loop. Temperatures had stabilized around 320
5 some odd degrees and our initial impulse at that time, I remember
6 talking to Mike on the phone about it, is that we're just gonna, every-
7 thing is good right now and we're gonna go down and cool down, normal
8 cooldown, we're in a position to execute a normal cooldown, that was
9 our initial thinking. And I think we came really quite close to that.
10 We got held, and I think we got held about that time from some offsite
11 direction. So the other problem that we had at that time as I remember
12 it, although we had the bubble gone from the loops, the saturation and
13 I'm doing this from not from memory of the incident at the time although
14 I did take, yes I guess I am, I'm looking back at a couple of things I
15 wrote down at that time that I don't remember that until I look at it,
16 but the saturation pressure temperature relationship with the pressurizer
17 didn't match the pressure in the system at that time. Although the
18 bubbles appeared to be gone from the loops themselves, we were still at
19 too high a pressure for the temperature that we were seeing in the
20 pressurizer.

21
22 HUNTER: Then what did that mean to you at that time?
23
24
25

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1 SEELINGER: Well, you know I know what it means to me now.
2

3 HUNTER: No, what it meant to you then.
4

5 SEELINGER: At that time, I'm assuming in going back that it still had
6 to mean the same thing it means to me now. We had a lot of inputs that
7 day, but you know that had to mean you got a bubble still in the head
8 of the reactor and you know that's still where your pressurizer is.
9

10 HUNTER: But you were at that time if I'm following the logic pay up,
11 you were in fact, solid at that time with the makeup system in operation
12 and some letdown.
13

14 SEELINGER: That's correct.
15

16 HUNTER: But you were setting with a full pressurizer at that time.
17

18 SEELINGER: We still had a full pressurizer at that time.
19

20 HUNTER: Okay.
21
22
23
24
25

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1 SEELINGER: And we were trying to drain but draining under that set of
2 circumstances isn't gonna cause a bubble because the pressurizer is not
3 your hot spot in the system for your system pressure.
4

5 HUNTER: Do you recall at that time discussions in the afternoon or in
6 the evening, discussion of the letdown flow path, of the letdown flow?
7

8 SEELINGER: Yeh, we were working towards trying to get, because there
9 had been some discussion earlier that day that we thought maybe we had
10 demineralizers or filters that were causing the letdown path to be such
11 that we couldn't get adequate letdown, and as it turned out we bypassed
12 those and still didn't, there was some thought about trying to change a
13 filter in the letdown system, which from a radiological standpoint
14 would of really been difficult. And we were able to bypass those and
15 saw no change in letdown flow and therefore, I do remember that we
16 felt, gee it's not filters we just got something else that we plain
17 can't fully explain perhaps we have some boron crystallization from the
18 amount of boron we put in that's blocking flow paths. On subsequent
19 days, we cut down on the cooling water flow from the letdown coolers in
20 attempts to heat up, heatup the system and get more flow to take any
21 boron that had crystalized, trying to get it back into solution. But
22 during that day specific to letdown flow we had determined that, as I
23
24
25

1 remember, I maybe on the next day, because it runs together. But as I
2 remember it, we determined that filters were not specifically the
3 problem.

4
5 HUNTER: Okay.

6
7 SEELINGER: I can well be on the next day because I don't how we would
8 of determined that that day. I don't think we had anybody in the
9 building to determine that.

10
11 HUNTER: Okay. Looking at the plant, if in fact, the charging rate was
12 a certain, you were charging at a certain rate to the makeup system,
13 and you were, your intention was to letdown and the fellows had the
14 letdown orifice open in a matter, really and/or the bypass open, there's
15 a relief valve on the letdown line.

16
17 SEELINGER: That's correct.

18
19 HUNTER: Which would place, at zero flow, would place the reactor
20 coolant pressure, on the, attempt to place reactor coolant pressure,
21 raise the letdown line to reactor coolant pressure which obviously
22 won't happen, the relief valve would lift. Now that relief valve goes
23 to the Bleed Tank supposedly.

24
25

1 SEELINGER: That's correct.

2
3 HUNTER: Are you, in your experience at the plant, is there any way to
4 your knowledge that you can say it does go to the Bleed Tank and not
5 somewhere else?

6
7 SEELINGER: I wouldn't know.

8
9 HUNTER: Not to the floor.

10
11 SEELINGER: I wouldn't know that.

12
13 HUNTER: Okay. I'm trying to make sure that the paths, the communication
14 path outside the containment is obvious at that time with letdown
15 makeup. Containment isolation is complete and verified so you only
16 have a certain amount.

17
18 SEELINGER: There're only a finite number of possibilities. That's ...

19
20 HUNTER: And that's what, I'm looking at those paths.

21
22 SEELINGER: We feel that, but this is really a hind sight kind of
23 thing. We feel that one of the things may have been through the Waste
24 Gas System where that communication was. And that the, some of that

25

1 communication happened off the RC drain, off the RC Drain Tank, and
2 that it, perhaps went to the Air Water Separators and the Waste Gas
3 Compressors. And then came out onto the floor ...
4

5 HUNTER: When you flooded the gas system?
6

7 SEELINGER: From that point. But right now, how the water got there,
8 remains somewhat of a mystery. Hhowever, it's significant to note that
9 when there was an operator tour through the building at 7:30 in the
10 morning, that water wasn't on the floor.
11

12 HUNTER: I understand that. Also you said that ...
13

14 SEELINGER: And in the afternoon it was on the floor.
15

16 HUNTER: It's also significant to note that at 8 o'clock you had a
17 building isolation.
18

19 SEELINGER: That's right.
20

21 HUNTER: So that everything was isolated with the exception of these
22 finite paths that were available.
23
24
25

1 SEELINGER: That's right.

2
3 HUNTER: That's, I'm getting down to that point, I just want to know if
4 to determine if you had any, make sure that I'm following the logic
5 that you used during the daytime.

6
7 SEELINGER: Yeh, we did talk about relief lifting during that period,
8 whether or not it was that day or the second day, it's hard to say.

9
10 HUNTER: Was a check made on the Bleed Tank at that time to see if the
11 Bleed Tank level was increasing? The Bleed Tanks are hot, the Bleed
12 Tanks apparently also, through whether it's a three-way valve or from
13 some path, have, at least one has reactor coolant in it or some amount
14 of it.

15
16 SEELINGER: Well, during that period of time when we tried to letdown,
17 if you would have had a full pressurizer, the natural operator action
18 would have been to letdown to the Bleed Tank ... and to ...

19
20 HUNTER: To divert it.

21
22 SEELINGER: ... Divert the water to the Bleed Tank through a three-way
23 valve.

24
25
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1 HUNTER: If he wasn't diverting through that path, it would of been
2 diverting to the relief valve anyway, if the relief valve goes.
3

4 SEELINGER: If a relief valve lifted, it would of ...
5

6 HUNTER: ... Did you have indication that letdown flow, which is
7 indicated not recorded, was varying plus or minus 20 gallons around 1
8 orifice, 45 gallons plus or minus 20 gallons, which would be indicative
9 of a relief valve lifting, for a substantial, or some amount time other
10 in the morning. I'm just trying to get a feel for that.
11

12 SEELINGER: I have not heard that.
13

14 HUNTER: Apparently the operators didn't know, hadn't really put that
15 together.
16

17 SEELINGER: Put that together.
18

19 HUNTER: Put that together and he wasn't, that maybe thinking he was
20 going through a three-way valve which is downstream from the filters
21 when he really wasn't, he was going through a ...
22

23 SEELINGER: That's very possible.
24
25

1 HUNTER: An upstream flow path which still didn't really, it got the
2 water where you wanted it hopefully. But hopefully, that it was piped
3 not to the Auxiliary Building Sump Tank.
4

5 SEELINGER: Yeh.
6

7 HUNTER: Or I'm not sure of that yet, myself nobody's been down to
8 check the line to make sure ...
9

10 SEELINGER: It'll probably be awhile till that gets checked.
11

12 HUNTER: That's right. That it goes to the right place.
13

14 SEELINGER: This is just a matter of interest that really posed a
15 significant problem. The radiation levels during the day in terms of
16 being able to investigate things, just put us in a completely different
17 set of circumstances than we'd really ever imagined ourselves in.
18

19 HUNTER: Yeh, the only way we would of known whether it was a letdown
20 path that was the problem would of been to isolate the letdown totally
21 at the containment if you will, and then made a attempt to see if no
22 more water was entering the Auxiliary Building.
23
24
25

683 069

1 SEELINGER: If I'm not mistaken, that does on an ES Actuation isolate,
2 MUV 376 I think shuts on an ES signal.

3
4 HUNTER: That is true, but that was the only path out of containment to
5 maintain pressure, that was the normal pressure control. You put it
6 get right back on and do every, you know, that's the normal procedure
7 as long as its pressurized and it's available, then it's not really a
8 containment isolation problem, per se. But it was a path. We're gonna
9 look at that more too, but I think you got, it appears you were at
10 catch 22 at one point where you needed something to maintain pressure,
11 so we'll cover that. Let me ask you a couple of general questions in
12 your experience with Units 1 and 2. Unit 1 and 2 is, Unit 2, has had
13 previous trips similiar in nature to this where the, actually lost the
14 feedwater, and the reactor went on high pressure.

15
16 SEELINGER: Yes, yes.

17
18 HUNTER: Power operated relief valve operates on this plant. Can you
19 give me a general feeling of how, what you considered maybe the difference
20 between Units, significant differences between Unit 2 as far as the way
21 they respond to trips, pressurizer level that type of thing? Based on
22 your experience, your review of your trip reports and your review of
23 the transient, if there is a significant difference and the way they
24 respond?
25

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1 SEELINGER: Yeh, I think I can give you a feel for that, that feedwater
2 and condensate system is much more sensitive in Unit 2 and operated
3 much closer to design limits than in Unit 1. You got to, I think
4 perhaps, appreciate the fact that Unit 1 is a 100 megawatts electrical
5 smaller unit than Unit 2. And in terms of thermal, Unit 1 is 25-35 or
6 27-72 in Unit 2. And we have experienced trips of the feedwater and
7 condensate system in Unit 2. Many of them were associated with startup,
8 consequently didn't seem to be abnormal from a standpoint of something
9 that you wouldn't expect during a startup situation. Seldom did we
10 just run along and all of a sudden we had a trip of condensate pump,
11 usually it was attributable to some kind of a condition, perhaps bringing
12 the heater drain system on the line because we had some initial problems
13 with our heater drain system during the startup on Unit 2. That we had
14 one or two times, prior to this, with our condensate polishing system
15 where either through an operator or maintenance technician error, or an
16 air system, not err but air type system problem where flow got inter-
17 rupted through the polisher, and I may have my two units confused here
18 at this point.

19
20 HUNTER: No, I'm fine, go ahead.

21
22 SEELINGER: The feedpump turbines on Unit 2 trip on low suction pressure.
23 Unit 1, the feedpump turbines don't trip on low suction pressure. When
24 the both feedpumps turbines trip, the reactor, the turbine trips, the
25

1 turbine generator trips, and when the turbine generator trips the
2 reactor may or may not trip but it's certainly runs back and does goes
3 through a heck of a transient. Now on Unit 2 we had what I'll call
4 three significant, let me ask a question Frank on this, how long how
5 much longer do you think this tape will be?
6

7 HUNTER: I've got a few questions.
8

9 SEELINGER: I've got a 1 o'clock meeting that I've ...
10

11 HUNTER: I need 5 minutes.
12

13 SEELINGER: Can we wrap it up to about 5 to 1, would that, can we
14 shoot for that?
15

16 HUNTER: Yes, we'll try to do it.
17

18 SEELINGER: Okay.
19

20 SINCLAIR: We have about three minutes of tape left.
21

22 SEELINGER: We had three significant incidents, what I'll call it
23 significant incidents in Unit 2, and all three involved ES's. The
24 first incident happened on ironically on March 29, 1978, one day short
25

1 of a year from this and that incident happened when we lost power to
2 one of the vital buses in Unit 2 and we lost power to the electromatic
3 relief valve failed open, and at that time we had no indication of
4 electromatic relief valve failure in the Unit 2 Control Room. We were
5 all relatively surprised at how quickly the plant blew down and we blew
6 down to an ES situation. At that time the sodium hydroxide tank was
7 hooked up to in parallel with the Borated Water Storage Tank and we
8 injected sodium hydroxide into the reactor vessel, and the chloride
9 contamination from the sodium hydroxide was such that we had to get,
10 cleanup chlorides for quite some time and in addition to make some
11 plant changes. Not a significant number of plant changes got made as a
12 result of that, I think we were just a little bit, perhaps a little bit
13 naive at that point in time relative to how much indication and so
14 forth the operator needed. We made a little bit of noise that gee this
15 isn't right and so forth but we were under a construction kind of a
16 situation in the startup of the plant at times and in retrospect that
17 particular situation we felt well we understand why it happened, we
18 understand why we lost the power, we're gonna fix why we lost that and
19 weren't not gonna have this problem again. On April 23, 1978 we had a
20 very significant trip. The trip was significant in that it was our
21 second ES, we again dumped the sodium hydroxide in, we again had the
22 chloride problem. We had problems with our main steam relief valves.
23 We ejected liners out of the main steam relief valves, you probably
24
25

1 read the reports on that and so forth. They even, one of them landed
2 on top of the trailer, they were trapped now and they were large, this
3 big around and they're this long and they're stainless steel and we
4 were lucky we didn't kill somebody and that accident got a very hard
5 look and in fact I wrote the report up on that, the onsite report, who
6 was about 3/4 inch thick at least, perhaps an inch. And went through a
7 very detailed analysis of why what had happened, happened, and as a
8 result of that we were able to execute what we thought to be some very
9 significant plant changes to help ourselves out of this situation.

10
11 HUNTER: Okay.

12
13 SINCLAIR: The time is 12:39 p.m. and we're gonna continue on Tape 4.

14
15 SINCLAIR: The time is 12:40 p.m., and we are continuing the interview
16 with Mr. Seelinger.

17
18 SEELINGER: When we had that particular trip, we had very rapid cooldown,
19 because the relief valve stuck open. We blew down cooled down to 130½
20 is about 3 minutes. Those are normal values. But in a minute we
21 emptied I don't want to say it that way, we lost pressurizer level
22 indication. Whether or not we emptied the pressurizer we well could
23 have emptied the pressurizer. We did quite a bit of analysis. I would
24 have to read back through it to make sure if we knew the specific
25

1 details. However we lost pressurizer indication and had it off scale
2 low for a period of an actual off scale reading for a period of a good
3 minute or so. The relief valves finally reset after 3 1/2 minutes. We
4 went into a very lengthy program to replace all the main steam relief
5 valves with completely different designed valves and it took the period
6 of the summer. But during that time we also recognized the need to
7 have indications on some vital pieces of equipment, one of which being,
8 one of which was the electromatic relief valve, and we put up to that
9 time we had no indication and as a result of that trip we got our two
10 cents worth in terms of getting indication on that. And I think it was
11 as a result of that but it may have been as a result of the previous
12 one. We had a light that flashes like a flash bulb up there, there was
13 a red light on the electromatic relief valve. Excuse me. But it is
14 the signal going to the valve as I am sure you've heard before opposed
15 to the actual valve position, which seemed to be a the way to go at the
16 time. In retrospect that was a bum decision, but that's Monday morning
17 quarterbacking and that's done. Perhaps what was practical at the
18 time. We were relatively happy by the changes that got made. One of
19 the other things I did is I ended up putting had a microphone put so
20 you could hear any steam reliefs lift. I'm still pleased with that
21 because the operator has thousands of inputs to look at but he has very
22 little to hear other than two or three alarms which really don't mean
23 too much other than he has an alarming condition. He has no ear pri-
24 oritization in this thing, if you will. Where I thinks it's very
25

1 important to have something other than the eye sensors because you can
2 only observe so much with your eyes. It is very difficult as an operator
3 in that vast control room to try and pick out what's happened. That
4 terribly difficult. But I know that if I hear a main steam relief lift
5 on my microphone I know I have a turbine trip and I better look and see
6 if I got a reactor trip. And I could tell you how to respond with
7 either of those two, so we put a microphone in, but the big point is
8 that the pressurizer did go very low and did so as a result of that
9 rapid cooldown. Now we had a trip in November in which as I remember
10 it we also we had an ES again. This was caused by a runback which
11 eventually became a trip. We had an elevated T_h to perform a test
12 during a test program and I'd have to dig out all the particulars on
13 that one, I didn't write that report, I don't feel as familiar with
14 that without refamiliarizing myself with the report. But as I remember
15 it, the pressurizer level again went quite low and when we talked to
16 one of the other plants that's of the same vintage as Unit 2 is as
17 opposed to Unit 1 and they have also had the problem of the low pres-
18 surizer level as a result of transients. So the pressurizer in Unit 2
19 is in my mind more of a concern than Unit 1 and I guess I'd have to say
20 it's more of a concern because you are operating at a higher power
21 level and because of that higher power level it just plain seems to
22 affect the plant differently as a result of the tran. You got more heat
23 that all of a sudden you are dealing with to relieve as on your main
24 steam relief valves, as a result of that kind of a transient, perhaps
25

1 it's the particular situations that we were in, but we did see at least
2 two situations in which we saw rapid cooldown in a transient kind of
3 situation effect the level in the pressurizer somewhat severely.
4

5 SINCLAIR: Yeah. During these events it appears that the operators
6 upon a unit trip closed the letdown flow off, they did it very quick in
7 fact, and start the second make-up pump
8

9 SEELINGER: Yes.
10

11 HUNTER: This in fact is a result of these transients of the plant.
12

13 SEELINGER: This is what's called for in our emergency procedure.
14

15 HUNTER: Right, but the development of those emergency procedures said
16 to start the second make-up pump
17

18 SEELINGER: That I would have to say that was out of the original B&W
19 draft procedures, because we wrote in it two procedures from Unit 1's
20 and they were that step was in Unit 1's procedures, and still is.
21

22 HUNTER: Okay.
23
24
25

1 SEELINGER: In other words when a reactor trips we start a second
2 make-up pump and shut the letdown isolation valve.
3

4 HUNTER: And it is.
5

6 SEELINGER: It may be in Unit 1 I can't remember if it's shut it neces-
7 sary...
8

9 HUNTER: It's not automatic?
10

11 SEELINGER: Doesn't start automatically it is an operation action.
12

13 HUNTER: I noticed that and also at pressurizer level went down to 20
14 inches you would have started the third makeup if available.
15

16 SEELINGER: That's correct.
17

18 HUNTER: Okay. So that is in lieu of trying to get the pressurizer
19 level back or maintain it.
20

21 SEELINGER: That's right.
22
23
24
25

1 HUNTER: Okay. In the in this particular transient, the operators had
2 the spray valves in the heater in manual...

3
4 SEELINGER: In the beginning of it, you know, or during it?

5
6 HUNTER: During it when he saw the trip he turned put everything back
7 to automatic due to leakage to the power operated relief valve, while
8 boron concentration in the pressurizer was increasing. To your know-
9 ledge is this a routine type evolution?

10
11 SEELINGER: To take manual control of the spray valve is not a routine
12 kind of thing, the operator typically has taken manual control of the
13 spray valve when he gets a, if he gets a trip that does not result in a
14 reactor trip. It may have been the result of the operator taking
15 manual control of the spray valve and mitigating the pressure the
16 upward pressure excursion by spraying down.

17
18 HUNTER: I understand they do that.

19
20 SEELINGER: Yes.

21
22 HUNTER: But in this case they had upwards of a few gallons a minute
23 indicated leakage to the reactor coolant drain tank from the power from
24 sources including the power operated relief valve.
25

1 SEELINGER: Prior to

2
3 HUNTER: And they were correcting it by taking a corrective volume on
4 the reactor coolant drain tank to maintain to pressurize the minimize
5 the leakage to less than a gallon a minute.

6
7 SEELINGER: I didn't know that.

8
9 HUNTER: Okay. Is that a routine have you ever seen that done before
10 or would that be a routine that you are aware of?

11
12 SEELINGER: Not that I'm aware of.

13
14 HUNTER: One more question. The reactor

15
16 SEELINGER: That doesn't mean it isn't a routine. Don't get that
17 wrong.

18
19 HUNTER: Okay. Not that you are aware of okay. One other thing I want
20 to touch on and then I am going to drop, the reactor power the reactor
21 continued to operate for eight seconds after the turbine trip, feed
22 pump trip, turbine trip, aux feed pump start, all time zero, the reactor
23 did not the power level did not appear to go down or change until after
24 the reactor trip, does that

25

1 SEELINGER: Based on what?
2

3 HUNTER: Based on the power range indication and the reactimeter, it
4 took, the reactor continued for eight seconds. The power actually
5 increased upwards of 100%, indicated.
6

7 SEELINGER: Okay.
8

9 HUNTER: Is that reasonable that the ICS system or the runback did not
10 take effect during that time? Or that the rods are operated out so far
11 that the power that derived did not have time to take effect?
12

13 SEELINGER: I think that it was a combination of those two things plus
14 zercing the reactimeter from what I'd seen before, is all so terribly
15 difficult to initialize your time zero that when the signal actually
16 happened to go to the thing versus what time we actually had a trip.
17

18 HUNTER: Right. We used a number of charts including of course the
19 chart on the plant.
20

21 SEELINGER: The chart of the plant would not be enough fast to see.
22

23 SINCLAIR: Right, well you can see the spike , you know, that it does
24
25

1 SEELINGER: Your time sequence is that

2
3 HUNTER: Obviously it's not the accuracy _____

4
5 SEELINGER: It is not a high enough speed recorder to zero all your
6 times on. I guess I'm saying that I don't think the eight seconds
7 would be unreasonable given the variables I've just given you.

8
9 HUNTER: Okay.

10
11 SEELINGER: Because I think that there's sufficient error in those
12 variables that I have no reason to believe that the plant performed as
13 designed from the standpoint of the reactor trip.

14
15 KIRKPATRICK: I would like to ask just a few brief questions it shouldn't
16 take me too long, and what I'm trying to do is to establish what people
17 were thinking during that first time period when the reactor in the
18 morning. You mentioned that later on in the evening you were using the
19 pressure temperature in the fact that the pressure-temperature and T
20 sat were not consistent for the pressurizer in determining that you had
21 a bubble. Earlier in the morning was there any attempt to determine
22 that pressure-temperature relationship and how saturated temperatures
23 fit?

1 SEELINGER: I don't know Don. I just don't remember. I was there for
2 a couple hour period I don't remember during that period other than I
3 know we felt like we had bubble. You got to remember that we didn't
4 know what the temperature was.
5

6 KIRKPATRICK: I see.
7

8 SEELINGER: Because of the incore thermocouples had question marks and
9 the T_h was in excess of 620 and we knew that what our pressure was, and
10 we knew that we had temperature in excess of the saturation temperature
11 for that pressure.
12

13 KIRKPATRICK: So then you knew you did have superheat.
14

15 SEELINGER: Yes. That's true.
16

17 KIRKPATRICK: Do you know if anyone understood why you had superheat?
18

19 SEELINGER: Well, yes and no. We don't understand it. We didn't
20 understand it then with the same clarity that we understand now. It is
21 very difficult to understanding it now and try to remember exactly what
22 you understood at that point.
23
24
25

1 KIRKPATRICK: Well

2
3 SEELINGER: We knew that we had a bubble. The people that were directing
4 the casualty between 8 and 10:00 in the morning and for a good share
5 of the day, had not seen the entire unfolding of the evolution. They
6 had come in after the evolution was unfolded and had to pick it up from
7 that point. So to specifically say that they understood each step of
8 the sequence of steps, I would have to say no. We probably didn't
9 understand each and every detail until the next morning in terms of
10 when we had time to sit back and we knew we had a bubble, we knew what
11 we had, in terms of knowing exactly how we got there. We had that
12 feeling.

13
14 KIRKPATRICK: I am not trying to key on every each and every detail.
15 What I'm saying is the fact that there was superheat would imply that
16 there were metal surfaces in there that were hotter than the water
17 temperature. Were people aware of this at the time?

18
19 SEELINGER: I would say that we probably were aware of it. We may not
20 have realized the significance, but I'd have to say we were aware of
21 it. We were aware we hadn't taken heat out with the steam generator.
22 We were aware we hadn't any flow and we were aware that we had a terrific
23
24
25

1 heat sink or I should say a terrific heat source in the fuel. We were
2 therefore aware we had steam bubble somewhere that was causing the
3 temperature to be very very high for the pressure that we were at.
4

5 KIRKPATRICK: Did you think at that time that you had uncovered the
6 core? That a core had been uncovered?
7

8 SEELINGER: I think that the thought certainly had crossed our minds.
9 We in retrospect for the fact that we had all this radiation that we
10 had never really thought about dealing with before (unintelligible).
11 This presents a hard statement on ourselves. The levels that we had not
12 imagined before in terms of radiation, nor had anyone dealt with before
13 in this magnitude, had to say that we had done some core damage, somehow.
14 The logic way to assume it is that the certain portions of it were
15 atleast uncovered.
16

17 KIRKPATRICK: Well at one time you said that there was consideration
18 for cutting off the pumps and actually did I guess get cut off the
19 pumps. Was this in the belief that you already were full of water at
20 this time?
21

22 SEELINGER: Well I'd have to even go back and listen to what I said
23 before that time because I don't remember if maybe you can take me back
24 two or three hours after talking this long.
25

1 KIRKPATRICK: It's rough, that's rough.

2
3 SEELINGER: If you remember that discussion I think I said something to
4 the fact that as I sit here I don't remember specifically what our
5 logic was but what it may have been. It may have gone along these
6 lines but that's me thinking about it now as opposed to what we said
7 and thought at the time, because I don't remember.

8
9 KIRKPATRICK: Well the reason I'm asking these things is that obviously
10 people didn't have enough information available to really assess the
11 situation. And you wonder what kinds of things would have been helpful
12 to have had there. So what I am trying to establish is what people
13 thought. In other words

14
15 SEELINGER: Well I think it's safe to say that rather than what we
16 thought what we knew, we knew we had a full pressurizer and we knew
17 that we wanted to get the bubble back into the pressurizer somehow. We
18 wanted to establish this thing in a normal set of circumstances, but
19 how to get from where we were to that point we were severely restricted
20 in what we had available to us. We had a vent that was operable in the
21 pressurizer

22
23 KIRKPATRICK: Yeah.

1 SEELINGER: We had pressurizer heaters that were operable and we had a
2 reactor coolant pump. We had make-up pumps operating that we knew
3 could put out about 3000 pounds in terms of pressure, and after that we
4 had the core flood tanks. Those were the kinds of variables and systems
5 available to us that we could take our pick from, indication or not,
6 that's about it. And so we had to kind of choose from those which to
7 manipulate. If you go back and look real hard you come up with those
8 but this is monday morning quarterbacking if you go back to the basic
9 principals of the whole thing and you got pressure, temperature, and
10 flow those are the things that protect you. Those three items and the
11 big one that got us out of the whole thing it was flow. We got the
12 flow back from the reactor coolant pump. We kept the flow from the
13 make-up tanks once we decided that we don't understand what we have
14 well enough to secure it we started it back up after a matter of minutes.

15
16 KIRKPATRICK: It appears after the fact that your main problem was that
17 you simply didn't have enough water. What I am trying to get at is
18 how you could have known at the time with what the water level was? If
19 in fact there was a way to determine what it was?

20
21 SEELINGER: Water level on the floor?

22
23 KIRKPATRICK: Water inventory in the primary systems basically more
24 importantly.

1 SEELINGER: We didn't know what that water inventory was. We did not.
2 Not at the time. We didn't know what the size of the bubble was,...that
3 I remember. We felt there was a bubble but
4

5 KIRKPATRICK: As far as actually what the water level was you had no
6 idea at all.
7

8 SEELINGER: You've got to remember now. It's pressurized water reactor
9 not a boiling water reactor. People aren't use to speaking in terms of
10 what was the level in the core, what's the level in the reactor vessel?
11 People are used to thinking what's the level in the pressurizer. The
12 pressurizer level was full.
13

14 KIRKPATRICK: So.
15

16 SEELINGER: Our training in terms of how to operate these things you
17 got to throw that out the window in terms of level control.
18

19 KIRKPATRICK: So what I'm saying is, from what you are saying, people
20 must then have believed that there was water in this primary system.
21 Basically it was full in other words, even though you may have had a
22 bubble somewhere.
23
24
25

1 SEELINGER: The initial thinking, I'm guessing here, but I am sure
2 that the initial thinking of the operator based on his actions was yes
3 the primary system was full. He had every reason to believe with the
4 exception of decreasing pressure that it was full.

5
6 KIRKPATRICK: Now I am specifically talking about this time period
7 when you were in the control room.

8
9 SEELINGER: We knew we had water. We felt very strongly that we had
10 water in the reactor coolant system. Whether or not and how much of
11 the core was covered I don't think we didn't really have any way to
12 know that at all. We knew we knew we had some kind of a bubble. We
13 knew that the relationships in the thermodynamic properties and it
14 didn't fit for not having a bubble.

15
16 KIRKPATRICK: Alright I have one more question and that is do you have
17 any recommendations on what kind of instrumentation would have been
18 needed, should exist to prevent or to control a situation such as this
19 in the future?

20
21 SEELINGER: Well, yeah I do. I think that the control room itself is a
22 mish-mash of instrumentation. I think that there is far too much to
23 expect any person to digest. It's far too much to ask a Ph.D. to digest,
24 or the best operator in the world. There is absolutely no prioritization
25

1 of alarms of indication or whatever, you know, at control rooms of the
2 nuclear power plants of our particular vintage. It's quite obvious
3 that the fact that you have an alarm on a condensate polishing system
4 or on the screenhouse whatever system, doesn't deserve the same kind of
5 priority as low pressure in the reactor coolant system. I've seen this
6 suggestion twice and I think it a real good one to pressure-temperature
7 printout versus saturation pressure temperature on a CRT type presentation
8 would be just very very valuable piece of information for the operator.
9 The other thing that it would do is that it would take him back to the
10 real basics of what he is trying to do and that's where I think that I
11 won't say that we got fouled up because I think our operators had a
12 pretty good picture of that with what they had available. But I do
13 think that we tend to become easily distorted with everything else and
14 all the other inputs that he's got. Level, you know, we used to key on
15 level control because it was a pressurized water reactor, that's level
16 control. We now that that's not right anymore. Level control is not
17 necessarily meaningful as it was not in this particular situation.
18 Under most situations it is meaningful, but not under this one. So
19 therefore pressure, temperature, and flow are your big ones.

20
21 KIRKPATRICK: You mentioned the fact that the instrumentation is not
22 prioritized and it's quite confusing; however, assuming you can't
23 believe the level which is apparently what the problem is in this
24 particular case, under certain circumstances, and you say that level
25 simply is not right.

1 SEELINGER: That level was full, that level was right.

2
3 KIRKPATRICK: Is there any way that the operator can determine the
4 primary coolant inventory?

5
6 SEELINGER: His inventory?

7
8 KIRKPATRICK: Assuming he knows every bit of information he's got on
9 that on instruments?

10
11 SEELINGER: Oh sure I'm sure there's a way but I can't tell you what it
12 is. I'm sure you could develop a program or simple calculation to do
13 it.

14
15 KIRKPATRICK: Other than some kind of a time history math balance I'm
16 talking about given an instant time is there any instrument he can look
17 at that can tell him how much water he's got in the primary system?

18
19 SEELINGER: No. Not installed instrument.

20
21 KIRKPATRICK: Do you think something like this might be needed?

22
23 SEELINGER: Possibly. I think we could talk to BWR people and get a
24 feel for it. I don't have any experience on a BWR, so I just plain
25 don't know. I'd be blowing smoke if I told you.

1 KIRKPATRICK: I think that is all I have.
2

3 HUNTER: Let me ask one question, Hunter speaking, again. Your experi-
4 ence at this plant, are the fellows afraid to take this palnt, would it
5 bother or would it bother you or in your training, does it bother or
6 would it bother you to take this plant solid to fill the pressurizer
7 tank solid and take it to the safety valve setpoints?
8

9 SEELINGER: It wouldn't bother me. I'd like to, you know, I mean it's
10 an evolution that I would like to think about before I did it and make
11 sure I fully understand that evolution, but I was prepared as one of
12 the Shift Superintendents, to take the plant solid should had I lost
13 pressurizer level indication, because that was certainly in the first
14 two days of our recovery from this thing. It looked like a very real
15 possibility. We lost LT-1 as I remember was the transmitter that we
16 lost, and we had two more left and I fully knew that there would be all
17 kinds of help from the rest of the world, the NRC in approving our
18 procedures and so forth. But had it gone in one of those first five or
19 six days, I knew that it would be me that it was going to have to do it
20 and in spite of everybody else and all their wonderful suggestions, I
21 was ready to do it. That first day if I had to take it solid I would
22 have taken it solid.
23
24
25

1 HUNTER: A question, to comment earlier about temperature-pressurization
2 curve printout, the temperature-pressurization then in fact, with the
3 pump running with flow natural connection the temperature pressurization
4 printout then would guarantee operation above the saturation pressure
5 for the temperature anywhere in the coolant system.
6

7 SEELINGER: That's right. That's right.
8

9 HUNTER: Do you feel like the guy, the fellows on shift, apparently
10 didn't have a feeling or an adequate feeling for temperature pres-
11 surization that morning?
12

13 SEELINGER: I don't know the answer to that
14

15 HUNTER: Was it full pressurized?
16

17 SEELINGER: I would have to say that that had I been on shift that I
18 don't think that I would have locked on to that in terms of the im-
19 mediate thing to respond to. I think that I would have probably responded
20 as they responded. Go on with the level because of all the training
21 received up to that point, the pressurizer level is stressed how to run
22 and when to run that reactor coolant pump is stressed. I think the guy
23 had the choice in terms of what thing to go with and he made his choice.
24 I don't think as it turned out it wasn't necessarily correct; however,
25

1 I think he called his indication pretty well he did great. I think. I
2 am very pleased with the operator response is what I'm trying to say, I
3 think he did a good job and I think he behaved correctly in relative to
4 the training he's been given and his indications under an extreme
5 amount of pressure.

6
7 HUNTER: You are keying on the training that he received and what he
8 knew of this sytem as the key issue.

9
10 SEELINGER: Yeah. I think that I think that per his training he has
11 received up to this point, I think that his response was good. I
12 really do. I think that and I'll say this before I quit, I think as an
13 industry let me say this, I think our training here at Three Mile
14 Island is meet or exceeded in most cases of the industry standards
15 significantly. I think our operators are well trained. They have
16 recently returned, I don't know if this specific crew had, but I think
17 they had recently returned from simulator training. I think within the
18 past month to two months. That's an optimum kind of time, you know, if
19 you don't have one of these things well you are familiar with the way
20 your transients behave. I think that well we have been aware of the
21 pressure temperature relationships and how important they are to safety
22 analysis and so forth, I don't think we have focussed in the right
23 place. I think we as an industry need to change our training considerably,
24 and look at this thing from a different aspect. I think we have got to
25

1 operate a little bit different aspect. I feel very strongly about that,
2 having been up there, having had to go through this go through the
3 pressure of this thing, I wouldn't want to go back up on the line
4 unless I felt very confident that I could keep this from happening
5 again.

6
7 HUNTER: May I ask a question along that line. The technical specifi-
8 cation has it in the front in section 2 safety limits. Those operators
9 did not have indications in front of them of safety limits per se all
10 of them, they had some of them, but they did not have temperature
11 pressurization displayed they were individually displayed. In other
12 words, pressure is a safety limit.

13
14 SEELINGER: That's a very good example.

15
16 HUNTER: Overpower or of temperature pressure relationship in this
17 plant is a safety limit.

18
19 SEELINGER: That's right.

20
21 HUNTER: That is not specifically

22
23 SEELINGER: There is no temperature pressure relationship displayed.
24
25

1 HUNTER: Displayed together, so that the operator can say hey I am not
2 within this box, I am not within this window.

3
4 SEELINGER: You have also got to remember he didn't have temperature.
5 He did not have temperature.

6
7 HUNTER: As long as the pumps were on he had temperature.

8
9 SEELINGER: After he lost the pump

10
11 HUNTER: Right, but after the

12
13 SEELINGER: He didn't have temperature.

14
15 HUNTER: That's right I agree. He had saturated pressure and that was
16 all, which he could have construed as temperature, but up until a point
17 that they turned the pumps off they had temperature.

18
19 SEELINGER: But he couldn't construe that to be temperature either.
20 Saturation pressure versus saturation temperature that doesn't tell him
21 anything. He had to be hotter than that.

22
23 HUNTER: I realize that.

1 SEELINGER: We were way down in pressure.

2
3 HUNTER: I realize.

4
5 SEELINGER: His incore thermocouples are the only indication he had and
6 those didn't printout other than as a question mark.

7
8 HUNTER: You're hearing what I'm saying. Pressurizer temperature was
9 not indicative of

10
11 SEELINGER: That's right.

12
13 HUNTER: the pressurizer, so he had pressure temperature relationship
14 to look at. He looked at them and he made a decision based on the way
15 he was trained, and it turned out monday morning quarterback day, it
16 was maybe the wrong decision, okay.

17
18 SEELINGER: That's right.

19
20 HUNTER: We'll key on the issue of getting him the appropriate instru-
21 mentation to tell him what he has and get him in that curve.

1 SEELINGER: But we have to be very careful and this we have to I feel
2 so strongly about this, we have to be very careful that this accident
3 does not get us a whole bunch more things. That's not what we need to
4 operate a nuclear power plant. We don't need more things. There are
5 too many things right now. There are too many systems, NRC's got too
6 many control points and I'll go on record and say that. It was just
7 beautiful to watch NRR and I am being a little subjective right now, to
8 watch NRR and I&E come in and each guise their checkpoint and when you
9 put all those checkpoints together, it's damn near impossible to operate
10 a nuclear power plant. When you put security and you put HP and you put
11 QC and you put tagging and you put personnel safety and you put pro-
12 cedures and then you put administrative requirements on trying to do
13 something, I not totally sure that we've offered ourselves any control.
14 We control so much that we don't have any control at all. We built
15 such a paper empire that we've lost sight of the objective. We've done
16 a hell of a great job of doing all that stuff that what we can respond
17 any place of concern, but the conglomeration of concerns is a terrible
18 and drastic mistake. And absolutely we as an industry are missing the
19 boat with all those concerns, for every new system we create we better
20 wipe out one or two old ones, at least two old ones or we're going to
21 end up with another nuclear accident, because we are going to loose
22 sight. I shouldn't have said that, no, I said that too strongly. We
23 are going to end up since it's going, we are going to end with a situation
24 that could be a dangerous kind of a situation. A situation where we
25

1 again don't have the control we need to operate an industry in something
2 that is potentially that has the potential for danger like this industry
3 really does have. We need to have control but you don't build controls
4 through so many systems that we can't get to the end point. We can't
5 cookbook a nuclear power plant. That doesn't offer us any control.
6

7 KIRKPATRICK: It appears to me though,
8

9 SINCLAIR: We are going to have to change the tape.
10

11 SEELINGER: We oughta change cause now you have me wound up. I was on
12 the end here.
13

14 SINCLAIR: The time is 1:11 p.m. We are going to take a break and
15 change t e tape here.
16

17 KIRKPATRICK: The a make sure you include this kind of...the a priori-
18 tization of alarms...make sure you clear that.
19

20 SEELINGER: Okay.
21

22 SINCLAIR: The time is 1:15 p.m.
23
24
25

1 SEELINGER: Okay, what I was trying to say is relative to what indication
2 the operator needs, if he doesn't need so much additional indication as
3 he needs perhaps a different groupings of indication and prioritization.
4 As an example, the pressure-temperature relationship that you gentlemen
5 spoke of, should certainly be plotted together for and compared to the
6 safety limit. Under an accident scenario he's never going to have the
7 time in his brain to be able to convert that together when he's got 10
8 alarms beeping at him, two other operators perhaps along side of him
9 trying to manipulate the controls, and he has to function in that kind
10 of a scenario. Very, very difficult kind of a scenario. Almost im-
11 possible from an human engineering standpoint. He doesn't have a very
12 good chance. So from that standpoint, the alarms, the printouts and so
13 forth, need to be very carefully prioritized such that there's a good
14 stuff...90% of that stuff in the control room he doesn't need to look
15 at. But let's make sure that we've got the 10% that he does need to
16 look at prioritized so that they're easily accessible, easily readable,
17 and that they can be used in conjunction with controls that he has a
18 very good real probable chance of doing the right thing at the right

19
20 SINCLAIR: This time is 1:11 p.m. and we are going to take a break and
21 change the tape here.
22
23
24
25

1 KIRKPATRICK: Make sure the prioritization of alarms. Make sure you
2 clear that. You know, make sure clear that.
3

4 MARSH: Okay, let's start the tape, the time is 1:15 p.m.
5

6 SEELINGER: Okay what I was trying to say is relative to what indications
7 the operator needs, is he doesn't need so much additional indication as
8 he needs perhaps a different grouping of indications and prioritization,
9 as an example, the pressure-temperature relationship that you gentlemen
10 spoke of, should certainly be plotted together and compared to the
11 safety limit. Under an accident scenario, he's never going to have the
12 time in his brain to be able to convert that together when he's got ten
13 alarms beeping at him, two other operators perhaps along side of him
14 trying to manipulate controls and he has to function in that kind of a
15 scenario. It's a very very difficult kind of a scenario, almost impossible
16 from an human engineering standpoint. He doesn't have a very good
17 chance. So from that standpoint, the alarms, the printouts and so
18 forth, need to be very carefully prioritized such that there's a good
19 stuff, 90% of that stuff in the control room he doesn't even look at.
20 But let's make sure that we've got the 10% that he does need to be
21 looked at, prioritized so that they're easily accessible, easily readable
22 and that they can be used in conjunction with controls that he has a
23
24
25

1 very good real probable chance of doing the right things at the right
2 time. And that's where we need to be. And I don't think you will find
3 that as an industry we are as close to that as we need to be.
4

5 KIRKPATRICK: I think you've got a very good point. Okay.
6

7 SEELINGER: I don't have any more gentlemen.
8

9 SINCLAIR: Okay, this is John Sinclair and we are going to conclude the
10 interview with Mr. Seelinger and it's 1:16 p.m. on May 8, 1979.
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